COUNTY OF TULARE

RESOURCE MANAGEMENT AGENCY

5961 South Mooney Boulevard
Visalia, CA 93277

Hash Farms (Andersen Village) Development Project

Draft Environmental Impact Report
(SCH# 2016091017)

December 2017

Prepared for:

County of Tulare Resource Management Agency
Economic Development and Planning Branch
Environmental Planning Division

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Hash Farms Development Project

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Appendix A: Air Quality & Greenhouse Gas

"Hash Farms Development Air Quality Impact Analysis and Greenhouse Gas Study." Prepared by Crawford & Bowen Planning, Inc., November, 2017.

Appendix B: Biological Resources

"Reconnaissance-Level Biological Evaluation of Potential Impacts Sensitive and Listed Species on a 46-Acre, 225-Unit Residential Subdivision in Kingsburg, Fresno County, California." Prepared by Kamansky's Ecological Consulting. April 9, 2015.

Appendix C: Cultural and Tribal Cultural Resources

California Historical Resources Information System search, Southern San Valley Historical Resources Information Center, at California State University, Bakersfield. March 30, 2015.

California Native American Heritage Commission Sacred Lands File, August 25, 2016.

Appendix D: Technical Memorandum Water Supply & Water Quality

"*Technical Memorandum Water Supply & Water Quality for the Hash Farms Development Project*." Prepared by Crawford & Bowen Planning, Inc., November, 2017.

Appendix E: Traffic Study

"Traffic Study for the Hash Farms Proposed Residential Development." Prepared by Ruettgers & Schuler Civil Engineers. January 2017.

Appendix F: Agricultural Conversion Study

"Agricultural Land Conversion Analysis for the Hash Farms Residential Development." Prepared by Crawford & Bowen Planning, Inc., November, 2017.

Appendix G: Notice of Preparation, Scoping Meeting, and Agency Comment Letters Received

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Appendix I: Water Will Serve Letter

Executive Summary

This Draft Environmental Impact Report (DEIR) concludes that the proposed Hash Farms (Andersen Village) Development Project ("Project" or "Proposed Project") would result in ***No Significant Impact*** on the environment**.** The proposed Project includes the residential development of 160 single family residences and up to 40 multi-family residences over approximately 54 acres.

The EIR has been prepared consistent with the California Environmental Quality Act (CEQA). Its intent is to inform the public and the Tulare County Board of Supervisors of the potential environmental impacts the proposed Project could have on resources as specified in the CEQA Guidelines. This EIR, in its entirety, addresses and discloses potential environmental effects associated with construction and operation of the proposed Project, including direct, indirect, and cumulative impacts in the following resource areas:

Aesthetics
Air Quality
Cultural Resources
Greenhouse Gas Emissions
Hydrology and Water Quality
Mineral Resources
Population and Housing
Recreation
Utilities-and Service Systems
Agriculture and Forestry Resources
Biological Resources
Geology and Soils
Hazards and Hazardous Materials
Land Use and Planning
Noise
Public Services
Transportation/Traffic
Tribal Cultural Resources
Mandatory Findings of Significance

Although the Mandatory Findings of Significance is not a resource per se, it is required as it essentially provides a summary conclusion of the Project's potential on Long Term Impacts; Cumulative Impacts; and Impacts to Species, Historical Resources, and on Human Beings. It is at this discussion where the EIR concludes that there would be no significant adverse environmental impacts as a result of this Project.

The California Environmental Quality Act (CEQA) requires that local government agencies, prior to taking action on projects over which they have discretionary approval authority, consider the environmental consequences of such projects. An Environmental Impact Report (EIR) is a public disclosure document designed to provide local and state governmental agency decision makers with an objective analysis of potential environmental consequences to support informed decision-making. This EIR (State of California Clearinghouse # 2016091017) has been prepared by Tulare County in accordance with CEQA Guidelines §15120 through §15131 and §15161 regulating EIRs to evaluate the environmental consequences of the Project, to discuss alternatives to the proposed Project, and to propose mitigation measures that will offset, minimize or avoid identified significant environmental impacts. This document focuses on issues determined to be potentially significant as discussed in the Initial Study and the public scoping process completed for this Project, as well as comments received on the Notice of Preparation

(NOP) that was initially circulated for 30 days by the County of Tulare County beginning September 7, 2016. On September 15, 2016, a Public Scoping Meeting was held during the NOP comment period at Tulare County RMA Main Conference Room at 5961 South Mooney Boulevard, Visalia, CA to solicit input on the scope of the EIR. (see **Appendix "G"** of this DEIR).

PROJECT DESCRIPTION

The Hash Farms Development Specific Plan is a proposed plan for development of a 200-unit residential subdivision (160 single-family units and 40 multi-family units) on a total of 54 acres, including a 2.54-acre park and 1.15 acre fenced stormwater basin. A cross section of the proposed development is detailed in. The proposed Specific Plan and "Memorandum of Understanding: Hash Subdivision Financing and Tax Sharing Plan" is provided in Appendix "H" of this DEIR.

Open Space/Parks and Recreation and Public Services.

The proposed Project will provide 2.54 acres of parks and 1.8 acres of perimeter landscaped open space and a pedestrian/bike trail, which exceeds the County's and City's standard. In total, there is approximately 195,600 square feet of open space, pedestrian corridors, landscaped bulbouts, pedestrian walkthroughs, etc. The 2.54-acre park will include a large play structure, "splash pad", basketball court, shade and picnic structures, and a half-sized soccer practice field. The park is located to provide access to and from the existing neighborhood which does not have a neighborhood park. The park is also located to preserve open easterly and southerly views. These facilities will be maintained through an assessment district mechanism and/or Community Facilities District. The proposed Project also includes a 1.15 acre fenced in stormwater basin, south of the proposed residential units.

The Tulare County Sheriff will continue to service the site, but in a back-up capacity, with City police forces acting as the first responders. The applicant will pay Kingsburg's Police Facility impact fee and an amount equal to 0.25 full time employees (FTE) in the police department. The impact fee will be provided through a combination of property tax sharing from Tulare County and special assessments as part of the Community Facilities District, as detailed in Appendix "H".

Similar to Sherriff, Tulare County/CalFire will continue to service the site, but in a back-up capacity, with City Ambulance/Fire acting as the first responders. The applicant will pay the Fire Facility Impact Fee, and an amount equate to 0.25 FTE in the fire department. The impact fee will be provided through a combination of property tax sharing from Tulare County General Fund, Tulare County Fire Fund, and special assessments as part of the Community Facilities District, as detailed in Appendix "H".

Circulation

Vehicular access to the proposed Project will be primarily from two access points along Road 16 and two access points along Avenue 396. The proposed Project will also be accessible from existing residential streets that will be extended from the City of Kingsburg. The proposed Project consists of a network cul-de-sacs and standard rectangle shaped blocks and has been designed to encourage walkability in and around the development. The proposed Project provides adequate emergency vehicle access.

Infrastructure and On-Site Improvements.

Pacific Gas and Electric will supply electricity, Southern California Gas will provide natural gas, the City of Kingsburg will provide water service and SKF will provide sewer service. Storm water will be collected on-site and dispersed to bio-swales and/or ponds as necessary.

The City will extend water services from the existing City stub in Madsen/Road 16 and routed in tract to other City stubs in Lindquist Street and Mariposa Street and future residents will pay typical city water service fees according to a resident's fee schedule, with the permission of the Tulare County LAFCo. The applicant will pay the $1,454/unit Water Impact Fee. The proposed Project will also be annexed to the Selma Kingsburg Fowler Sanitation District (SKF) for sewer services. The existing sewer line in Kern Street/Avenue 396 just west of the Project's western boundary will be extended to the proposed Project's entrance at Bergman Street and routed through the development.

The Cole Slough along the eastern edge of the proposed Project site will be piped underground, as a continuation to the existing undergrounded Cole Slough immediately north of the proposed Project site. The Project will also install and maintain frontage improvements (landscaping, sidewalk, etc.) along the Project boundaries on Road 16 and Avenue 396.

Site Maintenance

As part of the proposed Project, a Community Facilities District will be formed to maintain the on-site park areas, landscaping, and streets. This District will maintain open space, landscaping, parks, streets and street lights, and provide a funding mechanism for municipal services to be provided by City of Kingsburg.

PROJECT LOCATION

The proposed Project will be located in the central San Joaquin Valley, approximately 20 miles southeast of the City of Fresno and 80 miles northwest of the City of Bakersfield. The proposed Project will be located at the northwest corner of Road 16 and Avenue 396, partially within the City of Kingsburg, Fresno County and Tulare County. The site is approximately one-half mile east of State Route 99 and approximately one-tenth of a mile south of State Route 201. The 54-acre site is located on Tulare County APNs 028-140-007, 012, 013, 018 and 022, and Fresno

County APNs 396-020-008 and 014. The site is currently zoned A in Tulare County and R-1-6 in the City of Kingsburg and is within the Selma 7.5 Minute USGS Quadrangle. The proposed Project site lies within a portion of the NE ¼ of Section 26, Township 16S, Range 22E, M.D.B.&M.

The coordinates of the proposed Project site are:

Latitude: N 36° 30'44"
Longitude: W 119° 32'30"

PROJECT OBJECTIVES & BENEFITS

The purpose of the proposed Project is to implement a mixed-density master planned community in Tulare County (County) and the City of Kingsburg (City), consistent with the City's and County's Guiding Principles related to new development. The proposed Project is intended to provide for the orderly and systematic development of a residential community with the ultimate development pattern guided by the following project objectives:

- **Complete Comprehensive Planning for the Hash Farm Specific Plan Area:** Formulate a specific plan, related land use planning documents, and regulatory approvals for the Hash Farm Specific Plan Area as a means of developing the City of Kingsburg and County of Tulare in an orderly manner, accommodating the areas share of future regional population growth, being compatible with surrounding land uses, complementing the pattern and intensity of existing development in the City, and providing new benefits to the City and County.

- **Existing Policies:** Satisfy the City of Kingsburg and Tulare County policies, regulations and expectations as defined in the Tulare County General Plan 2030 Update, City of Kingsburg General Plan, the City and Tulare County Zoning Ordinances, City and County Improvement Standards, and all other applicable plans, documents, and programs adopted by the City and County. As the project will ultimately need wastewater collection and treatment services, the project will also comply with Selma-Kingsburg-Fowler (SKF) Sanitation District policies, standards, etc.

- **Common Development Standards.** Since the project is located adjacent to the City of Kingsburg and will share the same water and sewer systems, a project objective is to adopt a specific plan that will establish development standards and urban improvement standards that are similar to those the City of Kingsburg. To this end, the Specific Plan will establish the City of Kingsburg's improvement standards as the appropriate standards for the project, and contain residential neighborhood standards that are similar to those established contained in the North Kingsburg Specific Plan.

- **Housing Opportunities:** Plan for an economically feasible residential project consisting of up to 200 residential units to provide housing choices in varying densities to respond to a range of market segments.
    - **Regional Housing Needs Allocation:** Aid the County of Tulare and City of Kingsburg in meeting its obligation to accommodate a percentage of future population growth in the region (as embodied in the respective Regional Housing Needs Allocation) identified by the Tulare County Association of Governments, Council of Fresno County Governments, and the California Department of Housing and Community Development by increasing the residential holding capacity in an area identified as appropriate for such development.

    - **Community Form:** Shape the physical form and character of development that is functional and creates a sense of place in order to:
        - Create a land use transition and connection between the City of Kingsburg and Tulare County.
        - Organize neighborhoods to be identifiable and walkable, and to incorporate gathering places such as parks and walking pathways.
        - Provide housing that is close to Downtown Kingsburg to support the economic viability of the downtown businesses.

    - **Contribute to Regional Preserve Planning:** Create open space preserves which provide regional benefit for habitat, resources, and open space amenities.

SUMMARY OF CHAPTERS

Chapter 1 Introduction

The County of Tulare is proposing the Hash Farms Subdivision Project to allow the development of the phased construction of 160 single family residential units and forty multi-family units over approximately 54 acres. Also proposed in the development is a 2.54 acre park. The proposed Project lies within a portion of the NE ¼ of Section 26, Township 16S, Range 22E, M.D.B.& M. The site is currently zoned A (Agriculture) and R-1-7 (Single Family Residential) and as a part of the proposed Project, will be rezoned to R-1-7, R-1-6 and RM (Multi-family Residential).

Local Regulatory Context: The Tulare County General Plan Update 2030 was adopted on August 28, 2012. As part of the General Plan, an EIR and background report were prepared. The General Plan background report contained contextual environmental analysis for the General Plan. The 2015 -2023 Tulare County Housing Element was adopted on November 17, 2015, and certified by State of California Department of Housing and Community Development on December 9, 2015.

Identification of Potentially Significant Impacts: Indicates that the EIR must identify potentially significant impacts consistent with CEQA Guidelines Section 15002 (h).

Consideration of Significant Impacts: Indicates that the EIR must consider significant impacts consistent with CEQA Guidelines Section 15126.2.

Mitigation Measures: Indicates that the EIR is required to contain mitigation measures consistent with CEQA Guidelines Section 15126.4.

Environmental Review Process: Summarizes steps taken prior to release of the draft EIR such as the Notice of Preparation, Scoping Meeting, and comments received from persons and/or agencies in response to the Notice of Preparation.

Chapter 2 Project Description, Objectives, and Environmental Setting

As noted earlier, the Hash Farms Development Specific Plan is a proposed plan for development of a 200-unit residential subdivision (160 single-family units and 40 multi-family units) on a total of 54 acres, including a 2.54 acre park and 1.15 acre fenced stormwater basin. The proposed Specific Plan and "Memorandum of Understanding: Hash Subdivision Financing and Tax Sharing Plan" is provided in Appendix "H" of this DEIR.

In summary, Chapter 2 contains the following:

- Project Location: The proposed Project will be located at the northwest corner of Road 16 and Avenue 396, partially within the City of Kingsburg, Fresno County and Tulare County. The site is approximately one-half mile east of State Route 99 and approximately one-tenth of a mile south of State Route 201.
- Vicinity of Project Site: Generally, in the northwest quadrant of Tulare County and in the southeast portion of the City of Kingsburg, as shown in Figure 2-1.
- Project Description (baseline conditions information pertinent to the proposed Project): Describes the existing land use and the improvements proposed with the residential development.
- Project Objectives and Benefits: See pages ES-4 and ES-5, or Chapter 2, pages 2-5 and 2-6)
- Regulatory Setting: Applicable statutes, rules, regulations, standards, policies, etc. of the County of Tulare, local or special districts, utilities, and State and Federal governments.

Chapter 3 Impact Analysis of Resources

The CEQA Guidelines include a Checklist of resources that must be addressed in an EIR. These resources are listed on page ES-1. There are 18 specific Resources and Mandatory Findings of Significance discussed in detail in Chapter 3. The Resources are discussed in separate sections of Chapter 3 and each section is structured as follows:

- Summary of Findings;
- Introduction, including Thresholds of Significance;
- Environmental Settings;

- Regulatory Settings such as applicable Federal, State, and Local laws, statutes, rules, regulations, and policies;
- Impact Evaluation including Project Impacts, Cumulative Impacts, Mitigation Measures, and Conclusion;
- Definitions and Acronyms; and
- References.

Some resources required expertise to evaluate the Project's potential for impacts. As such, qualified experts prepared studies, evaluations, assessments, modeling, search results, etc. (studies/technical memoranda/search results; i.e.; supporting documents) to quantify and/or qualify potential resource impacts. The supporting documents are contained in Appendices "A" through "I". Among the studies are "Air Quality Impact Analysis and Greenhouse Gas Study for the Hash Farms Development" (Appendix "A"); biological (Appendix "B"); cultural (that is, archaeological, historical, cultural , and tribal cultural resources, (Appendix "C"); "Technical Memorandum Water Supply & Water Quality for the Hash Farms Development Project" (Appendix "D"); "Traffic Study" (Appendix "E"); "Agricultural Land Conversion Analysis for the Hash Farms Residential Development" (Appendix "F"); Notice of Preparation and Public Scoping Meeting, and Agency Comment Letters Received (Appendix "G"); The proposed Specific Plan and "Memorandum of Understanding: Hash Subdivision Financing and Tax Sharing Plan" (Appendix "H"); and a Will Serve Letter from the Selma-Kingsburg-Fowler County Sanitation District (Appendix "I").

Chapter 4 Energy

Per Appendix F of the CEQA Guidelines and Public Resources Code Section 21100(b)(2), an EIR must disclose and discuss the potential for the project to result in impacts on energy conservation and/or consumption. A project may have the potential to cause such impacts if it would result in the inefficient, wasteful, or unnecessary consumption of energy, including electricity, natural gas, or transportation fuel supplies and/or resources.

Based on the analysis contained in Chapter 4, it can be concluded that the demand for energy (total equivalent BTUs for electrical and natural gas usage) as a result of the Project is lower than County and the state average energy demands, and VMT is 20 percent less than county and state averages; as such, the Project has been demonstrated to be more energy efficient. When considering the potential for the Project to result in greater conservation of electricity, natural gas, and transportation fuel through the implementation of proposed Project design features and required mitigation measures not quantified above, the proposed Project has a low potential to result in adverse impacts on energy resources and conservation.

Chapter 5 Summary of Cumulative Impacts

A critically important component of an EIR is the Cumulative Impacts discussion. Chapter 5 discusses a Cumulative Impact Analysis under CEQA. Including Past, Present, Probable Future Projects; and a Summary of Cumulative Impacts. Whereas a project in and of itself may not

result in an adverse environmental impact, its cumulative effects may. Therefore the CEQA Guidelines require a discussion of cumulative impacts per Section 15130. The Discussion of Cumulative Impacts defines cumulative impacts per Section 15355 - "Cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

With the exception of Air Quality, Greenhouse Gas Emissions, Biological, and Hydrological Resources, Chapter 5 defines Tulare County as the geographic extent of the impact analysis. The geographic area is considered the appropriate extent because:

1) The proposed Project is geographically located in Tulare County and City of Kingsburg and the County of Tulare is the Lead Agency; and
2) Tulare County General Plan and City of Kingsburg policies apply to the proposed Project.

The basis for the other Resource-specific cumulative impact analyses includes:

- Air Quality and Greenhouse Gas Emissions are based on the San Joaquin Valley Air Basin;
- Biological Resources are based on the San Joaquin Valley, the state of California, and the western United States;
- Hydrology is based on the Tulare County, the Tulare Lake Basin, and, the Tule Lake Sub-basin aquifers;
- Land Use Impacts are based on the County of Tulare 2030 General Plan; and
- Mandatory Findings of Significance are based on the San Joaquin Valley, the state of California, and the western United States

The Summary of Cumulative Impacts section discusses mitigable and immitigable impacts. Checklist Item criteria that would result in no impacts or less than significant impacts are discussed in the Chapter 3 and are not reiterated in Chapter 5. As noted in Chapter 5, there are no Significant and Unavoidable Impacts; and Less Than Significant Impacts With Mitigation are summarized in Table 5-3 (Checklist Items with Less than Significant with Mitigation). There are a number of cumulative impacts that do not need mitigation; these impacts are listed in Table 5-4 (Checklist Items with Less Than Significant Impacts). Chapter 9 contains a complete list of Mitigation Measures to be implemented as part of the proposed Project. Chapter 5 also contains a No Impacts summary in Table 5-5 (Checklist Items with No Impacts).

Chapter 6 Alternatives

CEQA Guidelines Section 15126.6 requires that a reasonable range of Alternatives to the proposed Project be discussed in the EIR. The proposed Project is the superior alternative. The conclusion contained in Chapter 6 is based on the criteria established for the site and the three reasonable Alternatives. The three Alternatives evaluated are:

Alternative 1 – Reduced Density (Same Footprint)

Alternative 2 – Increased Density (Smaller Footprint)
Alternative 3 – No Build / No Project

The proposed Alternatives were analyzed based on five evaluation criteria which include each of the objectives of the Project and the assessment of the potential environmental impacts. Each Alternative considered did not meet all the evaluation criteria, as identified in Table 6-2 (Comparison of Alternatives Attaining Evaluation Criteria), contained in Chapter 6. The following is a summary of the advantages and disadvantages of each Alternative:

Alternative No. 1 Advantages and Disadvantages	
Advantages	**Disadvantages**
Slightly less impacts to air quality/GHG, noise, traffic, water use, utilities, and population/housing.	Lack of diversity of housing products.
More attractive product to higher-end estate type housing buyers.	Economic feasibility (e.g., housing affordability) in question due to potential lack of higher-end buyers.

Alternative No. 2 Advantages and Disadvantages	
Advantages	**Disadvantages**
Slightly less impacts to air quality/GHG, noise, traffic, water use, utilities, and population/housing.	Does not provide for comprehensive planning of the specific plan area.
More lower/moderate income housing.	Lack of diversity of housing products.
Less impacts to agriculture, biological and cultural resources.	Lack of continuity with existing neighborhoods.
	Difficulty in farming a small remaining section of the land.

Alternative No. 3 Advantages and Disadvantages	
Advantages	**Disadvantages**
No environmental impacts beyond baseline conditions.	Does not meet any project objectives or project-specific elements.

As discussed in Alternatives 1 and 2, each of the Alternatives could result in more adverse environmental impacts than the proposed Project as specified on the CEQA resources checklist. Therefore, the proposed Project is the environmentally superior alternative.

Environmental impacts associated with each of the alternatives presented compared to the Preferred Alternative are shown in **Table 6-1 Impacts of Alternatives Compared to the Proposed Project. Table 6-2** is a matrix comparing each Alternative's and the Preferred Alternative's abilities to achieve the Evaluation Criteria.

Chapter 7 Economic, Social, & Growth Inducing Impacts

This Chapter discusses the Economic, Social, and Growth Inducing effects of the Project. It contains Table 7-1 which provides the CEQA requirements and a summary of the impact analysis as follows:

- Economic Effects - The proposed Project will not result in negative impacts to the region. It will result in increases in economic benefits to the region in the short term and long term. The Project will result in temporary construction-related jobs. Long term economic benefits include payment of property taxes as well as on-going income expenditures of the residents of the new housing in and around Kingsburg (such as groceries, gasoline, household items, etc.).
- Social Impacts - The proposed Project would not result in disproportionate environmental effects on minority populations, low income populations, or Native Americans. The proposed Project does not pose any adverse environmental justice issues that would require mitigation. The project would improve the availability of quality residential housing in the area.
- Growth Inducing Effects - The proposed Project would not result in significant growth inducing impacts. The Project site is already in the Kingsburg Sphere of Influence and is planned for residential development. The growth and associated population increase is in accordance with the housing parameters set forth in the City of Kingsburg General Plan and the Tulare County General Plan in reaching their RHNA goals.

The overall conclusion contained in Chapter 7 is implementation of the proposed Project will result in ***Less Than Significant*** environmental impacts, either individually or cumulatively, caused by either economic, social, or growth inducing effects.

Chapter 8 Immitigable Impacts

This discussion provides determinations consistent with CEQA Guidelines Sections 15126.2 (b) Environmental Effects That Cannot Be Avoided, 15126.2 (c) Irreversible Impacts, and Statement of Overriding Considerations.

This Project will not result in significant and unavoidable impacts. All impacts have been found to be less than significant, or have been mitigated to a level considered less than significant. Based on the analysis contained in the No Environmental Impacts That Cannot Be Avoided and the No Irreversible Impact sections contained in Chapter 8, a Statement of Overriding Considerations is not necessary. The Project's merits and objectives are discussed in the Project Description and are found to be consistent with the intent of the County of Tulare and its 2030 General Plan. As noted earlier, there are one hundred fourteen (114) General Plan Policies that apply to this Project. Chapter 3 of this document provides a complete list of applicable policies for the specific Resource item discussed. Thus, the Project's benefits would outweigh any unavoidable and immitigable impacts to warrant a Statement of Overriding Considerations.

Chapter 9 Mitigation Monitoring and Reporting Program

A summary of the Mitigation Monitoring and Reporting Program is contained at the end of this Executive Summary and in its entirety in Chapter 9. CEQA Section 21081.6 requires adoption of a reporting or monitoring program for those measures placed on a project to mitigate or avoid adverse effects on the environment. The mitigation monitoring and reporting program is required to ensure compliance during a project's implementation. Consistent with CEQA requirements, the Mitigation Monitoring and Reporting Program contained in this EIR include the following elements:

- **Action and Procedure.** The mitigation measures are recorded with the action and procedure necessary to ensure compliance. In some instances, one action may be used to verify implementation of several mitigation measures.

- **Compliance and Verification.** A procedure for compliance and verification has been outlined for each action necessary. This procedure designates who will take action, what action will be taken and when, and to whom and when compliance will be reported.

- **Flexibility.** The program has been designed to be flexible. As monitoring progresses, changes to compliance procedures may be necessary based upon recommendations by those responsible for the Mitigation Monitoring and Reporting Program. As changes are made, new monitoring compliance procedures and records will be developed and incorporated into the program.

Chapter 10 EIR Preparation

Key persons from the County of Tulare and the consulting firms that contributed to preparation of the Draft Environmental Impact Report (Draft EIR) are identified.

The sitting Tulare County Board of Supervisors, Tulare County Resource Management Agency RMA Director (Reed Schenke), Associate RMA Director/Economic Development and Planning Director (Michael Washam), Chief Environmental Planner (Hector Guerra) are noted.

This EIR also relied on the expertise of the consulting firm Kamansky's Ecological Consulting in preparing the Reconnaissance Level Biological Evaluation (Appendix "B" of this DEIR), Ruettgers & Schuler Civil Engineers for preparing the Traffic Study (Appendix "E" of this DEIR), Crawford & Bowen Planning, Inc. in preparing the Agricultural Land Conversion Analysis (Appendix "F" of this DEIR), the Air Quality Impact Analysis and Greenhouse Gas Study (Appendix "A" of this DEIR), and the Water Supply Assessment Memorandum (Appendix "D" of this DEIR). Importantly, this EIR could not have been completed without the diligent efforts of Crawford and Bowen Planning, Inc. (Travis Crawford and Emily Bowen, Principals) who prepared the draft EIR.

SUMMARY OF POTENTIAL IMPACTS & MITIGATION MEASURES

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
BIOLOGICAL RESOURCES							
Swainson's hawks and other raptors and migratory birds (including Loggerhead Shrike)							
4-1. Pre-construction surveys shall be conducted to determine the presence of nesting birds if ground clearing or construction activities will be initiated during the breeding season (February 15 through September 15). Potential nesting areas on the proposed Project site and potential nesting areas within 500 feet of the site should be surveyed prior to June 5th. Surveys shall be performed by a qualified biologist to verify the presence or absence of nesting birds. Construction shall not occur within a 500 foot buffer surrounding active nests of raptors or a 250 foot buffer surrounding active nests of migratory birds. If construction within these buffer areas is required or if nests must be removed to allow continuation of construction, then approval and specific removal methodologies should be obtained from California Department of Fish and Wildlife.	Prior to start of construction.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Field survey by a qualified Biologist.			
4-2. All trees which are suitable for Swainson's hawk nesting that are within 2,640 feet of construction activities shall be inspected by a qualified biologist.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			

Table ES-1
Mitigation Monitoring and Reporting Program

<table>
<tr><th rowspan="2">Mitigation Measure</th><th rowspan="2">Monitoring Timing / Frequency</th><th rowspan="2">Action Indicating Compliance</th><th rowspan="2">Monitoring Agency</th><th rowspan="2">Person conducting Monitoring / Reporting</th><th colspan="3">Verification of Compliance</th></tr>
<tr><th>Initials</th><th>Date</th><th>Remarks</th></tr>
<tr><td>4-3. If potential Swainson’s hawk nests are found during the inspection, then surveys shall be conducted at the following intensities, depending upon dates of initiation of construction:
<table>
<tr><th>Construction start</th><th>Survey period</th><th>Number of surveys</th><th>Timing</th></tr>
<tr><td>1 January to 20 March</td><td>1 January to 20 March</td><td>1</td><td>All day</td></tr>
<tr><td>21 March to 24 March</td><td>1 January to 20 March</td><td>1</td><td>All day</td></tr>
<tr><td></td><td>21 March to 24 March</td><td>Up to 3</td><td>Sunrise to 10 am and 4 pm to sunset</td></tr>
<tr><td>24 March to 5 April</td><td>1 January to 20 March</td><td>1</td><td>All day</td></tr>
<tr><td></td><td>21 March to 5 April</td><td>3</td><td>Sunrise to 10 am and 4 pm to sunset</td></tr>
<tr><td>6 April to 9 April</td><td>21 March to 5 April</td><td>3</td><td>Sunrise to 10 am and 4 pm to sunset</td></tr>
<tr><td></td><td>6 April to 9 April</td><td>Up to 3</td><td>Sunrise to 10 am and 4 pm to sunset</td></tr>
<tr><td></td><td>1 January to 20 March</td><td>1 (if all 3 surveys are performed between 6 and 9 April, then this</td><td>All day</td></tr>
</table></td><td>Prior to construction-related activities.</td><td>Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable</td><td>County of Tulare Planning Department</td><td>Qualified biologist.</td><td></td><td></td><td></td></tr>
</table>

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
<table><tr><td></td><td></td><td>survey need not be conducted)</td><td></td></tr><tr><td>10 April to 30 July</td><td>21 March to 5 April</td><td>3</td><td>Sunrise to 10 am and 4 pm to sunset</td></tr><tr><td></td><td>6 April to 20 April</td><td>3</td><td>Sunrise to 12 pm and 4:30 pm to sunset</td></tr><tr><td>31 July to 15 September</td><td>6 to 20 April</td><td>3</td><td>Sunrise to 12 pm and 4:30 pm to sunset</td></tr><tr><td></td><td>10 to 30 July</td><td>3</td><td>Sunrise to 12 pm and 4 pm to sunset</td></tr></table>							
4-4. If Swainson's hawks are detected to be actively nesting in trees within 2,640 feet of the construction area, construction shall not occur within this zone until after young Swainson's hawks have fledged (this usually occurs by early June). The nest shall be monitored by a qualified biologist to determine fledging date.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-5. If Swainson's hawks (foraging) or other raptors are found actively nesting within 250 feet of the construction area, construction should be postponed until after young have fledged. The date of fledging should be determined by a qualified biologist. If construction cannot be delayed, the CDFW shall be	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of	County of Tulare Planning Department	Qualified biologist.			

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
consulted and alternative protection measures required by the CDFW shall be followed.		Findings, if applicable					
4-6. If other nesting birds (particularly non-raptor species listed on the MBTA) are found actively nesting within 250 feet of the construction area, construction should be postponed until after young have fledged. The date of fledging should be determined by a qualified biologist. If construction cannot be delayed within this zone, the CDFW and/or the USFWS shall be consulted and alternative protection measures required by the CDFW and/or the USFWS shall be followed."[1]	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
Protection of San Joaquin kit fox							
4-7. A standardized pre-construction/ pre-activity shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any Project activity likely to impact the San Joaquin kit fox. Surveys shall identify kit fox habitat features on the Project site and evaluate use by kit fox and, if possible, assess the potential impacts to the kit fox by the proposed activity. The status of all dens shall be determined and mapped. Written results of pre-construction/pre-activity surveys must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			

[1] Op. Cit. Pages 27-30.

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
4-8. Disturbance to all San Joaquin kit fox dens shall be avoided to the maximum extent possible.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-9. If a natal/pupping den is discovered within the Project area or within 200-feet of the site boundary, USFWS shall be immediately notified and under no circumstances should the den be disturbed or destroyed without prior authorization. If the pre-construction/pre-activity survey reveals an active natal pupping or new information, the Project applicant shall contact USFWS immediately to obtain the necessary take authorization/permit.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-10. Destruction of any den shall be accomplished by careful excavation until it is certain that no kit foxes are inside. The den shall be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-11. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above shall be resumed. Destruction of the	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/	County of Tulare Planning Department	Qualified biologist.			

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
den may be completed when, in the judgment of the qualified biologist, the animal has escaped without further disturbance from the partially destroyed den.		submittal of Report of Findings, if applicable					
4-12. Project-related vehicles shall observe a daytime speed limit not to exceed 20-mph throughout the site in all proposed Project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. Night-time construction shall be minimized to the extent possible. However if it does occur, then the speed limit shall be reduced to 10-mph. Off-road traffic outside of designated project areas shall be prohibited.	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-13. To prevent inadvertent entrapment of kit fox or other animals during the construction phase of the proposed Project, all excavated, steep-walled holes or trenches more than 2-feet deep shall be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks shall be installed. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS and the California Department of Fish and Wildlife shall be contacted as noted under Mitigation Measure 4-20 referenced below.	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-14. Kit fox are attracted to den-like structures such as pipes and may enter stored pipes and become	Prior to and during	Retention of professional	County of Tulare Planning	Qualified biologist.			

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit fox before the pipe is used or moved, buried, or capped in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the CFW has been consulted. If necessary, and under the direct supervision of a qualified biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.	construction-related activities.	biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	Department				
4-15. All food-related trash outside of the enclosed facility such as wrappers, cans, bottles, and food scraps shall be disposed of daily in securely closed containers and removed at least once a week during both construction and operational phases.	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-16. No pets, such as dogs or cats, shall be allowed on the Project site in order to prevent harassment, mortality of kit fox, or destruction of dens.	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-17. Use of rodenticides and herbicides in Project areas shall be restricted. If rodent control must be used	Prior to and during	Retention of professional	County of Tulare Planning	Qualified biologist.			

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
it shall be limited to the use of zinc phosphide because of its demonstrated lower risk to kit fox.	construction-related activities.	biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	Department				
4-18. A representative shall be appointed by the Project Applicant to serve as the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative will be identified during the employee education program and their name, telephone number, or other pertinent contact information shall be provided to the Service.	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-19. An employee education program shall be conducted to alert employees of potential impacts to kit fox or other species of concern. The program shall consist of a brief presentation by persons knowledgeable in kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and military and/or agency personnel involved in the project. The program shall include the following: A description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of kit fox in the Project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during Project construction and implementation. A fact sheet conveying this information shall be prepared for	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
distribution to the previously referenced people and anyone else who may enter the Project site.							
4-20. Any contractor, employee, or military or agency personnel who are responsible for inadvertently killing or injuring a San Joaquin kit fox shall immediately report the incident to their representative. The Sacramento Fish and Wildlife Office and CFW shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The Sacramento Fish and Wildlife Office contact is: Mr. Paul Hoffman 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670 (530) 934-9309	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-21. New sightings of kit fox shall be reported to the California Natural Diversity Database (CNDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed shall also be provided to Fish and Wildlife at the address below. Endangered Species Division 2800 Cottage Way, Suite W2605 Sacramento, California 95825-1846 (916) 414-6620 or (916) 414-6600	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
Protection of Burrowing Owl							
4-22. In accordance with CDFG's 2012 *Staff Report on Burrowing Owl Mitigation*, a qualified biologist shall conduct three surveys for burrowing owls where potential burrowing owl habitat occurs within 500 feet of Project activities. Surveys shall occur during the peak breeding season for this species (15 April through 15 July), and spaced three weeks apart. If active burrowing owl burrows are identified within 500 feet of the Project site, then avoidance, take avoidance surveys, site surveillance, minimization, and buffer mitigation measures shall be implemented, in accordance with the 2012 CDFG *Staff Report* and direct consultation with CFW.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
Protection of Sensitive Amphibians and Reptiles							
4-23. Preconstruction surveys shall be conducted during a period of high hydrological activity for the Slough. This may coincide with irrigation deliveries to downstream agriculture, typically an initial release from dams occurs in February-March and May-July. These surveys will detect tiger salamanders (early survey) and western pond turtles (late survey, if present. For spadefoots, survey shall be conducted after they emerge subsequent to 1-2 inches of precipitation at the start of the rainy season (usually around the beginning of December). If surveys detect these species, they shall be allowed to passively relocate off of the site before construction on the Slough begins.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
CULTURAL RESOURCES							
5-1. In the event that archaeological or	During	Daily or as needed	County of	A qualified			

Table ES-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
paleontological resources are discovered during site excavation, the County shall require that grading and construction work on the project site be immediately suspended until the significance of the features can be determined by a qualified archaeologist or paleontologist. In this event, the property owner shall retain a qualified archaeologist/paleontologist to make recommendations for measures necessary to protect any site determined to contain or constitute an historical resource, a unique archaeological resource, or a unique paleontological resource or to undertake data recover, excavation analysis, and curation of archaeological or paleontological materials. County staff shall consider such recommendations and implement them where they are feasible in light of Project design as previously approved by the County.	Construction	throughout the construction period if suspicious resources are discovered	Tulare Planning Department via field evaluation of the resource finds by a qualified archaeologist	archaeologist shall document the results of field evaluation and shall recommend further actions that shall be taken to mitigate for unique resource or human remains found, consistent with all applicable laws including CEQA.			
5-2. The property owner shall avoid and minimize impacts to paleontological resources. If a potentially significant paleontological resource is encountered during ground disturbing activities, all construction within a 100-foot radius of the find shall immediately cease until a qualified paleontologist determines whether the resources requires further study. The owner shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. The paleontologist shall notify the Tulare County Resource Management Agency and the project proponent of the procedures that must be followed before construction is allowed to resume at the location of the find. If the find is determined to be significant and the Tulare County	During Construction	Daily or as needed throughout the construction period if suspicious resources are discovered	County of Tulare Planning Department via field evaluation of the resource finds by a qualified archaeologist	A qualified archaeologist shall document the results of field evaluation and shall recommend further actions that shall be taken to mitigate for unique resource or human remains found, consistent with all			

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
Resource Management Agency determines avoidance is not feasible, the paleontologist shall design and implement a data recovery plan consistent with applicable standards. The plan shall be submitted to the Tulare County Resource Management Agency for review and approval. Upon approval, the plan shall be incorporated into the project.				applicable laws including CEQA.			
5-3. Consistent with Section 7050.5 of the California Health and Safety Code and (CEQA Guidelines) Section 15064.5, if human remains of Native American origin are discovered during project construction, it is necessary to comply with State laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (Public Resources Code Sec. 5097). In the event of the accidental [that is, unanticipated] discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken: 1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: a. The Tulare County Coroner/Sheriff must be contacted to determine that no investigation of the cause of death is required; and b. If the coroner determines the remains to be Native American: i. The coroner shall contact the Native American Heritage Commission within 24 hours.	During Construction	Daily or as needed throughout the construction period if suspicious resources are discovered	County of Tulare Planning Department via field evaluation of the resource finds by a qualified archaeologist	A qualified archaeologist shall document the results of field evaluation and shall recommend further actions that shall be taken to mitigate for unique resource or human remains found, consistent with all applicable laws including CEQA.			

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
ii. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. iii. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code section 5097.98, or 2. Where the following conditions occur, the landowner or his/her authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance. a. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission. b. The descendant fails to make a recommendation; or c. The landowner or his authorized representative rejects the recommendation of the descendent.							
HYDROLOGY AND WATER QUALITY							

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
9-1. The Project applicant shall prepare a Storm Water Pollution Prevention Plan (SWPPP) according to the latest regulations to be retained onsite. The SWPPP must include best management practices that, when implemented, prevent storm water quality degradation to the extent practical by preventing sediments and other pollutants from leaving the Project site.	Prior to Construction	SWPPP submittal and acceptance.	County of Tulare Planning Department	Construction Contractor			
9-2. New sewage disposal systems shall be designed by an Engineer, Registered Environmental Health Specialist, Geologist, or other competent persons, all of whom must be registered and/or licensed professionals knowledgeable and experienced in the field of sewage disposal system and design. The specifications and engineering data for the system shall be submitted to the TCEHSD for review and approval prior to the issuance of a building permit.	Prior to Issuance of Building Permit.	Submittal of disposal system design.	TCEHSD	TCEHSD			
9-3. All new construction shall have water conserving fixtures (water closets, low flow showerheads, low flow sinks, etc.) New urinals shall also conserve water through waterless, zero flush, or other water conservation technique and/or technology.	Prior to Issuance of Building Permit.	Verified on submitted site plans.	Tulare County Building Inspector	Tulare County Building Inspector			
9-4. The proposed Project shall conform to the Tulare County Water Efficient Landscaping Ordinance.	Prior to Issuance of Building Permit.	Verified on submitted site plans.	Tulare County Building Inspector	Tulare County Building Inspector			
9-5. No ground water shall be transported off-site for any use.	Prior to Issuance of Building Permit.	Verified on submitted site plans.	Tulare County Building Inspector	Tulare County Building Inspector			

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
TRANSPORTATION/TRAFFIC							
16-1. The Project Applicant will be responsible for paying fair share fees as identified in Table 3.16-11 through payment of standard City traffic impact fees and an additional ad hoc mitigation fee of $175 per dwelling unit. The Applicant will pay the fee amounts at building permit. This shall be made a condition of Project approval.	Prior to Issuance of Building Permit.	Payment of Fees	Tulare County Planning Department	Tulare County Planning Department			
TRIBAL CULTURAL RESOURCES							
17-1. In the event that historical, archaeological or paleontological resources are discovered during site excavation, the County shall require that grading and construction work on the Project site be immediately suspended until the significance of the features can be determined by a qualified archaeologist or paleontologist. In this event, the property owner shall retain a qualified archaeologist/paleontologist to provide recommendations for measures necessary to protect any site determined to contain or constitute an historical resource, a unique archaeological resource, or a unique paleontological resource or to undertake data recover, excavation analysis, and curation of archaeological or paleontological materials. County staff shall consider such recommendations and implement them where they are feasible in light of Project design as previously approved by the County.	During Construction	Daily or as needed throughout the construction period if suspicious resources are discovered	Tulare County Planning Department	A qualified archaeologist shall document the results of field evaluation and shall recommend further actions that shall be taken to mitigate for unique resource or human remains found, consistent with all applicable laws including CEQA.			
17-2 Consistent with Section 7050.5 of the California Health and Safety Code and (CEQA Guidelines) Section 15064.5, if human remains of Native American origin are discovered during Project construction, it is	During Construction	Daily or as needed throughout the construction period if	Tulare County Planning Department	A qualified archaeologist shall document the results of			

Table ES-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
necessary to comply with State laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (Public Resources Code Sec. 5097). In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken: 1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: a. The Tulare County Coroner/Sheriff must be contacted to determine that no investigation of the cause of death is required; and b. If the coroner determines the remains to be Native American: i. The coroner shall contact the Native American Heritage Commission within 24 hours. ii. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely iii. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code section 5097.98, or		suspicious resources are discovered		field evaluation and shall recommend further actions that shall be taken to mitigate for unique resource or human remains found, consistent with all applicable laws including CEQA.			

Table ES-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
2. Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance. a. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission. b. The descendant fails to make a recommendation; or c. The landowner or his authorized representative rejects the recommendation of the descendent.							

INTRODUCTION
Chapter 1

PROJECT SUMMARY

The County of Tulare is proposing the Hash Farms (Andersen Village) Development Project to allow the development of the phased construction of 160 single family residential units and forty multi-family units over approximately 54 acres. Also proposed in the development is a 2.54 acre park. The proposed Project lies within a portion of the NE ¼ of Section 26, Township 16S, Range 22E, M.D.B.& M. The site is currently zoned A (Agriculture) and R-1-7 (Single Family Residential) and as a part of the proposed Project, will be rezoned to R-1-7, R-1-6 and RM (Multi-family Residential).

LOCAL REGULATORY CONTEXT

The Tulare County General Plan Update 2030 was adopted on August 28, 2012. As part of the General Plan an EIR was prepared as was a background report. The General Plan background report contained contextual environmental analysis for the General Plan. The Housing Element for 2009-2014 was adopted on May 8, 2012, and certified by State of California Department of Housing and Community Development on June 1, 2012.

SCOPE AND METHODOLOGY

The County of Tulare has determined that a project level EIR fulfills the requirements of CEQA and is the appropriate level evaluation to address the potential environmental impacts of the proposed project. A project level EIR is described in Section 15161 of the State CEQA Guidelines as one that examines the environmental impacts of a specific development project. A project level EIR must examine all phases of the project, including planning, construction, and operation.

This document addresses environmental impacts to the level that they can be assessed without undue speculation (CEQA Guidelines Section 15145). This *Draft Environmental Impact Report (DEIR)* acknowledges this uncertainty and incorporates these realities into the methodology to evaluate the environmental effects of the Plan, given its long term planning horizon. The degree of specificity in an EIR corresponds to the degree of specificity of the underlying activity being evaluated (CEQA Guidelines Section 15146). Also, the adequacy of an EIR is determined in terms of what is reasonably feasible, in light of factors such as the magnitude of the project at issue, the severity of its likely environmental impacts, and the geographic scope of the project (CEQA Guidelines Sections 15151 and 15204(a)).

CEQA Guidelines Section 15002 (a) specifies that, "[t]he basic purposes of CEQA are to:

(1) Inform governmental decision makers and the public about the potential, significant environmental effects of proposed activities.

(2) Identify ways that environmental damage can be avoided or significantly reduced.
(3) Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
(4) Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved."[1]

CEQA Guidelines Section 15002 (f) specifies that, "[a]n environmental impact report (EIR) is the public document used by the governmental agency to analyze the significant environmental effects of a proposed project, to identify alternatives, and to disclose possible ways to reduce or avoid the possible environmental damage… An EIR is prepared when the public agency finds substantial evidence that the project may have a significant effect on the environment… When the agency finds that there is no substantial evidence that a project may have a significant environmental effect, the agency will prepare a "Negative Declaration" instead of an EIR..."[2]

Pursuant to CEQA Guidelines Section 15021 Duty to Minimize Environmental Damage and Balance Competing Public Objectives:

"(a) CEQA establishes a duty for public agencies to avoid or minimize environmental damage where feasible.
    (1) In regulating public or private activities, agencies are required to give major consideration to preventing environmental damage.
    (2) A public agency should not approve a project as proposed if there are feasible alternatives or mitigation measures available that would substantially lessen any significant effects that the project would have on the environment.
(b) In deciding whether changes in a project are feasible, an agency may consider specific economic, environmental, legal, social, and technological factors.
(c) The duty to prevent or minimize environmental damage is implemented through the findings required by Section 15091.
(d) CEQA recognizes that in determining whether and how a project should be approved, a public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social factors and in particular the goal of providing a decent home and satisfying living environment for every Californian. An agency shall prepare a statement of overriding considerations as described in Section 15093 to reflect the ultimate balancing of competing public objectives when the agency decides to approve a project that will cause one or more significant effects on the environment."[3]

IDENTIFICATION OF POTENTIALLY SIGNIFICANT IMPACTS

CEQA Guidelines Section 15002 (h) addresses potentially significant impacts, to wit, "CEQA requires more than merely preparing environmental documents. The EIR by itself does not control the way in which a project can be built or carried out. Rather, when an EIR shows that a

[1] CEQA Guidelines, Section 15002 (a)
[2] Ibid., Section 15002 (f)
[3] Ibid., Section 15021

project could cause substantial adverse changes in the environment, the governmental agency must respond to the information by one or more of the following methods:

(1) Changing a proposed project;
(2) Imposing conditions on the approval of the project;
(3) Adopting plans or ordinances to control a broader class of projects to avoid the adverse changes;
(4) Choosing an alternative way of meeting the same need;
(5) Disapproving the project;
(6) Finding that changes in, or alterations, the project are not feasible.
(7) Finding that the unavoidable, significant environmental damage is acceptable as provided in Section 15093."[4] (See Chapter 7)

This *Draft EIR* identifies potentially significant impacts that would be anticipated to result from implementation of the proposed Project. Significant impacts are defined as a "substantial or potentially substantial, adverse change in the environment."[5] Significant impacts must be determined by applying explicit significance criteria to compare the future plan conditions to the existing environmental setting.[6]

The existing setting is described in detail in each resource section of Chapter 3 of this document and represents the most recent, reliable, and representative data to describe current regional conditions. The criteria for determining significance are also included in each resource section in Chapter 3 of this document.

CONSIDERATION OF SIGNIFICANT IMPACTS

Pursuant to CEQA Guidelines Section 15126.2, "[a]n EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people

[4] 2013 CEQA Guidelines, Section 15002 (h)
[5] Public Resources Code Section 21068
[6] CEQA Guidelines Section 15126.2(a)

to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[7]

MITIGATION MEASURES

CEQA Guidelines Section 15126.4 specifies that:

"(1) An EIR shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy.

(A) The discussion of mitigation measures shall distinguish between the measures which are proposed by project proponents to be included in the project and other measures proposed by the lead, responsible or trustee agency or other persons which are not included but the lead agency determines could reasonably be expected to reduce adverse impacts if required as conditions of approving the project. This discussion shall identify mitigation measures for each significant environmental effect identified in the EIR.

(B) Where several measures are available to mitigate an impact, each should be discussed and the basis for selecting a particular measure should be identified. Formulation of mitigation measures should not be deferred until some future time. However, measures may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way.

(C) Energy conservation measures, as well as other appropriate mitigation measures, shall be discussed when relevant. Examples of energy conservation measures are provided in Appendix F.

(D) If a mitigation measure would cause one or more significant effects in addition to those that would be caused by the project as proposed, the effects of the mitigation measure shall be discussed but in less detail than the significant effects of the project as proposed. (*Stevens v. City of Glendale* (1981) 125 Cal.App.3d 986.)

(2) Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding instruments. In the case of the adoption of a plan, policy, regulation, or other public project, mitigation measures can be incorporated into the plan, policy, regulation, or project design.

(3) Mitigation measures are not required for effects which are not found to be significant.

(4) Mitigation measures must be consistent with all applicable constitutional requirements, including the following:

(A) There must be an essential nexus (i.e. connection) between the mitigation measure and a legitimate governmental interest. *Nollan v. California Coastal Commission*, 483 U.S. 825 (1987); and

(B) The mitigation measure must be "roughly proportional" to the impacts of the project. *Dolan v. City of Tigard*, 512 U.S. 374 (1994). Where the mitigation

[7] 2013 CEQA Guidelines, Section 15126.2

measure is an ad hoc exaction, it must be "roughly proportional" to the impacts of the project. *Ehrlich v. City of Culver City* (1996) 12 Cal.4th 854.

(5) If the lead agency determines that a mitigation measure cannot be legally imposed, the measure need not be proposed or analyzed. Instead, the EIR may simply reference that fact and briefly explain the reasons underlying the lead agency's determination."[8]

ORGANIZATION OF THE EIR

Executive Summary

The Executive Summary Chapter summarizes the analysis in this Draft Environmental Impact Report.

CHAPTER 1

Provides a brief introduction to the Environmental Analysis required by the California Environmental Quality Act (CEQA).

CHAPTER 2

Describes the proposed Project. The chapter also includes the objectives of the proposed Project. The environmental setting is described and the regulatory context within which the proposed Project is evaluated is outlined.

CHAPTER 3

Includes the Environmental Analysis in response to each Checklist item. Within each analysis the following is included:

Summary of Findings

Each chapter notes a summary of findings.

Introduction

Each chapter will begin with a summary of impacts, pertinent CEQA requirements, applicable definitions and/or acronyms, and thresholds of significance.

Environmental Setting

Each environmental factor analysis in Chapter 3 will outline the environmental setting for each environmental factor. In addition, methodology is explained when complex analysis is required.

[8] 2013 CEQA Guidelines, Section 15126.4

Regulatory Setting

Each environmental factor analysis in Chapter 3 will outline the regulatory setting for that resource.

Project Impact Analysis

Each evaluation criteria will be reviewed for potential Project-specific impacts.

Cumulative Impact Analysis

Each evaluation criteria will be reviewed for potential cumulative impacts.

Mitigation Measures

Mitigation Measures will be proposed as deemed applicable.

Conclusion

Each conclusion will outline whether recommended mitigation measures will, based on the impact evaluation criteria, substantially reduce or eliminate potentially significant environmental impacts. If impacts cannot be mitigated, unavoidable significant impacts will be identified.

Definitions/Acronyms

Some sub-chapters of Chapter 3 will have appropriate definitions and/or acronyms.

References

Reference documents used in each chapter are listed at the end of each sub-chapter.

CHAPTER 4

Includes an analysis of the proposed Projects potential energy usage

CHAPTER 5

Summarizes the cumulative impacts addressed in Chapter 3.

CHAPTER 6

Describes and evaluates alternatives to the proposed Project. The proposed Project is compared to each alternative, and the potential environmental impacts of each are analyzed.

CHAPTER 7

Evaluates or describes CEQA-required subject areas: Economic Effects, Social Effects, and Growth Inducement.

CHAPTER 8

Evaluates or describes CEQA-required subject areas: Environmental Effects That Cannot be Avoided, Irreversible Impacts, and Statement of Overriding Considerations.

CHAPTER 9

Provides a Mitigation Monitoring and Reporting Program that summarizes the environmental issues, the significant mitigation measures, and the agency or agencies responsible for monitoring and reporting on the implementation of the mitigation measures.

CHAPTER 10

Outlines persons preparing the EIR.

APPENDICES

Following the text of this *Draft EIR*, several appendices and technical studies have been included as reference material.

ENVIRONMENTAL REVIEW PROCESS

Pursuant to CEQA Guidelines §15082, the Notice of Preparation (NOP) for the Proposed Project was circulated for review and comment on September 7, 2016 and circulated for a 30-day comment period ending October 6, 2016. Tulare County RMA received three comments on the NOP. Comments were received from the following agencies, individuals, and/or organizations:

- City of Kingsburg, dated September 21, 2016
- California Department of Transportation District 6, dated October 5, 2016
- County of Fresno Department of Public Works and Planning, dated October 3, 2016
- California Department of Conservation Division of Land Resource Protection, dated October 5, 2016
- Native American Heritage Commission, dated September 12, 2016
- Table Mountain Rancheria Tribal Government Office, dated September 12, 2016

A copy of the NOP is included in **Appendix "G",** along with copies of letters received in response to the NOP.

Consistent with CEQA Guidelines Section 15103, "Responsible and Trustee Agencies, and the Office of Planning and Research shall provide a response to a Notice of Preparation to the Lead Agency within 30 days after receipt of the notice. If they fail to reply within the 30 days with either a response or a well justified request for additional time, the lead agency may assume that none of those entitles have a response to make and may ignore a late response."[9]

A scoping meeting was duly noticed in a newspaper of general circulation and held on September 15, 2016. No comments were received during this meeting.

Section 15093 of the State CEQA Guidelines requires decision-makers to balance the benefits of a proposed project against any unavoidable adverse environmental effects of the project. If the benefits of the project outweigh the unavoidable adverse environmental effects, then the decision-makers may adopt a statement of overriding considerations, finding that the environmental effects are acceptable in light of the project's benefits to the public.

As noted in CEQA Guidelines § 15105 (a), a Draft EIR that is submitted to the State Clearinghouse shall have a minimum review period of 45 days. This *Draft EIR* was circulated publicly for a 45-day comment period beginning on December 22, 2017 and ending on February 4, 2018. Following completion of the review period, staff will prepare responses to comments and a *Final EIR* will be prepared. The *Final EIR* will then be forwarded to the County of Tulare Planning Commission for consideration of certification. Notwithstanding an appeal to the County of Tulare Board of Supervisors, a Notice of Determination will then be filed with the County of Tulare Clerk's Office and also forwarded to the State of California, Office of Planning and Research/State Clearinghouse.

ORGANIZATIONS AND PERSONS CONSULTED

1) U.S. Fish & Wildlife Service
2) U.S. Army Corps of Engineers Planning Division
3) U.S. Navy – Mr. David S. Hulse, Naval Facilities Engineering Command
4) California State Clearinghouse
5) San Joaquin Valley Unified Air Pollution Control District
6) City of Kingsburg Planning Department
7) County of Fresno Department of Public Works and Planning
8) Fresno County Local Agency Formation Commission
9) Tulare County Local Agency Formation Commission
10) Tulare County Resource Management Agency:
    a. Planning Branch (Environmental Planning, Project Review, Building and Housing Divisions)
    b. Public Works Branch
    c. Tulare County Flood Control
    d. Tulare County Fire
11) Tulare County Environmental Health and Human Services Agency, Environmental Health Division
12) Gabrieleno Band of Mission Indians – Kizh Nation

[9] 2013 CEQA Guidelines, Section 15103

13) Gabrieleno / Tongva San Gabrial Band of Mission Indians
14) Gabrielino Tongva Indians of California
15) Gabrielino Tongva Tribe
16) Kitanemuk & Yowlumne Tejon Indians
17) San Fernando Band of Mission Indians
18) Santa Rosa Rancheria Tachi Yokut Tribe
19) Table Mountain Rancheria
20) Tule River Indian Tribe

Project Description & Objectives
Chapter 2

INTRODUCTION

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, Section 21000 et seq.), the County of Tulare Resource Management Agency (RMA) is preparing this Environmental Impact Report (EIR) to evaluate the environmental effects associated with the adoption and implementation of the Hash Farms Development (Andersen Village) Specific Plan.

PROJECT LOCATION

The proposed Project will be located in the central San Joaquin Valley, approximately 20 miles southeast of the City of Fresno and 80 miles northwest of the City of Bakersfield (see **Figure 2-1**). The proposed Project will be located at the northwest corner of Road 16 and Avenue 396, partially within the City of Kingsburg, Fresno County and Tulare County (see **Figure 2-2**). The site is approximately one-half mile east of State Route 99 and approximately one-tenth of a mile south of State Route 201. The 54-acre site is located on Tulare County APNs 028-140-007, 012, 013, 018 and 022, and Fresno County APNs 396-020-008 and 014. The site is currently zoned A in Tulare County and R-1-6 in the City of Kingsburg and is within the Selma 7.5 Minute USGS Quadrangle. The proposed Project site lies within a portion of the NE ¼ of Section 26, Township 16S, Range 22E, M.D.B.& M.

The coordinates of the proposed Project site are:

Latitude: N 36° 30’44”
Longitude: W 119°32’30”

PROJECT DESCRIPTION

This EIR examines the potential environmental impacts of a proposed Project that includes approvals by the County of Tulare as Lead Agency, City of Kingsburg, County of Fresno, Fresno County Local Agency Formation Commission, Consolidated Irrigation District, and the Selma-Kingsburg-Fowler County Sanitation District (SKF), as responsible agencies, that would:

- Annex approximately two acres from Fresno County to the City of Kingsburg
- Adopt the Hash Farms Development Specific Plan
- Approve a zone change in Tulare County from A-1 to R-1-7/R-1-10 PD/RM
- Annex approximately 49 acres of land in Tulare County into SKF
- Approve a Tentative Map in Tulare County
- Approve a Tentative Map in City of Kingsburg

- Form a Communities Facilities District and a Tulare County Service Area
- Detach approximately 49 acres from Consolidated Irrigation District

The Hash Farms Development Specific Plan is a proposed plan for development of a 200-unit residential subdivision (160 single-family units and 40 multi-family units) on a total of 54 acres, including a 2.54 acre park and 1.15 acre fenced stormwater basin (see **Figure 2-3**). A cross section of the proposed development is detailed in **Figure 2-4**. The proposed Specific Plan and "Memorandum of Understanding: Hash Subdivision Financing and Tax Sharing Plan" is provided in Appendix H of this DEIR.

Open Space/Parks and Recreation and Public Services.

The proposed Project will provide 2.54 acres of parks and 1.8 acres of perimeter landscaped open space and a pedestrian/bike trail, which exceeds the County's and City's standard. In total, there is approximately 195,600 square feet of open space, pedestrian corridors, landscaped bulbouts, pedestrian walkthroughs, etc. The 2.54-acre park will include a large play structure, "splash pad", basketball court, shade and picnic structures, and a half-sized soccer practice field. The park is located to provide access to and from the existing neighborhood which does not have a neighborhood park. The park is also located to preserve open easterly and southerly views. These facilities will be maintained through an assessment district mechanism and/or Community Facilities District. The proposed Project also includes a 1.15 acre fenced in stormwater basin, south of the proposed residential units.

The Tulare County Sheriff will continue to service the site, but in a back-up capacity, with City police forces acting as the first responders. The applicant will pay Kingsburg's Police Facility impact fee and an amount equal to 0.25 full time employees (FTE) in the police department. The impact fee will be provided through a combination of property tax sharing from Tulare County and special assessments as part of the Community Facilities District, as detailed in Appendix H.

Similar to Sherriff, Tulare County/CalFire will continue to service the site, but in a back-up capacity, with City Ambulance/Fire acting as the first responders. The applicant will pay the Fire Facility Impact Fee, and an amount equate to 0.25 FTE in the fire department. The impact fee will be provided through a combination of property tax sharing from Tulare County General Fund, Tulare County Fire Fund, and special assessments as part of the Community Facilities District, as detailed in Appendix H.

Circulation

Vehicular access to the proposed Project will be primarily from two access points along Road 16 and two access points along Avenue 396. The proposed Project will also be accessible from existing residential streets that will be extended from the City of Kingsburg. The proposed Project consists of a network cul-de-sacs and standard rectangle shaped blocks and has been designed to encourage walkability in and around the development. The proposed Project provides adequate emergency vehicle access.

Infrastructure and On-Site Improvements.

Pacific Gas and Electric will supply electricity, Southern California Gas will provide natural gas, the City of Kingsburg will provide water service and SKF will provide sewer service. Storm water will be collected on-site and dispersed to bio-swales and/or ponds as necessary.

The City will extend water services from the existing City stub in Madsen Avenue/Road 16 and routed in tract to other City stubs in Lindquist Street and Mariposa Street and future residents will pay typical city water service fees according to a resident's fee schedule, with the permission of the Tulare County LAFCo. The applicant will pay the $1,454/unit Water Impact Fee. The proposed Project will also be annexed to the Selma-Kingsburg-Fowler Sanitation District (SKF) for sewer services. The existing sewer line in Kern Street/Avenue 396 just west of the Project's western boundary will be extended to the proposed Project's entrance at Bergman Street and routed through the development as shown in **Figure 2-3**.

The Cole Slough along the eastern edge of the proposed Project site will be piped underground, as a continuation to the existing undergrounded Cole Slough immediately north of the proposed Project site. The Project will also install and maintain frontage improvements (landscaping, sidewalk, etc.) along the Project boundaries on Road 16 and Avenue 396.

Site Maintenance

As part of the proposed Project, a Community Facilities District will be formed to maintain the on-site park areas, landscaping, and streets. This District will maintain open space, landscaping, parks, streets and street lights, and provide a funding mechanism for municipal services to be provided by City of Kingsburg.

Project Design Features

Lot sizes of the single family residential units will range between 7,000 sq. ft. to 15,100 sq. ft. with an average size of approximately 8,960 sq. ft. The multi-family component will consist of ten lots with up to four units per lot and will front on to Avenue 396 (Kern Street). Density for the single family portion of the proposed Project is 3.2 units per gross acre, compared to a typical residential density of 3.75 to 4.00 units per gross acre for project in the North Kingsburg Specific Plan.

Other project design features include:

- Approximately one mile of community bike and pedestrian paths (not including city sidewalks), including a perimeter bike and pedestrian(ped) paths on Kern Street and Madsen Avenue, and a diagonal ped/bike path along the linear park from Mariposa Avenue to Plumas Street.

- Repave of Madsen Avenue and Kern Street along the project's frontage.

- Landscape bulbouts in the Project for traffic calming.

- Walk-through cul-de-sacs similar to those in Figure V-8 of the North Kingsburg Specific Plan along Kern Street.

- Drought tolerant landscaping.

- Internal traffic calming to limit through traffic into the neighborhood to the west.

- Landscaped entries on Kern Street and Madsen Avenue.

- A central park in the project that is intended to service the needs of future residents and the existing neighborhood to the west and north.

- Mitigation of Project agricultural impacts through payment of building permit mitigation fee to the County of Tulare equal to $1,000 per acre, the value of an agricultural conservation easement meeting Department of Conservation specifications on a property of equal mitigation value. A total of 55.2 acres of farmland will be converted (54.2 acres of residential development and a 1-acre ponding basin south of Kern Street). The corresponding agricultural (ag) mitigation fee for each dwelling unit will be $275 per dwelling unit.

- Formation of a Community Facilities District and a Tax Sharing Agreement with Tulare County for equitable funding of services, and for maintenance of infrastructure.

- Adoption of a Specific Plan by the County of Tulare to establish engineering improvement standards comparable to those for the City of Kingsburg, and design requirements similar to those in the North Kingsburg Specific Plan.

Construction

Proposed Project construction will require site preparation activities such as demolition to remove the existing crops and structures on the site, and site grading activities. Existing agricultural wells will be capped per the applicable standards and existing overhead utilities may need to be moved or replaced. Construction is expected to occur over four years as determined by market demands and will be constructed over four phases, broken down as follows:

- Phase 1 – 51 Single Family units and 16 multifamily units
- Phase 2 – 50 Single Family units and 16 multifamily units.
- Phase 3 – 49 Single Family units
- Phase 4 – 10 Single Family units and 8 multifamily units

CURRENT LAND USE AND SURROUNDING LAND USE

The majority of the proposed Project is currently in active agricultural production with grapes, plums and peaches. The northern portion of the site is fallowed. The Cole Slough runs parallel to Road 16 along the eastern edge of the proposed Project site. One residence and three farm structures are also along Road 16 (see **Figure 2-2**).

The proposed Project site is immediately adjacent to Lincoln Elementary School and approximately 0.4 and 0.6 miles east of the City of Kingsburg Police and Fire Stations, respectively. The land uses surrounding the property are primarily residential to the north and west and primarily agricultural to the south and east, with rural residences interspersed with row crops and orchards. The Kings River is approximately 0.9 miles to the southeast of the proposed Project site and generally flows from northeast to southwest in the vicinity.

The proposed Project is within the Kingsburg Sphere of Influence and is designated for low density development on the City's Land Use Diagram; it is shown as being within the Kingsburg Urban Development Boundary (UDB) in the Tulare County General Plan and is designated as "Mixed Use". Both General Plans clearly anticipate and expect that this parcel will develop as a residential extension of the City.

The proposed Project site is logically served by the same entities and in the same manner as the areas of Kingsburg that are in Fresno County. The Project site is serviced by Kingsburg schools, is in the (Fresno) State Center Community College District, is in the Sphere of Influence for the Selma-Kingsburg-Fowler (SKF) sanitation district, is in the Kingsburg Hospital District, as well as being in several other Kingsburg service areas. The City's water, police, fire and recreation facilities are immediately adjacent to the site, and can logically service the proposed Project. From a planning perspective, it is within walking distance of Kingsburg's downtown area, and its development would likely provide added sales to that commercial district.

PROJECT OBJECTIVES

The purpose of the proposed Project is to implement a mixed-density, master planned community in Tulare County (County) and the City of Kingsburg (City), consistent with the City's and County's Guiding Principles related to new development. The proposed Project is intended to provide for the orderly and systematic development of a residential community with the ultimate development pattern guided by the following project objectives:

- **Complete Comprehensive Planning for the Hash Farm Specific Plan Area:** Formulate a specific plan, related land use planning documents, and regulatory approvals for the Hash Farm Specific Plan Area as a means of developing the City of Kingsburg and County of Tulare in an orderly manner, accommodating the areas' share of future regional population growth, being compatible with surrounding land uses, complementing the pattern and intensity of existing development in the City, and providing new opportunities (i.e., housing, recreational, shopping, etc.) to the City and County.
- **Existing Policies:** Satisfy the City of Kingsburg and Tulare County policies, regulations and expectations as defined in the Tulare County General Plan 2030 Update, City of Kingsburg General Plan, the City and Tulare County Zoning Ordinances, City and County Improvement Standards, and all other applicable plans, documents, and programs adopted by the City and County. As the project will ultimately need wastewater collection and treatment services, the project will also comply with Selma-Kingsburg-Fowler (SKF) Sanitation District policies, standards, etc.
- **Common Development Standards.** Since the project is located adjacent to the City of Kingsburg and will share the same water and sewer systems, a project objective is to adopt a specific plan that will establish development standards and urban improvement standards that are similar to those the City of Kingsburg. To this end, the Hash Farms Specific Plan will establish the City of Kingsburg's improvement standards as the appropriate standards for the project, and contain residential neighborhood standards that are similar to those established contained in the North Kingsburg Specific Plan.
- **Housing Opportunities:** Plan for an economically feasible residential project consisting of up to 200 residential units to provide housing choices in varying densities to respond to a range of market segments.
- **Regional Housing Needs Allocation:** Aid the County of Tulare and City of Kingsburg in meeting its obligation to accommodate a percentage of future population growth in the region (as embodied in the respective Regional Housing Needs Allocation) identified by the Tulare County Association of Governments, Council of Fresno County Governments, and the California Department of Housing and Community Development by increasing the residential holding capacity in an area identified as appropriate for such development.
- **Community Form:** Shape the physical form and character of development that is functional and creates a sense of place in order to:
    - Create a land use transition and connection between the City of Kingsburg and Tulare County.
    - Organize neighborhoods to be identifiable and walkable, and to incorporate gathering places such as parks and walking pathways.
    - Provide housing that is close to Downtown Kingsburg to support the economic viability of the downtown businesses.
- **Contribute to Regional Preserve Planning:** Create open space preserves which provide regional benefit for habitat, resources, and open space amenities.

ACTIONS REQUIRED FOR IMPLEMENTATION

To accommodate the proposed Project, the following actions will need to occur:

- Annexation of approximately two acres from Fresno County to the City of Kingsburg
- Annexation of approximately 49 acres of land in Tulare County in to the Selma-Kingsburg-Fowler County Sanitation District
- Formation of a Community Facilities District and a Tulare County Service Area
- Tulare County approval of a Tentative Map
- Tulare County approval of a Specific Plan
- City of Kingsburg approval of a Master Plan
- City of Kingsburg approval of a Tentative Map
- Detachment from Consolidated Irrigation District

In addition to the actions listed above, the San Joaquin Valley Air Pollution Control District (Air District) will require compliance with Regulation VIII (Fugitive PM10 Prohibitions); a series of eight (8) rules adopted by the Air District that requires action to prevent, reduce or mitigate fugitive dust emissions from construction-related or other earth-moving/earth-disturbing activities. Regulation VIII may also require a District-approved Dust Control Plan prior to initiation of construction-related activities. A Dust Control Plan identifies the fugitive dust sources at the construction site and describes all of the dust control measures to be implemented before, during, and after any dust generating activity for the duration of the project.

Figure 2-1: Regional Vicinity

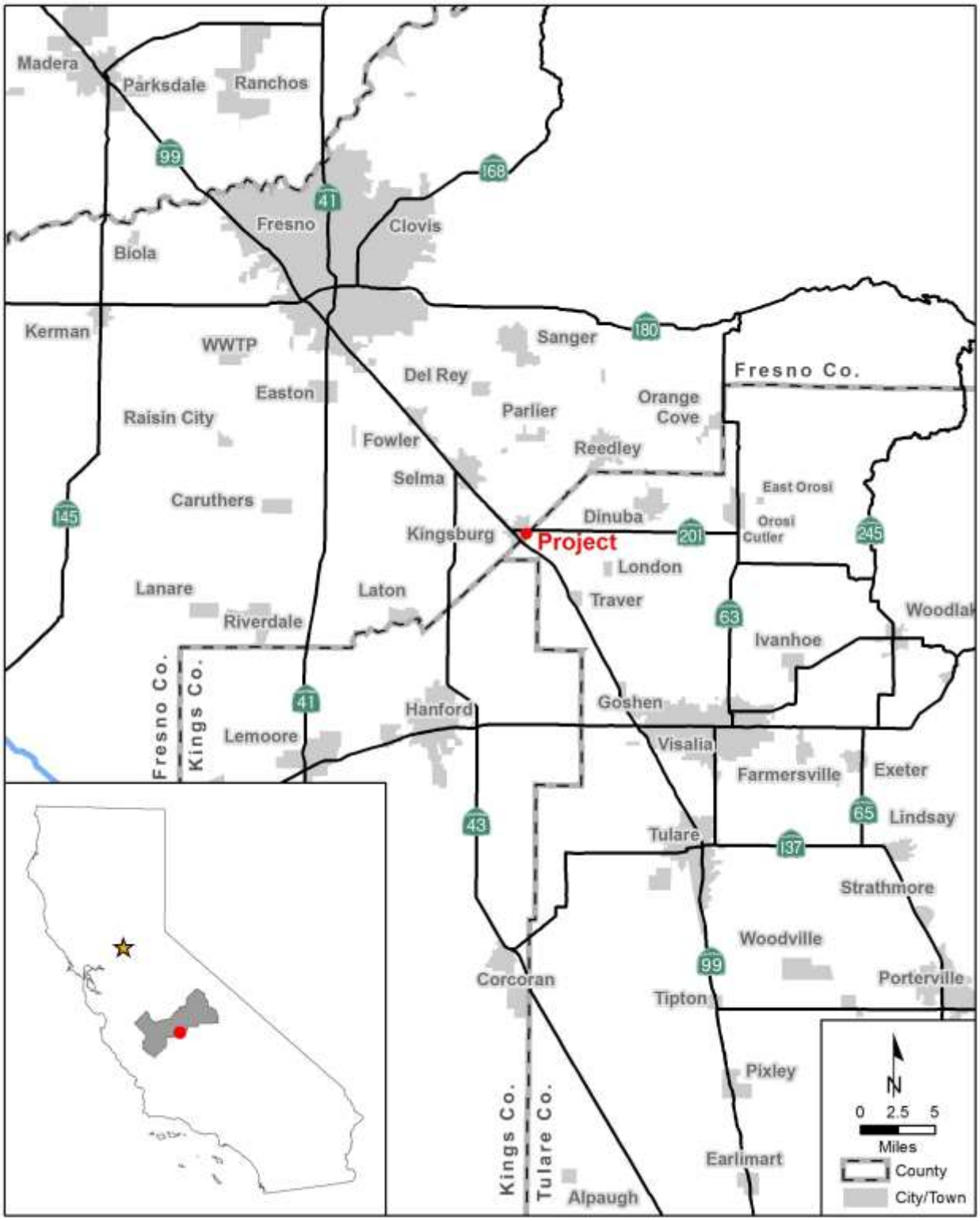


Figure 2-2: Site Aerial

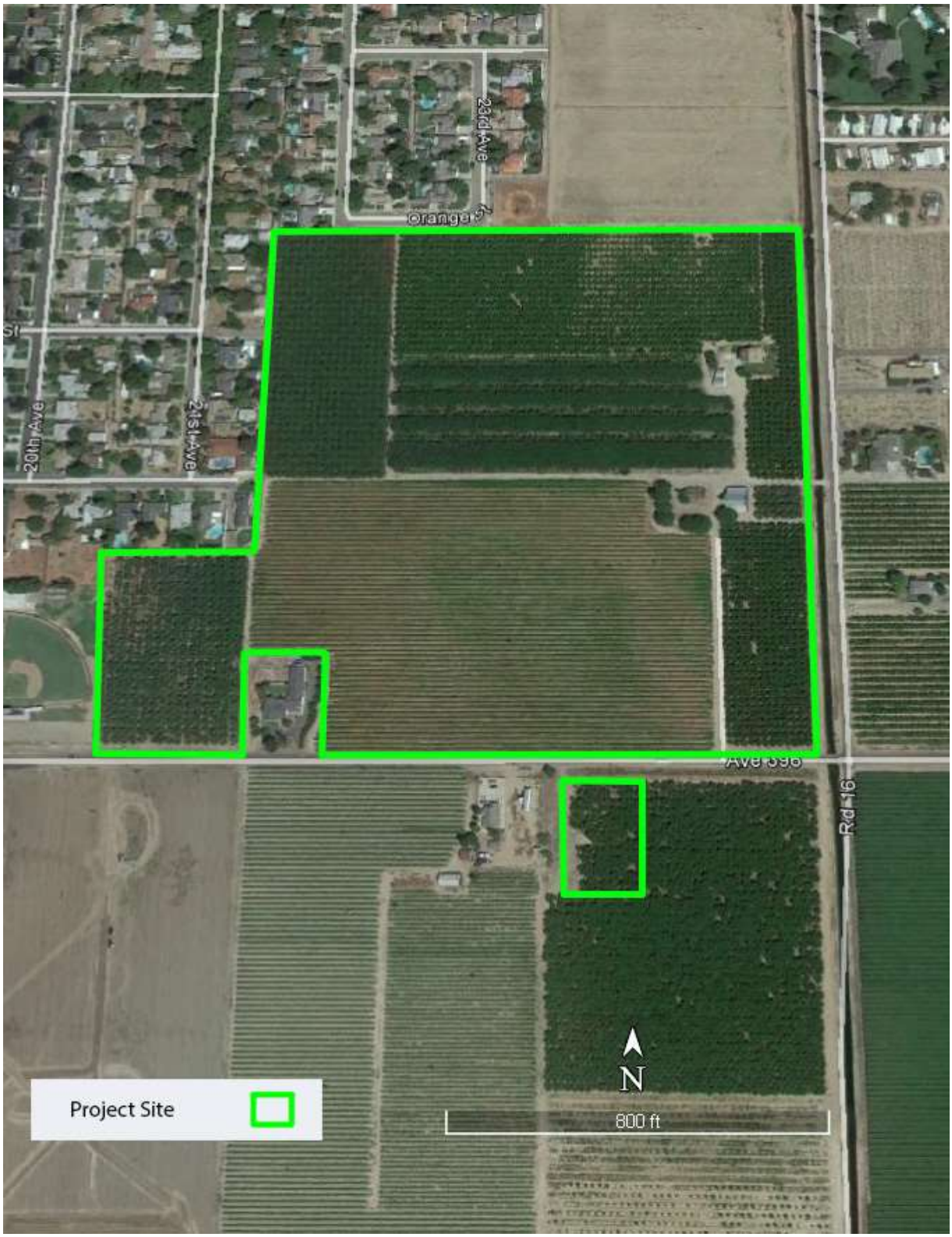
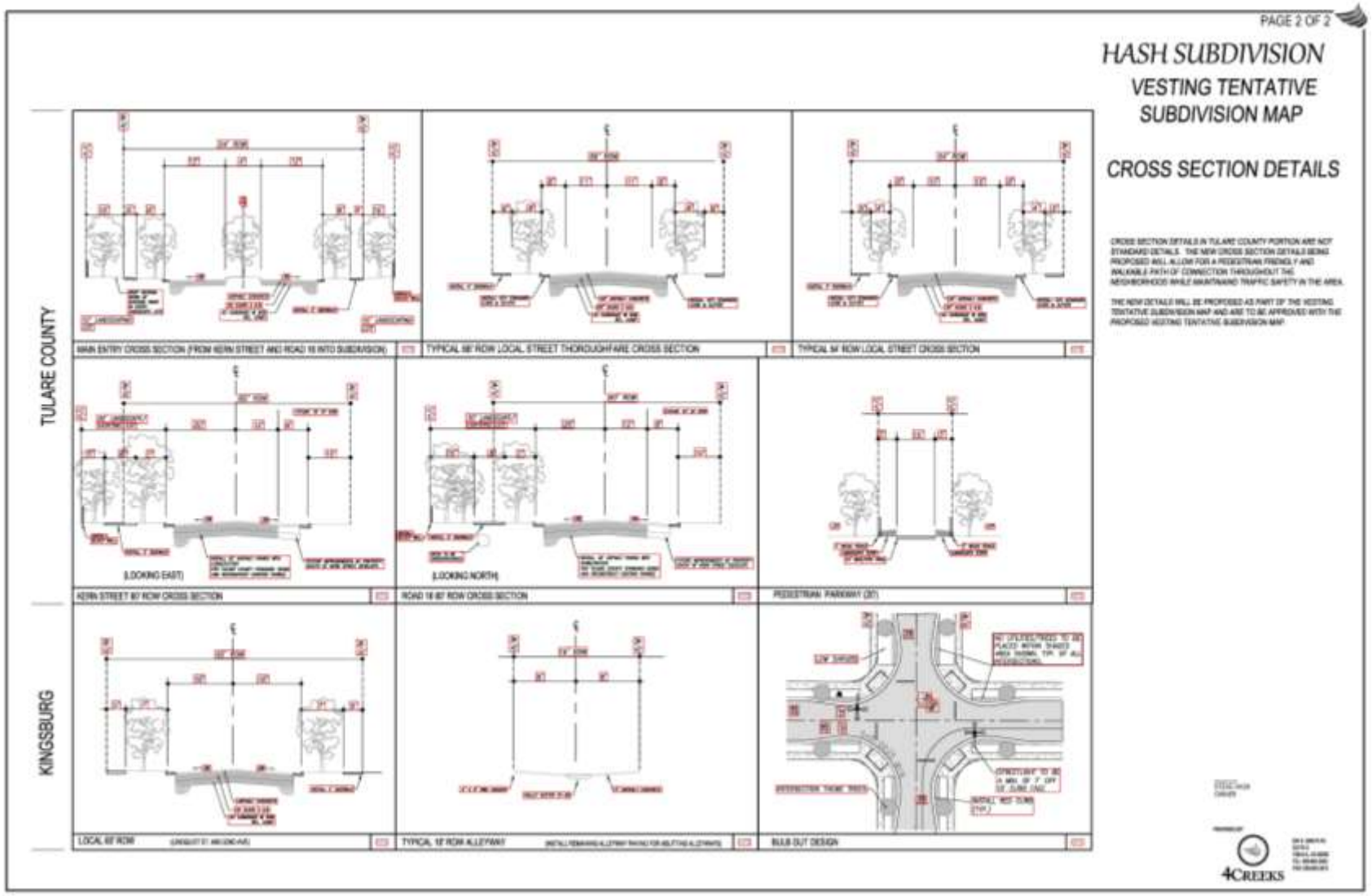


Figure 2-3: Proposed Site Plan

Figure 2-4: Proposed Project Cross Section Details



Aesthetics
Chapter 3.1

SUMMARY OF FINDINGS

The proposed Project will have ***Less Than Significant Impacts*** related to Aesthetics. A detailed review of potential impacts is provided in the following analysis.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

CEQA requires that significant impacts on the environment be identified and, where possible, measures be added to minimize or eliminate impacts (CEQA Guidelines Section 15382). A "[s]ignificant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project…" (CEQA Guidelines Section 15382). With respect to aesthetics, potentially significant CEQA impacts include visual impacts to scenic highways, the visual character of the site, and impacts from lighting.

This section describes the existing visual environment in the vicinity of the Project area using accepted methodology to evaluate aesthetic/visual landscape quality and light/glare. Aesthetic considerations tend to be subjective. The methodologies used to evaluate aesthetic impacts to visual character are qualitative in nature, and are based on photographic documentation of the site and surrounding area.

The proposed Project site is located in the agricultural (Valley) portion of Tulare County. The Environmental Setting section describes scenic and aesthetic resources in the region, with special emphasis on the proposed Project site and vicinity. The Regulatory Setting provides a description of applicable State and local regulatory policies. A description of the potential impacts of the proposed Project is also provided and includes the identification of feasible mitigation to avoid or lessen the impacts.

The analyses of the existing visual setting and potential visual impacts resulting from the proposed Project are based primarily on information provided by the Project applicant.

Thresholds of Significance:

The threshold of significance for this section will include the following:

- Impact on a scenic vista
- Impact on a scenic highway
- Impact on visual quality
- Creation of glare or impacts on nighttime views

ENVIRONMENTAL SETTING

Visual Character of the Region

"Tulare County is located in a predominately agricultural region of central California. The terrain in the County varies. The western portion of the County includes a portion of the San Joaquin Valley (Valley), and is generally flat, with large agricultural areas with generally compact towns interspersed. In the eastern portion of the County are foothills and the Sierra Nevada mountain range. The Project site is located on the Valley floor, which is very fertile and has been intensively cultivated for many decades. Agriculture and related industries such as agricultural packing and shipping operations and small and medium sized manufacturing plants make up the economic base of the Valley region. Many communities are small and rural, surrounded by agricultural uses such as row crops, orchards, and dairies. From several locations on major roads and highways through out the County, electric towers and telephone poles are noticeable. Mature trees, residential, commercial, and industrial development, utility structures, and other vertical forms are highly visible in the region because of the flat terrain. Where such vertical elements are absent, views are expansive. Most structures are small; usually one story in height, through occasionally two story structures can be seen commercial or industrial agricultural complexes. The County provides a wide range of views from both mobile and stationary locations."[1]

Existing Visual Conditions

A 2.5-acre portion of the proposed Project site is within the southeast portion of the City of Kingsburg and as such, land uses in the Project vicinity include urban and built-up land. The majority of the proposed Project site is within an unincorporated area of Tulare County (approximately 49 acres), with a 2.5-acre section being in an unincorporated area of Fresno County (which is planned for annexation into the City of Kingsburg as part of this Project). The County portions of the proposed Project site can be characterized as agricultural land with scattered rural residences. Surrounding agricultural lands consist of stone fruit orchards, row crops and other farmed lands. The Cole Slough canal borders the site to the east. Figures 3.1-1 and 3.1-2 depict existing site conditions.

[1] Tulare County General Plan 2030 Update: Recirculated Draft EIR (RDEIR), Page 3.1-11

Figure 3.1-1
View looking west toward Project site from Avenue 396

Figure 3.1-2
View looking northwest toward Project site from Avenue 396, along the Cole Slough Canal

REGULATORY SETTING

Federal Agencies & Regulations

None that apply to the proposed Project.

State Agencies & Regulations

Title 24 Outdoor Lighting Standards

Title 24 Outdoor Lighting Standards were adopted by the State of California Energy Commission (Commission) (Title 24, Parts 1 and 6, Building Energy Efficiency Standards (Standards) on November 5, 2003 and went into effect on October 1, 2005. The changes included new requirements for outdoor lighting, which vary according to which "lighting Zone" the equipment is in. The Commission defines rural areas as Lighting Zone 2. Existing outdoor lighting systems are not required to meet these lighting allowances.

Scenic Highway Program

The California Scenic Highway Program was established by the state Legislature in 1963 for the purpose of protecting and enhancing the natural scenic beauty of California highways and adjacent corridors through special conservation treatment. The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been officially designated. The state laws governing the scenic highways program are found in The Streets and Highways Code Sections 260-263. In Tulare County, portions of State Routes 190,198, and 180 are eligible for state scenic highway designation.[2]

Local Policy & Regulations

"The scenic landscapes in Tulare County will continue to be one of the County's most visible assets. The Tulare County General Plan emphasizes the enhancement and preservation of these resources as critical to the future of the County. The County will continue to assess the recreational, tourism, quality of life, and economic benefits that scenic landscapes provide and implement programs that preserve and use this resource to the fullest extent."[3]

County Scenic Roadways

"Tulare County's existing General Plan identifies State designated scenic highways and County designated eligible highways. There are three highway segments designated as eligible by the State. These include State Route 198 from Visalia to Three Rivers, State Route 190 from Porterville to Ponderosa, and State Route 180 extending through Federal land in the northern portion of Tulare County. State Route 198 closely follows around Lake Kaweah and the Kaweah River, while State Route 190 follows around Lake Success and the Tule River. Both Scenic

[2] Tulare County General Plan 2030 Update, Goals and Policies Report Part 1, page 7-5
[3] Tulare County General Plan 203 Update Goals and Policies Report, p. A-2

Highways travel through agricultural areas of the valley floor to the foothills and the Sierra Nevada Range. Additionally, the General Plan Update identifies preserving the rural agricultural character of SR 99 and SR 65 as valuable to the County and communities."[4]

Tulare County General Plan Policies

The Tulare County General Plan has several policies that apply to projects within the County of Tulare. General Plan policies that relate to the proposed Project are listed below.

SL-1.1 Natural Landscapes

During review of discretionary approvals, including parcel and subdivision maps, the County shall as appropriate, require new development to not significantly impact or block views of Tulare County's natural landscapes. To this end, the County may require new development to:

1. Be sited to minimize obstruction of views from public lands and rights-of- ways,
2. Be designed to reduce visual prominence by keeping development below ridge lines, using regionally familiar architectural forms, materials, and colors that blend structures into the landscape,
3. Screen parking areas from view,
4. Include landscaping that screens the development,
5. Limit the impact of new roadways and grading on natural settings, and
6. Include signage that is compatible and in character with the location and building design

SL-1.2 Working Landscapes

The County shall require that new non-agricultural structures and infrastructure located in or adjacent to croplands, orchards, vineyards, and open rangelands be sited so as to not obstruct important viewsheds and to be designed to reflect unique relationships with the landscape by:

1. Referencing traditional agricultural building forms and materials,
2. Screening and breaking up parking and paving with landscaping, and
3. Minimizing light pollution and bright signage.

LU-3.1 Residential Developments

The County shall encourage new major residential development to locate near existing infrastructure or employment centers, services, and recreation.

LU-7.2 Integrate Natural Features

The County shall emphasize each community's natural features as the visual framework for new development and redevelopment.

LU-7.4 Streetscape Continuity

The County shall ensure that streetscape elements (e.g., street signs, trees, and furniture) maintain visual continuity and follow a common image for each community.

LU-7.14 Contextual and Compatible Design

The County shall ensure that new development respects Tulare County's heritage by requiring that development respond to its context, be compatible with the traditions and character of each

[4] Tulare County General Plan 2030 Update, Goals and Policies Report, page 7-2

community, and develop in an orderly fashion which is compatible with the scale of surrounding structures.

LU-7.9 Visual Access
The County shall require new development to maintain visual access to views of hillsides, creeks, and other distinctive natural areas by regulating building orientation, height, and bulk.

LU-7.19 Minimize Lighting Impacts
The County shall ensure that lighting in residential areas and along County roadways shall be designed to prevent artificial lighting from reflecting into adjacent natural or open space areas unless required for public safety.

ERM-5.19 Night Sky Protection
Upon demonstrated interest by a community, mountain service center, or hamlet, the County will determine the best means by which to protect the visibility of the night sky.

ERM-1.15 Minimize Lighting Impacts
The County shall ensure that lighting associated with new development or facilities (including street lighting, recreational facilities, and parking) shall be designed to prevent artificial lighting from illuminating adjacent natural areas at a level greater than one foot candle above ambient conditions.

Kingsburg City General Plan Policies

Goal No. 4 – Policy 1
Architectural design review shall be required of all Planned Unit Developments (PUD's), and of all multi-family, office, commercial, institutional and industrial uses.

Goal No. 4 – Commercial and Industrial Areas – Policy 2
The visual interface between commercial/industrial areas and residential areas shall be designed and developed so as to avoid obtrusive visual impacts of commercial or industrial activities on nearby residential areas.

Goal No. 4 – Commercial and Industrial Areas – Policy 3
All outdoor storage areas shall be visually screened with ornamental fencing or walls, and landscaping.

Goal No. 4 – Commercial and Industrial Areas – Policy 4
Street trees and frontage landscaping, with automatic irrigation, shall be provided for all commercial sites outside of the CBD, and may be required by the City within the CBD; shade trees shall be provided within off-street parking areas as determined under site plan review.

Goal No. 4 – Urban Open Space System – Policy 1
Features of the urban open space system should include neighborhood and community recreation-parks, recreation corridors along natural and man-made drainages and waterways, recreation corridors which connect with major components of the park system, and specialized

recreation facilities such as a municipal golf course, centers for teenage youth and the elderly, and swimming pool. Neighborhood parks should be adjacent to and integrated with elementary school sites as well as being free-standing. Community parks should be adjacent to and integrated with junior high and high school sites, as well as being freestanding.

IMPACT EVALUATION

Would the project:

a) Have a substantial adverse effect on a scenic vista?

Project Impact Analysis: ***Less Than Significant Impact***

The proposed Project site is in the Valley portion of Tulare County. The site is generally flat with unobstructed views of the surrounding agricultural lands, educational, and residential land uses. Neither the proposed Project site nor any of the surrounding land uses contains features typically associated with scenic vistas (e.g. ridgelines, peaks, overlooks). Therefore, little opportunity exists for project development to obscure views of scenic vistas that may be located within the immediate area of the proposed Project site.

The Sierra Nevada Mountains are the only natural and visual resource in the Project area. Views of these distant mountains are afforded only during clear conditions. Due to the impacts of air quality in the Valley, the view of this mountain range can often be limited. Distant views of the Sierra Nevada Mountains would largely be unaffected by the development of the proposed Project because of the distance and limited visibility of these features. Neither the County of Tulare, nor the City of Kingsburg, identify views of these features as required to be "protected."

Although the proposed Project will be visible from Avenue 396 and from Road 16, it is anticipated that design features will minimize visual impacts to those viewing the site. Any structure developed on the site will not exceed 35 feet in height, therefore, the height will be consistent with those allowed in a residential zone[5], nor will it impair unobstructed views of the Sierra Nevada from Avenue 396 and from Road 16 once the Project is full built-out. In conclusion, the proposed Project will not include any structures that would exceed a maximum of 35 feet in height and no higher than two stories in height, per the City of Kingsburg development code. Therefore, with this design limitation, scenic vistas would not be impacted.

Therefore, the proposed Project will not include any structures that would exceed a maximum of 35 feet in height. As such, with this height design limitation, obstruction to scenic vistas would result in a ***Less Than Significant Impact***.

Cumulative Impact Analysis: ***No Impact***

[5] Kingsburg Code of Ordinances. Ordinance No. 2017-002, passed May 17, 2017. https://library.municode.com/ca/kingsburg/codes/code_of_ordinances?nodeId=TIT17ZO. Accessed October 2017.

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan Background Report, the Tulare County General Plan 2030 Update EIR, and the 1990 City of Kingsburg General Plan.

There are no scenic vistas on or near the Project site; as such there will be ***No Cumulative Impacts*** related to this Checklist Item.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, there are ***No Project-specific or Cumulative Impacts*** related to this Checklist Item.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Project Impact Analysis: ***No Impact***

There are no designated state scenic highways Tulare County or in the City of Kingsburg. A portion of State Route 180 in Fresno County is an Officially Designated State Scenic Highway[6]; however, that portion is over 15 miles northeast of the proposed Project site. The Tulare County General Plan 2030 Update also lists a series of Scenic County Routes, several of which are in agricultural areas; however, none are in the proposed Project vicinity. There will be ***No Impact*** to this Checklist Item.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan Background Report, the Tulare County General Plan 2030 Update EIR, and the 1990 City of Kingsburg General Plan.

There will be ***No Cumulative Impacts*** because the proposed Project will not create visual impacts to State Scenic Highways or Scenic County Routes.

Mitigation Measure(s): ***None required.***

Conclusion: ***No Impact***

[6] California Department of Transportation. Officially Designated State Scenic Highways. http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/. Accessed March 2015.

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

c) Substantially degrade the existing visual character or quality of the site and its surroundings

Project Impact Analysis: ***Less Than Significant Impact***

Agricultural landscapes throughout Tulare County are typically considered scenic and visually appealing. While the Project is not located on a Scenic County Road or Eligible State Scenic Highway, the Project site is located in an area with large agricultural fields under cultivation which are generally considered visually pleasing. At full build-out, implementation of the proposed Project will alter the visual character of the site from agricultural fields to a residential development. The Project will be required to comply with the substantial design review and design limitations required by the City of Kingsburg's adopted design guidelines and zoning regulations, which require setbacks, landscaping and designs to limit impact to neighboring properties. Conformance with the development standards will ensure that the proposed Project will be a streamlined extension of the existing adjacent residences. Also, the proposed Project would be an extension of the existing residential areas located at the southeastern edge of the City of Kingsburg. As such, the residential development of the proposed Project with residences will not create a visually degraded character or quality to the Project site or to the properties near and around the Project site. Therefore, the Project would result in ***Less Than Significant Impacts*** on the visual character within or adjacent to the Project site.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan Background Report, the Tulare County General Plan 2030 Update EIR, and the 1990 City of Kingsburg General Plan.

As the proposed Project would not create any project specific visual impacts, ***Less Than Significant Cumulative Impacts*** on visual character will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less than Significant Impact***

The proposed Project will have ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Project Impact Analysis: ***Less Than Significant Impact***

Lighting impacts are often associated with the use of artificial light during the evening and nighttime hours. Impacts could potentially include light emanating from building interiors (seen through windows) and light from exterior sources, such as security lighting, street lighting, etc. Glare is typically a daytime occurrence caused by light reflecting off highly polished surfaces such as window glass or polished metallic surfaces.

The proposed Project will include new street and house lighting within the development and all new lighting will be consistent with current City of Kingsburg standards, which will minimize light spillage or other negative lighting impacts. Other than typical daylight reflecting from residences windows, no other sources of glare (such as light reflecting off highly polished surfaces) would occur as a result of the Project. Therefore, ***Less Than Significant Impacts*** to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan Background Report, the Tulare County General Plan 2030 Update EIR, and the 1990 City of Kingsburg General Plan.

Development projects and urbanization typically adds small amounts of light that could incrementally impact the night sky. The proposed Project will essentially be an extension of existing housing subject to City of Kingsburg standards which will minimize light spillage or other lighting impacts. As such, the proposed Project's cumulative incremental increase of light and glare will be less than significant. As such, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item will occur.

DEFINITIONS

Scenic landscapes - Landscapes that include agricultural lands, woodlands, forestlands, watercourses, mountains, meadows, structures, communities, and other types of scenery that contribute to the visual beauty of Tulare County.

Natural Landscapes - An expanse of naturally-formed scenery that contribute to the visual beauty of Tulare County.

Working Landscapes - These are landscapes shaped by human activities that produce economic commodities such as agricultural lands, ranch lands, and timber lands. They may also include picturesque commercial districts in communities, crops, orchards, agricultural structures, stands of timber, and canals."

Viewshed - An area of land, water, or other environmental features that is visible from a fixed vantage point. Viewsheds tend to be areas of particular scenic or historic value that are deemed worthy of preservation against development or other change. The preservation of viewsheds is typically the goal in the designation of open space areas, green belts, and urban separators.

REFERENCES

California Department of Transportation. Officially Designated State Scenic Highways. http://www.dot.ca.gov/hq/LandArch/scenic/schwy.htm. Accessed March 2015.

Kingsburg Code of Ordinances. Ordinance No. 2017-002, passed May 17, 2017. https://library.municode.com/ca/kingsburg/codes/code_of_ordinances?nodeId=TIT17ZO. Accessed October 2017.

Tulare County General Plan 2030 Update, Goals and Policies Report Part 1, pages 7-2, 7-5

Tulare County General Plan 2030 Update: Recirculated Draft EIR (RDEIR), page 3.1-11

Tulare County General Plan 2030 Update Goals and Policies Report, p. A-2

Agricultural Land and Forestry Resources Chapter 3.2

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts*** to Agricultural Land and Forestry Resources. The analysis in this Chapter is based on the Agricultural Land Conversion Analysis prepared by Crawford & Bowen Planning, Inc. and is provided in Appendix F of this Draft EIR. No mitigation measures will be required. A detailed review of potential impacts is provided in the analysis below.

INTRODUCTION

CEQA Requirements for Evaluation of Impacts to Agricultural Land and Forestry Resources

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to agricultural land and forestry resources. As required in Section 15126, all phases of the proposed Project will be considered was part of the potential environmental impact.

As noted in 15126.2 a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed Project. In assessing the impact of a proposed Project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the Project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the Project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision will have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."
The environmental setting provides a description of the Agricultural Lands and Forestry Resources in the County. The regulatory setting provides a description of applicable Federal, State and Local regulatory policies that were developed in part from information contained in the Tulare County 2030 General Plan, the Tulare County General Plan Background Report and/or

the Tulare County General Plan Revised DEIR incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

CEQA THRESHOLDS OF SIGNIFICANCE

The Department of Conservation identifies the location of prime Agricultural Land resource areas and Williamson Act Contract lands. Thresholds of potential significance will include the following:

- Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance
- Conflict with Williamson Act Contracts
- Convert Forest Land

ENVIRONMENTAL SETTING

"Tulare County exhibits a diverse ecosystems landscape created through the extensive amount of topographic relief (elevations range from approximately 200 to 14,000 feet above sea level). The County is essentially divided into three eco-regions. The majority of the western portion of the County comprises the Great Valley Section, the majority of the eastern portion of the County is in the Sierra Nevada Section, and a small section between these two sections comprises the Sierra Nevada Foothill Area."[1]

State of California

State of California Agricultural Production

"The sales value generated by California agriculture decreased by 16.8% between the 2014 and 2015 crop years. The State's 77,500 farms and ranches received a record $47.1 billion for their output, down from the $56.6 billion received in 2014. California's revenue was led by the dairy industry, followed by almonds and grapes.

Almond cash receipts decreased to $5.33 billion. Cash receipts fell by 27.9 percent due to a fall in prices from $4.00 per pound in 2015. Grape production generated $4.95 billion in cash receipts in 2015, down 5.4 percent from 2014. Production decreased by 1.3 percent from 2014, and prices received by growers decreased from $756 per ton of grapes in 2014 to $724 per ton in 2015. Revenue generated from cattle was $3.40 billion, a 9.0 percent decrease from the 2014 record high of $3.73 billion.

The dairy industry, California's leading commodity in cash receipts, generated $6.23 billion for milk production in 2015, down 32.8 percent from 2014. Milk production decreased by 3.4 percent, and milk prices received by producers decreased from $22.12 per hundred pounds of

[1] Ibid. 3.11-5

milk sold in 2014 to $15.40 in 2015. As the leading dairy producing state in the country, California produced nearly 20 percent of the nation's supply in 2015.

California remained the leading state in cash farm receipts in 2015 with combined commodities representing nearly 13 percent of the U.S. total. California's leading crops remained fruits, nuts and vegetables."[2]

State of California Farmland Conversion

Of California's approximately 100 million acres of land, 43 million acres are used for agriculture. Of this, 16 million acres are grazing land and 27 million acres are cropland. Only about nine million acres of irrigated land are considered to be Prime, Unique or of Statewide Importance.[3]

"Irrigated farmland in California decreased by more than 91 square miles (58,587 acres) between 2010 and 2012. The highest-quality agricultural soils, known as Prime Farmland, comprised 81 percent of the loss. Urban development, which totaled 29, 342 acres, decreased by 34 percent compared with the 2010 update. The 2012 urban land increase was the lowest recorded in the program's history, reflecting impacts of the recent recession. Of the nearly 46 square miles of new Urban and Build-up Land in the state, 43 percent occurred in the Southern California region.

Land was removed from irrigated categories – to uses aside from urban – at a rate of 41 percent lower than compared with the prior update (252,473 acres in 2010 and 149,577acres in 2012). Land idling and reversion to dry farming were responsible for the majority of this type of conversion. The southern San Joaquin Valley and counties in the Sacramento-San Joaquin Delta were most impacted by land idling. Three counties had 10,000 or more acres of this conversion type: Fresno, Kern, and Kings."[4]

Tulare County

Agricultural Productivity

The Project site is located in the San Joaquin Valley portion of Tulare County. This area is characterized by rich, highly productive farmland. Agriculture is the most important sector in Tulare County's economy, and agriculture and related industries make Tulare County the most productive agricultural county in the United States, according to Tulare County Farm Bureau statistics.[5][6] "Agricultural lands (crop and commodity production and grazing) also provide the County's most visible source of open space lands. As such, the protection of agricultural lands

[2] United States Department of Agriculture. California Agricultural Statistics Review, 2015-2016 Crop Year. https://www.nass.usda.gov/Statistics_by_State/California/Publications/California_Ag_Statistics/Reports/2015cas-all.pdf. Accessed July 2017.
[3] California Department of Food and Agriculture. AgVision 2030 White Paper. Agricultural Land Loss & Conversion. July 2009. http://www.cdfa.ca.gov/agvision/docs/Agricultural_Loss_and_Conservation.pdf. Accessed June 2017.
[4] California Department of Conservation. 2015 California Farmland Conversion Report. http://www.conservation.ca.gov/dlrp/fmmp/Pages/FMMP_2010-2012_FCR.aspx. Accessed July 2017.
[5] Tulare County Farm Bureau. Tulare County Agricultural Facts. http://www.tulcofb.org/index.php?page=agfacts. Accessed October 19, 2015.
[6] Tulare County Agricultural Commissioner. 2014 Tulare County Annual Crop and Livestock Report. http://agcomm.co.tulare.ca.us/default/index.cfm/standards-and-quarantine/crop-reports1/crop-reports-2011-2020/2014-crop-report/. Accessed October 19, 2015.

and continued growth and production of agriculture industries is essential to all County residents."[7]

The *2015 Tulare County Annual Crop and Livestock Report* stated "Tulare County's total gross production value for 2015 as $6,980,977,800. This represents a decrease of $1,703,694,600 or 13.7% below 2014's values of $8,084,672,400. Milk continues to be the leading agricultural commodity in Tulare County; with a total gross value of $1,718,001,000, a decrease of $822,231,000 or 32.4%. Milk produce represents 24.6% of the total crop and livestock value for 2015. Total milk production in Tulare County remained relatively stable. Livestock and Poultry's gross value of $1,022,620,000 represents a decrease of 4.89% below 2014, mostly due to lower per unit value for cattle and less poultry production."[8]

"Tulare County's agricultural strength is based on diversity of the crops produced. The 2015 report covers more than 120 different commodities, 45 of which had a gross value in excess of $1,000,000. Although individual commodities may experience difficulties from year to year, Tulare County continues to produce high-quality crops that provide food and fiber to more than 90 countries throughout the world."[9]

Tulare County Farmland Conversion

In line with the State of California, Tulare County has also seen a decrease in FMMP-designated farmland, with the total inventoried land down over one percent, as seen in **Table 3.2-1** between the years 1998 and 2012. Between the years 2010 and 2012, Tulare County lost 13,488 acres of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland.[10]

Much of Tulare County's farmland is under California Land Conservation Act (Williamson Act) contracts, a program designed to prevent premature conversion of farmland to residential or other urban uses. As shown in **Table 3.2-2**, as of January 1, 2014 there were 1,081,936 acres of farmland under Williamson Act or Farmland Security Zone contracts in Tulare County. This total includes 565,190 acres of Williamson Act prime, 505,654 acres nonprime, and 11,1101 acres of Farmland Security Zone lands (The acreage totals also include 3,838 acres Williamson Act prime contracted land in nonrenewal and 7,301 acres of Williamson Act nonprime in nonrenewal.).[11] The proposed Project site is not under a Williamson Act contract.

[7] Tulare County General Plan 2030 Update, August 2012, page 3-4
[8] 2015 Tulare County Annual Crop and Livestock Report, August 2016. Cover letter from Marilyn Kinoshita, Agricultural Commissioner. http://agcomm.co.tulare.ca.us/default/index.cfm/standards-and-quarantine/crop-reports1/crop-reports-2011-2020/2015-tulare-county-annual-crop-and-livestock-report-pdf/. Accessed June, 2017.
[9] Ibid.
[10] California Department of Conservation. California Farmland Conversion Report 2015. September. Table A-44. http://www.conservation.ca.gov/dlrp/fmmp/Documents/fmmp/pubs/2010-2012/FCR/FCR%202015_complete.pdf. Accessed November, 2017.
[11] Tulare County Subvention Report "California Open Space Subvention Act Program Survey for Fiscal Year 2012-2013" (submitted to Department of Conservation November 21, 2012)

Table 3.2-1 Tulare County FMMP-Designated Land (1998-2012)							
Farmland Category	**Total Acres Inventoried**						
	1998[12]	**2000[13]**	**2002[14]**	**2004[15]**	**2006[16]**	**2010[17]**	**2012[18]**
Prime Farmland	396,130	393,030	387,620	384,340	379,760	370,249	368,527
Farmland of Statewide Importance	357,220	351,720	345,760	339,580	332,160	323,599	321,296
Unique Farmland	11,790	11,720	12,750	12,530	12,220	11,593	11,474
Important Farmland Subtotal	**765,140**	**756,470**	**746,130**	**736,450**	**724,140**	**705,441**	**701,297**
Farmland of Local Importance	110,040	124,140	126,820	137,440	143,830	154,550	158,823
Grazing Land	439,960	434,050	440,550	440,620	440,140	440,042	439,940
Total	1,315,140	1,314,660	1,313,500	1,314,560	1,308,110	1,300,033	1,300,060

Table 3.2-2[19]: 2014 Tulare County Lands under Williamson Act or Farmland Security Zone Contracts	
Acres	**Category**
565,190	*Total prime = Prime active + NR Prime
505,645	*Total Nonprime = Nonprime active + NR Prime
11,101	Farmland Security Zone
1,081,936	Total Acres in Williamson Act and Farmland Security Zone contracts
**Prime total includes 3,838 acres in nonrenewal; Nonprime total includes 7,301 acres in nonrenewal*	

Important Farmland Trends

"For Tulare County and the surrounding region, the reported major cause of this conversion is the downgrading of important farmlands to other agricultural uses (e.g., such as expanded or new livestock facilities, replacing irrigated farmland with non-irrigated crops, or land that has been fallow for six years or longer)."[20]

Proposed Project Site

The 54-acre proposed Project site is currently in active agricultural production. According to Steve Hash, of Steve Hash Farms, grapes, plums, nectarines, and peaches have been grown on the proposed Project site over the last five years. Approximately 51 acres of the 54-acre proposed

[12] Tulare County General Plan 2030 Update Recirculated Draft EIR Sch#2006041162. Table 3.10-4.
[13] Ibid.
[14] Op. Cit.
[15] Op. Cit.
[16] Op. Cit.
[17] California Department of Conservation, Division of Land Resource Protection. Farmland Mapping and Monitoring Program California Farmland Conversion Report 2015. http://www.conservation.ca.gov/dlrp/fmmp/Documents/fmmp/pubs/2010-2012/FCR/FCR%202015_complete.pdf. Accessed July 2017.
[18] Ibid.
[19] Ibid.
[20] Tulare County General Plan 2030 Update, Recirculated DEIR (SCH # 2006041162),, Feb. 2010, page 3.10-13.

Project site is either open space or housing. Land Classifications as defined by the FMMP and Soils as classified by the United States Department of Agriculture, Natural Resource Conservation Service are discussed in this section too. The crops, yields, and total value[21] are provided in **Table 3.2-3**.

Grapes

Grapes were ranked number four among the top 15 crops grown in Tulare County for the year 2015 with a value of $643,621,000. The Tulare County Crop 2015 Report indicates an acre produced a yield of 11.80 tons with a crop value of $1,350 per ton.

Plums

Plums and pluots were ranked number 15 among the top 15 crops grown in Tulare County for the year 2015 with a value of $74,444,000. The Tulare County 2015 Crop Report indicates an acre produced a yield of 5.70 tons with a crop value of $1,480 per ton.

Nectarines

Nectarines were ranked number 13 among the top 15 crops grown in Tulare County for the year 2012 with a value of $118,584,000. The Tulare County 2015 Crop Report indicates an acre produced a yield of 7.98 tons with a crop value of $1,620 per ton.

Peaches

Peaches were ranked number 11 among the top 15 crops grown in Tulare County for the year 2015 with a value of $174,234,000. The Tulare County 2015 Crop Report indicates an acre of freestone peaches produced a yield of 10.30 tons with a crop value of $1,800 per ton.

Table 3.2-3
Project Site Crop Yield[22]

Crops	Bearing Acreage	Per Acre Yield/Ton	Total Tons	Unit Value per Ton ($)	Total Value ($)
Grapes	14	11.80	165.20	1,350	223,020
Plums	14	5.70	79.80	1,480	118,104
Nectarines	6	7.98	47.88	1,620	77,566
Peaches	4	10.30	41.20	1,800	74,160
Total	38				492,850

[21] 2015 Tulare County Annual Crop and Livestock Report. August 2016. http://agcomm.co.tulare.ca.us/default/index.cfm/standards-and-quarantine/crop-reports1/crop-reports-2011-2020/2015-tulare-county-annual-crop-and-livestock-report-pdf/. Accessed October 2017.
[22] Agricultural Land Conversion Analysis. Hash Farms Residential Development. Prepared by Crawford & Bowen Planning, Inc. August 2014. See Appendix B. Page 15.

Land Classifications

According to the FMMP[23], the 54-acre proposed Project site is mapped as containing approximately 2 acres of Farmland of Local Importance, 0.5 acres of Prime Farmland, 49 acres of Farmland of Statewide Importance, and the remaining 2.5 acres is urban and built-up land.

Soils

The 54-acre proposed Project site is composed of four different soil types, as depicted in **Table 3.2-4**.

Table 3.2-4
Project Site Soils and Storie Index[24]

Soil Type	Acreage	Site %	Storie Index	Characteristics
Calgro-Calgro	45.6	86.4	Grade 4	Saline-Sodic complex, 0-2% slopes, alluvium derived from granitic rock sources, moderately w drained, no frequency of ponding, low available water storage
Tujunga loamy sand	5.8	11.0	Grade 2	0-2% slopes, alluvium derived from granitic rock sources, well drained, no frequency of ponding, moderate ability to store water
Hanford sandy loam	0.8	1.5	Grade 1	0-2% slopes, alluvium derived from granitic rock sources, well drained, no frequency of ponding, moderate ability to store water
Hesperia fine sandy loam	0.6	1.1	Grade 1	0-2% slopes, parent material is granitic alluvium, well drained with no frequency of ponding, moderate availability to store water

Storie Index

The California Revised Storie Index is a soil rating based on soil properties that govern a soil's potential for cultivated agriculture in California. The Storie Index assesses the productivity of a soil from the following four characteristics: Factor A, degree of soil profile development; factor B, texture of the surface layer; factor C, slope; and factor X, manageable features, including drainage, microrelief, fertility, acidity, erosion, and salt content. A score ranging from 0-100 percent is determined for each factor, and the scores are then multiplied together to derive an index rating. The ratings have been combined into six grade classes as follows: Grade 1 (excellent), 100 to 80; grade 2 (good), 79 to 60; grade 3 (fair), 59 to 40; grade 4 (poor), 39 to 20; grade 5 (very poor), 19 to 10; and grade 6 (nonagricultural), less than 10. Approximately 2.6% of the proposed Project site has a Storie Index rating of 1, 11% has a Storie Index rating of 2 and the remaining 86.4% has a Storie Index rating of 4[25].

[23] California Department of Conservation. Farmland Mapping and Monitoring Program. Tulare County. ftp://ftp.consrv.ca.gov/pub/dlrp/fmmp/pdf/2014/tul14_no.pdf. Accessed October 2017.
[24] United States Department of Agriculture, NRCS, Web Soil Survey: USDA Soil Survey of Eastern Fresno Area and Tulare County, Western Part. Accessed July, 2014. Appendix F of this DEIR.
[25] Agricultural Land Conversion Analysis. Hash Farms Residential Development. Prepared by Crawford & Bowen Planning, Inc. November 2017. See Appendix F of this DEIR..

Soil Capability Class

Another way of measuring the suitability of soils for most field crops is by determining the soil capability class. In this system, soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. They are also classified based on whether they are irrigated or non-irrigated. Capability classes are designated by the numbers 1 through 8. The Project site is primarily Non-irrigated Capability Class 3 and 4, which means that soils have severe to very severe limitations that restrict the choice of plants used, or that requires moderate conservation practices, or both[26].

Forest Lands

"Timberlands that are available for harvesting are located in the eastern portion of Tulare County in the Sequoia National Forest. Hardwoods found in the Sequoia National Forest are occasionally harvested for fuel wood, in addition to use for timber production. Since most of the timberlands are located in Sequoia National Forest, the U.S. Forest Service has principal jurisdiction, which encompasses over 3 million acres. The U.S. Forest Service leases these federal lands for timber harvests."[27] As the proposed Project is located on the Valley floor, there is no timberland or forest in the Project vicinity.

REGULATORY SETTING

Federal Agencies & Regulations

Federal Farmland Protection Act (FFPA)

"The FFPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that to the extent possible federal programs are administered to be compatible with state, local units of government, and private programs and policies to protect farmland… Projects are subject to FFPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a Federal agency or with assistance from a Federal agency."[28]

U.S. Forest Service

"The U.S. Department of Agriculture Forest Service is a Federal agency that manages public lands in national forests and grasslands. The Forest Service is also the largest forestry research organization in the world, and provides technical and financial assistance to state and private forestry agencies. Gifford Pinchot, the first Chief of the Forest Service, summed up the purpose of the Forest Service—"to provide the greatest amount of good for the greatest amount of people in the long run.""[29]

[26] Ibid.
[27] Tulare County General Plan 2030 Update, Background Report, February 2010, page 4-17
[28] United States Department of Agriculture. Natural Resources Conservation Service, http://www.fs.fed.us/about-agency/newsroom/how-we-operate. Accessed February 2015.
[29] U.S. Forest Service, "About Us – Meet the Forest Service", http://www.fs.fed.us/aboutus/meetfs.shtml. Accessed February 2015.

State Agencies & Regulations

California Department of Conservation: Farmland Mapping and Monitoring Program

"The California Department of Conservation (DOC), under the Division of Land Resource Protection, has developed the Farmland Mapping and Monitoring Program (FMMP), which monitors the conversion of the state's farmland to and from agricultural use. Data is collected at the county level to produce a series of maps identifying eight land use classifications using a minimum mapping unit of 10 acres. The program also produces a biannual report on the amount of land converted from agricultural to non-agricultural use. The program maintains an inventory of state agricultural land and updates the "Important Farmland Series Maps" every two years."[30]

Williamson Act: California Land Conservation Act of 1965

"The California Land Conservation Act (CLCA) of 1965, Sections 51200 et seq. of the California Government Code, commonly referred to as the "Williamson Act", enables local governments to restrict the use of specific parcels of land to agricultural or related open space use. Landowners enter into contracts with participating cities and counties and agree to restrict their land to agriculture or open space use for a minimum of ten years. In return, landowners receive property tax assessments that are much lower than normal because they are based upon farming and open space uses as opposed to full market (speculative) value. Local governments receive an annual subvention of forgone property tax revenues from the state via the Open Space Subvention Act of 1971."[31]

California Department of Forestry and Fire Protection (CAL FIRE)

"CAL FIRE manages eight Demonstration State Forests that provide for commercial timber production, public recreation, and research and demonstration of good forest management practices. CAL FIRE foresters can be found in urban areas working to increase the number of trees planted burial ground in the path of a logging operation or fire may be verified and saved due to a CAL FIRE archaeologist's review of the area. And, an improved strain of trees, resistant to disease and in our cities, or preventing the spread of disease by identifying and removing infected trees. A Native American burial ground in the path of a logging operation or fire may be verified and saved due to a CAL FIRE archaeologist's review of the area. And, an improved strain of trees, resistant to disease and pests, may be nurtured and introduced by a CAL FIRE forester."[32]

Local Policy & Regulations

Tulare County General Plan Policies

The Tulare County General Plan 2030 Update (TCGP) has policies that apply to projects within Tulare County that serve to protect farmland. General Plan policies that are generally applicable to the proposed Project are listed below:

[30] Tulare County General Plan 2030 Update, Background Report, February 2010, page 4-12
[31] Tulare County General Plan 2030 Update, Background Report, February 2010, page 4-13
[32] California Department of Forestry and Fire Protection. About Cal Fire, http://www.fire.ca.gov/about/about.php. Accessed January 2015.

AG-1.1 - Primary Land Use - The County shall maintain agriculture as the primary land use in the valley region of the County, not only in recognition of the economic importance of agriculture, but also in terms of agriculture's real contribution to the conservation of open space and natural resources.

AG-1.6 Conservation Easements - The County shall consider developing an Agricultural Conservation Easement Program (ACEP) to help protect and preserve agricultural lands (including "Important Farmlands"), as defined in this Element. This program may require payment of an in-lieu fee sufficient to purchase a farmland conservation easement, farmland deed restriction, or other farmland conservation mechanism as a condition of approval for conservation of important agricultural land to non-agricultural use. If available, the ACEP shall be used for replacement lands determined to be of statewide significance (Prime or other Important Farmlands), or sensitive and necessary for the preservation of agricultural land, including land that may be a part of a community separator as part of a comprehensive program to establish community separators. The in-lieu fee or other conservation mechanism shall recognize the importance of land value and shall require equivalent mitigation..

AG-1.7 Preservation of Agricultural Lands - The County shall promote the preservation of its agricultural economic base and open space resources through the implementation of resource management programs such as the Williamson Act, Rural Valley Lands Plan, Foothill Growth Management Plan or similar types of strategies and the identification of maximum growth parameters for all urban areas located in the County.

AG-1.14 Right-to-Farm Noticing - The County shall condition discretionary permits for special uses and residential development within or adjacent to agricultural areas upon the recording of a Right-to-Farm Notice (Ordinance Code of Tulare County, Part VII, Chapter 29, Section 07-29-1000 and following), which is an acknowledgement that residents in the area should be prepared to accept the inconveniences and discomfort associated with normal farming activities and that an established agricultural operation shall not be considered a nuisance due to changes in the surrounding area.

AG-1.17 Agricultural Water Resources - The County shall seek to protect and enhance surface water and groundwater resources critical to agriculture.

IMPACT EVALUATION

Tulare County, as a Lead Agency, typically bases a determination of agricultural resources significance on the thresholds established by the California Environmental Quality Act (CEQA) Guidelines. The Environmental Checklist Form of the CEQA Guidelines contains a list of impacts that may be deemed potentially significant. The Lead Agency should address questions from this checklist that are relevant to a project's environmental effects. The following significance thresholds are contained in Appendix G of the CEQA Guidelines.

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to California Dept. of Conservation FMMP in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural uses?

Project Impact Analysis: ***Less Than Significant Impact***

Pursuant to CEQA Statute §21060.1, "Agricultural land" means Prime Farmland, Farmland of Statewide Importance, or Unique Farmland, as defined by the United States Department of Agriculture land inventory and monitoring criteria.

Approximately 51 acres of the 54-acre proposed Project site is currently being farmed. The site is immediately adjacent to existing residential development within the City of Kingsburg (City) and agricultural lands within the County of Tulare. According to the FMMP[33], the 54-acre proposed Project site is mapped as containing approximately 2 acres of Farmland of Local Importance, 0.5 acres of Prime Farmland, 49 acres of Farmland of Statewide Importance, and the remaining 2.5 acres is urban and built-up land.

A Land Evaluation and Site Assessment (LESA) was conducted to analyze potential impacts resulting from the conversion of farmland. The LESA was developed by the California Department of Conservation to make determinations of the potential significance of a project's conversion of agricultural lands. The site specific LESA results are shown in **Table 3.2-5** and the associated worksheets are contained in their entirety in Appendix "F" of this DEIR.

Table 3.2-5
Land Evaluation and Site Assessment Model Scoring Summary

Category	Factor	Raw Points	Factor Weight	Weighted Points	Comments
Land Evaluation	Land Capability Class	60.2	0.25	15.05	Majority of site is LCC III
	Storie Index	3.69	0.25	0.92	Majority of site is ranked as 4
	Subtotal		**0.50**	**15.97**	
Site Assessment	Project Size	60	0.15	9.00	
	Water Resource Availability	100	0.15	15.00	Groundwater is available via on-site wells
	Surrounding	50	0.15	7.5	The majority of land west of site is

[33] California Department of Conservation. Farmland Mapping and Monitoring Program. Tulare County. ftp://ftp.consrv.ca.gov/pub/dlrp/fmmp/pdf/2014/tul14_no.pdf. Accessed October 2017.

	Agricultural Land				residential
	Surrounding Protected Resource Lands	0	0.05	0.00	Only 66.13 acres in ZOI are under contract
		Subtotal	**0.50**	**31.50**	
			Final Score	**47.47**	

Per the Department of Conservation, an agricultural site with a score between 40 to 59 points is, "Considered significant only if LE [Land Evaluation] and SA [Site Assessment] subscores are each greater than or equal to 20 points."[34] As the proposed Project's score totaled 47.47 (15.97 for the LE and 31.50 for the SA), the results of the conversion would be less than significant as the LE scored did not reach the 20 points or more scoring criteria threshold of "…each greater than…". Additionally, the proposed Project site is within the Tulare County Urban Development Boundary for the City of Kingsburg and the City of Kingsburg's Sphere of Influence, and as such, has already been planned for ultimate, urban-type development. Also, the Project must comply with Tulare County General Plan policy AG-1.6 Conservation Easements for conservation of important agricultural land to non-agricultural use through an in-lieu fee or other conservation mechanism. Therefore, ***Less Than Significant Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is the entire State of California. This cumulative analysis is based on the Statewide FMMP map and the LESA model provided by the California State Department of Conservation.

As noted earlier in this Section, the proposed Project site has an overall LESA score of 47.47, which results in less than significant impacts should the site be converted to non-agricultural uses. Additionally, the proposed Project site is within the Tulare County Urban Development Boundary for the City of Kingsburg and the City of Kingsburg Sphere of Influence, and as such, has already been planned for, urban-type development. Therefore, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measures: ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted above, the Project will have a ***Less Than Significant Impact*** to this Checklist Item.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Project Impact Analysis: ***No Impact***

[34] California Agricultural Land Evaluation and Assessment Model, Instruction Manual. Page. 31. accessed on December 29, 2016 at: http://www.conservation.ca.gov/dlrp/lesa/Documents/lesamodl.pdf.

This impact evaluates the potential for the proposed Project to conflict with any existing Williamson Act Contract on the site or conflict with the existing zone designation. The Project site does not have a Williamson Act contract so there would be no impact to a Williamson Act Contract. As part of the Project, the Agricultural Zone on approximately 49 acres of the Project site would be changed to R-1 and R-2/3, which would accommodate the proposed Project. The Project site is within the County of Tulare's "A-1" Agricultural Zone. The purpose of the zone is also to prepare for eventual adjustments in zoning based on precise planning and development proposals for such areas.[35] As noted earlier, the Project areas lies within the Tulare County Urban Development Boundary for the City of Kingsburg and the City of Kingsburg Sphere of Influence, and as such, has already been planned for urban-type development. The use of a Specific Plan for the proposed Project will rezone these properties through Ordinance, as approved by both the City and County. As proposed, the Project is to comprise of three separate and distinct zoning and design districts. The suggested changes to the City and County Zoning requirements to the City's R-1 and R-1-6/R-MU will be adopted as part of the Specific Plan and become the Zoning Districts, specifically, and will only be applied to the Specific Plan in both the City and County. Therefore, there is no requirement to the overall zoning language changes to create new districts in each jurisdiction. As such, there would be ***No Impact*** to existing zoning or a Williamson Act Contract.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is the entire State of California. This cumulative analysis is based on provisions of the California Land Conservation Act of 1965 (Williamson Act) and on Tulare County allowed uses in agricultural zones.

The proposed Project site is not under a Williamson Act Contract and will not conflict with the overlaying Zone District. Therefore, ***No Impacts*** related to this Checklist Item will occur.

Mitigation Measures: ***None Required.***

Conclusion: ***No Impact***

As noted above, ***No Project-specific or Cumulative Impacts*** will occur.

c) Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code § 12220(q), timberland (as defined by Public Resources Code § 4526), or timberland zoned Timberland Production (as defined by Government Code § 51104(g))?

Project Impact Analysis: ***No Impact***

[35] Tulare County Zoning Ordinance, Section 10 A-1 Zone which can be accessed at : http://www.tularecounty.ca.gov/rma/index.cfm/documents-and-forms/planning-documents/tulare-county-zoning-ordinance/chapter-3-section-10-a-1-agricultural-zone-pdf/. Accessed on December 29, 2016.

This impact evaluates the potential for the proposed Project to conflict with existing Forest Land zoning or result in the loss of forest land or result in the conversion of forest land to non-forest use. There is no forest land zoning on the proposed Project site and there are no forest uses on the site. No loss of forest land would occur and no conflicts would forest land zoning would occur. As such, ***No Project-specific Impacts*** to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

The proposed Project is not located within a forestland zone or would require the change of a forestland zone. As such ***No Cumulative Impacts*** to this Checklist Item will occur.

Mitigation Measures: ***None Required.***

Conclusion: ***No Impact***

As noted above, ***No Project-specific or Cumulative Impacts*** to this Checklist Item will occur.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

Project Impact Analysis: ***No Impact***

As noted above, the proposed Project is not located within a forest land zone or will require the change of a forest land zone. As such, ***No Project specific Impacts*** to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

As noted above, the proposed Project is not located within a forest land zone or will require the change of a forest land zone. As such, ***No Cumulative Impacts*** to this Checklist Item will occur.

Mitigation Measures: ***None Required.***

Conclusion: ***No Impact***

As noted above, ***No Project-specific or Cumulative Impacts*** to this Checklist Item will occur.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of agricultural use or conversion of forest land to non-forest use?

Project Impact Analysis: ***No Impact***

The requested Zone Change is site specific and does not apply to any properties other than the approximate 54-acre Project site. The site is within the City of Kingsburg's adopted Sphere of Influence and Tulare County's adopted Urban Development Boundary for the City of Kingsburg. The site has been planned for development and as such, there is no potential for the proposed Project to result in the conversion of any surrounding agricultural uses or forest land to non-agricultural uses or non-forest uses; respectively.

As a result, the Project will result in ***No Impact*** to this resource.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

As noted earlier, the proposed Project site has been pre-planned for residential development and will not generate off-site farmland conversion and it is not located within a forest land zone or will require the change of a forest land zone. As such, there will be ***No Impact*** to Cumulative Impacts.

Mitigation Measures: ***None Required.***

Conclusion: ***No Impact***

As noted above, ***No Project-specific Impact or Less Than Significant Cumulative Impacts*** to this Checklist Item will occur.

ABBREVIATIONS

CALFIRE	California Department of Forestry and Fire Protection
CLCA	California Land Conservation Act (Williamson Act)
DOC	California Department of Conservation
FFPA	Federal Farmland Protection Act
FMMP	Farmland Mapping and Monitoring Program
UDB	Urban Development Boundaries

DEFINITIONS

"The California Department of Conservation, Division of Land Resource Protection, maintains the Farmland Mapping and Monitoring Program (FMMP), which monitors the conversion of the state's farmland to and from agricultural use. The map series identifies eight classifications (discussed below) and uses a minimum mapping unit size of 10 acres. The program also produces a biannual report on the amount of land converted from agricultural to non-agricultural use. The program maintains an inventory of state agricultural land and updates its "Important Farmland Series Maps" every two years[36]. Although the program monitors a wide variety of farmland types (more fully described below), Important Farmland consists of lands classified as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland."[37]

Prime Farmland (P):

> *"Prime Farmland is farmland with the best combination of physical and chemical features to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date."*[38]

Farmland of Statewide Importance (S):

> *"Farmland of Statewide Importance is similar to Prime Farmland but has minor shortcomings, such as greater slopes or a lesser ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date."*[39]

Unique Farmland (U):

> *"Unique Farmland has lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards*

[36] California Department of Conservation, DLRP, Farmland Mapping and Monitoring Program, downloaded from, http://www.conservation.ca.gov/dlrp/fmmp/Pages/Index.aspx
[37] Tulare County General Plan 2030 Update, Recirculated DEIR (SCH # 2006041162), page 3.10-4
[38] Ibid.
[39] Op. Cit.

or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date."[40]

Farmland of Local Importance (L):

"Farmland of Local Importance is land important to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee."[41]

Grazing Land (G):

"Grazing Land is land on which the vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, the University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres."[42]

Urban and Built-Up Land (D):

"Urban and Built-Up Land is land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes."[43]

Other Land (X):

"Other Land is land not included in any other mapping category. Common examples include low-density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry, or aquaculture facilities; strip mines and borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land."[44]

Water (W):

"Water is defined as perennial water bodies with an extent of at least 40 acres. While the number of agricultural lands classified as Important Farmlands (i.e., Prime Farmland, Farmland of Statewide Importance, and Unique Farmland) have been decreasing over the past several years, the total acreage for all categories of farmland (including grazing land) remained relatively stable between the years 1998 and 2006 (see Table 3.10-4). The locations of these farmland types are identified in Figure 3.10-1. The farmlands are concentrated in the Rural Valley/Foothill Planning areas. No important farmlands are located in the Mountain Area."[45]

[40] Op.Cit.
[41] Tulare County General Plan 2030 Update, Recirculated DEIR, February 2010 (SCH # 2006041162), page 3.10-4
[42] Ibid.
[43] Op. Cit. 3.10-4 to 3.10-5
[44] Op. Cit. 3.10-5
[45] Tulare County General Plan 2030 Update, Recirculated DEIR, February 2010 (SCH # 2006041162), page 3.10-5

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Air Quality
Chapter 3.3

SUMMARY OF FINDINGS

Based on the impact analysis below, potential impacts to air quality as a result of the proposed Project are determined to be ***Less Than Significant***. The impact determinations in this chapter are based upon information obtained from the References listed at the end of this chapter, as well as information contained in the Hash Farms Development Air Quality Impact Analysis and Greenhouse Gas Study, provided in Appendix A of this DEIR. A detailed review of potential impacts is provided in the analysis below.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to Air Quality. As required in Section 15126, all phases of the proposed Project will be considered as part of the potential environmental impact.

As noted in Section 15126.2(a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1]

[1] CEQA Guidelines, Section 15126.2(a).

The environmental setting provides a description of the Air Quality in the County. The regulatory setting provides a description of applicable Federal, State and Local regulatory policies that were developed in part from information contained in the Tulare County General Plan 2030 Update (General Plan), Tulare County General Plan 2030 Update Background Report (Background Report), and/or Tulare County General Plan 2030 Update Recirculated Draft Environmental Impact Report (RDEIR) incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

CEQA Thresholds of Significance

The thresholds of significance for this section are established by the CEQA Checklist Item questions. The following are potential thresholds for significance.

- Result in an exceedance of criteria pollutants as established in the 1990 Clean Air Act amendments.
- Result in an exceedance of San Joaquin Valley Unified Air Pollution Control District criteria pollutant threshold.
- Result in nuisance odors.
- Result in emissions of toxic air contaminants (TAC).
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.

ENVIRONMENTAL SETTING

San Joaquin Valley Air Basin (SJVAB)

"Tulare County falls within the southern portion of the San Joaquin Valley Air Basin (SJVAB), which is bordered on the east by the Sierra Nevada range, on the west by the Coast Ranges, and on the south by the Tehachapi Mountains. These features restrict air movement through and out of the SJVAB.

The topography of Tulare County significantly varies in elevation from its eastern to western borders, which results in large climatic variations that ultimately affect air quality. The western portion of the County is within the low-lying areas of the SJVAB. This portion of the County is much dryer in comparison to the eastern portion that is located on the slopes of the Sierra Nevada Mountains. The higher elevation contributes to both increased precipitation and a cooler climate.

Wind direction and velocity in the eastern section varies significantly from the western portion of the County. The western side receives northwesterly winds. The eastern side of the County exhibits more variable wind patterns, but the wind direction is typically up-slope during the day and down-

slope in the evening. Generally, the wind direction in the eastern portion of the County is westerly; however terrain differences can create moderate directional changes. "[2]

Generally, the temperature of air decreases with height, creating a gradient from warmer air near the ground to cooler air at elevation. This gradient of cooler air over warm air is known as the environmental lapse rate. Inversions occur when warm air sits over cooler air, trapping the cooler air near the ground. These inversions trap pollutants from dispersing vertically and the mountains surrounding the San Joaquin Valley trap the pollutants from dispersing horizontally. Strong temperature inversions occur throughout the Basin in the summer, fall, and winter. Daytime temperature inversions occur at elevations of 2,000 to 2,500 feet above the San Joaquin Valley floor during the summer and at 500 to 1,000 feet during the winter. The result is a relatively high concentration of air pollution in the valley during inversion episodes. These inversions cause haziness, which in addition to moisture may include suspended dust, a variety of chemical aerosols emitted from vehicles, particulates from wood stoves, and other pollutants. In the winter, these conditions can lead to carbon monoxide "hotspots" along heavily traveled roads and at busy intersections. During summer's longer daylight hours, stagnant air, high temperatures, and plentiful sunshine provide the conditions and energy for the photochemical reaction between reactive organic gases (ROG) and oxides of nitrogen (NOx), which results in the formation of ozone.

"The SJVAB is highly susceptible to pollutant accumulation over time due to the transport of pollutants into the SJVAB from upwind sources. Stationary emission sources in the County include the use of cleaning and surface coatings and industrial processes, road dust, local burning, construction/demolition activities, and fuel combustion. Mobile emissions are primarily generated from the operation of vehicles. According to air quality monitoring data, the SJVAB has been in violation for exceeding ozone and PM10 emission standards for many years."[3] As of December 2015, the SJVAB is in nonattainment for federal and state ozone and $PM_{2.5}$ standards, attainment for federal PM_{10} standards, and nonattainment for state PM_{10} standards.

Existing Conditions Overview

"Unlike other air basins in California, the pollution in the San Joaquin Valley Air Basin (SJVAB) is not produced by large urban areas. Instead, emissions are generated by many moderate sized communities and rural uses. Emission levels in the Central Valley have been decreasing overall since 1990. This can be primarily attributed to motor vehicle emission controls that reduce the amount of vehicle emissions and controls on industrial/stationary sources. In spite of these improvements, the San Joaquin Valley is still identified as having some of the worst air quality in the nation.

The main source of CO and NO_x emissions is motor vehicles. The major contributors to ROG emissions are mobile sources and agriculture. ROG emissions from motor vehicles have been decreasing since 1985 due to stricter standards, even though the vehicle miles have been increasing. Stationary source regulations implemented by the SJVAPCD have also substantially reduced ROG emissions. ROG from natural sources (mainly from trees and plants) is the largest

[2] Tulare County General Plan 2030 Update RDEIR. Page 3.3-9.
[3] Ibid.

source of this pollutant in Tulare County. Atmospheric modeling accomplished for recent ozone planning efforts has found that controlling NO_x is more effective at reducing ozone concentrations than controlling ROG. However, controls meeting RACT and BACT are still required for SJVAPCD plans.

The SJVAB has been ranked the 2nd worst in the United States for O_3 levels, even though data shows that overall O_3 has decreased between 1982 and 2001.

Direct PM10 emissions have decreased between the years 1975 and 1995 and have remained relatively constant since 2000. The main sources of PM_{10} in the SJVAB are from vehicles traveling on unpaved roads and agricultural activities. Regional Transportation Planning Agencies must implement BACM for sources of fine particulate matter (PM10) to comply with federal attainment planning requirements for PM10."[4]

SJVAB Attainment Status

The United States Environmental Protection Agency (EPA) and the California Air Resources Board (ARB) designate air basins where ambient air quality standards are exceeded as "nonattainment" areas. If standards are met, the area is designated as an "attainment" area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." The federal non-attainment designation is subdivided into five categories (listed in order of increasing severity): marginal, moderate, serious, severe, and extreme. The degree of an area's non-attainment status reflects the extent of the pollution and the expected time period required in order to achieve attainment.

Designated non-attainment areas are generally subject to more stringent review by CARB and EPA. In the endeavor to improve air quality to achieve the standards, projects are subject to more stringent pollution control strategies and requirements for mitigation measures (such as mobile source reduction measures). If the National Ambient Air Quality Standards (NAAQS) are not achieved within the specified timeframe, federal highway funding penalties (and a federally administered implementation plan incorporating potentially harsh measures to achieve the NAAQS) will result.

Table 3.3-1 identifies the current federal and state attainment designations for the SJVAB while **Table 3.3-2** summarizes the ambient air quality standards from which the federal and state attainment status are derived. **Table 3.3-3** summarizes the common sources, health effects, and methods for prevention and control of criteria pollutant emissions.

[4] Tulare County 2030 General Plan 2030 Update, Part 1 Goals and Policies Report. Pages 9-4 to 9-5.

Table 3.3-1
SJVAB Attainment Status

	Designation Classification	
Pollutant	**Federal Standards**	**State Standards**
Ozone – one hour	No Federal Standard[1]	Nonattainment/Severe
Ozone – eight hour	Nonattainment/Extreme[2]	Nonattainment
PM_{10}	Attainment[3]	Nonattainment
$PM_{2.5}$	Nonattainment[4]	Nonattainment
CO	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide	Attainment/Unclassified	Attainment
Sulfur Dioxide	Attainment/Unclassified	Attainment
Lead	No Designation/Classification	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Vinyl Chloride	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified

1 Effective June 15, 2005, the U.S. Environmental Protection Agency (EPA) revoked the federal 1-hour ozone standard, including associated designations and classifications. However, EPA had previously classified the SJVAB as extreme nonattainment for this standard. Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.
2 Though the Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010)
3 On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM_{10} National Ambient Air Quality Standard (NAAQS) and approved the PM_{10} Maintenance Plan.
4 The Valley is designated nonattainment for the 1997 PM2.5 NAAQS. EPA designated the Valley as nonattainment for the 2006 PM2.5 NAAQS on November 13, 2009 (effective December 14, 2009).

Source: San Joaquin Valley Unified Air Pollution Control District website accessed at: http://www.valleyair.org/aqinfo/attainment.htm.

Table 3.3-2
State and Federal Ambient Air Quality Standards

Pollutant	**Averaging Time**	**California Standards**		**National Standards**		
		Concentration	**Method**	**Primary**	**Secondary**	**Method**
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		-		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	---	---	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12 µg/m^3	15.0 µg/m^3	

Table 3.3-2
State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		National Standards		
		Concentration	Method	Primary	Secondary	Method
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	---	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 µg/m^3 (10 mg/m^3)	---	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		---	---	
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemilumi-nescence	100 ppb (188 µg/m^3)	Same as Primary Standard	Gas Phase Chemilumi-nescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)		
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	---	Ultraviolet Flourescence; Spectrophoto-metry (Pararo-saniline Method)
	3 Hour	---		---	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)	---	
	Annual Arithmetic Mean	---		0.030 ppm (for certain areas)	---	
Lead	30 Day Average	1.5 µg/m^3	Atomic Absorption	---	---	High Volume Sampler and Atomic Absorption
	Calendar Quarter	---		1.5 µg/m^3 (for certain areas)	Same as Primary Standard	
	Rolling 3-Month Average	---		0.15 µg/m^3		
Visibility Reducing Particles	8 Hour	ARB converted visibility standards to instrumental equivalents in 1989	Beta Attenuation and Transmittance through Filter Tape	**No National Standards**		
Sulfates	24 Hour	25 µg/m3	Ion Chromatography			
Hydrogen Sulfide (H_2S)	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Source: California Air Resources Board. Ambient Air Quality Standards. https://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed December 2017.

Table 3.3-3
Air Pollutant Sources, Effects and Control[5]

Pollutant	Sources	Effects	Prevention and Control
Ozone (O_3)	Formed when reactive organic gases (ROG) and nitrogen oxides react in the presence of sunlight. ROG sources include any source that burns fuels, (e.g., gasoline, natural gas, wood, oil) solvents, petroleum processing and storage and pesticides.	Breathing Difficulties, Lung Tissue Damage, Damage to Rubber and Some Plastics	Reduce motor vehicle reactive organic gas (ROG) and nitrogen oxide emissions through emissions standards, reformulated fuels, inspections programs, and reduced vehicle use. Limit ROG emissions from commercial operations and consumer products. Limit ROG and NOx emissions from industrial sources such as power plants and refineries. Conserve energy.
Respirable Particulate Matter (PM_{10})	Road Dust, Windblown Dust (Agriculture) and Construction (Fireplaces) Also formed from other pollutants (acid rain, NOx, SOx, organics). Incomplete combustion of any fuel.	Increased Respiratory Disease, Lung Damage, Cancer, Premature Death, Reduced Visibility, Surface Soiling	Control Dust Sources, Industrial Particulate Emissions, Wood Burning Stoves and Fireplaces Reduce secondary pollutants which react to form PM_{10}. Conserve energy.
Fine Particulate Matter ($PM_{2.5}$)	Fuel Combustion in Motor Vehicles, Equipment and Industrial Sources, Residential and Agricultural Burning. Also formed from reaction of other pollutants (acid rain, NOx, SOx, organics).	Increases Respiratory Disease, Lung Damage, Cancer, Premature Death, Reduced Visibility, Surface Soiling	Reduces Combustion Emissions from Motor Vehicles, Equipment, Industries and Agriculture and Residential Burning. Precursor controls, like those for ozone, reduce fine particle formation in the atmosphere.
Carbon Monoxide (CO)	Any source that burns fuel such as automobiles, trucks, heavy construction equipment, farming equipment and residential heating.	Chest Pain in Heart Patients, Headaches, Reduced Mental Alertness	Control motor vehicle and industrial emissions. Use oxygenated gasoline during winter months. Conserve energy.
Nitrogen Dioxide (NO_2)	See Carbon Monoxide	Lung Irritation and Damage. Reacts in the atmosphere to form ozone and acid rain	Controls motor vehicle and industrial combustion emissions. Conserve energy.
Lead	Metal Smelters, Resource Recovery, Leaded Gasoline, Deterioration of Lead Paint	Learning Disabilities, Brain and Kidney Damage	Control metal smelters, no lead in gasoline. Replace leaded paint with non-lead substitutes.
Sulfur Dioxide (SO_2)	Coal or Oil Burning Power Plants and Industries, Refineries, Diesel Engines	Increases lung disease and breathing problems for asthmatics. Reacts in the atmosphere to form acid rain.	Reduces the use of high sulfur fuels (e.g., use low sulfur reformulated diesel or natural gas). Conserve energy.
Visibility Reducing Particles	See $PM_{2.5}$	Reduces visibility (e.g., obscures mountains and other scenery), reduced airport safety, lower real estate value, discourages tourism.	See $PM_{2.5}$
Sulfates	Produced by the reaction in the air of SO_2 (see SO_2 sources), a component of acid rain.	Breathing Difficulties, Aggravates Asthma, Reduced Visibility	See SO_2
Hydrogen Sulfide	Geothermal Power Plants, Petroleum Production and Refining, Sewer Gas	Nuisance Odor (Rotten Egg Smell), Headache and Breathing Difficulties (Higher Concentrations)	Control emissions from geothermal power plants, petroleum production and refining, sewers, sewage treatment plants.

[5] California Air Resources Board. ARB Fact Sheet: Air Pollution Sources, Effects and Control. https://www.arb.ca.gov/research/health/fs/fs2/fs2.htm. Accessed December 2017.

Air Quality Conditions in Tulare County

Tulare County lies within the southern portion of the SJVAB. Topography and climate are unusually favorable for the development of air pollution, especially in the southern portion of the air basin where pollutants build up against the Tehachapi Mountains. Due to the SJVAB's light wind patterns, long periods of warm and sunny days, and surrounding mountains, air quality problems can occur at any time of the year.

Existing local air quality conditions can be characterized by reviewing air pollution concentration data near the Project area for comparison with the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS). Air samples are collected continuously for some pollutants and periodically for other pollutants depending on the type of monitoring equipment installed. Monitoring sites are usually chosen to be representative of the emissions in a community. There are currently 36 air monitoring stations in the SJVAB. Of these, there are currently five stations in Tulare County: Porterville; Sequoia National Park–Ash Mountain; Sequoia National Park–Lower Kaweah; Visalia–Church; and Visalia–Airport. However, CO and SO_2 are not collected in these five stations, so the next closest monitor with those emissions must be identified.

For the purposes of background data and this air quality assessment, this analysis relied on data collected in the last three years for the CARB monitoring stations that are located in the closest proximity to the Project site. **Table 3.3-4** provides the background concentrations for ozone, particulate matter of 10 microns (PM_{10}), particulate matter of less than 2.5 microns ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_x), sulfur dioxide (SO_2), and lead (Pb) as of July 2015. Since each monitoring site does not monitor all criteria pollutants information is provided from three separate monitoring sites, Fresno – 1st Street, Visalia – N Church Street, and Porterville – 1839 Newcomb St. monitoring stations for 2012 through 2014. No data is available for hydrogen sulfide, vinyl chloride or other toxic air contaminants in Tulare County or any nearby counties.

Based on the air monitoring data from these three stations two measured air pollutants, ozone and particulate matter, have generally exceeded state air quality standards. The amount over the standards and the number of days each year that the standards were exceeded provide an indicator of the severity of the air quality problems in the local area.

Table 3.3-4
Air Quality Monitoring Summary[6]

Air Pollutant	Averaging Time	Item	2012	2013	2014
Ozone (O_3) [1]	1-hour	Max 1-hour (ppm)	0.102	0.112	0.085
		Days > State Standard (0.09 ppm)	10	5	0
	8-hour	State Max 8-hour (ppm)	0.092	0.104	0.075
		Days > State Standard (0.07 ppm)	80	52	5
		National Max 8-hour (ppm)	0.092	0.103	0.074
		Days > National Standard (0.075 ppm)	44	23	0
Inhalable coarse particles (PM_{10}) [2]	Annual	Annual Average (µg/m^3)	38.1	44.5	ID
	24 hour	State 24-hour (µg/m^3)	76.2	160.0	104.2
		Days > State Standard (50 µg/m3)	15	16	17
		National 24-hour (µg/m^3)	75.7	155.0	102.4
		Days > National Standard (150 µg/m^3)	0	1	0
Fine particulate matter ($PM_{2.5}$) [2]	Annual	Annual Average (µg/m^3)	14.7	18.9	17.8
	24-hour	24-hour (µg/m^3)	76.2	124.2	81.3
		Days > National Standard (35 µg/m^3)	7	14	12
Carbon monoxide (CO) [3]	8-hour	Max 8-hour (ppm)	2.22	ID	ID
		Days > State and National Standards (9 ppm)	0	0	0
Nitrogen dioxide (NO_2) [2]	Annual 1-hour	Annual Average (ppm)	12	12	10
		Max 1-hour (ppm)	61.0	62.3	64.5
		Days > State Standard (0.18 ppm)	0	0	0
		Days > National Standard (100 ppb)	0	0	0
Sulfur dioxide (SO_2) [3, 4]	Annual	Annual Average (ppm)	ID	ID	ID
	24-hour	Max 24-hour (ppm)	0.004	ID	ID

Abbreviations: ppm = parts per million; > = exceeded; µg/m^3= micrograms per cubic meter; ID = insufficient data; max = maximum

State Standard = CAAQS; National Standard = NAAQS

[1] data from Porterville station
[2] data from Visalia-Church station
[3] data from Fresno-First station
[4] data shown is for period 2011-2013 as data for 2014 is not available

The health impacts of the various air pollutants of concern can be presented in a number of ways. The clearest in comparison is to the state and federal ozone standards. If concentrations are below the standard, it is safe to say that no health impact would occur to anyone. When concentrations

[6] California Air Resources Board. Top 4 Summary. https://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed December 2017.

exceed the standard, impacts will vary based on the amount the standard is exceeded. The EPA developed the Air Quality Index (AQI) as an easy to understand measure of health impact compared to concentrations in the air. As the SJVAB is in nonattainment at the federal level for ozone and PM2.5, the discussion below includes only those emissions with respect to the AQI. **Table 3.3-5** and **Table 3.3-6** provide a description of the health impacts of ozone and $PM_{2.5}$, respectively, at different concentrations.

Table 3.3-5
Air Quality Index and Health Effects of Ozone[7]

Air Quality Index/ Ozone Concentration	Health Effects Description
AQI 0-50 – Good	Sensitive Groups: Children and people with asthma are the groups most at risk.
Concentration 0-59 ppb	Health Effects Statements: None
	Cautionary Statements: None
AQI 51-100 – Moderate	Sensitive Groups: Children and people with asthma are the groups most at risk.
Concentration 60-75 ppb	Health Effects Statements: Unusually sensitive individuals may experience respiratory symptoms.
	Cautionary Statements: Unusually sensitive people should consider limiting prolonged outdoor exertion.
AQI 101-150 – Unhealthy for Sensitive Groups	Sensitive Groups: Children and people with asthma are the groups most at risk.
Concentration 76-95 ppb	Health Effects Statements: Increasing likelihood of respiratory symptoms and breathing discomfort in active children and adults and people with respiratory disease, such as asthma.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
AQI 151-200 – Unhealthy	Sensitive Groups: Children and people with asthma are the groups most at risk.
Concentration 96-115 ppb	Health Effects Statements: Greater likelihood of respiratory symptoms and breathing difficulty in active children and adults and people with respiratory disease, such as asthma; possible respiratory effects in general population.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.

[7] U.S. Environmental Protection Agency. AirNow. Air Quality Index Basics. https://www.airnow.gov/index.cfm?action=aqibasics.aqi. AirNow. AQI Calculator. https://airnow.gov/index.cfm?action=airnow.calculator. Accessed December 2017.

Table 3.3-5 Air Quality Index and Health Effects of Ozone[7]	
Air Quality Index/ Ozone Concentration	**Health Effects Description**
AQI 201-300 – Very Unhealthy Concentration 116-374 ppb	Sensitive Groups: Children and people with asthma are the groups most at risk.
	Health Effects Statements: Increasingly severe symptoms and impaired breathing likely in active children and adults and people with respiratory disease, such as asthma; increasing likelihood of respiratory effects in general population.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.
AQI 301-500 – Hazardous*	Sensitive Groups: Children and people with asthma are the groups most at risk.
Concentration ≥405 ppb	Health Effects Statements: Severe respiratory effects and impaired breathing likely in active children and adults and people with respiratory disease, such as asthma; increasingly severe respiratory effects likely in general population.
	Cautionary Statements: Everyone should avoid all outdoor exertion.
* AQI 300-500 are calculated using 1-hr ozone data (under 1-hr ozone concentrations 375-404 ppb are identified as Very Unhealthy)	

Table 3.3-6 Air Quality Index and Health Effects of $PM_{2.5}$[8]	
Air Quality Index/ $PM_{2.5}$ Concentration	**Health Effects Description**
AQI 0-50 – Good	Sensitive Groups: People with respiratory or heart disease, the elderly and children are the groups most at risk.
Concentration 0-12.0 μg/m^3	Health Effects Statements: None
	Cautionary Statements: None
AQI 51-100 – Moderate	Sensitive Groups: People with respiratory or heart disease, the elderly and children are the groups most at risk.
Concentration 12.1-35.4 μg/m^3	Health Effects Statements: Unusually sensitive people should consider reducing prolonged or heavy exertion.
	Cautionary Statements: Unusually sensitive people should consider reducing prolonged or heavy exertion.

[8] Op.Cit.

Table 3.3-6
Air Quality Index and Health Effects of $PM_{2.5}$[8]

Air Quality Index/ $PM_{2.5}$ Concentration	Health Effects Description
AQI 101-150 – Unhealthy for Sensitive Groups	Sensitive Groups: People with respiratory or heart disease, the elderly and children are the groups most at risk.
Concentration 35.5-55.4 µg/m^3	Health Effects Statements: Increasing likelihood of respiratory symptoms in sensitive individuals, aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly.
	Cautionary Statements: People with respiratory or heart disease, the elderly and children should limit prolonged exertion.
AQI 151-200 – Unhealthy	Sensitive Groups: People with respiratory or heart disease, the elderly and children are the groups most at risk.
Concentration 55.5-150.4 µg/m^3	Health Effects Statements: Increased aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; increased respiratory effects in general population.
	Cautionary Statements: People with respiratory or heart disease, the elderly and children should avoid prolonged exertion; everyone else should limit prolonged exertion.
AQI 201-300 – Very Unhealthy	Sensitive Groups: People with respiratory or heart disease, the elderly and children are the groups most at risk.
Concentration 150.5-250.4 µg/m^3	Health Effects Statements: Significant aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; significant increase in respiratory effects in general population.
	Cautionary Statements: People with respiratory or heart disease, the elderly and children should avoid any outdoor activity; everyone else should avoid prolonged exertion.
AQI 301-500 – Hazardous*	Sensitive Groups: People with respiratory or heart disease, the elderly and children are the groups most at risk.
Concentration ≥250.5 µg/m^3	Health Effects Statements: Serious aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; serious risk of respiratory effects in general population.
	Cautionary Statements: Everyone should avoid any outdoor exertion; people with respiratory or heart disease, the elderly and children should remain indoors.

Based on the AQI scale for the 8-hour ozone standard, the nearest monitoring station in Porterville experienced at least three days in the last three years that would be categorized as unhealthful (AQI 151-200), and as many as 80 days that were unhealthful for sensitive groups (AQI 101-150) or moderate (AQI 50-100). The highest reading for the 8-hour standard was 104 ppb in 2013 and the highest reading for the 1-hour ozone standard 112 ppb in 2013. These values are higher than the 95-ppb cut off point for unhealthful for sensitive groups (AQI 101-150), but lower than the 115-ppb cut off point for unhealthy (AQI 151-200). Active children and adults, and people with respiratory disease should avoid prolonged outdoor exertion when the AQI is at this level.

An AQI of 51-100 for $PM_{2.5}$ is considered moderate and would be triggered by a 24-hour average concentration of 35.4 $\mu g/m^3$, which is considered an exceedance of the federal $PM_{2.5}$ standard. The monitoring station in Visalia exceeded the standard up to 14 days in one year over the last three years. People with respiratory or heart disease, the elderly and children are the groups most at risk. An unhealthy AQI (AQI 151-200) was also exceeded on at least three days in the last three years. The highest concentration recorded was 124.2 $\mu g/m^3$ in 2013. At this concentration, increased aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly and increased respiratory effects in general population would occur. People with respiratory or heart disease, the elderly, and children should avoid prolonged exertion; everyone else should limit prolonged exertion when the AQI exceeds this level.

REGULATORY SETTING

Federal Agencies & Regulations

Federal Clean Air Act

"The Federal Clean Air Act (CAA), adopted in 1970 and amended twice thereafter (including the 1990 amendments), establishes the framework for modern air pollution control. The act directs the Environmental Protection Agency (EPA) to establish ambient air standards, the National Ambient Air Quality Standards (NAAQS)… for six pollutants: ozone, carbon monoxide, lead, nitrogen dioxide, particulate matter (less than 10 microns in diameter [PM_{10}] and less than 2.5 microns in diameter [$PM_{2.5}$]), and sulfur dioxide. The standards are divided into primary and secondary standards; the former are set to protect human health with an adequate margin of safety and the latter to protect environmental values, such as plant and animal life.

Areas that do not meet the ambient air quality standards are called "non-attainment areas". The Federal CAA requires each state to submit a State Implementation Plan (SIP) for non-attainment areas. The SIP, which is reviewed and approved by the EPA, must demonstrate how the federal standards will be achieved. Failing to submit a plan or secure approval could lead to the denial of federal funding and permits for such improvements as highway construction and sewage treatment plants. For cases in which the SIP is submitted by the State but fails to demonstrate achievement of the standards, the EPA is directed to prepare a federal implementation plan or EPA can "bump up" the air basin in question to a classification with a later attainment date that allows time for additional reductions needed to demonstrate attainment, as is the case for the San Joaquin Valley.

SIPs are not single documents. They are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations and federal controls. The California SIP relies on the same core set of control strategies, including emission standards for cars and heavy trucks, fuel regulations and limits on emissions from consumer products. California State law makes the California Air Resources Board (CARB) the lead agency for all purposes related to the SIP. Local Air Districts and other agencies, such as the Bureau of Automotive Repair and the Department of Pesticide Regulation, prepare SIP elements and submit them to CARB

for review and approval. The CARB forwards SIP revisions to the EPA for approval and publication in the Federal Register."[9]

State Agencies & Regulations

California Clean Air Act

"The California CAA of 1988 establishes an air quality management process that generally parallels the federal process. The California CAA, however, focuses on attainment of the State ambient air quality standards (see Table 3.3-1 [of the General Plan RDEIR]), which, for certain pollutants and averaging periods, are more stringent than the comparable federal standards. Responsibility for meeting California's standards is addressed by the CARB and local air pollution control districts (such as the eight county AIR DISTRICT, which administers air quality regulations for Tulare County). Compliance strategies are presented in district-level air quality attainment plans.

The California CAA requires that Air Districts prepare an air quality attainment plan if the district violates State air quality standards for criteria pollutants including carbon monoxide, sulfur dioxide, nitrogen dioxide, $PM_{2.5}$, or ozone. Locally prepared attainment plans are not required for areas that violate the State PM_{10} standards. The California CAA requires that the State air quality standards be met as expeditiously as practicable but does not set precise attainment deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards."[10]

"The air quality attainment plan requirements established by the California CAA are based on the severity of air pollution caused by locally generated emissions. Upwind air pollution control districts are required to establish and implement emission control programs commensurate with the extent of pollutant transport to downwind districts."[11]

California Air Resources Board

"The CARB is responsible for establishing and reviewing the State ambient air quality standards, compiling the California State Implementation Plan (SIP) and securing approval of that plan from the U.S. EPA. As noted previously, federal clean air laws require areas with unhealthy levels of ozone, inhalable particulate matter, carbon monoxide, nitrogen dioxide, and sulfur dioxide to develop SIPs. SIPs are comprehensive plans that describe how an area will attain NAAQS. The 1990 amendments to the Federal CAA set deadlines for attainment based on the severity of an area's air pollution problem. State law makes CARB the lead agency for all purposes related to the SIP. The California SIP is periodically modified by the CARB to reflect the latest emission inventories, planning documents, and rules and regulations of various air basins. The CARB produces a major part of the SIP for pollution sources that are statewide in scope; however, it relies on the local Air Districts to provide emissions inventory data and additional strategies for sources under their jurisdiction. The SIP consists of the emission standards for vehicular sources and

[9] Tulare County General Plan 2030 Update REIR. Pages 3.3-1 to 3.3-2.
[10] Ibid. 3.3-2 to 3.3-3.
[11] Op. Cit. 3.3-5.

consumer products set by the CARB, and attainment plans adopted by the local air agencies as approved by CARB. The EPA reviews the air quality SIPs to verify conformity with CAA mandates and to ensure that they will achieve air quality goals when implemented. If EPA determines that a SIP is inadequate, it may prepare a Federal Implementation Plan for the nonattainment area, and may impose additional control measures.

In addition to preparation of the SIP, the CARB also regulates mobile emission sources in California, such as construction equipment, trucks, automobiles, and oversees the activities of air quality management districts and air pollution control districts, which are organized at the county or regional level. The local or regional Air Districts are primarily responsible for regulating stationary emission sources at industrial and commercial facilities within their jurisdiction and for preparing the air quality plans that are required under the Federal CAA and California CAA."[12]

California Air Resources Board Airborne Toxic Control Measures

"Diesel engines emit a complex mixture of air pollutants, composed of gaseous and solid material. The visible emissions in diesel exhaust are known as particulate matter or PM, which includes carbon particles or "soot." In 1998, following a 10-year scientific assessment process, ARB identified diesel PM as a toxic air contaminant based on its potential to cause cancer and other health problems, including respiratory illnesses, and increased risk of heart disease. Subsequent to this action, research has shown that diesel PM also contributes to premature deaths. Health risks from diesel PM are highest in areas of concentrated emissions, such as near ports, railyards, freeways, or warehouse distribution centers. Exposure to diesel PM is a health hazard, particularly to children whose lungs are still developing and the elderly who may have other serious health problems.

Both private businesses and public agencies operating stationary prime and emergency standby diesel engines in California are subject to the ATCM. Emergency standby engines are those that are used only when normal power or natural gas service fails or when needed for fire suppression or flood control. Prime engines are those that are not used for emergency standby purposes. Examples of businesses that are affected include private schools and universities, private water treatment facilities, hospitals, power generation, communications, broadcasting, building owners, agricultural production, banks, hotels, refiners, resorts, recycling centers, quarries, wineries, dairies, food processing, and manufacturing entities. A variety of public agencies are also affected including military installations, prisons and jails, public schools and universities, and public water and wastewater treatment facilities."[13]

"The ATCM for stationary diesel engines was originally adopted by the Air Resources Board (ARB or Board) at the February 26, 2004, Board Hearing. On November 8, 2004, the Final Regulation Order for the ATCM was approved by the Office of Administrative Law (OAL) and filed with the Secretary of State. The rulemaking became effective December 8, 2004. Among other provisions, the ATCM established emission standards and fuel use requirements for new and

[12] Op. Cit. 3.3-6 to 3.3-7.
[13] Frequently Asked Questions. Airborne Toxic Control Measure For Stationary Compression Ignition Engines, Requirements for Stationary Engines Use in Non-Agricultural Applications. California Air Resources Board, Stationary Source Division, Emissions Assessment Branch, May 2011. Page 2. Which can be accessed at: http://www.arb.ca.gov/diesel/documents/atcmfaq.pdf.

in-use stationary engines used in prime and emergency back-up applications (non-agricultural) and for new stationary engines used in agricultural applications.

A modification of the 2004 action was necessary to address the required PM emission standard for new agricultural engines. Therefore, an Emergency Regulatory Amendment was heard at the March 17, 2005 Board Hearing. On April 4, 2005, the Office of Administrative Law approved the amendments to the ATCM which removed the requirement that new stationary agriculture pump engines meet the 0.15g/bhp-hr PM standard. Instead, such engines must meet the appropriate Tier 2 emissions standard. The Board approved a temporary emergency action (Resolution 05-29) to replace the 0.15 g/bhp-hr PM standard for these engines with the appropriate ARB and federal new off-road/nonroad engine certification standards. Following this emergency rulemaking proceeding, ARB conducted another rulemaking in accordance with all procedural requirements of the California Administrative Procedure Act to make a modified version of the emergency amendments permanent at the May 26, 2005 Board Hearing. The final rulemaking package was approved by OAL and filed with the Secretary of the State on September 9, 2005. The regulation became effective that same day.

In November 2006, the Board approved amendments to the ATCM to include requirements for stationary in-use agricultural engines. Additional amendments addressed implementation and compliance issues primarily involving non-agricultural emergency standby and prime engines. These issues included streamlining certain fuel reporting requirements, updating electricity tariff schedules, modifying the definitions of California (CARB) diesel fuel and alternative diesel fuel, an alternative compliance demonstration option to the 0.01 g/bhp-hr diesel PM standard, and a "sell-through" provision to allow stationary diesel-fueled engine wholesalers and retailers to sell (and owners or operators to use) stock engines that do not meet new, more stringent emissions standards when they become effective. The amendments also authorized the Executive Officer or local air district to allow the sale, purchase, or installation of a new stock engine from the previous model year to meet new stationary diesel-fueled engine emission standards, if verifiable information is provided documenting that current mode year engines meeting the new emission standards are not available in sufficient numbers or in a sufficient range of makes, models, and horsepower ratings. The OAL approved the amendments on September 18, 2007, which became effective October 18, 2007.

In October 2010, the Board approved amendments to the ATCM to more closely align with the emission standards for new stationary diesel-fueled emergency standby engines, including direct-drive fire pump engines, and new prime engines with the federal Standards of Performance for Stationary Compression- Ignition Internal Combustion Engines (NSPS) promulgated July 11, 2006. Amendments to help clarify provisions in the ATCM and address new information, and to remove provisions no longer needed were also approved."[14]

[14] Ibid. 1 and 2.

Regional Agencies & Regulations

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air Pollution Control District (Air District) is made up of eight counties in California's Central Valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, and Tulare Counties, and the San Joaquin Valley portion of Kern County.

"The Air District is a public health agency whose mission is to improve the health and quality of life for all San Joaquin Valley residents through efficient, effective and entrepreneurial air quality-management strategies."[15] The Air District's 10 core values include: protection of public health; active and effective air pollution control efforts with minimal disruption to the San Joaquin Valley's economic prosperity; outstanding customer service; ingenuity and innovation; accountability to the public; open and transparent public process; recognition of the uniqueness of the San Joaquin Valley; continuous improvement; effective and efficient use of public funds; and respect for the opinions and interests of all San Joaquin Valley residents. To achieve these core values the Air District has adopted air quality plans pursuant to the California CAA and a comprehensive list of rules to limit air quality impacts. The air plans currently in effect in the SJVAB and specific rules that apply to the Project are listed and described further below.

Ozone Plans[16]

"The SJVAB has severe ozone problems. The EPA has required the Air District to demonstrate in a plan, substantiated with modeling, that the ozone NAAQS could be met by the November 15, 2005 deadline. However, the district could not provide this demonstration for several reasons, including that its achievement would require regulation of certain source categories not currently under the jurisdiction of the district. According to the district, in order to meet the standard the SJVAB must reduce the total emissions inventory by an additional 30 percent (300 tons per day). Because attainment by the deadline could not be demonstrated by the mandated deadlines, the federal sanction clock was started. The clock was to be stopped if the Air District SIP could demonstrate compliance with specified federal requirements by November 15, 2005. However, the district recognized that it could not achieve demonstration in time. Therefore, the district, through petition by the State on behalf of AIR DISTRICT, sought a change in the federal nonattainment classification from "severe" to "extreme" nonattainment with the ozone standard. An extreme nonattainment designation would effectively move the compliance deadline to year 2010 before federal sanctions would begin.

On February 23, 2004, EPA publicly announced its intention to grant the request by the State of California to voluntarily reclassify the SJVAB from a "severe" to an "extreme" 1-hour ozone nonattainment area. The EPA stated that, except for a demonstration of attainment of the ozone standard by 2005, the Air District has submitted all of the required severe area plan requirements and they were deemed complete. The CARB submitted the 2004 Extreme Ozone Attainment Demonstration Plan to EPA on November 15, 2004. On August 21, 2008, the District adopted

[15] Air District website accessed at: http://www.valleyair.org/General_info/aboutdist.htm#Mission.
[16] The various ozone plans can be found on the Air District's website at: http://www.valleyair.org/Air_Quality_Plans/Ozone_Plans.htm.

Clarifications for the 2004 Extreme Ozone Attainment Demonstration Plan for 1-hour Ozone, and on October 16, 2008, EPA proposed to approve the District's 2004 Extreme Ozone Attainment Demonstration Plan for 1-hour Ozone."[17]

The planning requirements for the 1-hour plan remain in effect until replaced by a federal 8-hour ozone attainment plan. The EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan, including revisions to the plan, on March 8, 2010, effective April 7, 2010. However, the Air Basin failed to attain the standard in 2010 and was subject to a $29-million Clean Air Act penalty. The penalty is being collected through an additional $12 motor vehicle registration surcharge for each passenger vehicle registered in the Air Basin that will be applied to pollution reduction programs in the region. The District also instituted a more robust ozone episodic program to reduce emissions on days with the potential to exceed the ozone standards.

On May 6, 2014, the District submitted a formal request that the EPA determine that the Valley has attained the federal 1-hour ozone standard and to eliminate the $29 million Clean Air Act penalty. Per federal requirements, the District's submittal includes a clean data finding (2011-2013) and a finding that attainment is due to permanent and enforceable emissions reductions.

As part of the clean data finding, the District requested EPA concurrence that an exceedance at Fresno-Drummond on August 10, 2012 was due to an exceptional event. Alternatively, the District also provided compelling evidence that the Valley would attain the 1-hour ozone standard but for the influence of international air pollutant transport, allowing nonattainment penalties to be lifted under CAA 179B.

EPA originally classified the Air Basin as serious nonattainment for the 1997 federal 8-hour ozone standard with an attainment date of 2013. On April 30, 2007, the District's Governing Board adopted the 2007 Ozone Plan, which contained analysis showing a 2013 attainment target to be infeasible. The 2007 Ozone Plan details the plan for achieving attainment on schedule with an "extreme nonattainment" deadline of 2024. At its adoption of the 2007 Ozone Plan, the District also requested a reclassification to extreme nonattainment. ARB approved the plan in June 2007, and EPA approved the request for reclassification to extreme nonattainment on April 15, 2010.

The 2007 Ozone Plan contains measures to reduce ozone and particulate matter precursor emissions to bring the Basin into attainment with the federal 8-hour ozone standard. The 2007 Ozone Plan calls for a 75-percent reduction of NO_x and a 25-percent reduction of ROG (SJVAPCD 2007). The plan, with innovative measures and a "dual path" strategy, assures expeditious attainment of the federal 8-hour ozone standard for all Basin residents. The District Governing Board adopted the 2007 Ozone Plan on April 30, 2007. The ARB approved the plan on June 14, 2007. The 2007 Ozone Plan requires yet to be determined "Advanced Technology" to achieve additional reductions after 2021 to attain the standard at all monitoring stations in the Basin by 2024 as allowed for areas designated extreme nonattainment by the federal CAA.

"The County continues to evaluate and consider a variety of Federal, State, and Air District programs in order to respond to the non-attainment designation for Ozone that the SJVAB has received, and

[17] Tulare County General Plan 2030 Update RDEIR. Pages 3.3-12 to 3.3-13.

will continue to adopt resolutions to implement these programs. The Tulare County Board of Supervisor resolutions are described below. These resolutions were adopted in 2002 and 2004, respectively.

Resolution 2002-0157. Resolution 2002-0157, as adopted on March 5, 2002, requires the County to commit to implementing the Reasonably Available Control Measures included in the Resolution. The following Reasonably Available Control Measures were included in the resolution:

- Increasing transit service to the unincorporated communities of Woodville, Poplar and Cotton Center;
- Purchase of three new buses and installation of additional bicycle racks on buses;
- Public outreach to encourage the use of alternative modes of transportation;
- Providing preferential parking for carpools and vanpools;
- Removing on-street parking and providing bus pullouts in curbs to improve traffic flow;
- Supporting the purchase of hybrid vehicles for the County fleet;
- Mandating that the General Plan 2030 Update implement land use policies supporting public transit and vehicle trip reduction; and
- Programming $13,264,000 of highway widening projects.

Resolution 2004-0067. As part of a follow up effort to Resolution 2002-0157 and to address the federal reclassification to Extreme non-attainment for ozone, the County Board of Supervisors adopted Resolution 2004-067. The resolution contains additional Reasonably Available Control Measures as summarized below:

- Encouraging land use patterns which support public transit and alternative modes of transportation;
- Exploring concepts of Livable Communities as they address housing incentives and transportation;
- Consideration of incentives to encourage developments in unincorporated communities that are sensitive to air quality concerns; and
- Exploring ways to enhance van/carpool incentives, alternative work schedules, and other Transportation Demand Management strategies."[18]

[18] Ibid. 3.3-13.

Particulate Matter Plans[19]

The SJVAB was designated nonattainment of state and federal health-based air quality standards for PM_{10}. However, as discussed below, the SJVAB has demonstrated attainment of the federal PM_{10} standards and currently remains in nonattainment only for the state standards. The SJVAB is also designated nonattainment of state and federal standards for $PM_{2.5}$.

To meet CAA requirements for the PM_{10} standard, the Air District adopted a PM10 Attainment Demonstration Plan (Amended 2003 PM10 Plan and 2006 PM10 Plan), which had an attainment date of 2010. The Air District adopted the 2007 PM10 Maintenance Plan in September 2007 to assure the San Joaquin Valley's continued attainment of the EPA's PM_{10} standard. The EPA designated the San Joaquin Valley as an attainment/maintenance area for PM_{10} on September 25, 2008. Although the San Joaquin Valley has exceeded the standard since then, those days were considered exceptional events that are not considered a violation of the standard for attainment purposes.

On April 30, 2008, the Air District adopted the 2008 PM2.5 Plan satisfying federal implementation requirements for the 1997 federal $PM_{2.5}$ standard. However, on the verge of the demonstration of attainment with the standard the SJVAB was plagued with extreme drought, stagnation, strong inversions, and historically dry conditions and could not achieve attainment by the 2015 deadlines. The 2015 Plan for the 1997 PM2.5 Standard (2015 PM2.5 Plan) was adopted by the Air District on April 16, 2015, and is a continuation of the Air District's strategy to improve the air quality in the SJVAB. The 2015 PM2.5 Plan contains stringent measures, best available control measures, additional enforceable commitments for further reductions in emissions, and ensures attainment of the 1997 federal 24-hour standard (65 µg/m³) by 2018 and the annual standard (15 µg/m³) by 2020.

In December 2012, the Air District adopted the 2012 PM2.5 Plan to bring the San Joaquin Valley into attainment of the EPA's 2006 24-hour $PM_{2.5}$ standard of 35 µg/m³. The ARB approved the Air District's 2012 PM2.5 Plan for the 2006 standard at a public hearing on January 24, 2013. This plan seeks to bring the San Joaquin Valley into attainment with the standard by 2019, with the expectation that most areas will achieve attainment before that time. EPA lowered the annual $PM_{2.5}$ standard in 2012 and is in the process of completing attainment designations. The Air District continues to work with EPA on issues surrounding these plans, including EPA implementation updates.

The County continues to evaluate and consider Federal, State, and Air District programs in order to respond to the non-attainment designation for state PM10 standards that the SJVAB has received. "On September 25, 2008, EPA redesignated the San Joaquin Valley to attainment for the PM10 NAAQS and approved the PM10 Maintenance Plan. However, prior to this redesignation, Tulare County Board of Supervisors adopted the following resolution (Resolution 2002-0812) on October 29, 2002. Although now designated in attainment of the federal PM10 standard, all requirements included in the AIR DISTRICT PM10 Plan are still in effect. The resolution contains the following Best Available Control Measures (BACMs) to be implemented in order to reduce PM10 emissions in the County:

[19] The various particulate matter plans can be found on the Air District's website at: http://www.valleyair.org/Air_Quality_Plans/PM_Plans.htm.

- Paving or stabilizing of unpaved roads and alleys;
- Paving, vegetating, chemically stabilizing unpaved access points onto paved roads;
- Curbing, paving, or stabilizing shoulders on paved roads;
- Frequent routine sweeping or cleaning of paved roads;
- Intensive street cleaning requirements for industrial paved roads and streets providing access to industrial/ construction sites; and
- Debris removal after wind and rain runoff when blocking roadways."[20]

Criteria Pollutant Emissions

To assess air quality impacts, the Air District has established significance thresholds to assist Lead Agencies in determining whether a project may have a significant air quality impact[21]. The Air District's thresholds of significance for criteria pollutants, which are based on Air District Rule 2201 (New and Modified Stationary Source Review) offset thresholds, are provided in **Table 3.3-7**. As shown in the Table, the Air District has three sets of significance thresholds for each pollutant based on the source of the emissions. According to the Air District's Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI), "The District identifies thresholds that separate a project's short-term emissions from its long-term emissions. The short-term emissions are mainly related to the construction phase of a project and are recognized to be short in duration. The long-term emissions are mainly related to the activities that will occur indefinitely as a result of project operations."[22]

Table 3.3-7
Air Quality Thresholds of Significance – Criteria Pollutants

Pollutant/ Precursor	Construction Emissions	Operational Emissions	
		Permitted Equipment and Activities	Non- Permitted Equipment and Activities
	Emissions (tpy)	Emissions (tpy)	Emissions (tpy)
CO	100	100	100
NOx	10	10	10
ROG	10	10	10
SOx	27	27	27
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15
Source: Air District, GAMAQI, Table 2, page 80			

[20] Tulare County General Plan 2030 Update RDEIR. Page 3.3-14.
[21] Air District, Guidance for Assessing and Mitigating Air Quality Impacts. Page 74.
[22] Ibid. 75.

Operational emissions are further separated into permitted and non-permitted equipment and activities. Stationary (permitted) sources that comply or will comply with Air District rules and regulations are generally not considered to have a significant air quality impact. Specifically, the GAMAQI states, "District Regulation II ensures that stationary source emissions will be reduced or mitigated to below the District's significance thresholds. However, the Lead Agency can, and should, make an exception to this determination if special circumstances suggest that the emissions from any permitted or exempt source may cause a significant air quality impact. For example, if a source may emit objectionable odors, then odor impacts on nearby receptors should be considered a potentially significant air quality impact. District implementation of New Source Review (NSR) ensures that there is no net increase in emissions above specified thresholds from New and Modified Stationary Sources for all nonattainment pollutants and their precursors. Furthermore, in general, permitted sources emitting more than the NSR Offset Thresholds for any criteria pollutant must offset all emission increases in excess of the thresholds. However, under certain circumstances, the District may be precluded by state law or other District rule requirements from requiring a stationary source to offset emissions increases."[23]

Air District Rules and Regulations[24]

The Air District is primarily responsible for regulating stationary source emissions within the SJVAB and preparing the air quality plans (or portions thereof) for its jurisdiction. The Air District's primary approach of implementing local air quality plans occurs through the adoption of specific rules and regulations. Stationary sources within the jurisdiction are regulated by the Air District's permit authority over such sources and through its review and planning activities. The following Air District rules and regulations that may apply to this Project include, but are not limited to, the following:

Regulation VIII – Fugitive PM_{10} Prohibitions. The Air District adopted its Regulation VIII on October 21, 1993 and amended on August 8, 2004 to implement Best Available Control Measures (BACM). This Regulation consists of a series of emission reduction rules consistent with the PM_{10} Maintenance Plan. These rules are designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and track-out, etc. All development projects that involve soil disturbance are subject to at least one provision of the Regulation VIII series of rules. Regulation VIII specifically addresses the following activities:

- Construction, Demolition, Excavation, Extraction and Other Earthmoving Activities (Rule 8021);
- Bulk Materials (including Handling and Storage) (Rule 8031);
- Carryout and Track-Out (Rule 8041);
- Open Areas (Rule 8051);
- Paved and Unpaved Roads (Rule 8061); and

[23] Op. Cit. 76.
[24] For a full list of Air District rules and regulations, see their website at: http://www.valleyair.org/rules/1ruleslist.htm.

- Unpaved Vehicle/Equipment Parking (including Shipping and Receiving, Transfer, Fueling, and Service Areas) (Rule 8071).

Rule 2201 – New and Modified Stationary Source Review. This rule applies to all new stationary sources and all modifications to stationary sources which are subject to Air District Permit Requirements. Rule 2201 requires stationary source projects that exceed certain thresholds to install best available control technology (BACT) and to obtain emission offsets to ensure that growth in stationary sources on a cumulative basis will not result in an increase in emissions. Examples of stationary sources associated with the Project that may require District permits include, but not limited to, potential expansion of the Traver Wastewater Treatment Plant.

Rule 4002 – National Emissions Standards for Hazardous Air Pollutants. The purpose of the rule is to incorporate the National Emission Standards for Hazardous Air Pollutants from Part 61, Chapter I, Subchapter C, Title 40, Code of Federal Regulations and the National Emission Standards for Hazardous Air Pollutants for Source Categories from Part 63, Chapter I, Subchapter C, Title 40, Code of Federal Regulations to protect the health and safety of the public from HAPs, such as asbestos.

Rule 4101 – Visible Emissions. The purpose of this rule is to prohibit the emissions of visible air contaminants to the atmosphere. The provisions of this rule shall apply to any source operation which emits or may emit air contaminants.

Rule 4102 – Nuisance. The purpose of this rule is to protect the health and safety of the public, and applies to any source operation that emits or may emit air contaminants or other materials.

Rule 4625 – Wastewater Separators. The purpose of this rule is to limit .VOC emissions from wastewater separators by requiring vapor loss control devices, recordkeeping, inspections and test methods.

The Air District has limited authority to regulate transportation sources and indirect sources that attract motor vehicle trips.

Rule 9510 – Indirect Source Review. This rule reduces the impact of NO_x and PM_{10} emissions from growth on the Air Basin. The rule places application and emission reduction requirements on development projects meeting applicability criteria in order to reduce emissions through on-site mitigation, off-site Air District -administered projects, or a combination of the two. The rule defines a development project as a project, or portion thereof, that results in the construction of a building or facility for the purpose of increasing capacity or activity.[25] The rule also exempts any development project on a facility whose primary functions are subject to Air District permitting requirements.[26] The Project includes the installation of infrastructure to provide existing residences without municipal sewage facilities with connection to an existing wastewater treatment plant. As such, the Project does not increase capacity or activity and upon completion will be tied into a facility subject to Air District permitting requirements; therefore, the Project is not subject to Rule 9510.

[25] Air District Rule 9510, Section 3.13
[26] Ibid. Section 4.4.3

Air District's CEQA Role

As a public agency, the District takes an active part in the intergovernmental review process under CEQA. In carrying out its duties under CEQA, the District may act as a Lead Agency, a Responsible Agency, or a Trustee/Commenting Agency depending on the approvals required by the District and other land use agencies.

"The District is always the Lead Agency for projects such as the development of District rules and regulations. The District may be Lead Agency for projects subject to District permit requirements. As discussed above, for projects triggering BACT, the District has discretionary approval in deciding how to permit the project. For projects subject to BACT, the District serves as Lead Agency when no other agency has principal responsibility for approving the project."[27]

"As a Responsible Agency, the District assists Lead Agencies by providing technical expertise in characterizing project-related impacts on air quality and is available to provide technical assistance in addressing air quality issues in environmental documents. When commenting on a Lead Agency's environmental analysis, the District reviews the air quality section of the analysis and other sections relevant to assessing potential impacts on air quality, i.e. sections assessing public health impacts. At the conclusion of its review the District may submit to the Lead Agency comments regarding the project air quality analysis. Where appropriate, the District will recommend feasible mitigation measures."[28]

"As a Trustee Agency, the District assists Lead Agencies by providing technical expertise or tools in characterizing project-related impacts on air quality and identifying potential mitigation measures, and is available to provide technical assistance in addressing air quality issues in environmental documents. At the conclusion of its review the District may submit to the Lead Agency comments regarding the project air quality analysis. Where appropriate, the District will recommend feasible mitigation measures. The process is subject to change due to the District's continuous improvements efforts." [29]

Local Policy & Regulations

Tulare County General Plan Policies

The General Plan has a number of policies that apply to projects within Tulare County. General Plan policies that relate to the Project are listed below:

AQ-1.1 Cooperation with Other Agencies - The County shall cooperate with other local, regional, Federal, and State agencies in developing and implementing air quality plans to achieve State and federal Ambient Air Quality Standards. The County shall partner with the Air District, Tulare County Association of Governments (TCAG), and the California Air Resource Board to achieve better air quality conditions locally and regionally.

[27] Air District, GAMAQI. Page 50.
[28] Ibid. 51.
[29] Op. Cit. 52.

AQ-1.2 Cooperation with Local Jurisdictions - The County shall participate with cities, surrounding counties, and regional agencies to address cross-jurisdictional transportation and air quality issues.

AQ-1.3 Cumulative Air Quality Impacts - The County shall require development to be located, designed, and constructed in a manner that would minimize cumulative air quality impacts. Applicants shall be required to propose alternatives as part of the State CEQA process that reduce air emissions and enhance, rather than harm, the environment.

AQ-1.4 Air Quality Land Use Compatibility - The County shall evaluate the compatibility of industrial or other developments which are likely to cause undesirable air pollution with regard to proximity to sensitive land uses, and wind direction and circulation in an effort to alleviate effects upon sensitive receptors.

AQ-1.5 California Environmental Quality Act (CEQA) Compliance - The County shall ensure that air quality impacts identified during the CEQA review process are consistently and reasonable mitigated when feasible.

AQ-1.7 Support Statewide Climate Change Solutions - The County shall monitor and support the efforts of Cal/EPA, CARB, and the AIR DISTRICT, under AB 32 (Health and Safety Code Section38501 et seq.), to develop a recommended list of emission reduction strategies. As appropriate, the County will evaluate each new project under the updated General Plan to determine its consistency with the emission reduction strategies.

IMPACT ANALYSIS

Will the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Project Impact Analysis: ***Less Than Significant Impact***

"The CEQA Guidelines indicate that a significant impact would occur if the proposed project would conflict with or obstruct implementation of the applicable Air Quality Plan (AQP). AQPs are plans for reaching attainment of air quality standards. The assumptions, inputs, and control measures are analyzed to determine if the Air Basin can reach attainment for the ambient air quality standards. In order to show attainment of the standards, the District analyzes the growth projections in the valley, contributing factors in air pollutant emissions and formations, and existing and future emissions controls. The District then formulates a control strategy to reach attainment.

The District's GAMAQI provides the following guidance on analyzing conformity with the Air Quality Plan (AQP), "As presented in Chapter 8, the District has established threshold of significant for criteria pollutant emissions, which are based on District New Source Review

(NSR) offset requirements for stationary sources. Stationary sources in the District are subject to some of the toughest regulatory requirements in the nation. Emission reductions achieved through implementation of District offset requirements are a major component of the District's air quality plans. Thus, projects with emission below the thresholds of significance for criteria pollutants would be determined to "Not conflict or obstruct implementation of the District's air quality plan."[30]

Contribution to Air Quality Violations

A measure of determining if the project is consistent with the AQPs is if the project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQPs. The SJVAB is in attainment for the federal PM_{10} standards. Because of the region's nonattainment status for ozone (state and federal standards), $PM_{2.5}$ (state and federal standards), and PM_{10} (state standards), if project-generated emissions of either of the ozone precursor pollutants (ROG and NOx), PM_{10}, or $PM_{2.5}$ would exceed the Air District's significance thresholds and were not included in the AQP's growth forecast, then the project may be considered to conflict with the AQP.

As discussed in Impact 2 and Impact 3, criteria pollutant emissions associated with the construction and operation of the Project would neither result in CO hotspots nor exceed any of the Air District's thresholds of significance. Therefore, the Project would not result in a significant contribution to air quality violations.

Control Measures

The Air District's AQPs contains a number of control measures, which are enforceable requirements through the adoption of rules and regulations. A detailed description of rules and regulations that apply to this Project is provided in Chapter Three, Regulatory Setting above. The Project will comply with all applicable Air District rules and regulations. Therefore, the Project would not conflict with or obstruct implementation of the applicable AQPs."[31] Therefore, the Project would result in a ***Less Than Significant Project-specific Impact*** to this Checklist Item.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is the San Joaquin Valley Air Basin. As previously discussed, Project-related criteria pollutant emissions would not exceed Air District significance thresholds and, as such, the Project is consistent with and would not obstruct the applicable air quality attainment plan. Furthermore, the Project would comply with all applicable Air District rules and regulations. Therefore, the Project would result in a ***Less Than Significant Cumulative Impact*** related this Checklist Item.

[30] San Joaquin Valley Air Pollution Control District. Guidance for Assessing and Mitigating Air Quality Impacts. March 19, 2015. Page 65.
[31] Hash Farms Development. Air Quality Impact Analysis and Greenhouse Gas Study. November 2017. Appendix A of this DEIR. Page 52-53.

Mitigation Measure(s): ***None Required***

Conclusion: ***Less Than Significant Impact***

As noted earlier, the Project is consistent with all applicable AQPs, it would comply with required control measures, and it would not contribute substantially to an existing or projected air quality violation. Therefore, the Project would result in ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Project Impact Analysis: ***Less Than Significant Impact***

"Localized emissions from project construction and operation have been assessed using concentration-based thresholds that determine if the project would result in a localized exceedance of any ambient air quality standards or would make a cumulatively considerable contribution to an existing exceedance. The SJVAPCD's GAMAQI, adopted in 2015, contains significance thresholds for CO, NO_x, ROG, SOx, PM_{10} and $PM_{2.5}$, as seen in Table 5 [**Table 3.3-7** of this DEIR]. The primary pollutants of concern during project construction and operation are ROG, NO_x, PM_{10}, and $PM_{2.5}$.

Construction-Related Emissions

Construction-related emissions, resulting from both on-site and off-site activities, can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. The proposed Project is estimated to start construction in March 2018, and end in September 2021. As demonstrated in [**Table 3.3-8** of this DEIR] Table 7, construction-related emissions are below the SJVAPCD significance thresholds and, therefore, would result in a less than significant impact. CalEEMod output files are shown in Attachment A [of Appendix A.]

Operational Emissions

Operational emissions occur over the lifetime of the project and are from two main sources: area sources and motor vehicle, or mobile sources. Project construction is expected to begin in March 2018, with full buildout completed in September 2021. First occupancy is expected as early as fall of 2018. As shown in Table 8 [**Table 3.3-9** of this DEIR], operations-related emissions at full buildout are below the SJVAPCD significance thresholds and, therefore, would result in a less than significant impact.

Table 3.3-8 – Estimated Construction Emissions (tons/year)								
		CO	**NO_x**	**ROG**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**CO_2e**
Annual SJVAPCD Threshold		**100**	**10**	**10**	**27**	**15**	**15**	**--**
2018	**Phase I Construction**	2.2679	3.0958	0.3395	0.000	0.4268	0.2735	347.0288
2019	**Phase I Construction + Phase II Construction**	2.5925	3.3319	1.3787	0.000	0.4544	0.2893	406.0148
2020	**Phase II Construction + Phase III Construction**	2.5760	3.1298	1.3324	0.000	0.4170	0.2691	398.4107
2021	**Phase III + Phase IV Construction**	1.4809	1.6676	1.2510	0.000	0.2997	0.1829	246.8277
Total Construction Emissions		8.9173	11.2251	4.3001	0.0000	1.5979	1.0148	1,398.282
Additional ISR Reductions		0	2.2450	0	0	0.7191	0	0
Total after ISR		**8.9173**	**8.9801**	**4.3001**	**0.0000**	**0.8788**	**1.0148**	**1,398.282**
Exceeds Thresholds		**No**	**No**	**No**	**No**	**No**	**No**	**---**

Table 3.3-9– Estimated Operational Emissions (tons/year)								
		CO	**NOx**	**ROG**	**SO2**	**PM10**	**PM2.5**	**CO2e**
Annual SJVAPCD Threshold		**100**	**10**	**10**	**27**	**15**	**15**	**--**
2019	**Phase I Mitigated Operation**	4.2937	0.6943	0.8353	0.0000	0.8180	0.2308	900.5749
2020	**Phase II Mitigated Operation**	3.3127	0.5484	0.7832	0.0000	0.5656	0.1619	785.3269
2021	**Phase III Mitigated Operation + Phase IV Mitigated Operation**	3.0489	0.5676	0.8026	0.0000	0.5918	0.1685	785.8735
Total at Buildout		10.6553	1.2427	2.4211	0.0000	1.9754	0.5612	2,471.7753
Additional ISR Reductions		0	0.4101	0	0	0.9877	0	0
Total after ISR		**10.6553**	**0.8326**	**2.4211**	**0.0000**	**0.9877**	**0.5612**	**2,471.7753**
Exceeds Thresholds		**No**	**No**	**No**	**No**	**No**	**No**	**---**

Carbon Monoxide Hot Spot Analysis

Localized high levels are associated with traffic congestion and idling or slow-moving vehicles. The SJVAPCD provides screening criteria to determine when to quantify local CO concentrations based on impacts to the level of service of intersections in the project vicinity.

The project construction would result in minor increases in traffic for the surrounding road network during the construction duration. Motor vehicles accessing the site when it becomes operational would result in a minor increase in daily trips that would not substantially reduce the level of service.[32] Furthermore, local roadways are not identified as operating at unacceptable conditions under existing and future buildout conditions, according to the City of Kingsburg General Plan. Therefore, the project would not significantly contribute to an exceedance of state or federal CO standards."[33] Therefore, the Project would result in a ***Less Than Significant Project-specific Impact*** to this Checklist Item.

Cumulative Impact Analysis: ***Less Than Significant Impacts***

The geographic area of this cumulative analysis is the San Joaquin Valley Air Basin. The Project would result in short-term emissions relating to proposed Project construction. Ongoing operation would also result in emissions; however, as demonstrated in the Project analysis, anticipated emissions would result in less than significant impacts to air quality. Project related emissions would not substantially contribute to cumulative impacts in the air basin. Therefore, the Project would result in a ***Less Than Significant Cumulative Impact*** to this Checklist Item.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impacts***

As noted earlier, the Project's construction and operational emissions would not exceed the Air District's thresholds of significance and would not contribute substantially to an existing or projected air quality violations. Therefore, the Project would result in ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?

Project Impact Analysis: ***Less Than Significant Impact***

[32] Traffic Study for the Hash Farms Proposed Residential Development. Prepared by Ruettgers & Schuler Civil Engineers. January, 2017. Page 19.
[33] Hash Farms Development. Air Quality Impact Analysis and Greenhouse Gas Study. November 2017. Appendix A of this DEIR. Pages 53-55.

"To result in a less than significant impact, the following criteria must be true:

1. *Regional analysis: emissions of nonattainment pollutants must be below the District's regional significance thresholds.*

   The Air Basin is in nonattainment for PM_{10}, $PM_{2.5}$ and ozone, therefore, if the project exceeds the regional thresholds for PM10 or $PM_{2.5}$, then it contributes to a cumulatively considerable impact for those pollutants. If the project exceeds the regional threshold for NOx or ROG, then it follows that the project would contribute to a cumulatively considerable impact for ozone. As shown in Tables 7 and 8 [**Tables 3.3-8** and **3.3-9** of this DEIR], criteria pollutant emissions would not exceed any threshold of significance during project construction or operation. As such, this project would not cumulatively contribute to a significant impact according to this criterion.

2. *Summary of projections: the project must be consistent with current air quality attainment plans including control measures and regulations.*

   As discussed in Impact 1 – Consistency with Air Quality Plans, the project is consistent with all applicable control measures in the air quality attainment plans. The project would comply with any SJVAPCD rules and regulations that may pertain to implementation of the Air Quality Plans. Therefore, impacts would be less than significant regarding compliance with applicable rules and regulations.

3. *Cumulative health impacts: the project must result in less than significant cumulative health effects from the nonattainment pollutants.*

   Since the San Joaquin Air Basin is in nonattainment for PM_{10}, $PM_{2.5}$ and ozone, it is considered to have an existing significant cumulative health impact without the project. When this occurs, the analysis considers whether the project's contribution to the existing violation of air quality standards is cumulatively considerable and the SJVAPCD regional thresholds for NO_x, VOC or ROG, PM_{10} or $PM_{2.5}$ are applied as cumulative contribution thresholds. As shown in Tables 7 and 8, criteria pollutant emissions would not exceed any threshold of significance during project construction or operation, which demonstrates the projects consistency with the applicable Air Quality Attainment Plan. The project would not result in significant cumulative health impacts."[34] Therefore, the Project would have a ***Less Than Significant Project-specific Impact*** related to this Checklist Item.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is San Joaquin Valley Air Basin. This cumulative analysis is based on the information provided the Hash Farms Development Air Quality Impact Analysis and Greenhouse Gas Study, and provided in Appendix A of this DEIR. During construction and operation phases, the Project would not exceed Air District thresholds of significance and, therefore would not substantially contribute to cumulative

[34] Hash Farms Development. Air Quality Impact Analysis and Greenhouse Gas Study. November 2017. Appendix A of this DEIR. Pages 56-57.

impacts in the air basin. As such, the Project would result in a ***Less Than Significant Cumulative Impact*** to this Checklist Item.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impacts***

As noted earlier, the Project construction- and operations-related emissions would not exceed the Air District's thresholds of significance and would not contribute substantially to an existing or projected air quality violations. Therefore, the Project would result in ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item.

d) Expose sensitive receptors to substantial pollutant concentrations?

Project Impact Analysis: ***Less Than Significant Impact***

"Sensitive receptors are those who are sensitive to air pollution, including children, the elderly, and persons with preexisting respiratory or cardiovascular illness. The SJVAPCD considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants.

Construction – ROG

ROG is emitted during the application of architectural coatings (painting). The amount emitted is dependent on the amount of ROG (or VOC) in the paint. ROG emissions are typically an indoor air quality health hazard concern rather than an outdoor air quality health hazard concern. Therefore, exposures to ROG during architectural coatings is a less than significant health impact.

There are three types of asphalt that are typically used in paving, asphalt cements, cutback asphalts and emulsified asphalts. However, SJVAPCD Rule 4641 prohibits the use of the following types of asphalt: rapid cure cutback asphalt, medium cure cutback asphalt, slow cure asphalt that contains more than one-half percent of organic compounds that evaporate at 500 degrees Fahrenheit or lower, and emulsified asphalt containing organic compounds in excess of three percent by volume, that evaporate at 500 degrees Fahrenheit or lower. An exception to this is medium cure asphalt when the National Weather Service forecast of the high temperature for the 24-hour period following application is below 50 degrees Fahrenheit.

The acute (short-term) health effects from worker direct exposure to asphalt fumes include irritation of the eyes, nose and throat. Other effects include respiratory tract symptoms and pulmonary function changes. Residents are not in the immediate vicinity of fumes; therefore they would not be subjected to concentrations high enough to evoke a negative response. In addition, the restrictions that are placed on asphalt in the San Joaquin Valley reduce ROG emissions from asphalt and exposure. The impact to nearby sensitive receptors from ROG during construction is less than significant.

Operation – ROG

During operation, ROG would be emitted primarily from motor vehicles. Direct exposure to ROG from project motor vehicles would not result in health effects, because the ROG would be distributed across miles and miles of roadway and in the air. The concentrations would not be great enough to result in direct health effects.

Construction – NO_X, PM_{10}, $PM_{2.5}$

As discussed in Impact 2, emissions during construction would not exceed the SJVAPCD thresholds, and would not be expected to result in concentrations that would exceed ambient standards or contribute substantially to an existing exceedance of an ambient air quality standard.

Operation – PM_{10}, $PM_{2.5}$, CO, NO_x

As discussed in Impact 2, localized concentrations of PM_{10}, $PM_{2.5}$, CO and NO_x would not exceed the ambient air quality standards. Residential development is an insignificant source of these pollutants, except for projects that allow wood burning devices that emit PM_{10}, $PM_{2.5}$ in wood smoke. The project will include only natural gas fueled fireplaces and inserts that are not significant sources of $PM_{2.5}$ and PM_{10}. Therefore, the project would not expose sensitive receptors to substantial criteria air pollutant concentrations during operation.

Health Risk Assessment

The Air District does not provide specific guidance on evaluation of a project's potential for adverse health risks during construction-related activities. However, the Air District's Ambient Air Quality Analysis Project Daily Emissions Assessment (2013) and draft policy Project Impact on Ambient Air Quality Status under CEQA (2015) documents do provide guidance on how to evaluate whether a project would require an Ambient Air Quality Analysis (AAQA). Projects requiring an AAQA would also need to prepare a health risk assessment if the AAQA indicates that project emissions exceed any ambient air quality standards at the project boundary.

Pursuant to the Air District's guidance, project-related average daily emissions were calculated and are provided in Table 9 [**Table 3.3-10** of this DEIR]. As shown in Table 9 [**Table 3.3-10** of this DEIR], the average daily emissions are all below the Air District's 100 pound per day (lb/day) threshold for requiring an AAQA.

Table 3.3-10 Maximum Daily Air Pollutant Emissions During Construction					
Maximum Daily Emissions	**Emissions (lb/day)**				
	ROG	**NO_x**	**CO**	**PM_{10}**	**$PM_{2.5}$**
2018 Construction	5.2480	59.6435	36.3573	20.8747	12.3639
2019 Construction	135.2153	54.6264	34.4957	20.6881	12.1922
2020 Construction	181.1723	50.2909	32.9557	20.4951	12.0147
2021 Construction	127.6018	40.5718	21.9710	20.3421	11.8739
Maximum Daily Emissions	**127.6018**	**59.6435**	**36.3573**	**20.8747**	**12.3639**
Screening Threshold	--	100	100	100	100
Exceed screening threshold?	N/A	No	No	No	No

Since the Project's construction-related emissions do not require an AAQA, the project does not warrant a health risk assessment."[35] Therefore, the Project would result in a ***Less Than Significant Project-specific Impact*** related to this Checklist Item.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is the San Joaquin Valley Air Basin. Although there are sensitive receptors (in the form of residences) along the Project's alignment, it is anticipated that the Project would not expose sensitive receptors to substantial pollutant concentrations. Therefore, based on the above analysis and projected emissions from the Project's construction phase, the Project would result in a ***Less Than Significant Cumulative Impact*** related to this Checklist Item.

Mitigation Measure(s): ***None Required***

Conclusion: ***Less Than Significant Impact***

As noted earlier, the Project would result in ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item.

[35] Hash Farms Development. Air Quality Impact Analysis and Greenhouse Gas Study. November 2017. Appendix A of this DEIR. Pages 57-59.

e) Create objectionable odors affecting a substantial number of people?

Project Impact Analysis: ***Less Than Significant Impact***

"Land uses that are typically identified as sources of objectionable odors include landfills, transfer stations, sewage treatment plants, wastewater pump stations, composting facilities, feed lots, coffee roasters, asphalt batch plants, and rendering plants. The project would not engage in any of these activities and as such, would not be considered to be a generator of objectionable odors during operations.

During construction, the various diesel-powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and would not likely be noticeable for extended periods of time beyond the project's site boundaries. The potential for diesel odor impacts would be less than significant.

As a residential development, the project has the potential to place sensitive receptors near existing odor sources; however, this project is not within any major odor generating sources screening distance of the site, as listed in Table 6. Therefore, the uses in the vicinity of the project would not cause substantial odor impacts to the project."[36] Therefore, the Project would result in a ***Less Than Significant Project-specific Impact*** related to this Checklist Item.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is the San Joaquin Valley Air Basin. The Project's construction-related activities could potentially generate odors associated with diesel combustion emissions; however, construction-related odors are anticipated to be temporary and short-term. The Project's permanent operation is not anticipated to result in the release of substantial or significant odors into the atmosphere. As such, the Project would result in a ***Less Than Significant Cumulative Impacts*** related to this Checklist Item.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, the Project would result in ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item.

[36] Hash Farms Development. Air Quality Impact Analysis and Greenhouse Gas Study. November 2017. Appendix A of this DEIR. Pages 59-60.

DEFINITIONS/ACRONYMS

Definitions

Ambient Air Quality Standards, These standards measure outdoor air quality. They identify the maximum acceptable average concentrations of air pollutants during a specified period of time. These standards have been adopted at a State and Federal level.

Best Available Control Measures (BACM), A set of programs that identify and implement potentially best available control measures affecting local air quality issues.

Best Available Control Technologies (BACT), The most stringent emission limitation or control technique of the following: 1.) Achieved in practice for such category and class of source 2.) Contained in any State Implementation Plan approved by the Environmental Protection Agency for such category and class of source. A specific limitation or control technique shall not apply if the owner of the proposed emissions unit demonstrates to the satisfaction of the APCO that such a limitation or control technique is not presently achievable 3.) Contained in an applicable federal New Source Performance Standard or 4.) Any other emission limitation or control technique, including process and equipment changes of basic or control equipment, found by the APCO to be cost effective and technologically feasible for such class or category of sources or for a specific source.

Carbon Monoxide (CO), Carbon monoxide is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels and is emitted directly into the air (unlike ozone).

Hydrogen Sulfide (H_2S), Hydrogen sulfide is a highly toxic flammable gas. Because it is heavier than air, it tends to accumulate at the bottom of poorly ventilated spaces.

Lead (Pb), Lead is the only substance which is currently listed as both a criteria air pollutant and a toxic air contaminant. Smelters and battery plants are the major sources of the pollutant "lead" in the air. The highest concentrations of lead are found in the vicinity of nonferrous smelters and other stationary sources of lead emissions. The EPA's health-based national air quality standard for lead is 1.5 micrograms per cubic meter ($\mu g/m_3$) [measured as a quarterly average].

Metropolitan Planning Organization (MPO), Tulare County Association of Governments (TCAG) is the MPO for Tulare County. MPO's are responsible for developing reasonably available control measures (RACM) and best available control measures (BACM) for use in air quality attainment plans and for addressing Transportation Conformity requirements of the federal Clean Air Act.

Mobile Source, A mobile emission source is a moving object, such as on-road and off-road vehicles, boats, airplanes, lawn equipment, and small utility engines.

Nitrogen Oxides (Oxides of Nitrogen, NO_x), NO_x are compounds of nitric oxide (NO) and nitrogen dioxide (NO_2). NO_x are primarily created from the combustion process and are a major contributor to ozone smog and acid rain formation. NOx also forms ammonium nitrate particulate

in chemical reactions that occur when NOx forms nitric acid and combines with ammonia. Ammonium nitrate particulate is an important contributor to PM10 and PM2.5.

Ozone (O_3), Ozone is a pungent, colorless, toxic gas created in the atmosphere rather than emitted directly into the air. O_3 is produced in complex atmospheric reactions involving oxides of nitrogen, reactive organic gases (ROG), and ultraviolet energy from the sun in a photochemical reaction. Motor vehicles are the major sources of O_3 precursors.

Ozone Precursors, Chemicals such as non-methane hydrocarbons, also referred to as ROG, and oxides of nitrogen, occurring either naturally or as a result of human activities, which contribute to the formation of ozone, which is a major component of smog.

Photochemical, Some air pollutants are direct emissions, such as the CO produced by an automobile's engine. Other pollutants, primarily O_3, are formed when two or more chemicals react (using energy from the sun) in the atmosphere to form a new chemical. This is a photochemical reaction.

Particulate Matter 2.5 Micrometers ($PM_{2.5}$), The federal government has recently added standards for smaller dust particulates. $PM_{2.5}$ refers to dust/particulates/aerosols that are 2.5 microns in diameter or smaller. Particles of this size can be inhaled more deeply in the lungs and the chemical compositions of some particles are toxic and have serious health impacts.

Particulate Matter 10 Micrometers (PM_{10}), Dust and other particulates exhibit a range of particle sizes. Federal and State air quality regulations reflect the fact that smaller particles are easier to inhale and can be more damaging to health. PM_{10} refers to dust/particulates that are 10 microns in diameter or smaller. The fraction of PM between $PM_{2.5}$ and PM_{10} is comprised primarily of fugitive dust. The particles between PM_{10} and $PM_{2.5}$ are primarily combustion products and secondary particles formed by chemical reactions in the atmosphere.

Reactive Organic Gas (ROG), A photo chemically reactive gas, composed of non-methane hydrocarbons that may contribute to the formation of smog. Also sometimes referred to as Volatile Organic Compounds (VOCs).

Reasonable Available Control Measures (RACM), A broadly defined term referring to technologies and other measures that can be used to control pollution. They include Reasonably Available Control Technology and other measures. In the case of PM_{10}, RACM refers to approaches for controlling small or dispersed source categories such as road dust, woodstoves, and open burning. Regional Transportation Planning Agencies are required to implement RACM for transportation sources as part of the federal ozone attainment plan process in partnership with the Air District.

Reasonable Available Control Technologies (RACT), Devices, systems, process modifications, or other apparatuses or techniques that are reasonably available, taking into account: the necessity of imposing such controls in order to attain and maintain a national ambient air quality standard; the social, environmental, and economic impact of such controls; and alternative means of providing for attainment and maintenance of such a standard.

San Joaquin Valley Air Basin (SJVAB), An air basin is a geographic area that exhibits similar meteorological and geographic conditions. California is divided into 15 air basins to assist with the statewide regional management of air quality issues. The SJVAB extends in the Central Valley from San Joaquin County in the north to the valley portion of Kern County in the south.

San Joaquin Valley Air Pollution Control District (Air District), The Air District is the regulatory agency responsible for developing air quality plans, monitoring air quality, developing air quality regulations, and permitting programs on stationary/industrial sources and agriculture and reporting air quality data for the SJVAB. The Air District also regulates indirect sources and has limited authority over transportation sources through the implementation of transportation control measures (TCM).

Sensitive Receptors, Sensitive receptors are defined as land uses that typically accommodate sensitive population groups such as long-term health care facilities, rehabilitation centers, retirement homes, convalescent homes, residences, schools, childcare centers, and playgrounds.

Sensitive Population Groups, Sensitive population groups are a subset of the general population that is at a greater risk than the general population to the effects of air pollution. These groups include the elderly, infants and children, and individuals with respiratory problems, such as asthma.

Sulfur Dioxide (SO_2), Sulfur dioxide belongs to the family of SOx. These gases are formed when fuel containing sulfur (mainly coal and oil) is burned, and during metal smelting and other industrial processes.

Stationary Source, A stationary emission source is a non-mobile source, such as a power plant, refinery, or manufacturing facility.

Sulfates, Sulfates occur as microscopic particles (aerosols) resulting from fossil fuel and biomass combustion. SOx can form sulfuric acid in the atmosphere that in the presence of ammonia forms ammonium sulfate particulates, a small but important component of PM_{10} and $PM_{2.5}$. Sulfates increase the acidity of the atmosphere and form acid rain.

Transportation Conformity, A federal requirement for transportation plans and projects to demonstrate that they will not result in emissions that exceed attainment plan emission budgets or exceed air quality standards.

Transportation Control Measures (TCMs), Any measure that is identified for the purposes of reducing emissions or concentrations of air pollutants from transportation sources by reducing vehicle use or changing traffic flow or congestion conditions.

Transportation Management Agencies, Transportation Management Agencies are private, non-profit, member-controlled organizations that provide transportation services in a particular area, such as a commercial district, mall, medical center, or industrial park. Transportation Management Agencies are appropriate for any geographic area where there are multiple employers or businesses clustered together that can benefit from cooperative transportation management or parking

brokerage services. Regional and local governments, business associations, and individual businesses can all help establish Transportation Management Agencies.

Transportation Management Associations (TMAs), Groups of employers uniting together to work collectively to manage transportation demand in a particular area.

Tulare County Association of Governments (TCAG), TCAG is the Transportation Planning Agency (TPA) for Tulare County. TCAG is also designated as a Metropolitan Planning Organization (MPO), the agency responsible for preparing long range Regional Transportation Plans and demonstrating Transportation Conformity with air quality plans.

Wood-burning Devices, Wood-burning devices are designed to burn "solid fuels" such as cordwood, pellet fuel, manufactured logs, or any other non-gaseous or non-liquid fuels.

Abbreviations and Acronyms

ARB	California Air Resources Board
BACM	Best Available Control Measures
BACT	Best Available Control Technologies
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CO	Carbon Monoxide
EPA	Environmental Protection Agency
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
HI	Hazard Index
H_2S	Hydrogen Sulfide
NAAQS	National Ambient Air Quality Standards
NO_2	Nitrogen Dioxide
MPO	Metropolitan Planning Organization
O_3	Ozone
Pb	Lead
PM2.5	Particulate Matter 2.5 Micrometers
PM10	Particulate Matter 10 Micrometers
RACM	Reasonable Available Control Measures
RACT	Reasonable Available Control Technologies
ROG	Reactive Organic Gases
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
AIR DISTRICT	San Joaquin Valley Air Pollution Control District
SJVAPCD	San Joaquin Valley Air Pollution Control District
SJVAB	San Joaquin Valley Air Basin
TAC	Toxic Air Contaminants
TCAG	Tulare County Association of Governments
TCM	Transportation Control Measures
VOC	Volatile Organic Compound
WWTP	Waste Water Treatment Plant

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Biological Resources
Chapter 3.4

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts with Mitigation*** to Biological Resources. A detailed review of potential impacts is provided in the following analysis. A Biological Evaluation conducted by Kamansky's Ecological Consulting is included as Appendix "B" of this document which is used as the basis for determining this Project will result in less than significant impacts.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

"Whenever possible, public agencies are required to avoid or minimize environmental impacts by implementing practical alternatives or mitigation measures. According to Section 15382 of the CEQA Guidelines, a significant effect on the environment means a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest."[1]

The California Environmental Quality Act (CEQA; California Public Resources Code §§ 21000-21177) requires that State agencies, local governments, and special districts evaluate and disclose impacts from "projects" in the State. CEQA Guidelines Section 15380 clearly indicates that species of special concern (SSCs) should be included in an analysis of project impacts if they can be shown to meet the criteria of sensitivity.[2]

CEQA Guidelines Sections 15063 and 15065 address how an impact is identified as significant. These sections are particularly relevant to SSCs. Project-level impacts on listed rare, threatened, or endangered species are generally considered significant, and therefore require lead agencies to prepare an Environmental Impact Report to fully analyze and evaluate the impacts. In determining to assign "impact significance" to populations of non-listed species, factors which are usually considered include population-level effects, proportion of the species' range affected by a project, regional effects, and impacts to habitat features.[3]

This section of the Draft Environmental Impact Report (DEIR) for the Project meets CEQA requirements by addressing potential impacts to biological resources on the proposed Project site, which is located in a portion of the San Joaquin Valley in Tulare County. The "Environmental Setting" section provides a description of biological resources in the region, with special emphasis on the proposed Project site and vicinity. The "Regulatory Setting" provides a description of applicable State and local regulatory policies. A description of the

[1] California Department of Fish and Wildlife. Wildlife: Nongame: Species of Special Concern. http://www.dfg.ca.gov/wildlife/nongame/ssc/. Accessed March 2015.
[2] Ibid.
[3] Ibid.

potential impacts of the proposed project is also provided and includes the identification of feasible mitigation to avoid or lessen the impacts.

Thresholds of Significance

The geographical area may be either statewide or nationwide, depending on the sensitive status of the species. Standards for listing as federal endangered species are determined by the Federal Endangered Species Act, administered by U.S. Department of Fish and Wildlife. Standards for listing of California special status species (Endangered, Threatened, Candidate Endangered, Candidate Threatened, and Sensitive Species) are administered by the California Department of Fish and Wildlife (DFW). These requirements are described in further detail in the "Regulatory" section of this document.

ENVIRONMENTAL SETTING

The proposed Project site is located in northwestern Tulare County, the City of Kingsburg (City), and Fresno County completely within the City of Kingsburg Sphere of Influence. The topography of the Project site is relatively flat as the site is currently in a mixed state of agricultural use with orchards and vineyards. A portion of the site in the north is fallow. The Cole Slough canal runs inside the eastern edge of the site.[4]

Kamansky's Ecological Consulting (KEC) prepared a Biological Evaluation for the proposed Project site in April, 2015, and can be found in Appendix "B" of this DEIR. This evaluation included a reconnaissance-level biological field survey for biotic habitats, the plants and animals occurring in those habitats, and significant habitat values that may be protected by state and federal law.

The Biological Evaluation identified 30 potential special status species and three native plant communities which might occur onsite or in the proposed Project vicinity. Sources of information used in KEC's research included: (1) the *California Natural Diversity Data Base*[5] *(CNDDB)*, (2) the *Online Inventory of Rare and Endangered Vascular Plants of California*[6], and (3) manuals, reports, and references related to plants and animals of the San Joaquin Valley region. Species and occurrences can be seen in Table 1 of Appendix B.

"The land on the subject property is disturbed and does not support historical flora. According to the natural community classification scheme used by Holland (1986), the Kingsburg site is located in a part of the southern San Joaquin Valley that originally contained components of two natural communities prior to development: Valley Grassland and Valley Oak Riparian Woodland."[7]

"Dominant species observed on the subject property during the field survey, aside from cultivated crops, include the following annuals in the grassland: hare barely (*Hordeum marinum* ssp. *Leproinum*), whitestem filaree (Erodium moschatum), redstem filaree (*Erosium cicutarium*), and ripgut grass (*Broumus diandrus*)."[8]

[4] Reconnaissance-Level Biological Evaluation, Kamansky's Ecological Consulting, April 9, 2015. Appendix "B" of the DEIR.
[5] California Department of Fish and Wildlife, 2014, Natural Diversity Data Base, Special Animal and Special Plants.
[6] California Native Plant Society, Rare Plant Program. 2014. Inventory of Rare and Endangered Plants (online edition, V8-02). http://www.rareplants.cnps.org/. Accessed July, 2014.
[7] Reconnaissance-Level Biological Evaluation, Kamansky's Ecological Consulting, April 9, 2015. Page 12. Appendix "B" of the DEIR.
[8] Ibid.

There are two habitat conservation plans that apply in Tulare County: 1) Recovery Plan for Upland Species of the San Joaquin Valley, and 2) the Kern Water Bank Habitat Conservation Plan.

The Recovery Plan for Upland Species of the San Joaquin Valley identifies the following species that are important in the San Joaquin Valley:

- California Jewelflower *(Caalanthus cahfornicus),*
- Palmate-Bracted Bird's-Beak *(Cordylanthus palmatus)*
- Kern Mallow *(Eremalche kernensis)*
- Hoover's Woolly-Star *(Eriastrumn hoox'eri)*
- San Joaquin Woolly-Threads *(Lemnbertia congdonii)*
- Bakersfield Cactus *(Opurmtia basilaris* var. *rreleasei)*
- Lesser Saltscale *(A triplex nminuscula)*
- Bakersfield Smallscale *(A triplex tularensis)*
- Lost Hills Saltbush *(Atriplex vallicola)*
- Vasek's Clarkia *(Clarkia tembloriensis* ssp. *calientensis)*
- Temblor Buckwheat *(Eriogonunm tentblorense)*
- Tejon Poppy *(Eschscholzia lenmnionii* ssp. *kernensis)*
- Diamond-petaled California Poppy *(Eschscholzia rhomimbipetala)*
- Comanche Point Layia *(La via leucopappa)*
- Munz's Tidy-tips *(Layia rnunzii)*
- Jared's Peppergrass *(Lepidiunmjaredii)*
- Merced Monardella *(Monardella leucocephala)*
- Merced Phacelia *(Phacelia ciliata* var. *opaca)*
- Oil Neststraw *(Stylocline citroleurn)*
- Giant Kangaroo Rat *(Dipodomys ingens)*
- Fresno Kangaroo Rat *(Dipodonmys nitratoides exilis)*
- Tipton Kangaroo Rat *(Dipodonmy's nitratoides nitratoides}*
- Blunt-Nosed Leopard Lizard *(Ganmbelia si/a)*
- San Joaquin Kit Fox (*Vu/pes macrotis nmutica)*
- Ciervo Aegialian Scarab Beetle *(Aegialia concinna)*
- San Joaquin Dune Beetle *(Coelus gracilis)*
- Doyen's Dune Weevil *(Trigonoscuta* sp.)
- San Joaquin Antelope Squirrel *(Antnmospermophilus nelsoni)*
- Short-Nosed Kangaroo Rat *(Dipodonmys nitratoides brevinasus)*
- Riparian Woodrat *(Neotomafuscipes riparia)*
- Tulare Grasshopper Mouse *(Onvchomys torridus tu/arensis)*
- Buena Vista Lake Shrew *(Sorex ormmatus relictus)*
- Riparian Brush Rabbit *(Sylvilagus bachmani riparius)*
- Le Conte's Thrasher *(Toxostoma lecontei leconrel)*

The Kern Water Bank Habitat Conservation Plan also applies to Tulare County; however, the Plan area is restricted to an area in Allensworth.

REGULATORY SETTING

Applicable Federal, State, and local regulations specific to biological resources are described below. The following environmental regulatory settings were summarized, in part, from information contained in the Tulare County General Plan 2010 Background Report.

Federal Agencies & Regulations

Federal Endangered Species Act

"The U.S. Fish and Wildlife Service (USFWS) administers the federal Endangered Species Act (16 USC Section 153 et seq.) and thereby has jurisdiction over federally listed threatened, endangered, and proposed species. Projects that may result in a "take" of a listed species or critical habitat must consult with the USFWS. "Take" is broadly defined as harassment, harm, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collection; any attempt to engage in such conduct; or destruction of habitat that prevents an endangered species from recovering (16 USC 1532, 50 CFR 17.3). Federal agencies that propose, fund, or must issue a permit for a project that may affect a listed species or critical habitat are required to consult with the USFWS under Section 7 of the Federal Endangered Species Act. If it is determined that a federally listed species or critical habitat may be adversely affected by the federal action, the USFWS will issue a "Biological Opinion" to the federal agency that describes minimization and avoidance measures that must be implemented as part of the federal action. Projects that do not have a federal nexus must apply for a take permit under Section 10 of the Act. Section 10 of the act requires that the project applicant prepare a habitat conservation plan as part of the permit application (16 USC 1539)."[9]

"Under Section 4 of the Federal Endangered Species Act, a species can be removed, or delisted, from the list of threatened and endangered species. Delisting is a formal action made by the USFWS and is the result of a determined successful recovery of a species. This action requires posts in the federal registry and a public comment period before a final determination is made by the USFWS."[10]

Habitat Conservation Plans

"Habitat Conservation Plans (HCPs) are required for a non-federal entity that has requested a take permit of a federal listed species or critical habitat under Section 10 of the Endangered Species Act. HCPs are designed to offset harmful effects of a proposed project on federally listed species. These plans are utilized to achieve long-term biological and regulatory goals. Implementation of HCPs allows development and projects to occur while providing conservation measures that protect federally listed species or their critical habitat and offset the incidental take of a proposed project. HCPs substantially reduce the burden of the Endangered Species Act on small landowners by providing efficient mechanisms for compliance with the ESA, thereby distributing the economic and logistic effects of compliance. A broad range of landowner activities can be legally protected under these plans.[11] There are generally two types of HCPs,

[9] Tulare County General Plan 2030 Update Recirculated DEIR, Page 3.11-2
[10] Ibid.
[11] Tulare County General Plan 2030 Update Background Report, Pages 9-6 and 9-7

project specific HCPs which typically protect a few species and have a short duration and multi-species HCPs which typically cover the development of a larger area and have a longer duration."[12]

Migratory Bird Treaty and Bald and Golden Eagle Protection Act

"The Migratory Bird Treaty Act (MBTA, 16 USC Section 703-711) and the Bald and Golden Eagle Protection Act (16 USC Section 668) protect certain species of birds from direct "take". The MBTA protects migrant bird species from take by setting hunting limits and seasons and protecting occupied nests and eggs. The Bald and Golden Eagle Protection Act (16 USC Sections 668-668d) prohibits the take or commerce of any part of Bald and Golden Eagles. The USFWS administers both acts, and reviews federal agency actions that may affect species protected by the acts."[13]

Clean Water Act - Section 404

"Wetlands and other waters of the U.S. are subject to the jurisdiction of the U.S. Army Corp of Engineers (USACE) and U.S. Environmental Protection Agency (EPA) under Section 404 of the Clean Water Act (33 U.S.C. 1251 et seq., 1972). Together, the EPA and the USACE determine whether they have jurisdiction over the non-navigable tributaries that are not relatively permanent based on a fact-specific analysis to determine if there is a significant nexus. These non-navigable tributaries include wetlands adjacent to non-navigable tributaries that are not relatively permanent and wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary."[14]

"Wet areas that are not regulated by this Act do not have a hydrologic link to other waters of the U.S., either through surface or subsurface flow and include ditches that drain uplands, swales or other erosional features. The USACE has the authority to issue a permit for any discharge, fill, or dredge of wetlands on a case-by-case basis, or by a general permit. General permits are handled through a Nationwide Permit (NWP) process. These permits allow specific activities that generally create minimal environmental effects. Projects that qualify under the NWP program must fulfill several general and specific conditions under each applicable NWP. If a proposed project cannot meet the conditions of each applicable NWP, an individual permit would likely be required from the USACE."[15]

State Agencies & Regulations

California Department of Fish and Wildlife (formerly Dept. of Fish and Game)

The California Department of Fish and Wildlife (DFW) regulates the modification of the bed, bank, or channel of a waterway under Sections 1601-1607 of the California Fish and Game Code. Also included are modifications that divert, obstruct, or change the natural flow of a waterway. Any party who proposes an activity that may modify a feature regulated by the Fish

[12] Tulare County General Plan 2030 Update Recirculated DEIR, Page 3.11-2
[13] Ibid. Page 3.11-3
[14] Op. Cit. Page 3.11-1
[15] Tulare County General Plan 2030 Update DEIR. Pages 3.11-1 to 3.11.2

and Game Code must notify DFW before project construction. DFW will then decide whether to enter into a Streambed Alteration Agreement with the project applicant either under Section 1601 (for public entities) or Section 1603 (for private entities) of the Fish and Game Code.

California Endangered Species Act

DFW administers the California Endangered Species Act of 1984 (Fish and Game Code Section 2080), which regulates the listing and "take" of endangered and threatened State-listed species. A "take" may be permitted by California Department of Fish and Game through implementing a management agreement. "Take" is defined by the California Endangered Species Act as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" a State-listed species (Fish and Game Code Sec. 86). Under State laws, DFW is empowered to review projects for their potential impacts to State-listed species and their habitats.

The DFW maintains lists for Candidate-Endangered Species (SCE) and Candidate-Threatened Species (SCT). California candidate species are afforded the same level of protection as State-listed species. California also designates Species of Special Concern (CSC) that are species of limited distribution, declining populations, diminishing habitat, or unusual scientific, recreational, or educational value. These species do not have the same legal protection as listed species, but may be added to official lists in the future. The CSC list is intended by DFW as a management tool for consideration in future land use decisions (Fish and Game Code Section 2080).[16]

All State lead agencies must consult with DFW under the California Endangered Species Act when a proposed project may affect State-listed species. DFW would determine if a project under review would jeopardize or result in taking of a State-listed species, or destroy or adversely modify its essential habitat, also known as a "jeopardy finding" (Fish and Wildlife Code Sec. 2090). For projects where DFW has made a jeopardy finding, DFW must specify reasonable and prudent alternatives to the proposed project to the State lead agency (Fish and Wildlife Code Sec. 2090 et seq.).[17]

Natural Communities Conservation Planning Act

The Natural Communities Conservation Planning Act allows a process for developing natural community conservation plans (NCCPs) under DFW direction. NCCPs allow for regional protection of wildlife diversity, while allowing compatible development. DFW may permit takings of State-listed species whose conservation and management are provided in a NCCP, once a NCCP is prepared (Fish and Game Code Secs. 2800 et seq.).[18]

Federally and State-Protected Lands

Ownership of California's wildlands is divided primarily between federal, state, and private entities. State-owned land is managed under the leadership of the Departments of Fish and

[16] Tulare County General Plan 2030 Update, Background Report, Pages 9-7 and 9-8.
[17] Ibid.
[18] Op. Cit.

Wildlife (DFW), Parks and Recreation, and Forestry and Fire Protection (CDF). Tulare County has protected lands in the form of wildlife refuges, national parks, and other lands that have large limitations on appropriate land uses. Some areas are created to protect special status species and their ecosystems.[19]

California Wetlands Conservation Policy

The California Wetlands Conservation Policy's goal is to establish a policy framework and strategy that will ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California. Additionally, the policy aims to reduce procedural complexity in the administration of State and federal wetlands conservation programs and to encourage partnerships with a primary focus on landowner incentive programs and cooperative planning efforts. These objectives are achieved through three policy means: statewide policy initiatives, three geographically based regional strategies in which wetland programs can be implemented, and creation of interagency wetlands task force to direct and coordinate administration and implementation of the policy. Leading agencies include the Resources Agency and the California Environmental Protection Agency (Cal/EPA) in cooperation with Business, Transportation and Housing Agency, Department of Flood and Agriculture, Trade and Commerce Agency, Governor's Office of Planning and Research, Department of Fish and Wildlife, Department of Water Resources, and the State Water Resources Control Board.[20]

Birds of Prey

Birds of Prey are protected under the California Fish and Wildlife Code Section 3503.5, which states:

> *"It is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."*

This includes any construction disturbance which could lead to nest abandonment, which is considered a "taking" by the DFW.

Special Status Species

"Several species of plants and animals within the state of California have low populations and/or limited distributions. Such species may be considered "rare" and are vulnerable to extirpation as the state's human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described more fully in Section 3.2, state and federal laws have provided the California Department of Fish and Wildlife (CDFW) (previously called the California Department of Fish and Game – CDFG) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. A sizable number of native plants and animals have been formally

[19] Op. Cit. Page 9-9.
[20] Tulare County General Plan 2030 Update, *Background Report*, Page 9-9

designated as "threatened" or "endangered" under state and federal endangered species legislation. Others have been designated as candidates for such listing. Still others have been designated as "species of special concern" by the CDFW. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened, or endangered. Collectively, these plants and animals are referred to as "special status species."[21]

CEQA and Oak Woodland Protection

CEQA Statute Section 21083.4, "Counties; Conversion of Oak Woodlands; Mitigation Alternatives," requires that counties determine whether a development will have potential impacts on oak woodlands:

> 21083.4(a): "For purposes of this section, "oak" means a native tree species in the genus *Quercus*, not designated as Group A or Group B commercial species pursuant to regulations adopted by the State Board of Forestry and Fire Protection pursuant to Section 4526, and that is 5 inches or more in diameter at breast height."
>
> 21083.4(b): "…a county shall determine whether a project within its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment. If a county determines that there may be a significant effect to oak woodlands, the county shall require one or more of the [listed] oak woodlands mitigation alternatives…"

Local Policy & Regulations

Tulare County General Plan Policies

The Tulare County General Plan has a number of policies that apply to projects within the County of Tulare. General Plan policies that relate to the proposed Project are listed below.

ERM-1.1 Protection of Rare and Endangered Species - The County shall ensure the protection of environmentally sensitive wildlife and plant life, including those species designated as rare, threatened, and/or endangered by State and/or Federal government, through compatible land use development.

ERM-1.2 Development in Environmentally Sensitive Areas - The County shall limit or modify proposed development within areas that contain sensitive habitat for special status species and direct development into less significant habitat areas. Development in natural habitats shall be controlled so as to minimize erosion and maximize beneficial vegetative growth.

ERM-1.15 Minimize Lighting Impacts - The County shall ensure that lighting associated with new development or facilities (including street lighting, recreational facilities, and parking) shall be designed to prevent artificial lighting from illuminating adjacent natural areas at a level greater than one foot candle above ambient conditions.

[21] Reconnaissance-Level Biological Evaluation, Kamansky's Ecological Consulting, April 9, 2015. Page 11. See Appendix "B" of this DEIR.

ERM-1.16 Cooperate with Wildlife Agencies - The County shall cooperate with State and federal wildlife agencies to address linkages between habitat areas.

IMPACT EVALUATION

Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Project Impact Analysis: ***Less Than Significant Impact With Mitigation***

The proposed Project site is currently in a mixed state of agricultural use. Plums, peaches and grapes are currently being grown on-site with the northern portion of the site being fallow. The Cole Slough canal runs inside the eastern edge of the proposed Project site.

According to the CNDDB search and as described in Appendix "B", eight Special Status plant species, 22 Special Status animal species, and three special habitats are known to occur in the general proposed Project vicinity. Field surveys were conducted by KEC in July and August of 2015 and it was determined that of the 30 Special Status species and three sensitive habitat areas, there is the possibility of presence of only six species in the area as a result of on-going disturbances on the site and the quality of habitat on and around the proposed Project site. A brief description of these six species is provided in the following paragraphs.

Swainson's hawk (Buteo swainsoni)

Swainson's hawk prefer open habitats, including mixed and short grass grasslands with scattered trees or shrubs for perching; dry grasslands; irrigated meadows; and edges between two habitat types. In Tulare County and Kings County, more than 33 Swainson's hawk nests have been located in isolated trees or small groves of eucalyptus, valley oak, Fresmont's cottonwood, Goodding's black willow, and deodar cedar. They have also been found in nest trees stand in (or adjacent to) open agricultural land, along riparian corridors or irrigation channels, or at the edge of a tailwater ponds. Foraging habitat surrounding the nest trees is chiefly alfalfa or other row crops, but also includes expanses of grassland and scrub habitat. *No Swainson's hawks were observed on the site.* (emphasis as shown in biological report)[22]

Western burrowing owl (Athene cunicularia)

The western burrowing owl is a State Species of Concern known to be present within the region of the proposed Project. Records for this species are on the Traver, Burris Park,

[22] Reconnaissance-Level Biological Evaluation, Kamansky's Ecological Consulting, April, 2015. Page 19. See Appendix "B" of this DEIR.

Conejo, Selma, and Reedley Quads. This species prefers short grass prairie and other sparsely-vegetated areas where foraging is optimal. Ground squirrel burrows suitable for burrowing owls were observed directly adjacent to the site; however, *no western burrowing owls were found on or near the site* (emphasis as shown in biological report). It is possible that they could be denning and foraging in the fallow fields and farm edges nearby or could move into the proposed Project area prior to construction-related activities. [23]

Loggerhead shrike (Lanius ludovicianus)

The Traver quad contains the only record for the Loggerhead shrike in the proposed Project area. *No Loggerhead shrikes were observed on the site during the survey* (emphasis as shown in biological report). They can typically be seen foraging in fallow fields and grassland habitats and nest in dense vegetation. Small suitable habitat patches exist on and nearby the proposed Project site.[24]

Western mastiff bat (Eumops perotis californicus)

The Traver and Selma quads contain records of the western mastiff bat. *No western mastiff bats were observed during the field survey* (emphasis as shown in biological report). This species is known to forage in a variety of habitats including agricultural lands, which occur on and adjacent to the site. There are also a few suitable potential roosting sites in the area; however, because of the existing site disturbance history, the proposed Project site lacks substantial breeding ground for the western mastiff bat.[25]

San Joaquin kit fox (Vulpes macrotis mutica)

Records of San Joaquin kit fox (Vulpes macrotis mutica) in this part of Tulare County come from eight quads: Visalia, Paige, Goshen, Tulare, Waukena, Traver, Monson, and Remnoy. These widespread occurrences suggest widespread activity in the area. No San Joaquin kit fox were observed during this field survey. The proposed Project site is suboptimal kit fox habitat because it does not provide important intrinsic habitat values unique to the area and has an extensive history of disturbance. However, some possible movement corridors are in the area and San Joaquin kit fox may occasionally pass through the site while foraging. Based on habitat characteristics and prey availability, this species would not be expected to den on the site; however, it is within the range of this species and potential kit fox dens were observed on and directly adjacent to the site. It should be noted though that no evidence of kit fox tracks or scat was found anywhere on the site. *No San Joaquin kit fox were observed during this field survey* (emphasis as shown in biological report).

Hoary bat (Lasiurus cinereus)

[23] Ibid. Pages 19-20.
[24] Op. Cit. Page 20.
[25] Op. Cit. Page 21.

The Reedley Quad contains records of this species. The records are likely from the Kings River riparian forest. *No Hoary bats were observed during field survey* (emphasis as shown in biological report). Possible roosting trees were found on and adjacent to the site and there are foraging opportunities throughout the site and the surrounding areas.

Pallid bat (Antrozous pallidus)

The Reedley quad contains records of the pallid bat (Antrozous pallidus). The records may come from the Kings River riparian forest. *No pallid bats were observed during the field study* (emphasis as shown in biological report). Pallid bats' habitat includes arid, rocky sites. The site does not include such habitat.[26]

Amphibians were detected along the Cole Slough Canal at the eastern edge of the property. As part of the proposed Project, the Cole Slough Canal will be undergrounded for approximately 2,000 feet.[27]

Various large nesting trees border or are present on the site. No raptors or nests were observed on the site, but are present in the general vicinity. Although the site is sub-optimal kit fox habitat, it is within the range of this species and potential kit fox dens were observed directly adjacent to the site. Dens could also be used by burrowing owls. Neo-tropical migratory birds occupied the site at the time of the biological surveys.[28]

Based on this analysis, implementation of Mitigation Measures 4-1 through 4-23 would reduce potential Project-specific impacts related to this Checklist Item to ***Less Than Significant With Mitigation***.

Cumulative Impact Analysis ***Less Than Significant Impact With Mitigation***

The geographic area of this cumulative analysis is the San Joaquin Valley. While the study area is limited to Tulare County, sensitive species with similar habitat requirements may exist in other portions of the San Joaquin Valley, and therefore cumulative impacts would extend beyond Tulare County political boundaries.

The proposed Project would only contribute to cumulative impacts related to this Checklist Item if Project-specific impacts were to occur. As the proposed Project does not result in significant loss of habitat or direct impact to these special status species, ***Less Than Significant Cumulative Impacts with Mitigation*** will occur. Consultants KEC recommended the following Mitigation Measures as contained in the Biological Evaluation (See Appendix "B" of this DEIR). For easier reading, the Mitigation Measures contained in the Biological Evaluation have been sequenced differently and numbered rather than using the format contained in the Biological Evaluation.

[26] Op. Cit. Page 22.
[27] Ibid. Page 27.
[28] Op. Cit.

Mitigation Measure(s):

"Protection of Swainson's hawks and other raptors and migratory birds (including Loggerhead Shrike).

4-1. Pre-construction surveys shall be conducted to determine the presence of nesting birds if ground clearing or construction activities will be initiated during the breeding season (February 15 through September 15). Potential nesting areas on the proposed Project site and potential nesting areas within 500 feet of the site should be surveyed prior to June 5th. Surveys shall be performed by a qualified biologist to verify the presence or absence of nesting birds. Construction shall not occur within a 500 foot buffer surrounding active nests of raptors or a 250 foot buffer surrounding active nests of migratory birds. If construction within these buffer areas is required or if nests must be removed to allow continuation of construction, then approval and specific removal methodologies should be obtained from California Department of Fish and Wildlife.

4-2. All trees which are suitable for Swainson's hawk nesting that are within 2,640 feet of construction activities shall be inspected by a qualified biologist.

4-3. If potential Swainson's hawk nests are found during the inspection, then surveys shall be conducted at the following intensities, depending upon dates of initiation of construction:

Construction start	Survey period	Number of surveys	Timing
1 January to 20 March	1 January to 20 March	1	All day
21 March to 24 March	1 January to 20 March	1	All day
	21 March to 24 March	Up to 3	Sunrise to 10 am and 4 pm to sunset
24 March to 5 April	1 January to 20 March	1	All day
	21 March to 5 April	3	Sunrise to 10 am and 4 pm to sunset
6 April to 9 April	21 March to 5 April	3	Sunrise to 10 am and 4 pm to sunset
	6 April to 9 April	Up to 3	Sunrise to 10 am and 4 pm to sunset
	1 January to 20 March	1 (if all 3 surveys are performed between 6 and 9 April, then this survey need not be conducted)	All day
10 April to 30 July	21 March to 5 April	3	Sunrise to 10 am and 4 pm to sunset
	6 April to 20 April	3	Sunrise to 12 pm and 4:30 pm to sunset
31 July to 15 September	6 to 20 April	3	Sunrise to 12 pm and 4:30 pm to sunset
	10 to 30 July	3	Sunrise to 12 pm and 4 pm to sunset

4-4. If Swainson's hawks are detected to be actively nesting in trees within 2,640 feet of the construction area, construction shall not occur within this zone until after young Swainson's hawks have fledged (this usually occurs by early June). The nest shall be monitored by a qualified biologist to determine fledging date.

4-5. If Swainson's hawks (foraging) or other raptors are found actively nesting within 250 feet of the construction area, construction should be postponed until after young have fledged. The date of fledging should be determined by a qualified biologist. If construction cannot be delayed, the CDFW shall be consulted and alternative protection measures required by the CDFW shall be followed.

4-6. If other nesting birds (particularly non-raptor species listed on the MBTA) are found actively nesting within 250 feet of the construction area, construction should be postponed until after young have fledged. The date of fledging should be determined by a qualified biologist. If construction cannot be delayed within this zone, the CDFW and/or the USFWS shall be consulted and alternative protection measures required by the CDFW and/or the USFWS shall be followed."[29]

"Protection of San Joaquin kit fox

4-7. A standardized pre-construction/ pre-activity shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any Project activity likely to impact the San Joaquin kit fox. Surveys shall identify kit fox habitat features on the Project site and evaluate use by kit fox and, if possible, assess the potential impacts to the kit fox by the proposed activity. The status of all dens shall be determined and mapped. Written results of pre-construction/pre-activity surveys must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities.

4-8. Disturbance to all San Joaquin kit fox dens shall be avoided to the maximum extent possible.

4-9. If a natal/pupping den is discovered within the Project area or within 200-feet of the site boundary, USFWS shall be immediately notified and under no circumstances should the den be disturbed or destroyed without prior authorization. If the pre-construction/pre-activity survey reveals an active natal pupping or new information, the Project applicant shall contact USFWS immediately to obtain the necessary take authorization/permit.

4-10. Destruction of any den shall be accomplished by careful excavation until it is certain that no kit foxes are inside. The den shall be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period.

[29] Op. Cit. Pages 27-30.

4-11. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above shall be resumed. Destruction of the den may be completed when, in the judgment of the qualified biologist, the animal has escaped without further disturbance from the partially destroyed den.

4-12. Project-related vehicles shall observe a daytime speed limit not to exceed 20-mph throughout the site in all proposed Project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. Night-time construction shall be minimized to the extent possible. However if it does occur, then the speed limit shall be reduced to 10-mph. Off-road traffic outside of designated project areas shall be prohibited.

4-13. To prevent inadvertent entrapment of kit fox or other animals during the construction phase of the proposed Project, all excavated, steep-walled holes or trenches more than 2-feet deep shall be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks shall be installed. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS and the California Department of Fish and Wildlife shall be contacted as noted under Mitigation Measure 4-20 referenced below.

4-14. Kit fox are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit fox before the pipe is used or moved, buried, or capped in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the CFW has been consulted. If necessary, and under the direct supervision of a qualified biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.

4-15. All food-related trash outside of the enclosed facility such as wrappers, cans, bottles, and food scraps shall be disposed of daily in securely closed containers and removed at least once a week during both construction and operational phases.

4-16. No pets, such as dogs or cats, shall be allowed on the Project site in order to prevent harassment, mortality of kit fox, or destruction of dens.

4-17. Use of rodenticides and herbicides in Project areas shall be restricted. If rodent control must be used it shall be limited to the use of zinc phosphide because of its demonstrated lower risk to kit fox.

4-18. A representative shall be appointed by the Project Applicant to serve as the contact source for any employee or contractor who might inadvertently kill or injure a kit

fox or who finds a dead, injured or entrapped kit fox. The representative will be identified during the employee education program and their name, telephone number, or other pertinent contact information shall be provided to the Service.

4-19. An employee education program shall be conducted to alert employees of potential impacts to kit fox or other species of concern. The program shall consist of a brief presentation by persons knowledgeable in kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and military and/or agency personnel involved in the project. The program shall include the following: A description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of kit fox in the Project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during Project construction and implementation. A fact sheet conveying this information shall be prepared for distribution to the previously referenced people and anyone else who may enter the Project site.

4-20. Any contractor, employee, or military or agency personnel who are responsible for inadvertently killing or injuring a San Joaquin kit fox shall immediately report the incident to their representative. The Sacramento Fish and Wildlife Office and CFW shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The Sacramento Fish and Wildlife Office contact is:

Mr. Paul Hoffman
1701 Nimbus Road, Suite A,
Rancho Cordova, California 95670
(530) 934-9309

4-21. New sightings of kit fox shall be reported to the California Natural Diversity Database (CNDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed shall also be provided to Fish and Wildlife at the address below.

Endangered Species Division
2800 Cottage Way, Suite W2605
Sacramento, California 95825-1846
(916) 414-6620 or (916) 414-6600"[30]

"Protection of burrowing owl

4-22. In accordance with CDFG's 2012 *Staff Report on Burrowing Owl Mitigation*, a qualified biologist shall conduct three surveys for burrowing owls where potential burrowing owl habitat occurs within 500 feet of Project activities. Surveys shall

[30] Op. Cit. Page 30-33.

occur during the peak breeding season for this species (15 April through 15 July), and spaced three weeks apart. If active burrowing owl burrows are identified within 500 feet of the Project site, then avoidance, take avoidance surveys, site surveillance, minimization, and buffer mitigation measures shall be implemented, in accordance with the 2012 CDFG *Staff Report* and direct consultation with CFW."[31]

"Protection of Sensitive Amphibians and Reptiles

4-23. Preconstruction surveys shall be conducted during a period of high hydrological activity for the Slough. This may coincide with irrigation deliveries to downstream agriculture, typically an initial release from dams occurs in February-March and May-July. These surveys will detect tiger salamanders (early survey) and western pond turtles (late survey, if present. For spadefoots, survey shall be conducted after they emerge subsequent to 1-2 inches of precipitation at the start of the rainy season (usually around the beginning of December). If surveys detect these species, they shall be allowed to passively relocate off of the site before construction on the Slough begins.

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item will occur.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?

Project Impact Analysis: ***No Impact***

As discussed in the Environmental Setting portion of this document, the proposed Project site currently consists of land that is both in active agricultural production and fallowed. The Cole Slough runs along the eastern boundary of the proposed Project site and as a part of this project, will be undergrounded. The site is heavily disturbed and the surrounding land is also heavily disturbed with active agricultural production. There are no sensitive riparian or natural habitats in the immediate proposed Project area and as such, ***No Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is the San Joaquin Valley. While the study area is limited to Tulare County, Fresno County and the City of Kingsburg, sensitive species with similar habitat requirements may exist in other portions of the San Joaquin Valley.

[31] Op. Cit. Page 38

The proposed Project would only contribute to cumulative impacts related to this Checklist Item if Project-specific impacts were to occur. As the proposed Project does not result in loss of riparian or otherwise sensitive habitat, ***No Cumulative Impacts*** will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Project Impact Analysis: ***No Impact***

As seen on the National Wetlands Inventory Map in Appendix B, no marshes, vernal pools, freshwater pond, or other types of wetlands occur on the proposed Project site. As such, the proposed Project would not result in an adverse effect on federally protected wetlands. ***No Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is the San Joaquin Valley. While the study area is limited to Tulare County, Fresno County and the City of Kingsburg, sensitive species with similar habitat requirements may exist in other portions of the San Joaquin Valley.

The proposed Project would only contribute to cumulative impacts related to this Checklist Item if Project-specific impacts were to occur. As the proposed Project does not result in the loss of federally protected wetlands, ***No Cumulative Impacts*** will occur.

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Project Impact Analysis ***Less Than Significant Impact***

The Kings River corridor does lie east of the proposed Project site several miles; however, the subject property is not situated on any known substantial wildlife corridor, and the proposed Project has limited scope and is not anticipated to obstruct wildlife movement. A

considerable amount of open space lands in the vicinity of the proposed Project site and will continue to be used by native species for home range and dispersal movement. Therefore, the proposed Project will result in a ***Less Than Significant Impact*** on regional wildlife movements.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is the San Joaquin Valley. While the study area is limited to Tulare County, Fresno County and the City of Kingsburg, corridors for fish and wildlife species with similar habitat requirements may exist in other portions of the San Joaquin Valley.

The proposed Project would only contribute to cumulative impacts related to this Checklist Item if Project-specific impacts were to occur. As the proposed Project does not impact federally protected wetlands, ***Less Than Significant Cumulative Impacts*** will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impacts***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Project Impact Analysis: ***No Impact***

The proposed Project will not conflict with any policies or ordinances protecting biological resources. ***No Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County and the City of Kingsburg.

There will be no impacts to policies or ordinances relating to biological resources, and therefore there will be ***No Cumulative Impacts*** related to this Checklist Item.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Project Impact Analysis: ***No Impact***

As noted earlier, there are two habitat conservation plans that apply in Tulare County. The Kern Water Habitat Conservation Plan only applies to an area in Allensworth and the project site is not subject to this plan. The Recovery Plan for Upland Species in the San Joaquin Valley outlines a number of species that are important to the San Joaquin Valley. None of these species were identified on the project site. As such, ***No Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is California. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, General Plan background Report, and/or Tulare County 2030 General Plan EIR.

There are ***No Impacts*** related to habitat conservation plans, and therefore there are ***No Cumulative Impacts*** that will conflict with local policies or ordinances.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

REFERENCES

California Department of Fish and Wildlife, 2014, Natural Diversity Data Base, Special Animal and Special Plants.

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California Native Plant Society, Rare Plant Program. 2014. Inventory of Rare and Endangered Plants (online edition, V8-02). http://www.rareplants.cnps.org/. Accessed July, 2014.

Reconnaissance-Level Biological Evaluation, Kamansky's Ecological Consulting, April 9, 2015. Appendix B.

Tulare County General Plan 2030 Update Background Report, Pages 9-6, -7, -8, -9

Tulare County General Plan 2030 Update Recirculated DEIR, Page 3.11-1, -2, -3

Cultural Resources
Chapter 3.5

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts With Mitigation*** to Cultural Resources. The Southern San Joaquin Valley Historical Resources Information Center, Bakersfield (Center) conducted a cultural resources records search on March 30, 2015 at the request of RMA Planning Branch staff, which is included as Appendix "C". In addition to the Center's search, the Native American Heritage Commission (NAHC) conducted a Sacred Lands File (SLF) search and provided their results on August 25, 2016 (see Appendix "C"). This information, and additional analysis in the resource discussion item, are used as the basis for determining that this Project will result in Less Than Significant Impacts With Mitigation.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

Several CEQA statutes and guidelines address requirements for cultural resources, including historic and archaeological resources. If a proposed Project may cause a substantial adverse effect on the significance of a historical resource, then the project may be considered to have a significant effect on the environment, and the impacts must be evaluated under CEQA.[1] The definition of "historical resources" is included in Section 15064.5 of CEQA Guidelines, and includes both historical and archaeological resources. "Substantial adverse change" is defined as "physical demolition, destruction, relocation, or alteration of the resource…"

Section 15064.5 also provides guidelines when there is a probable likelihood of Native American remains existing in the project site. Provisions for the accidental discovery of historical or unique archaeological resources accidentally discovered during construction include a recommendation for evaluation by a qualified archaeologist, with follow up as necessary.

Public Resources Code Section 5097.5 prohibits excavation or removal of any "vertebrate paleontological site…or any other archaeological, paleontological or historical feature, situated on public lands, except with express permission of the public agency having jurisdiction over such lands."

This section of the DEIR for the proposed Project meets CEQA requirements by addressing potential impacts to cultural resources on the proposed Project site. The "Environmental Setting" section provides a description of cultural resources in the region, with special emphasis on the proposed Project site and vicinity. The "Regulatory Setting" section provides a description of applicable State and local regulatory policies. Results of cultural resources field

[1] CEQA Section 21084.1

study and reports from CHRIS are included. A description of potential impacts is provided, along with feasible mitigation measures to reduce the impacts to less than significant.

CEQA Thresholds of Significance

Under CEQA Guidelines Section 15064.5. (b) "A project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment."

(1) Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.

(2) The significance of an historical resource is materially impaired when a project:

(A) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or

(B) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

(C) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

(3) Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer, shall be considered as mitigated to a level of less than a significant impact on the historical resource.

(4) A lead agency shall identify potentially feasible measures to mitigate significant adverse changes in the significance of an historical resource. The lead agency shall ensure that any adopted measures to mitigate or avoid significant adverse changes are fully enforceable through permit conditions, agreements, or other measures.

(5) When a project will affect state-owned historical resources, as described in Public Resources Code Section 5024, and the lead agency is a state agency, the lead agency shall consult with the State Historic Preservation Officer as provided in Public

Resources Code Section 5024.5. Consultation should be coordinated in a timely fashion with the preparation of environmental documents."[2]

ENVIRONMENTAL SETTING

"Tulare County lies within a culturally rich province of the San Joaquin Valley. Studies of the prehistory of the area show inhabitants of the San Joaquin Valley maintained fairly dense populations situated along the banks of major waterways, wetlands, and streams. Tulare County was inhabited by aboriginal California Native American groups consisting of the Southern Valley Yokuts, Foothill Yokuts, Monache, and Tubatulabal. Of the main groups inhabiting the Tulare County area, the Southern Valley Yokuts occupied the largest territory."[3]

"California's coast was initially explored by Spanish (and a few Russian) military expeditions during the late 1500s. However, European settlement did not occur until the arrival into southern California of land-based expeditions originating from Spanish Mexico starting in the 1760s. Early settlement in the Tulare County area focused on ranching. In 1872, the Southern Pacific Railroad entered Tulare County, connecting the San Joaquin Valley with markets in the north and east. About the same time, valley settlers constructed a series of water conveyance systems (canals, dams, and ditches) across the valley. With ample water supplies and the assurance of rail transport for commodities such as grain, row crops, and fruit, a number of farming colonies soon appeared throughout the region."[4]

"The colonies grew to become cities such as Tulare, Visalia, Porterville, and Hanford. Visalia, the County seat, became the service, processing, and distribution center for the growing number of farms, dairies, and cattle ranches. By 1900, Tulare County boasted a population of about 18,000. New transportation links such as SR 99 (completed during the 1950s), affordable housing, light industry, and agricultural commerce brought steady growth to the valley. The California Department of Finance estimated the 2007 Tulare County population to be 430,167"[5]

Existing Cultural and Historic Resources

"Tulare County's known and recorded cultural resources were identified through historical records, such as those found in the National Register of Historic Places, the Historic American Building Survey/Historic American Engineering Record (HABS/HAER), the California Register of Historic Resources, California Historical Landmarks, and the Tulare County Historical Society list of historic resources."[6]

Due to the sensitivity of many prehistoric, ethnohistoric, and historic archaeological sites, locations of these resources are not available to the general public. The Information Center at California State University Bakersfield houses records associated with reported cultural resources surveys, including the records pertinent to sensitive sites, such as burial grounds,

[2] CEQA Guidelines, Section 15064.5 (b)
[3] Tulare County General Plan 2030 Update, page 8-5.
[4] Ibid.
[5] Ibid. Page 8-6.
[6] Tulare County General Plan 2030 Update, *Background Report*, Page 9-56.

important village sites, and other buried historical resources protected under state and federal laws.

REGULATORY SETTING

Federal Agencies & Regulations

The National Historic Preservation Act

The National Historic Preservation Act of 1966 (NHPA) established federal regulations for the purpose of protecting significant cultural resources. The legislation established the National Register of Historic Places and the National Historic Landmarks Program. It mandated the establishment of the State Historic Preservation Office (SHPO), responsible for implementing statewide historic preservation programs in each state. A key aspect of SHPO responsibilities include surveying, evaluating and nominating significant historic buildings, sites, structures, districts and objects to the National Register. The NHPA also established requirements federal agencies to consider the effects of proposed federal projects on historic properties (Section 106, NHPA). Federal agencies and recipients of federal funding are required to initiate consultation with the State Historic Preservation Officer (SHPO) as part of the Section 106 review process.[7]

State Agencies & Regulations

California State Office of Historic Preservation (OHP)

The California State Office of Historic Preservation (OHP) is responsible for administering federally and state mandated historic preservation programs to further the identification, evaluation, registration and protection of California's irreplaceable archaeological and historical resources under the direction of the State Historic Preservation Officer (SHPO), appointed by the governor, and the State Historical Resources Commission, a nine-member state review board appointed by the governor.[8]

Among OHP's responsibilities are identifying, evaluating, and registering historic properties; and ensuring compliance with federal and state regulations. The OHP administers the State Register of Historical Resources and maintains the California Historical Resources Information System (CHRIS) database. The CHRIS database includes a statewide Historical Resources Inventory (HRI) database. The records are maintained and managed under contract by eleven independent regional Information Centers. Tulare, Fresno, Kern, Kings and Madera counties are served by the Southern San Joaquin Valley Historical Resources Information Center (Center), located in Bakersfield, CA. The Center provides information on known historic and cultural resources to governments, institutions and individuals.[9]

A historical resource may be eligible for inclusion in the California Register of Historical Resources (CRHR) if it:

[7] Advisory Council on Historic Preservation, http://www.achp.gov/criteria.html. Accessed March 2015.
[8] Advisory Council on Historic Preservation, State Historic Preservation Officers, http://www.achp.gov/shpo.html, Accessed March 2015.
[9] California Office of Historic Preservation, About OHP, http://ohp.parks.ca.gov/?page_id=1066. Accessed March 2015.

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated with the lives of persons important to our past;
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history.[10]

CEQA Guidelines: Historical Resources Definition

CEQA Guidelines Section 15064.5(a) defines a historical resource as:

"(1) A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Pub. Res. Code §5024.1, Title 14 CCR, Section 4850 et seq.).

(2) A resource included in a local register of historical resources, as defined in section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

(3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Pub. Res. Code, § 5024.1, Title 14 CCR, Section 4852) including the following:

(A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

(B) Is associated with the lives of persons important in our past;

(C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

(D) Has yielded, or may be likely to yield, information important in prehistory or history.

(4) The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or

[10] California Office of Historic Preservation. California Register. http://www.ohp.parks.ca.gov/?page_id=21238. Accessed March 2015.

identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1."[11]

CEQA Guidelines: Archaeological Resources

Section 15064.5(c) of CEQA Guidelines provides specific guidance on the treatment of archaeological resources as noted below.

"(1) When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource, as defined in subdivision (a).

(2) If a lead agency determines that the archaeological site is an historical resource, it shall refer to the provisions of Section 21084.1 of the Public Resources Code, and this section, Section 15126.4 of the Guidelines, and the limits contained in Section 21083.2 of the Public Resources Code do not apply.

(3) If an archaeological site does not meet the criteria defined in subdivision (a), but does meet the definition of a unique archeological resource in Section 21083.2 of the Public Resources Code, the site shall be treated in accordance with the provisions of section 21083.2. The time and cost limitations described in Public Resources Code Section 21083.2 (c-f) do not apply to surveys and site evaluation activities intended to determine whether the project location contains unique archaeological resources.

(4) If an archaeological resource is neither a unique archaeological nor an historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or EIR, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process."[12]

CEQA Guidelines: Human Remains

Public Resources Code Sections 5097.94 and 5097.98 provide guidance on the disposition of Native American burials (human remains), and fall within the jurisdiction of the Native American Heritage Commission:

"(d) When an initial study identifies the existence of, or the probable likelihood, of Native American human remains within the project, a lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission as provided in Public Resources Code Section 5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials with the appropriate Native Americans as identified by the Native American Heritage Commission. Action implementing such an agreement is exempt from:

[11] CEQA Guidelines, Section 15064.5(a)
[12] CEQA Guidelines, Section 15064.5(c)

(1) The general prohibition on disinterring, disturbing, or removing human remains from any location other than a dedicated cemetery (Health and Safety Code Section 7050.5).

(2) The requirements of CEQA and the Coastal Act."[13]

"(e) In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

(1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

(A) The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required, and

(B) If the coroner determines the remains to be Native American:

1. The coroner shall contact the Native American Heritage Commission within 24 hours.

2. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.

3. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or

(2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

(A) The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.

(B) The descendant identified fails to make a recommendation; or

(C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner."[14]

"(f) As part of the objectives, criteria, and procedures required by Section 21082 of the Public Resources Code, a lead agency should make provisions for historical or unique archaeological resources accidentally discovered during construction. These provisions should include an immediate evaluation of the find by a qualified archaeologist. If the

[13] CEQA Guidelines, Section 15064.5(d)
[14] CEQA Guidelines, Section 15064.5 (e)

find is determined to be an historical or unique archaeological resource, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be available. Work could continue on other parts of the building site while historical or unique archaeological resource mitigation takes place."[15]

CEQA Guidelines: Paleontological Resources

Public Resources Code Section 5097.5 prohibits excavation or removal of any "vertebrate paleontological site…or any other archaeological, paleontological or historical feature, situated on public lands, except with express permission of the public agency having jurisdiction over such lands."[16]

Tribal Consultation Requirements: SB 18 (Burton, 2004)

On September 29, 2004, Governor Schwarzenegger signed Senate Bill 18, Tribal Consultation Guidelines, into law. SB 18, enacted March 1, 2005, creates a mechanism for California Native American Tribes to identify culturally significant sites that are located within public or private lands within the city or county's jurisdiction. SB 18 requires cities and counties to contact, and offer to consult with, California Native American Tribes before adopting or amending a General Plan, a Specific Plan, or when designating land as Open Space, for the purpose of protecting Native American Cultural Places (PRC 5097.9 and 5097.993). The Native American Heritage Commission (NAHC) provides local governments with a consultation list of tribal governments with traditional lands or cultural places located within the Project Area of Potential Effect. Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe.[17]

Local Policy & Regulations

Tulare County General Plan Policies

The Tulare County General Plan has a number of policies that apply to projects within County of Tulare. General Plan policies that relate to the proposed Project are listed below.

ERM-6.1 Evaluation of Cultural and Archaeological Resources - The County shall participate in and support efforts to identify its significant cultural and archaeological resources using appropriate State and Federal standards.

ERM-6.2 Protection of Resources with Potential State or Federal Designations - The County shall protect cultural and archaeological sites with demonstrated potential for placement on the National Register of Historic Places and/or inclusion in the California State Office of Historic Preservation's California Points of Interest and California Inventory of Historic Resources. Such sites may be of Statewide or local significance and have anthropological, cultural, military,

[15] CEQA Guidelines, Section 15064.5(f)
[16] Public Resources Code Section 5097.5
[17] Government Code §65352.3

political, architectural, economic, scientific, religious, or other values as determined by a qualified archaeological professional.

ERM-6.3 Alteration of Sites with Identified Cultural Resources - When planning any development or alteration of a site with identified cultural or archaeological resources, consideration should be given to ways of protecting the resources. Development can be permitted in these areas only after a site-specific investigation has been conducted pursuant to CEQA to define the extent and value of resource, and mitigation measures proposed for any impacts the development may have on the resource.

ERM-6.4 Mitigation - If preservation of cultural resources is not feasible, every effort shall be made to mitigate impacts, including relocation of structures, adaptive reuse, preservation of facades, and thorough documentation and archival of records.

ERM-6.8 Solicit Input from Local Native Americans - The County shall continue to solicit input from the local Native American communities in cases where development may result in disturbance to sites containing evidence of Native American activity and/or to sites of cultural importance.

IMPACT EVALUATION

Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?

Project Impact Analysis: ***Less Than Significant Impact With Mitigation***

The proposed Project site has previously and is currently being used for agricultural purposes. The proposed Project site has no natural streams or rivers or geologic features on or near the site, which could have suggested the existence of cultural resources.

Section 106 of The National Historic Preservation Act does not apply to the proposed Project, since it is not eligible for listing on the National Register of Historic Places, and is not located on lands administered by a federal agency, nor is the project applicant requesting federal funding.

Cultural Records Search

The Southern San Joaquin Valley Historical Resources Information Center, Bakersfield (Center) conducted a cultural resources records search. The Center records search (dated March 30, 2015) identified no recorded cultural resources within the proposed Project area. There is one recorded resource within the one-half mile radius. Also within the half-mile radius are 52 historic properties that have been given a National Register Status Code of 2S2, which indicated these individual properties have been determined eligible for the National Register of Historic Places by a consensus through the Section 106 process. The records search included historic sites listed on the National Register of Historic Places, the California

Inventory of Historic Resources, the California Points of Historical Interest, and the California State Historic Landmarks Registry.

The Center does not consider farming as development, as it does not destroy cultural resources, but merely moves them around within the plow zone. As such, it is not known if cultural resources exist on the proposed Project site. Significant impacts could occur if any cultural resources were destroyed during the development process; however, implementation of Mitigation Measure 5-1 would reduce potential Project-specific impacts related to this Checklist Item to a level considered ***Less Than Significant***.

Cumulative Impact Analysis: ***Less Than Significant Impact With Mitigation***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, the Tulare County General Plan 2030 Update Recirculated Draft Environmental Impact Report (RDEIR), and the 1990 City of Kingsburg General Plan.

The proposed Project would only contribute to cumulative impacts related to this Checklist Item if Project-specific impacts were to occur. As the proposed Project would be mitigated to a level considered less than significant, cumulative impacts would also be considered ***Less Than Significant With Mitigation***.

Mitigation Measure(s):

5-1 In the event that archaeological or paleontological resources are discovered during site excavation, the County shall require that grading and construction work on the project site be immediately suspended until the significance of the features can be determined by a qualified archaeologist or paleontologist. In this event, the property owner shall retain a qualified archaeologist/paleontologist to make recommendations for measures necessary to protect any site determined to contain or constitute an historical resource, a unique archaeological resource, or a unique paleontological resource or to undertake data recover, excavation analysis, and curation of archaeological or paleontological materials. County staff shall consider such recommendations and implement them where they are feasible in light of Project design as previously approved by the County.

Conclusion: ***Less Than Significant Impact With Mitigation***

With implementation of Mitigation Measure 5-1, potential Project-specific and cumulative impacts related to this Checklist Item will be reduced to a ***Less Than Significant*** level.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

Project Impact Analysis: ***Less Than Significant Impact With Mitigation***

The proposed Project site has previously and is currently being used for agricultural purposes. There are no sites of archaeological significance within the City of Kingsburg's planning area[18] and no unique geologic features have previously been encountered on the Project site. The proposed Project site has no natural streams or rivers or geologic features on or near the site which may suggest the existence of archaeological resources. As noted earlier, a cultural resources record search was conducted on March 30, 2015 by the Southern San Joaquin Valley Historical Resources Information Center, Bakersfield. No archaeological deposits or isolated finds were identified during the cultural resources records search.

Although no archaeological deposits have been identified, there is the potential that archaeological resources may be discovered. With the implementation of Mitigation Measure 5-1, ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact With Mitigation***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, the Tulare County General Plan 2030 Update RDEIR, and the 1990 City of Kingsburg General Plan.

The proposed Project would only contribute to cumulative impacts related to this Checklist Item if Project-specific impacts were to occur. As such, the proposed Project will result in ***Less Than Significant Project-Specific and Cumulative Impacts With Mitigation***.

Mitigation Measure: **See Mitigation Measure 5-1**

Conclusion: ***Less Than Significant Impact With Mitigation***

With implementation of Mitigation Measure 5-1, potential Project-specific and cumulative impacts related to this Checklist Item will be reduced to a ***Less Than Significant*** level.

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Project Impact Analysis: ***Less Than Significant Impact With Mitigation***

The proposed Project site has previously and is currently being used for agricultural purposes. No paleontological resources or sites, or unique geologic features have previously

[18] City of Kingsburg General Plan Final EIR, Part VIII. 1992. Page VIII-9.

been encountered on the proposed Project site. The proposed Project site has no natural streams, rivers or geologic features on or near the site which may suggest the existence of paleontological resources. As noted earlier, a cultural resources records search was conducted of the site. No paleontological resources or isolated finds were identified during that search.

Although it cannot conclusively be demonstrated that no subsurface paleontological resources are present, it is possible to mitigate potentially significant impacts with Mitigation Measure 5-2. With implementation the Mitigation Measure 5-2, Project-specific impacts related to this Checklist Item will be reduced to ***Less Than Significant*** levels.

Cumulative Impact Analysis: ***Less Than Significant Impact With Mitigation***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, the Tulare County General Plan 2030 Update RDEIR, and the 1990 City of Kingsburg General Plan.

The proposed Project would only contribute to cumulative impacts related to this Checklist Item if Project-specific impacts were to occur. As such, the proposed Project would result in ***Less Than Significant Project-Specific and Cumulative Impacts With Mitigation***.

Mitigation Measure:

5-2 **The property owner shall avoid and minimize impacts to paleontological resources. If a potentially significant paleontological resource is encountered during ground disturbing activities, all construction within a 100-foot radius of the find shall immediately cease until a qualified paleontologist determines whether the resources requires further study. The owner shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. The paleontologist shall notify the Tulare County Resource Management Agency and the project proponent of the procedures that must be followed before construction is allowed to resume at the location of the find. If the find is determined to be significant and the Tulare County Resource Management Agency determines avoidance is not feasible, the paleontologist shall design and implement a data recovery plan consistent with applicable standards. The plan shall be submitted to the Tulare County Resource Management Agency for review and approval. Upon approval, the plan shall be incorporated into the project.**

Conclusion: ***Less Than Significant With Mitigation***

With implementation of Mitigation Measure 5-2, potential Project-specific and cumulative impacts related to this Checklist Item will be reduced to a ***Less Than Significant*** level.

d) Disturb any human remains, including those interred outside of formal cemeteries?

Project Impact Analysis: ***Less Than Significant Impact with Mitigation***

The proposed Project site has previously and is currently being used for agricultural purposes and no cultural resources have been encountered previously on the proposed Project site, as described in the cultural resources records search. Although it cannot conclusively be demonstrated that no subsurface human remains are present, it is possible to mitigate potentially significant impacts with the following Mitigation Measure. With implementation of Mitigation Measure 5-3, this Checklist Item will be reduced to ***Less Than Significant Impacts***.

Cumulative Impact Analysis: ***Less Than Significant Impact With Mitigation***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, the Tulare County General Plan 2030 Update RDEIR, and the 1990 City of Kingsburg General Plan.

The proposed Project would only contribute to cumulative impacts related to this Checklist Item if Project-specific impacts were to occur. Potential impacts to this resource by the proposed Project would be reduced to ***Less Than Significant Project-specific and Cumulative Impacts with Mitigation***.

Mitigation Measures:

5-3 Consistent with Section 7050.5 of the California Health and Safety Code and (CEQA Guidelines) Section 15064.5, if human remains of Native American origin are discovered during project construction, it is necessary to comply with State laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (Public Resources Code Sec. 5097). In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

a. The Tulare County Coroner/Sheriff must be contacted to determine that no investigation of the cause of death is required; and

b. If the coroner determines the remains to be Native American:

i. The coroner shall contact the Native American Heritage Commission within 24 hours.

ii. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.

iii. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code section 5097.98, or

2. Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

a. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.

b. The descendant fails to make a recommendation; or

c. The landowner or his authorized representative rejects the recommendation of the descendent.

Conclusion: ***Less Than Significant Impact With Mitigation***

With implementation of Mitigation Measure 5-3, potential ***Project-specific and Cumulative Impacts*** related to this Checklist Item will be reduced to a ***Less Than Significant*** level.

ACRONYMS

CEQA	California Environmental Quality Act
CHRIS	California Historic Resources Information System
CRHR	California Register of Historical Resources
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HRI	Historic Resources Inventory
NAHC	Native American Historic Commission
NHPA	National Historic Preservation Act of 1966
OHP	California State Office of Historic Preservation
PRC	Public Resources Code
SHPO	State Historic Preservation Officers

REFERENCES

Advisory Council on Historic Preservation, http://www.achp.gov/nrcriteria.html. Accessed March 2015.

Advisory Council on Historic Preservation, State Historic Preservation Officers, http://www.achp.gov/shop.html. , Accessed March 2015.

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California Office of Historic Preservation, About OHP, http://ohp.parks.ca.gov/?page_id=1066 . Accessed March 2015.

California Office of Historic Preservation. California Register. http://www.ohp.parks.ca.gov/?page_id=21238. Accessed March 2015.

CEQA Guidelines, Section 15064.5(a)(b)(c)(d)(e)(f)

CEQA Section 21084.1

City of Kingsburg. 1992. General Plan Final EIR Part VIII. Page VIII-9.

Government Code §65352.3

Tulare County General Plan 2030 Update, August 2012. Page 8-5, 8-6

Tulare County General Plan 2030 Update Background Report, February 2010, Page 9-56.

Tulare County General Plan 2030 Update Recirculated Draft Environmental Background Report, February 2010

Geology and Soils
Chapter 3.6

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts*** related to Geology and Soils, through project design features and implementation of Mitigation Measures. A review of the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) detailing the proposed Project site's soil composition is included as Appendix F. The impact analyses and determinations in this chapter are based upon information obtained from the References listed at the end of this chapter. A detailed review of potential impacts is provided in the analysis below.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to Geology and Soils. As required in Section 15126, all phases of the proposed Project will be considered as part of the potential environmental impact.

As noted in 15126.2(a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1]

[1] CEQA Guidelines Section 15126.2

The environmental setting provides a description of the Geology and Soils in the County. The regulatory setting provides a description of applicable Federal, State and Local regulatory policies that were developed in part from information contained in the Tulare County 2030 General Plan, the Tulare County General Plan Background Report and/or the Tulare County General Plan Revised DEIR incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

Thresholds of Significance

The thresholds of significance for this section are established by the CEQA Checklist Item.

- Located on a fault line
- Hazard to people or property
- Project subject to landslides
- Located on a liquefaction zone

ENVIRONMENTAL SETTING

"Seismicity varies greatly between the two major geologic provinces represented in Tulare County. The Central Valley is an area of relatively low tectonic activity bordered by mountain ranges on either side. The Sierra Nevada Mountains, partially located within Tulare County, are the result of movement of tectonic plates which resulted in the creation of the mountain range. The Coast Range on the west side of the Central Valley is also a result of these forces, and the continued uplifting of Pacific and North American tectonic plates continues to elevate these ranges. The remaining seismic hazards in Tulare County generally result from movement along faults associated with the creation of these ranges."[2]

"Earthquakes are typically measured in terms of magnitude and intensity. The most commonly known measurement is the Richter scale, a logarithmic scale which measures the strength of a quake. The Modified Mercalli Intensity Scale measures the intensity of an earthquake as a function of the following factors:

- Magnitude and location of the epicenter;
- Geologic characteristics;
- Groundwater characteristics;
- Duration and characteristic of the ground motion;
- Structural characteristics of a building."[3]

"Faults are the indications of past seismic activity. It is assumed that those that have been active most recently are the most likely to be active in the future. Recent seismic activity is measured

[2] Tulare County General Plan 2030 Update, *Background Report*, Page 8-5.
[3] Ibid.

in geologic terms. Geologically recent is defined as having occurred within the last two million years (the Quaternary Period). All faults believed to have been active during Quaternary time are considered "potentially active."[4]

"Settlement can occur in poorly consolidated soils during groundshaking. During settlement, the soil materials are physically rearranged by the shaking and result in reduced stabling alignment of the individual minerals. Settlement of sufficient magnitude to cause significant structural damage is normally associated with rapidly deposited alluvial soils, or improperly founded or poorly compacted fill. These areas are known to undergo extensive settling with the addition of irrigation water, but evidence due to groundshaking is not available. Fluctuating groundwater levels also may have changed the local soil characteristics. Sufficient subsurface data is lacking to conclude that settlement would occur during a large earthquake; however, the data is sufficient to indicate that the potential exists in Tulare County."[5]

"Liquefaction is a process whereby soil is temporarily transformed to a fluid form during intense and prolonged groundshaking. Areas most prone to liquefaction are those that are water saturated (e.g., where the water table is less than 30 feet below the surface) and consist of relatively uniform sands that are low to medium density. In addition to necessary soil conditions, the ground acceleration and duration of the earthquake must be of sufficient energy to induce liquefaction. Scientific studies have shown that the ground acceleration must approach 0.3g before liquefaction occurs in a sandy soil with relative densities typical of the San Joaquin alluvial deposits. Liquefaction during major earthquakes has caused severe damage to structures on level ground as a result of settling, tilting, or floating. Such damage occurred in San Francisco on bay-filled areas during the 1989 Loma Prieta earthquake, even though the epicenter was several miles away. If liquefaction occurs in or under a sloping soil mass, the entire mass may flow toward a lower elevation, such as that which occurred along the coastline near Seward, Alaska during the 1964 earthquake. Also of particular concern in terms of developed and newly developing areas are fill areas that have been poorly compacted."[6]

Earthquake Hazards

"Groundshaking is the primary seismic hazard in Tulare County because of the county's seismic setting and its record of historical activity. Thus, emphasis focuses on the analysis of expected levels of groundshaking, which is directly related to the magnitude of a quake and the distance from a quake's epicenter. Magnitude is a measure of the amount of energy released in an earthquake, with higher magnitudes causing increased groundshaking over longer periods of time, thereby affecting a larger area. Groundshaking intensity, which is often a more useful measure of earthquake effects than magnitude, is a qualitative measure of the effects felt by population. The valley portion of Tulare County is located on alluvial deposits, which tend to experience greater groundshaking intensities than areas located on hard rock. Therefore, structures located in the valley will tend to suffer greater damage from groundshaking than those located in the foothill and mountain areas. However, existing alluvium valleys and weathered or decomposed zones are scattered throughout the mountainous portions of the county which could

[4] Tulare County General Plan 2030 Update, *Background Report*, 8-5.
[5] Ibid. Page 8-9.
[6] Ibid.

also experience stronger intensities than the surrounding solid rock areas. The geologic characteristics of an area can therefore be a greater hazard than its distance to the epicenter of the quake."[7]

"There are three faults within the region that have been, and will be, principal sources of potential seismic activity within Tulare County. These faults are described below:

- **San Andreas Fault.** The San Andreas Fault is located approximately 40 miles west of the Tulare County boundary. This fault has a long history of activity, and is thus the primary focus in determining seismic activity within the county. Seismic activity along the fault varies along its span from the Gulf of California to Cape Mendocino. Just west to Tulare County lies the "Central California Active Area," where many earthquakes have originated.

- **Owens Valley Fault Group.** The Owens Valley Fault Group is a complex system containing both active and potentially active faults, located on the eastern base of the Sierra Nevada Mountains. The Group is located within Tulare and Inyo Counties and has historically been the source of seismic activity within Tulare County.

- **Clovis Fault.** The Clovis Fault is considered to be active within the Quaternary Period (within the past two million years), although there is no historic evidence of its activity, and is therefore classified as "potentially active." This fault lies approximately six miles south of the Madera County boundary in Fresno County. Activity along this fault could potentially generate more seismic activity in Tulare County than the San Andreas or Owens Valley fault systems. In particular, a strong earthquake on the Fault could affect northern Tulare County. However, because of the lack of historic activity along the Clovis Fault, inadequate evidence exists for assessing maximum earthquake impacts."[8] "Older buildings constructed before current building codes were in effect, and even newer buildings constructed before earthquake resistance provisions were included in the current building codes, are most likely to suffer damage in an earthquake. Most of Tulare County's buildings are no more than one or two stories in height and are of wood frame construction, which is considered the most structurally resistant to earthquake damage. Older masonry buildings (without earthquake-resistance reinforcement) are the most susceptible to structural failure, which causes the greatest loss of life. The State of California has identified unreinforced masonry buildings as a safety issue during earthquakes. In high risk areas (Bay Area) inventories and programs to mitigate this issue are required. Because Tulare County is not a high risk area, state law only recommends that programs to retrofit URMs are adopted by jurisdictions."[9]

[7] Tulare County General Plan 2030 Update, *Background Report*, 8-7.
[8] Ibid. Pages 8-6 to 8-7.
[9] Ibid. Page 8-8.

Liquefaction

"The San Joaquin Valley portion of Tulare County is located on alluvial deposits, which tend to experience greater groundshaking intensities than areas located on hard rock. Therefore, structures located in the valley will tend to suffer greater damage from groundshaking than those located in the foothill and mountain areas. However, existing alluvium valleys and weathered or decomposed zones are scattered throughout the mountainous portions of the county which could also experience stronger intensities than the surrounding solid rock areas. The geologic characteristics of an area can therefore be a greater hazard than its distance to the epicenter of the quake."[10]

"No specific countywide assessments to identify liquefaction hazards have been performed in Tulare County. Areas where groundwater is less than 30 feet below the surface occur primarily in the valley. However, soil types in the area are not conducive to liquefaction because they are either too coarse or too high in clay content. Areas subject to 0.3g acceleration or greater are located in a small section of the Sierra Nevada Mountains along the Tulare-Inyo County boundary. However, the depth to groundwater in such areas is greater than in the valley, which would minimize liquefaction potential as well. Detailed geotechnical engineering investigations would be necessary to more accurately evaluate liquefaction potential in specific areas and to identify and map the areal extent of locations subject to liquefaction."[11]

Landslides

"Landslides are a primary geologic hazard and are influenced by four factors:

- Strength of rock and resistance to failure, which is a function of rock type (or geologic formation);
- Geologic structure or orientation of a surface along which slippage could occur;
- Water (can add weight to a potentially unstable mass or influence strength of a potential failure surface); and,
- Topography (amount of slope in combination with gravitation forces)."[12]

Soils in the proposed Project area

The 54-acre proposed Project site is composed of four different soil types, as depicted in **Table 3.6-1**.

[10] Tulare County General Plan 2030 Update, *Background Report* 8-7.
[11] Ibid. Page 8-9.
[12] Ibid. Page 8-10.

Table 3.6-1
Project Site Soils and Storie Index[13]

Soil Type	Acreage	Site %	Storie Index	Characteristics
Calgro-Calgro	44.9	86.5	Grade 4	Saline-Sodic complex, 0-2% slopes, alluvium derived from granitic rock sources, moderately well drained, no frequency of ponding, low available water storage
Tujunga loamy sand	5.7	11.0	Grade 2	0-2% slopes, alluvium derived from granitic rock sources, well drained, no frequency of ponding, moderate ability to store water
Hanford sandy loam	0.8	1.5	Grade 1	0-2% slopes, alluvium derived from granitic rock sources, well drained, no frequency of ponding, moderate ability to store water
Hesperia fine sandy loam	0.6	1.1	Grade 1	0-2% slopes, parent material is granitic alluvium, well drained with no frequency of ponding, moderate availability to store water

REGULATORY SETTING

Federal Agencies & Regulations

None that apply to the proposed Project.

State Agencies & Regulations

Seismic Hazards Mapping Act

"Under the Seismic Hazards Mapping Act, the State Geologist is responsible for identifying and mapping seismic hazards zones as part of the California Geologic Survey (CGS). The CGS provides zoning maps of non-surface rupture earthquake hazards (including liquefaction and seismically induced landslides) to local governments for planning purposes. These maps are intended to protect the public from the risks associated with strong ground shaking, liquefaction, landslides or other ground failure, and other hazards caused by earthquakes. For projects within seismic hazard zones, the Seismic Hazards Mapping Act requires developers to conduct geological investigations and incorporate appropriate mitigation measures into project designs before building permits are issued."[14]

California Building Code

"The California Building Code is another name for the body of regulations known as the California Code of Regulations (C.C.R.), Title 24, Part 2, which is a portion of the California Building Standards Code. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards."[15]

[13] United States Department of Agriculture, NRCS, Web Soil Survey: USDA Soil Survey of Eastern Fresno Area and Tulare County, Western Part. Accessed July, 2014. Appendix F.
[14] USDA NRCS Web Soils Report, *Custom Soil Resource Report for Eastern Fresno Area and Tulare County, California, Western Part*, July 2014. Appendix F
[15] Ibid, Page 8-3.

Alquist-Priolo Earthquake Fault Zoning Act

"The Alquist- Priolo Earthquake Fault Zoning Act (formerly the Alquist- Priolo Special Studies Zone Act), signed into law December 1972, requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development on or near active fault traces to reduce the hazards associated with fault rupture and to prohibit the location of most structures for human occupancy across these traces."[16]

Local Policy & Regulations

Tulare County General Plan Policies

The General Plan has a number of policies that apply to projects within Tulare County. General Plan policies that relate to the proposed Project are listed below.

ERM-7.2 Soil Productivity - The County shall encourage landowners to participate in programs that reduce soil erosion and increase soil productivity. To this end, the County shall promote coordination between the Natural Resources Conservation Service, Resource Conservation Districts, UC Cooperative Extension, and other similar agencies and organizations.

ERM-7.3 Protection of Soils on Slopes - Unless otherwise provided for in this General Plan, building and road construction on slopes of more than 30 percent shall be prohibited, and development proposals on slopes of 15 percent or more shall be accompanied by plans for control or prevention of erosion, alteration of surface water runoff, soil slippage, and wildfire occurrence.

HS-2.1 Continued Evaluation of Earthquake Risks - The County shall continue to evaluate areas to determine levels of earthquake risk.

HS-2.4 Structure Siting - The County shall permit development on soils sensitive to seismic activity permitted only after adequate site analysis, including appropriate siting, design of structure, and foundation integrity.

HS-2.7 Subsidence - The County shall confirm that development is not located in any known areas of active subsidence. If urban development may be located in such an area, a special safety study will be prepared and needed safety measures implemented. The County shall also request that developments provide evidence that its long-term use of ground water resources, where applicable, will not result in notable subsidence attributed to the new extraction of groundwater resources for use by the development.

HS-2.8 Alquist-Priolo Act Compliance - The County shall not permit any structure for human occupancy to be placed within designated Earthquake Fault Zones (pursuant to and as determined by the Alquist-Priolo Earthquake Fault Zoning Act; Public Resource code, Chapter 7.5) unless the specific provision of the Act and Title 14 of the California Code of Regulations have been satisfied.

[16] Ibid, Page 8-3.

IMPACT EVALUATION

Would the project:

a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Project Impact Analysis: ***Less Than Significant Impact***

No substantial faults are known to traverse Tulare County according to the Alquist-Priolo Earthquake Fault Zoning Maps and the State of California Department of Conservation.[17] The nearest major fault line, which lies outside of Tulare County, is the San Andreas fault zones; well over 50 miles southwest of the proposed Project site. According to the Five County Seismic Safety Element (FCSSE), Tulare County is located in the V-1 zone. This zone includes most of the eastern San Joaquin Valley, and is characterized by a relatively thin section of sedimentary rock overlying a granitic basement. Amplification of shaking that would affect low to medium-rise structures is relatively high, but the distance of the faults that are expected sources of the shaking is sufficiently great that the effects should be minimal. The requirements of Zone II of the Uniform Building Code should be adequate for normal facilities.[18] Therefore, any impacts resulting from the rupture of a known earthquake fault would be ***Less Than Significant.***

ii) Strong seismic ground shaking?

Project Impact Analysis: ***Less Than Significant Impact***

Tulare County is characterized as Severity Zone "Nil" and "Low" for groundshaking events.[19] Deaggregation of the hazard was performed by using the USGS Interactive Deaggregation website and it was found that all faults within a 20 mile radius are quaternary faults between the ages of 750,000 and 1.6 million years old. [20] Quaternary faults are defined as those faults that have been recognized at the surface and which have evidence of movement in the past 1.6 million years, which is the duration of the Quaternary Period.[21] Due to the distance and types of faults in the proposed Project vicinity, strong ground shaking is unlikely. Therefore, any impact would be ***Less Than Significant.***

[17] State of California Department of Conservation, Alquist-Priolo Earthquake Fault Zone Maps, http://www.quake.ca.gov/gmaps/WH/regulatorymaps.htm. Accessed June, 2014.
[18] Five County Seismic Safety Element, Summary & Policy Recommendations II, 3 and 15.
[19] Tulare County General Plan 2030 Update, *Part 1-Goals and Policies Report*, 253.
[20] USGS, *Earthquake Hazards Program: Custom Mapping & Analysis Tools*, http://geohazards.usgs.gov/qfaults/ca/California.php. Accessed March, 2015.
[21] USGS. *Earthquake Hazards Program: Glossary*, http://earthquake.usgs.gov/hazards/qfaults/glossary.php#Q. Accessed March, 2015.

iii) Seismic-related ground failure, including liquefaction?

Project Impact Analysis: ***No Impact***

The proposed Project area is not located within an area mapped to have a potential for soil liquefaction. Liquefaction in soils and sediments occurs during earthquake events, when soil material is transformed from a solid state to a liquid state, generated by an increase in pressure between pore space and soil particles. Earthquake induced liquefaction typically occurs in low-lying areas with soils or sediments composed of unconsolidated, saturated, clay-free sands and silts, but it can also occur in dry, granular soils or saturated soils with partial clay content. Based on available subsurface data, the proposed Project site is underlain by shallow rock that would not liquefy, as shown in Table 3.6-1. Also shown in Table 3.6-1, the site soils are well drained and no subsidence-prone soils or oil or gas production are involved on or near the proposed Project site. As such, there would be ***No Impact*** caused by seismic-related ground failure, including liquefaction.

iv) Landslides?

Project Impact Analysis: ***No Impact***

Landslides are not a significant threat as the topography in the proposed Project area is relatively flat. No geologic landforms exist on or near the site that would result in a landslide event. Therefore, there proposed Project would result in ***No Impact***.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

With ***Less Than Significant*** Project-specific impacts, ***Less Than Significant Cumulative Impacts*** will also occur.

Mitigation Measures: ***None Required***

Conclusion: ***Less Than Significant Impact***

As noted earlier, implementation of the proposed Project will not cause a significant impact to this Checklist Item. ***Less Than Significant Cumulative Impacts*** are anticipated without mitigation.

b) Result in substantial soil erosion or the loss of topsoil?

Project Impact Analysis: ***Less Than Significant Impact***

The proposed Project area is primarily flat and as such, soil erosion is not anticipated. As required by the Clean Water Act (CWA) and the Central Valley Regional Water Quality Control Board (CVRWQCB), a Stormwater Pollution Prevention Plan (SWPPP) will be developed by a qualified engineer or erosion control specialist and implemented before construction begins. The SWPPP will be kept on site during construction-related activities and will be made available upon request to representatives of the CVRWQCB. The objectives of the SWPPP will be to identify pollutant sources that may affect the quality of stormwater associated with construction activity and to identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. To meet these objectives, the SWPPP will include a description of potential pollutants, a description of methods of management for dredged sediments, and hazardous materials present on site during construction (including vehicle and equipment fuels). The SWPPP will also include details for best management practices (BMPs) for the implementation of sediment and erosion control practices. Implementation of the SWPPP will comply with state and federal water quality regulations and will reduce this impact to a less-than-significant level. Compliance with local grading and erosion control ordinances will also help minimize adverse effects associated with erosion and sedimentation. Any stockpiled soils will be watered and/or covered to prevent loss due to wind erosion as part of the SWPPP during construction and reclamation. As a result of these efforts, loss of topsoil and substantial soil erosion during the construction and reclamation periods are not anticipated. The impact will be ***Less Than Significant***. No mitigation is required.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

The proposed Project site is not located on slope or adjacent to a designated waterway. The proposed Project also does not involve changes that will affect off-site hillsides or designated waterways. Therefore, ***Less Than Significant*** impacts related to this Checklist Item will occur.

Mitigation Measures: ***None required***

Conclusion: ***Less Than Significant Impact***

Implementation of the proposed Project will not cause a significant impact, potential Project-specific impacts related to this Checklist Item will be reduced to a level considered ***Less Than Significant*** and ***No Cumulative Impacts*** related to this Checklist Item will occur.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Project Impact Analysis: ***Less Than Significant Impact***

According to the USDA NRCS Web Soil Survey, the proposed Project site is located on alluvial fan remnants, which are unlikely to become unstable.[22] Substantial grade change will not occur in the topography to the point where the proposed Project would expose people or structures to potential substantial adverse effects on, or offsite, such as landslides, lateral spreading, liquefaction or collapse. Therefore, the impact will be ***Less Than Significant***.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

Engineered soil compaction will only occur in areas where development will occur, and as such, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measures: ***None required***

Conclusion: ***Less Than Significant Impact***

As noted earlier, the Project-specific or Cumulative Impacts related to this Checklist Item will be ***Less Than Significant***.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Project Impact Analysis: ***No Impact***

No subsidence prone soils, oil or gas production or overdraft exists at the proposed Project area. Furthermore, as indicated in the NRSC Web Soil Survey (see Appendix F) conditions are not prone to soil instability due to their low shrink swell behavior. Compliance with the City's and/or County's-adopted building code will result in ***No Project Impact.***

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the

[22] USDA NRCS Web Soils Report, *Custom Soil Resource Report for Eastern Fresno Area and Tulare County, California, Western Part*, July 2014. Appendix F

Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, the 1990 City of Kingsburg General Plan and the 2000 Fresno County General Plan.

The proposed Project site is not located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994). As such, the proposed Project will not create a risk to life or property related to this Checklist Item throughout any stage of the Project's life span. Therefore, ***No Cumulative Impacts*** will occur.

Mitigation Measures: ***None required***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Project Impact Analysis: ***No Impact***

The proposed Project does not include the construction or usage of septic tanks or alternative waste water disposal systems. The Project will be developed in similar soils within the Kingsburg area. Importantly, the Project will connect to Selma-Kingsburg-Fowler Sanitation District and will be required to comply with their standards. As such, ***No Project-specific impacts*** to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, the 1990 City of Kingsburg General Plan and the 2000 Fresno County General Plan. ***No Cumulative Impacts*** will occur.

Mitigation Measure ***None Required***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

DEFINITIONS

Fault - "A fault is a fracture in the Earth's crust that is accompanied by displacement between the two sides of the fault. An active fault is defined as a fracture that has shifted in the last 10,000 to 12,000 years (Holocene Period). A potentially active fault is one that has been active in the past 1.6 million years (Quaternary Period). A sufficiently active fault is one that shows evidence of Holocene displacement on one or more of its segments or branches (Hart, 1997)."[23]

Liquefaction - "Liquefaction in soils and sediments occurs during earthquake events, when soil material is transformed from a solid state to a liquid state, generated by an increase in pressure between pore space and soil particles. Earthquake-induced liquefaction typically occurs in low-lying areas with soils or sediments composed of unconsolidated, saturated, clay-free sands and silts, but it can also occur in dry, granular soils or saturated soils with partial clay content."[24]

Magnitude - "Earthquake magnitude is measured by the Richter scale, indicated as a series of Arabic numbers with no theoretical maximum magnitude. The greater the energy released from the fault rupture, the higher the magnitude of the earthquake. Magnitude increases logarithmically in the Richter scale; thus, an earthquake of magnitude 7.0 is thirty times stronger than one of magnitude 6.0. Earthquake energy is most intense at the point of fault slippage, the epicenter, which occurs because the energy radiates from that point in a circular wave pattern. Like a pebble thrown in a pond, the increasing distance from an earthquake's epicenter translates to reduced ground shaking."[25]

REFERENCES

CEQA Guidelines Section 15126.2

Five County Seismic Safety Element, Summary & Policy Recommendations II, 3 and 15.

State of California Department of Conservation, Alquist-Priolo Earthquake Fault Zone Maps, http://www.quake.ca.gov/gmaps/WH/regulatorymaps.htm. Accessed June, 2014.

Tulare County General Plan 2030 Update, *Background Report*, Pages 8-5, 8-7, and 8-8, 8-9, 8-10.

Tulare County General Plan 2030 Update, *Part 1-Goals and Policies Report*, 253.

USDA NRCS Web Soils Report, *Custom Soil Resource Report for Eastern Fresno Area and Tulare County, California, Western Part*, July 2014. Appendix F of this document.

USGS, *Earthquake Hazards Program: Custom Mapping & Analysis Tools*, http://geohazards.usgs.gov/qfaults/ca/California.php. Accessed March, 2015.

[23] Tulare County General Plan 2030 Update, *Background Report*, Page 8-2
[24] Ibid.
[25] Ibid.

USGS. *Earthquake Hazards Program: Glossary*, http://earthquake.usgs.gov/hazards/qfaults/glossary.php#Q. Accessed March, 2015.

Greenhouse Gas Emissions
Chapter 3.7

SUMMARY OF FINDINGS

Based on the impact analysis below, potential impacts to greenhouse gas emissions as a result of the proposed Project are determined to be ***Less Than Significant***. The impact determinations in this chapter are based upon information obtained from the References listed at the end of this chapter, as well as information contained in the Hash Farms Development Air Quality Impact Analysis and Greenhouse Gas Study, provided in Appendix A of this DEIR. A detailed review of potential impacts is provided in the analysis below.

INTRODUCTION

CEQA Requirements for Evaluation of Impacts to Greenhouse Gas Emissions

This section of the DEIR addresses potential impacts related to GHG emissions. As required in CEQA Guidelines §15126, all phases of the proposed Project would be considered as part of the potential environmental impact.

CEQA Guideline Section 15064.4 Determining the Significance of Impacts from Greenhouse Gas Emissions provides the following guidance for lead agencies in determining the significance of impacts from GHG emissions:

"(a) The determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in Section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

(1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or

(2) Rely on a qualitative analysis or performance based standards.

(b) A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

(1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;

(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.

(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the projects incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project."[1]

Thresholds of Significance

The thresholds of significance for this section are established by the CEQA Checklist Item questions. A significant impact would occur if the project would:

"(a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

(b) Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases."[2]

The San Joaquin Valley Unified Air Pollution Control District provides the following guidance to lead agencies for determining the cumulative significance of project specific GHG emissions on global climate change:

- "Projects determined to be exempt from the requirements of CEQA would be determined to have a less than significant individual and cumulative impact for GHG emissions and would not require further environmental review, including analysis of project specific GHG emissions. Projects exempt under CEQA would be evaluated consistent with established rules and regulations governing project approval and would not be required to implement BPS.
- Projects complying with an approved GHG emission reduction plan or GHG mitigation program which avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less than significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the lead agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement BPS.
- Projects implementing Best Performance Standards would not require quantification of project specific GHG emissions. Consistent with CEQA Guideline, such projects would be

[1] CEQA Guidelines, Section 15064.4
[2] Ibid. Appendix G: Environmental Checklist Form.

determined to have a less than significant individual and cumulative impact for GHG emissions.

- Projects not implementing Best Performance Standards would require quantification of project specific GHG emissions and demonstration that project specific GHG emissions would be reduced or mitigated by at least 29%, compared to BAU, including GHG emission reductions achieved since the 2002-2004 baseline period. Projects achieving at least a 29% GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG.
- Notwithstanding any of the above provisions, projects requiring preparation of an Environmental Impact Report for any other reason would require quantification of project specific GHG emissions. Projects implementing BPS or achieving at least a 29% GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG."[3]

ENVIRONMENTAL SETTING

"Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). The major concern is that increases in GHGs are causing global climate change. Global climate change is a change in the average weather on earth that can be measured by wind patterns, storms, precipitation and temperature. The gases believed to be most responsible for global warming are water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)."[4] Nitrogen trifluoride was not listed initially in AB 32 but was subsequently added to the list via legislation. [5]

"For over the past 200 years, the burning of fossil fuels such as coal and oil, deforestation, and other sources have caused the concentrations of heat-trapping "greenhouse gases" to increase significantly in our atmosphere. These gases absorb some of the energy being radiated from the surface of the earth and trap it in the atmosphere, essentially acting like a blanket that makes the earth's surface warmer than it would be otherwise.

Greenhouse gases are necessary to life as we know it, because without them the planet's surface would be about 60ºF cooler than present. But, as the concentrations of these gases continue to increase in the atmosphere, the Earth's temperature is climbing above past levels. According to NOAA and NASA data, the Earth's average surface temperature has increased by about 1.2 to 1.4ºF since 1900. The ten warmest years on record (since 1850) have all occurred in the past 13 years (EPA 2009). Most of the warming in recent decades is very likely the result of human activities. Other aspects of the climate are also changing such as rainfall patterns, snow and ice cover, and sea level. "[6]

[3] San Joaquin Valley Unified Air Pollution Control District, Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA. Pages 4 to 5.
[4] General Plan Background Report. Pages 6-19 to 6-20.
[5] California Air Resources Board. Assembly Bill 32 Overview. Website: http://www.arb.ca.gov/cc/ab32/ab32.htm. Accessed on September 20, 2017.
[6] United States Environmental Protection Agency, National Greenhouse Gas Emissions Data. Page 1-2. Website https://www.epa.gov/ghgemissions/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a-clean. Accessed September 20, 2017. EPA reference includes: Technical Support Document for the Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act. U.S. Environmental Protection Agency. December 2009.

"In 2007, Tulare County generated approximately 5.2 million tonnes of CO_2e [carbon dioxide equivalents]. The largest portion of these emissions (63 percent) is attributed to dairies/feedlots, while the second largest portion (16 percent) is from mobile sources."[7] **Table 3.7-1** below, identifies Tulare County's emissions by sector in 2007.

Table 3.7-1
Emissions by Sector in 2007[8]

Sector	CO_2e (tonnes/year)	% of Total
Electricity	542,690	11%
Natural Gas	321,020	6%
Mobile Sources	822,230	16%
Dairy/Feedlots	3,294,870	63%
Solid Waste	227,250	4%
Total	**5,208,060**	**100%**
Per Capita	**36.1**	

"In 2030, Tulare County is forecast to generate approximately 6.1 million tonnes of CO_2e. The largest portion of these emissions (59 percent) is attributed to dairies/feedlots, while the second largest portion (20 percent) is from mobile sources. … Per capita emissions in 2030 are projected to be approximately 27 tonnes of CO_2e per resident."[9]

Table 3.7-2
Emissions by Sector in 2030[10]

Sector	CO_2e (tonnes/year)	% of Total
Electricity	660,560	11%
Natural Gas	384,410	6%
Mobile Sources	1,212,370	20%
Dairy/Feedlots	3,601,390	59%
Solid Waste	246,750	4%
Total	**6,105,480**	**100%**
Per Capita	**27.4**	

The Tulare County General Plan 2030 Update Background Report contains the following: "Enhancement of the greenhouse effect can occur when concentrations of GHGs exceed the natural concentrations in the atmosphere. Of these gases, CO_2 and methane are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas methane primarily results from off-gassing associated with agricultural practices and landfills. SF_6 is a GHG commonly used in the utility industry as an insulating gas in transformers and other electronic equipment. There is widespread international scientific

[7] General Plan 2030 Update Background Report. Page 6-36.
[8] Ibid. 6-38.
[9] Op. Cit.
[10] Op. Cit.

agreement that human-caused increases in GHGs has and will continue to contribute to global warming, although there is much uncertainty concerning the magnitude and rate of the warming.

Some of the potential resulting effects in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CARB, 2006). Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects (IPCC, 2001):

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas; and
- More intense precipitation events.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood, and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great."[11]

REGULATORY SETTING

Applicable Federal, State, Regional, and local regulations specific to greenhouse gas resources are described below. The following environmental regulatory settings were summarized, in part, from information contained in the Tulare County 2030 General Plan Update Background Report, Tulare County 2030 General Plan Update Recirculated Draft Environmental Impact Report (RDEIR), the California Air Resources Board (ARB) website, and the United States Environmental Protection Agency (US EPA) website.

Federal Agencies & Regulations

United States Environmental Protection Agency (US EPA)

"The primary sources of greenhouse gas emissions in the United States are:

- **Electricity production** (31% of 2013 greenhouse gas emissions) - Electricity production generates the largest share of greenhouse gas emissions. Approximately 67% of our electricity comes from burning fossil fuels, mostly coal and natural gas. [2]

[11] General Plan 2030 Update Background Report. Page 6-31. Background Report citations include: ARB website: http://www.arb.ca.gov/cc/120106workshop/intropres12106.pdf (accessed July 2008) and IPCC website: http://www.grida.no/climate/ipcc%5Ftar/wg1/032.htm#f5 (accessed July 2008).

- **Transportation** (27% of 2013 greenhouse gas emissions) - Greenhouse gas emissions from transportation primarily come from burning fossil fuel for our cars, trucks, ships, trains, and planes. Over 90% of the fuel used for transportation is petroleum based, which includes gasoline and diesel. [3]
- **Industry** (21% of 2013 greenhouse gas emissions) - Greenhouse gas emissions from industry primarily come from burning fossil fuels for energy as well as greenhouse gas emissions from certain chemical reactions necessary to produce goods from raw materials.
- **Commercial and Residential** (12% of 2013 greenhouse gas emissions) - Greenhouse gas emissions from businesses and homes arise primarily from fossil fuels burned for heat, the use of certain products that contain greenhouse gases, and the handling of waste.
- **Agriculture** (9% of 2013 greenhouse gas emissions) - Greenhouse gas emissions from agriculture come from livestock such as cows, agricultural soils, and rice production.
- **Land Use and Forestry** (offset of 13% of 2013 greenhouse gas emissions) - Land areas can act as a sink (absorbing CO_2 from the atmosphere) or a source of greenhouse gas emissions. In the United States, since 1990, managed forests and other lands have absorbed more CO_2 from the atmosphere than they emit."[12]

Greenhouse Gas Endangerment Finding

"On December 7, 2009, Administrator Lisa Jackson signed a final action, under Section 202(a) of the Clean Air Act, finding that six key well-mixed greenhouse gases constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to the climate change problem."[13]

"On December 7, 2009, the Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases — carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) — in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare."[14]

[12] United States Environmental Protection Agency. Sources of Greenhouse Gas Emissions. Website: https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions. Accessed September 20, 2017.
[13] United States Environmental Protection Agency. Regulatory Initiatives. Website: http://www3.epa.gov/climatechange/EPAactivities/regulatory-initiatives.html. Accessed on November 17, 2015.
[14] United States Environmental Protection Agency. Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act. Website: http://www3.epa.gov/climatechange/endangerment/. Accessed on November 17, 2015

State Agencies & Regulations

California Clean Air Act

"The California CAA of 1988 establishes an air quality management process that generally parallels the federal process. The California CAA, however, focuses on attainment of the State ambient air quality standards,…which, for certain pollutants and averaging periods, are more stringent than the comparable federal standards. Responsibility for meeting California's standards is addressed by the CARB and local air pollution control districts (such as the eight county SJVAPCD, which administers air quality regulations for Tulare County). Compliance strategies are presented in district-level air quality attainment plans."[15]

Executive Order S-3-05

"In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger issued Executive Order S-3-05, which sets forth a series of target dates by which statewide emission of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The Executive Order additionally ordered that the Secretary of the California Environmental Protection Agency (Cal EPA) would coordinate oversight of the efforts among state agencies made to meet the targets and report to the Governor and the State Legislature biannually on progress made toward meeting the GHG emission targets. Cal EPA was also directed to report biannually on the impacts to California of global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry, and prepare and report on mitigation and adaptation plans to combat these impacts.

In response to the Executive Order, the Secretary of Cal EPA created the Climate Action Team (CAT), composed of representatives from the Air Resources Board; Business, Transportation, & Housing; Department of Food and Agriculture; Energy Commission; California Integrated Waste Management Board (CIWMB); Resources Agency; and the Public Utilities Commission (PUC). The CAT prepared a recommended list of strategies for the state to pursue to reduce climate change emission in the state (Climate Action Team, 2006)."[16]

Assembly Bill 32: California Global Warming Solutions Act of 2006

"In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.), which requires the CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020.

[15] Tulare County General Plan 2030 Update RDEIR. Pages 3.3-2 to 3.3-3.
[16] Tulare County General Plan 2030 Update Background Report. Pages 6-21 to 6-22. Background Report citation: Climate Action Team Report to Governor Schwarzenegger and the Legislature. March 2006.

The bill also requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG emission reductions. The bill authorizes CARB to adopt market-based compliance mechanisms. The bill additionally requires the state board to monitor compliance with and enforce any rule, regulation, order, emission limitation, emissions reduction measure, or market-based compliance mechanism adopted by the state board, pursuant to specified provisions of existing law. The bill also authorizes CARB to adopt a schedule of fees to be paid by regulated sources of GHG emissions. Because the bill requires CARB to establish emissions limits and other requirements, the violation of which would be a crime, this bill would create a state-mandated local program.

Under AB 32, by June 30, 2007, CARB was to identify a list of discrete early action GHG reductions that will be legally enforceable by 2010. By January 1, 2008, CARB was also to adopt regulations that will identify and require selected sectors to report their statewide GHG emissions. By January 1, 2011, CARB must adopt rules and regulations to achieve the maximum technologically feasible and cost-effective reductions in GHG reductions. CARB is authorized to enforce compliance with the program that it develops."[17]

Senate Bill 97

"Governor Schwarzenegger signed Senate Bill (SB) 97 (Sutton), a CEQA and GHG emission bill, into law on August 24, 2007. SB 97 requires the Governor's Office of Planning and Research (OPR) to prepare CEQA guidelines for the mitigation of GHG emissions, including, but not limited to, effects associated with transportation or energy consumption. OPR must prepare these guidelines and transmit them to the Resources Agency by July 1, 2009. On April 13, 2009, OPR submitted to the Secretary for Natural Resources its proposed amendments to the state CEQA Guidelines for greenhouse gas emissions. The Resources Agency must then certify and adopt the guidelines by January 1, 2010. OPR and the Resources Agency are required to periodically review the guidelines to incorporate new information or criteria adopted by CARB pursuant to the Global Warming Solutions Act, scheduled for 2012.

The OPR published a Technical Advisory in June of 2008 that is an "informal guidance regarding the steps lead agencies should take to address climate change in their CEQA documents" to serve in the interim until guidelines are established pursuant to SB 97 (OPR, 2008). This Advisory recommends that CEQA documents include quantification of estimated GHG emissions associated with a proposed project and that a determination of significance be made. With regard to significance the Advisory states that "lead agencies must determine what constitutes a significant impact. In the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a "significant impact", individual lead agencies may undertake a project-by-project analysis, consistent with the available guidance and current CEQA practice".[18]

[17] Ibid. 6-22 to 6-23
[18] Op. Cit. 6-26 to 6-27. Background Report citation: Technical Advisory – CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review. June 19, 2008.

Senate Bill 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG emission reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.[19]

California Air Resources Board (ARB or CARB)

"The Air Resources Board (ARB or Board) has established State ambient air quality standards (State standards) to identify outdoor pollutant levels considered safe for the public. After State standards are established, State law requires ARB to designate each area as attainment, nonattainment, or unclassified for each State standard. The area designations, which are based on the most recent available data, indicate the healthfulness of air quality throughout the State."[20] On July 22, 2004, The California Air Resources Board adopted the 2004 Revisions to the California State Implementation Plan for Carbon Monoxide[21].

Climate Change Scoping Plan

"The CARB published a *Climate Change Scoping Plan* in December 2008 (CARB, 2008c) that outlines reduction measures to lower the state's GHG emissions to meet the 2020 limit. The *Scoping Plan* "proposes a comprehensive set of actions designed to reduce overall carbon emissions in California, improve our environment, reduce our dependence on oil, diversify our energy sources, save energy, create new jobs, and enhance public health". Key elements for reducing California's GHG emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;

[19] Senate Bill 375 (Steinberg). Website: http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200720080SB375. Accessed September 19, 2017.
[20] California Air Resources Board. Air Quality Standards and Area Designations. Website: http://www.arb.ca.gov/desig/desig.htm. Accessed September 20, 2017
[21] California Air Resources Board. 2004 Revisions to the California State Implementation Plan for Carbon Monoxide. Website: http://www.arb.ca.gov/planning/sip/co/co.htm. Accessed September 20, 2017

- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation."[22]

Regional Agency Policy and Regulations

California Air Pollution Control Officers Association (CAPCOA)

"In January 2008, the California Air Pollution Control Officers Association (CAPCOA) issued a "white paper" on evaluating GHG emissions under CEQA (CAPCOA, 2008). The CAPCOA white paper strategies are not guidelines and have not been adopted by any regulatory agency; rather, the paper is offered as a resource to assist lead agencies in considering climate change in environmental documents."[23]

The California Association of Air Pollution Control Officers (CAPCOA) represents all thirty-five local air quality agencies throughout California. CAPCOA, which has been in existence since 1975, is dedicated to protecting the public health and providing clean air for all our residents and visitors to breathe, and initiated the Greenhouse Gas Reduction Exchange.[24]

"The Greenhouse Gas Reduction Exchange (GHG Rx) is a registry and information exchange for greenhouse gas emissions reduction credits designed specifically to benefit the state of California. The GHG Rx is a trusted source of locally generated credits from projects within California, and facilitates communication between those who create the credits, potential buyers, and funding organizations."[25] Four public workshops were held throughout the state including in the SJVAPCD. The mission is to provide a trusted source of high quality California-based greenhouse gas credits to keep investments, jobs, and benefits in-state, through an Exchange with integrity, transparency, low transaction costs and exceptional customer service.[26]

San Joaquin Valley Unified Air Pollution Control District (Air District)

"The San Joaquin Valley Air Pollution Control District is a public health agency whose mission is to improve the health and quality of life for all Valley residents through efficient, effective and entrepreneurial air quality-management strategies."[27] "The San Joaquin Valley Air Pollution

[22] Tulare County General Plan 2030 Update Background Report. Pages 6-27 to 6-28. Background Report citation: Climate Change Proposed Scoping Plan. October 2008.
[23] Op. Cit. Page 6-28. Background Report citation: CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act. January 2008.
[24] California Air Pollution Control Officers Association. Website: http://www.capcoa.org/. Accessed on September 20, 2017.
[25] Ibid.
[26] California Air Pollution Control Officers Association. CAPCOA Greenhouse Gas Reduction Exchange. Website: http://www.ghgrx.org/. Accessed September 20 2017.
[27] San Joaquin Valley Air Pollution Control District. About the District. Website: http://www.valleyair.org/General_info/aboutdist.htm#Mission. Accessed September 20, 2017.

Control District is made up of eight counties in California's Central Valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and the San Joaquin Valley Air Basin portion of Kern."[28]

The Air District has established a menu of performance standards, some of which depend on the existence of an adopted climate action plan or the establishment of Best Performance Standards (BPS). The Air District's *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Project under CEQA* document provides guidance to lead agencies for evaluating the significance of project-specific and cumulative impacts related to GHG emissions. As discussed above in the Thresholds of Significance discussion, the Air District has determined that the quantification of GHG emissions is expected for all projects that require an Environmental Impact Report.[29]

Local Policy & Regulations

Tulare County General Plan Policies

The General Plan has a number of policies that apply to projects within Tulare County that support reduction efforts of GHG. General Plan policies that relate to the proposed Project are listed as follows:

AQ-1.3 Cumulative Air Quality Impacts - The County shall require development to be located, designed, and constructed in a manner that would minimize cumulative air quality impacts. Applicants shall be required to propose alternatives as part of the State CEQA process that reduce air emissions and enhance, rather than harm, the environment.

AQ-1.4 Air Quality Land Use Compatibility - The County shall evaluate the compatibility of industrial or other developments which are likely to cause undesirable air pollution with regard to proximity to sensitive land uses, and wind direction and circulation in an effort to alleviate effects upon sensitive receptors.

AQ-1.5 California Environmental Quality Act (CEQA) Compliance - The County shall ensure that air quality impacts identified during the CEQA review process are consistently and reasonable mitigated when feasible.

AQ-1.7 Support Statewide Climate Change Solutions - The County shall monitor and support the efforts of Cal/EPA, CARB, and the SJVAPCD, under AB 32 (Health and Safety Code Section 38501 et seq.), to develop a recommended list of emission reduction strategies. As appropriate, the County will evaluate each new project under the updated General Plan to determine its consistency with the emission reduction strategies.

AQ-1.8 Greenhouse Gas Emissions Reduction Plan/Climate Action Plan - The County will develop a Greenhouse Gas Emissions Reduction Plan (Plan) that identifies greenhouse gas

[28] Ibid.
[29] San Joaquin Valley Air Pollution Control District Policy, Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Project under CEQA. Pages 3 to 5.

emissions within the County as well as ways to reduce those emissions. The Plan will incorporate the requirements adopted by the California Air Resources Board specific to this issue. In addition, the County will work with the Tulare County Association of Governments and other applicable agencies to include the following key items in the regional planning efforts.

1. Inventory all known, or reasonably discoverable, sources of greenhouse gases in the County,
2. Inventory the greenhouse gas emissions in the most current year available, and those projected for year 2020, and
3. Set a target for the reduction of emissions attributable to the County's discretionary land use decisions and its own internal government operations.

AQ-1.9 Support Off-Site Measures to Reduce Greenhouse Gas Emissions - The County will support and encourage the use of off-site measures or the purchase of carbon offsets to reduce greenhouse gas emissions.

Tulare County Climate Action Plan

"The Tulare County Climate Action Plan (CAP) serves as a guiding document for County of Tulare ("County") actions to reduce greenhouse gas emissions and adapt to the potential effects of climate change. The CAP is an implementation measure of the 2030 General Plan Update. The General Plan provides the supporting framework for development in the County to produce fewer greenhouse gas emissions during Plan buildout. The CAP builds on the General Plan's framework with more specific actions that will be applied to achieve emission reduction targets consistent with California legislation."[30]

IMPACT EVALUATION

Would the project:

a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Project Impact Analysis: ***Less Than Significant Impact***

Construction

The Air District does not have a recommendation for assessing the significance of construction related GHG emissions. Emissions from construction would be temporary; however, to account for the construction emissions, the emissions were amortized based on the life of the development (residential – 50 years) and added to the operational emissions. Greenhouse gas emissions generated during construction are shown in Table 9 [**Table 3.7-3** of this DEIR].

[30] Tulare County Climate Action Plan. Page 1

Table 3.7-3: Construction Greenhouse Gas Emissions	
Land Use	**Total $MTCO_2e$ per year**
2018	347.0288
2019	406.0148
2020	398.4107
2021	246.8277
Total	1,398.282
Amortized Emissions (Based on 50-year project life)	**27.9656**

Operation

Operational or long-term emissions occur over the project life. Sources of emissions may include motor vehicles and trucks, energy usage, water usage, waste generation, and area sources, such as landscaping activities and residential wood burning.

Business-As-Usual Operational Emissions

Operational emissions under the BAU scenario were modeled using CalEEMod Version 2016.3.1. The SJVAPCD guidance recommends using emissions in 2002-2004 in the baseline scenario to represent conditions[31]- as if regulations had not been adopted, to allow the effect of projected growth on achieving reduction targets to be clearly defined. CalEEMod defaults were used for project energy usage, water usage, waste generation, and area sources (architectural coating, consumer projects, and landscaping). The vehicle fleet mix was revised to reflect the residential fleet mix approved by SJVAPCD for year 2020. The year 2020 was chosen because it is the AB 32 target year. CalEEMod model outputs are provided in Attachment A [of Appendix A of this DEIR] and results of this analysis are presented in Table 11 [**Table 3.7-5** of this DEIR].

2020 Operational Emissions

Operational emissions for the year 2020 were modeled using CalEEMod which assumes compliance with some, but not all, applicable rules and regulations regarding energy

[31] San Joaquin Valley Air Pollution Control District. Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. December 17, 2009. https://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf. Accessed November 2017. Page 9.

efficiency, vehicle fuel efficiency, renewable energy usage, and other GHG reduction policies, as described in the CalEEMod User's Guide. The reductions obtained from each regulation and the source of the reduction amount used in the analysis are described below.

Emissions Accounting for Applicable Regulations

The following regulations are incorporated into the CalEEMod emission factors:

- Pavely I motor vehicle emission standards
- Low Carbon Fuel Standard
- 2005 and 2008 Title 24 Energy Efficiency Standards

The following regulations have not been incorporated into the CalEEMod emission factors and require alternative methods to account for emission reductions provided by the regulations:

- 2013 and 2016 Title 24 Energy Efficiency Standards
- Renewable Portfolio Standards (RPS)
- Green Building Code Standards (indoor water use)
- California Model Water Efficient Landscape Ordinance (Outdoor Water)

Title 24 reductions for 2013 and 2016 updates are not accounted for in CalEEMod. The California Energy Commission (CEC) estimates that 2013 Title 24 standards would result in an increase in energy efficiency of 25 percent in residential buildings compared to 2008 Title 24. The benefits of 2013 Title 24 are applied in the CalEEMod mitigation component to correctly allocate the reductions only to building components subject to the regulation. No additional reductions have been claimed for compliance with 2016 Title 24; however, the CEC indicates that the new standards will increase energy efficiency in residential buildings by 28 percent compared to the 2013 Title 24 standards.

RPS is not accounted for in CalEEMod. Reductions from RPS are addressed by revising the electricity emission intensity factor in CalEEMod to account for the utility RPS rate forecast for 2020. PG&E provides emission factors for the electricity it provides to customers and projections for its energy portfolio for 2020 that is used to estimate project emissions.

Energy savings from water conservation resulting from the Green Building Code Standards for indoor water use and California Model Water Efficient Lansdcape Ordinance for outdoor water use are not included in CalEEMod. The Water Conservation Act of 2009 mandates a 20 percent reduction in urban water use that is implemented with these regulations. Benefits of the water conservation regulations are applied in the CalEEMod mitigation component.

Regulations applicable to project sources and the percent reduction anticipated from each source area shown in Table 10 [**Table 3.7-4** of this DEIR]. The percentage reductions are only applied to the specific sources subject to the regulations. For example, the Paley Low Emission Vehicle Standards apply only to light duty cars and trucks.

Table 3.7-4 – Reductions from Greenhouse Gas Regulations			
Regulation	**Project Applicability**	**Reduction Source**	**Percent Reduction in 2020**
Title 24 Energy Efficiency Standards	Project building will be constructed to meet the latest version of Title 24 (currently 2016). Reduction applies only to energy consumption subject to the regulation.	CalEEMod defaults and CalEEMod mitigation component (2013)	25%[32]
Green Building Code Standards	The project will include water conservation features required by the standard	CalEEMod mitigation component	20%[33]
Water Efficient Land Use Ordinance	The project landscaping will comply with the regulation	CalEEMod mitigation component	20%[34]
Renewable Portfolio Standard (RPS)	Electricity purchased for use at the project site is subject to the 33 percent RPS mandate	CalEEMod adjusted energy intensity factors with PG&E emission factors that show the company will exceed the 33% mandate.	54.5%[35]
Solid waste	The solid waste service provider will need to provide programs to increase diversion and recycling to meet the 75 percent mandate	CalEEMod mitigation component	25%[36]

In addition to rules and regulations, the project would incorporate design features and would obtain benefits from its location and infrastructure that would reduce project vehicle miles travelled compared to default values. Note that CalEEMod nominally treats these design elements and conditions as "mitigation measures," despite their inclusion in the project description. Therefore reported operational emissions are considered to represent unmitigated project conditions. Full assumptions and model outputs are provided in Attachment A and results of this analysis are presented in Table 11 [**Table 3.7-5** of this DEIR].

Table 3.7-5 – Project Operational Greenhouse Gases			
	Emissions ($MTCO_2e$ per year)		
	Business as Usual	**2020 (with regulations and design features)**	**Percent Reduction**
2019	989.7650	900.5749	9.01
2020	956.4412	785.3269	17.89
2021	1,027.7781	785.8735	23.54
		Average	**16.81**

[32] California Energy Commission News Release: New Title 24 Standards Will Cut Residential Energy Use by 25 Percent, Save Water, and Reduce Greenhouse Gas Emissions.
[33] 2013 California Green Building Standards Code Section 5.303.2
[34] California Water Plan Update 2013.
[35] Based on CalEEMod default PG&E rate for 2005 and PG&E project emission factor for 2020
[36] CalRecycle 75 Percent Initiative: Defining the Future.

As shown in Table 11 [**Table 3.7-5** of this DEIR], the project would achieve an average reduction of 16.81 percent from BAU with regulations and design features, which surpasses the 6% reduction requirement by the Tulare County Action Plan."[37] As such, a ***Less Than Significant Project-specific Impact*** related to this Checklist Item would occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is the San Joaquin Valley Air Basin. As the proposed Project would result in Less Than Significant Project-specific Impacts, ***Less Than Significant Cumulative Impacts*** would also occur.

Mitigation Measure(s): ***None Required***

Conclusion: ***Less Than Significant Impact***

As noted earlier, the Project would result in ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Project Impact Analysis: ***No Impact***

Consistency with the Climate Action Plan

Tulare County adopted a CAP as part of the Tulare County General Plan Update on August 28, 2012. The CAP requires projects to achieve an average reduction that is 6 percent in excess of the reductions stated in the ARB Scoping Plan and by regional regulations and programs. When combined with reductions anticipated from the ARB Scoping Plan measures and regional regulations and programs, Tulare County emissions would be 26.2 percent below 2020 business-as-usual levels for development related sources, which is the amount needed for the State to reduce emissions to 1990 levels. As shown in Table 11 [**Table 3.7-5** of this DEIR], the project would exceed the required reduction and would therefore be consistent with the CAP 2020 target.

Since the adoption of the CAP, several additional regulations have been adopted by the State that provide additional reductions beyond those described in the CAP. The largest reductions are from LEVIII Light Duty Vehicle Standards and 2016 Title 24 Energy Efficiency Standards.

The CAP identifies General Plan policies that would help reduce greenhouse gas emissions; those policies can be seen in the following list. For a discussion of the benefits of the policies, refer to the CAP.

[37] Hash Farms Development. Air Quality Impact Analysis and Greenhouse Gas Study. November 2017. Appendix A of this DEIR. Pages 60-64.

PF-1.1 Maintain Urban Edges
PF-1.2 Location of Urban Development
PF-1.4 Available Infrastructure
AG-1.7 Conservation Easements
AG-1.8 Agriculture Within Urban Boundaries
AG-1.11 Agricultural Buffers
AG-1.14 Right to Farm Noticing
AG-2.11 Energy Production
AG-2.11 Energy Production
AG-2.6 Biotechnology and Biofuels
AQ-1.6 Purchase of Low Emission/Alternative Fuel Vehicles
AQ-1.7 Support Statewide Global Warming Solutions
AQ-1.8 Greenhouse Gas Emissions Reduction Plan
AQ-1.9 Off-Site Measures to Reduce Greenhouse Gas Emissions
AQ-1.10 Alternative Fuel Vehicle Infrastructure
AQ-2.1 Transportation Demand Management Programs
AQ-2.3 Transportation and Air Quality
AQ-2.4 Transportation Management Associations
AQ-2.5 Ridesharing
AQ-3.1 Location of Support Services
AQ-3.2 Infill Near Employment
AQ-3.3 Street Design
AQ-3.5 Alternative Energy Design
AQ-3.6 Mixed Use Development
LU-1.1 Smart Growth and Healthy Communities
LU-1.2 Innovative Development
LU-1.3 Prevent Incompatible Uses
LU-1.4 Compact Development
LU-1.8 Encourage Infill Development
LU-2.1 Agricultural Lands
LU-3.2 Cluster Development
LU-3.3 High-Density Residential Locations
LU-4.1 Neighborhood Commercial Uses
LU-7.1 Distinctive Neighborhoods
LU-7.2 Integrate Natural Features
ERM-1.2 Development in Environmentally Sensitive Areas
ERM-1.3 Encourage Cluster Development
ERM-1.4 Protect Riparian Management Plans and Mining Reclamation Plans
ERM-1.6 Management of Wetlands
ERM-1.7 Planting of Native Vegetation
ERM-1.8 Open Space Buffers
ERM-1.14 Mitigation and Conservation Banking Program
ERM-4.1 Energy Conservation and Efficiency Measures
ERM-4.2 Streetscape and Parking Area Improvements for Energy Conservation
ERM-4.3 Local and State Programs
ERM-4.4 Promote Energy Conservation Awareness

ERM-4.6 Renewable Energy
ERM-4.7 Reduce Energy Use in County Facilities
ERM-4.8 Energy Efficiency Standards
ERM-5.1 Parks as Community Focal Points
ERM-5.6 Location and Size Criteria for Parks
ERM-5.15 Open Space Preservation
HS-1.4 Building and Codes
TC-2.1 Rail Service
TC-2.4 High Speed Rail (HSR)
TC-2.7 Rail Facilities and Existing Development
TC-4.4 Nodal Land Use Patterns that Support Public Transit
TC-5.1 Bicycle/Pedestrian Trail System
TC-5.2 Consider Non-Motorized Modes in Planning and Development
TC-5.3 Provisions for Bicycle Use
TC-5.4 Design Standards for Bicycle Routes
TC-5.5 Facilities
TC-5.6 Regional Bicycle Plan
TC-5.7 Designated Bike Paths
TC-5.8 Multi-Use Trails
PFS-1.3 Impact Mitigation
PFS-1.15 Efficient Expansion
PFS-2.1 Water Supply
PFS-2.2 Adequate Systems
LU-7.3 Friendly Streets
LU-7.15 Energy Conservation
ED-2.3 New Industries
ED-2.8 Jobs/Housing Ratio
ED-5.9 Bikeways
ED-6.1 Revitalization of Community Centers
ED-6.2 Comprehensive Redevelopment Plan
ED-6.3 Entertainment Venues
ED-6.4 Culturally Diverse Business
ED-6.5 Intermodal Hubs for Community and Hamlet Core Areas
ED-6.7 Existing Commercial Centers
SL-3.1 Community Centers and Neighborhoods
ERM-1.1 Protection of Rare and Endangered Species
PFS-3.3 New Development Requirements
PFS-5.3 Solid Waste Reduction
PFS-5.4 County Usage of Recycled Materials and Products
PFS-5.5 Private Use of Recycled Products
PFS-8.3 Location of School Sites
PFS-8.5 Government Facilities and Services
WR-1.5 Expand Use of Reclaimed Wastewater
WR-1.6 Expand Use of Reclaimed Water
WR-3.5 Use of Native and Drought Tolerant Landscaping

Consistency with San Joaquin Valley Air Pollution Control District Plans

The SJVAPCD adopted its own procedures for addressing climate change impacts of projects where the SJVAPCD issues a permit. For these projects, the SJVAPCD is either a Lead Agency or a Responsible Agency for CEQA purposes. The procedures do not apply directly to projects subject to County approval; however, development projects that include stationary source emissions requiring a District permit would need to comply with District procedures.

The SJVAPCD adopted the Climate Change Action Plan (CCAP) in 2008. The Carbon Exchange Program is not applicable to this project, and the project would not require Voluntary Greenhouse Gas Mitigation Agreements, as greenhouse gas emissions impacts are less than significant. The project would comply with all applicable greenhouse gas regulations contained in the CCAP. Per Guidance provided by the SJVAPCD, the proposed Project is consistent with the adopted Tulare County CAP, as the CAP requires a 6% reduction in GHG emissions and the proposed project is expected to reduce GHG emissions by 14%.

Consistency with AB 32

The California State Legislature adopted AB 32 in 2006. AB 32 focuses on reducing greenhouse gases (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) to 1990 levels by the year 2020. Pursuant to the requirements in AB 32, the ARB adopted the Climate Change Scoping Plan (Scoping Plan) in 2008, which outlines actions recommended to obtain that goal. The Scoping Plan calls for an "ambitious but achievable" reduction in California's greenhouse gas emissions, cutting approximately 29 percent from business-as-usual emission levels projected for 2020, or about 10 percent from 2008 levels. On a per-capita basis, that means reducing annual emissions of 14 tons of carbon dioxide for every man, woman, and child in California down to about 10 tons per person by 2020.31[38] In addition, the total GHG per year divided by the total new population generated by the project (564) would be less than 10 tons per person, as 1,398.28 tons / 564 persons = 2.48 tons per person).

The Scoping Plan contains a variety of strategies to reduce the State's emissions. As shown in Table 12 [Table 3.7-6 of this DEIR], the strategies are either consistent or not applicable to the project."[39]

[38] California Air Resources Board. Initial AB 32 Climate Change Scoping Plan Document. https://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm. Accessed November 2017.
[39] Hash Farms Development. Air Quality Impact Analysis and Greenhouse Gas Study. November 2017. Appendix A of this DEIR. Pages 64-68.

Table 3.7-6
Scoping Plan Reduction Measures[40]

Scoping Plan Reduction Measure	Recommended Action
California Cap – and – Trade Program Linked to Western Climate Initiative Partner Jurisdictions – Implement a broad-based California cap-and-trade program to provide a firm limit on emissions, Link the California cap-and-trade program with other Western Climate Initiative Partner programs to create a regional market system to achieve greater environmental and economic benefits for California.	**Not applicable.** Under the cap-and-trade system, products or services (such as electricity) would be covered and the cost of the cap-and-trade system would be transferred to the consumers.
California Light-Duty Vehicle Greenhouse Gas Standards – Implement adopted Pavley standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs with long-term climate change goals.	**Consistent.** This is a statewide measure that cannot be implemented by a project applicant or lead agency. However, vehicles accessing projects in the Community would be subject to the standards.
Energy Efficiency – Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts including new technologies, and new policy and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California (including both investor-owned and publicly owned utilities).	**Consistent.** This is a measure for the state to increase its energy efficiency standards. However, the project would increase its energy efficiency through existing regulation.
Renewable Portfolio Standard – Renewables Portfolio Standard Achieve 33 percent renewable energy mix statewide.	**Consistent.** This is a statewide measure that cannot be implemented by a project applicant or lead agency. Southern California Edison obtains 19.9 percent of its power supply from renewable sources such as geothermal. However, residents and businesses in the community will purchase power with increasing amounts of renewable energy content.
Low Carbon Fuel Standard – Develop and adopt the Low Carbon Fuel Standard.	**Consistent.** This is a statewide measure that cannot be implemented by a project applicant or lead agency. However, the standard is applicable to the fuel used by vehicles that would access the project site.
Regional Transportation, Related Greenhouse Gas Targets – Develop regional greenhouse gas emissions reduction targets for passenger vehicles.	**Consistent.** The plan area will be constructed to densities consistent with the 2014 RTP/SCS.
Vehicle Efficiency Measures – Implement light-duty vehicle efficiency measures.	**Consistent.** The standards would be applicable to the light-duty vehicles that would access the project site.
Goods Movement – Implement adopted regulations for the use of shore power for ships at berth. Improve efficiency in goods movement activities.	**Not applicable.** The project does not propose any changes to maritime, rail, or intermodal facilities or forms of transportation.

[40] Ibid. Pages 68-69

Table 3.7-6 Scoping Plan Reduction Measures[40]	
Million Solar Roofs Program – Install 3,000 MW of solar-electric capacity under California's existing solar programs.	**Consistent.** This measure is to increase solar throughout California, which is being done by various electricity providers and existing solar programs. Residences within the project area will be able to take advantage of incentives that are in place at the time of construction.
Medium/Heavy-Duty Vehicles – Adopt medium and heavy-duty vehicle efficiency measures.	**Consistent.** This is a statewide measure that cannot be implemented by a project applicant or lead agency. When this measure is initiated, the standards would be applicable to the vehicles that access the project site.
Industrial Emissions – Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission.	**Not applicable.** Industrial sources are not proposed as a part of this project.
High Speed Rail – Support implementation of a high speed rail system.	**Not applicable.** This is a statewide measure that cannot be implemented by a project applicant or lead agency.
Green Building Strategy – Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.	**Consistent.** The State is to increase the use of green building practices. The project would implement some green building strategies through existing regulation.
High Global Warming Potential Gases – Adopt measures to reduce high global warming potential gases.	**Consistent.** This measure is applicable to the high global warming potential gases that would be used by the project (such as in air conditioning and refrigerators).
Recycling and Waste – Reduce methane emissions at landfills. Increase waste diversion, composting and other beneficial uses of organic materials, and mandate commercial recycling. Move toward zero-waste.	**Consistent.** The project would not contain a landfill. The State is to help increase waste diversion. The project would reduce waste with implementation of state mandated recycling and reuse mandates.
Sustainable Forests – Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation.	**Not applicable.** The project site is in an agricultural condition. No forested lands exist onsite.
Water – Continue efficiency programs and use cleaner energy sources to move and treat water.	**Consistent.** This is a measure for state and local agencies. However, project will comply with the California Green Building Standards Code, which requires a 20 percent reduction in indoor water use.
Agriculture – Encourage investment in manure digesters and at the five-year Scoping Plan update determine if the program should be made mandatory in 2020.	**Not applicable.** The project site is in an agricultural condition with orchards. No grazing, feedlot, or other agricultural activities that generate manure occur onsite or are proposed to be implemented by the project.

As such, ***Less Than Significant Project-specific Impacts*** related to this Checklist Item would occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is the San Joaquin Valley Air Basin. As the proposed Project is consistent with aforementioned plans, policies, and regulations, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item would occur.

Mitigation Measure(s): ***None Required***

Conclusion: ***Less Than Significant Impact***

As the proposed Project is consistent with aforementioned plans, policies, and regulations, ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item would occur.

DEFINITIONS

As defined by SJVAPCD or Tulare County General Plan:

Achieved-in-Practice: "Any equipment, technology, practice or operation available in the United States that has been installed and operated or used at stationary source site for a reasonable period of time sufficient to demonstrate that the equipment, technology, practice or operation is reliable when operated in a manner that is typical for the process. In determining whether equipment, technology, practice or operation is Achieved-in-Practice, the District will consider the extent to which grants, incentives or other financial subsidies influence the economic feasibility of its use."[41]

Approved Alternate Technology: "Any District approved, Non-Achieved-in-Practice GHG emissions reduction measure equal to or exceeding the GHG emission reduction percentage for a specific BPS."[42]

Baseline: "The three year average (2002-2004) of GHG emissions for a type of equipment or operation within an identified class and category, expressed as annual GHG emissions per unit."[43]

Best Performance Standard: "For a specific Class and Category, the most effective, District approved, Achieved-In-Practice means of reducing or limiting GHG emissions from a GHG emissions source, that is also economically feasible per the definition of Achieved-in-Practice. BPS includes equipment type, equipment design, and operational and maintenance practices for the identified service, operation, or emissions unit class and category."[44]

Business-as-Usual: "The emissions for a type of equipment or operation within an identified class and category projected for the year 2020, assuming no change in GHG emissions per unit of activity as established for the baseline period."[45] "Total baseline emissions for all emissions sources within the development type, projected for the year 2020, assuming no change in GHG emissions per unit of activity as established for the baseline period, 2002-2004. To relate BAU to an emissions generating activity, the District proposes to establish emission factors per unit of activity, for each class and category, using the 2002-2004 baseline period as the reference."[46]

Category: "A District approved subdivision within a "class" as identified by unique operational or technical aspects."[47]

[41] San Joaquin Valley Air Pollution Control District, Policy APR 2005: Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as Lead Agency. Page 6.
[42] Ibid. 6 to 7
[43] Op. Cit. 7
[44] Op. Cit.
[45] Op. Cit.
[46] San Joaquin Valley Air Pollution Control District, FACT SHEET: Addressing Greenhouse Gas Emission Impacts under the California Environmental Quality Act (CEQA). Page 1.
[47] District Policy, Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as Lead Agency.Page 7.

Class: "The broadest District approved division of stationary GHG sources based on fundamental type of equipment or industrial classification of the source operation."[48]

Global Warming: "Global warming is an increase in the temperature of the Earth's troposphere. Global warming has occurred in the past as a result of natural influences, but the term is most often used to refer to the warming predicted by computer models to occur as a result of increased emissions of greenhouse gases."[49]

Greenhouse Gas: "Greenhouse gas (GHG) emissions are the release of any gas that absorbs infrared radiation in the atmosphere. Generally when referenced in terms of global climate they are considered to be harmful. Greenhouse gases include, but are not limited to, water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrochlorofluorocarbons (HCFCs), ozone (O_3), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)."[50]

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[48] Op. Cit.
[49] General Plan 2030 Update Background Report. Page 6-3.
[50] Ibid. 6-3.

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Hazards and Hazardous Materials
Chapter 3.8

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts*** related to Hazards and Hazardous Materials. A detailed review of potential impacts is provided in the following analysis.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to Hazards and Hazardous Materials. As required in Section 15126, all phases of the proposed project will be considered as part of the potential environmental impact.

As noted in Section 15126.2 (a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1]

The environmental setting provides a description of the Hazards and Hazardous Materials in the County. The regulatory setting provides a description of applicable Federal, State and Local regulatory policies that were developed in part from information contained in the Tulare County

[1]CEQA Guidelines, Section 15126.2 (a)

2030 General Plan, Tulare County General Plan Background Report, and/or Tulare County 2030 General Plan EIR incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

Thresholds of Significance

- Create a significant hazard
- Located within one-quarter mile of an existing or proposed school
- Located on a list of hazardous materials sites
- Located within an airport land use plan
- Located within the vicinity of a private airstrip
- Interfere adopted emergency response plan or emergency evacuation plan
- Wildland Fire Risk

ENVIRONMENTAL SETTING

"A hazardous material is defined by the California Code of Regulations (CCR) as a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating, illness; or (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported or disposed of (CCR, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10)."[2]

"Hazardous wastes are hazardous materials that no longer have practical use, such as substances that have been discarded, discharged, spilled, contaminated, or are being stored prior to proper disposal. According to Title 22 of the CCR, hazardous materials and hazardous wastes are classified according to four properties: toxic, ignitable, corrosive, and reactive (CCR, Title 22, Chapter 11, Article 3)."[3]

Hazardous Waste Shipments Originating Within Tulare County

"In 2007, the DTSC Hazardous Waste Tracking System (HWTS) manifest data reports that approximately 5,925 tons of hazardous waste was transported from all categories of generators in Tulare County. As of November 2008, hazardous waste data available for 2008 indicated that approximately 7,160 tons of hazardous waste was generated in the county (DTSC, 2008a)"[4] The quantities of hazardous waste transported from facilities located within each zip code in Tulare County are shown in the Table 3.8-1.

[2] Tulare County General Plan 2030 Update Background Report, page 8-26
[3] Ibid. Pages 8-26
[4] Ibid. Page 8-37

Table 3.8-1
Transport of Hazardous Waste[5]

Zip Code	Total Tons	Zip Code	Total Tons	Zip Code	Total Tons	Zip Code	Total Tons
93219	0.579	93221	19.100	93223	14.73	93227	6.792
93244	4.270	93247	36.370	93256	14.39	93257	155.000
93262	0.459	93271	4.463	93272	17.78	93274	146.700
93275	14.870	93277	407.80	93279	52.01	93286	7.152
93291	321.700	93292	25.600	93615	2.606	93618	139.100
93631	321.700	93647	65.630	93654	4.255	93673	4.915

Environmental Health Department Futures Assessment

"The Environmental Health Department [EHD], of which the CUPA is a part, anticipates a slight increase in the reported volume of hazardous waste generated within Tulare County in year 2003/04. However, EHD does not expect an increase in the actual volume of hazardous waste generated over the same period."[6]

REGULATORY SETTING

Federal Agencies & Regulations

Hazardous Materials Transportation Act

The Hazardous Materials Transportation Act of 1975 (HMTA) as amended, is the major transportation-related statute affecting DOE. The objective of the HMTA according to the policy stated by Congress is ". . .to improve the regulatory and enforcement authority of the Secretary of Transportation to protect the Nation adequately against risks to life and property which are inherent in the transportation of hazardous materials in commerce." The HMTA empowered the Secretary of Transportation to designate as hazardous material any "particular quantity or form" of a material that "may pose an unreasonable risk to health and safety or property."

Regulations apply to ". . .any person who transports, or causes to be transported or shipped, a hazardous material; or who manufactures, fabricates, marks, maintains, reconditions, repairs, or tests a package or container which is represented, marked, certified, or sold by such person for use in the transportation in commerce of certain hazardous materials."[7]

Superfund

"Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), commonly referred to as "Superfund", was enacted on December 11, 1980. The purpose of

[5] Tulare County General Plan 2030 Update Draft 2008 Background Report, page 8-31
[6] Ibid. 8-32.
[7] US Department of Energy, The Office of Health, Safety and Security, http://homer.ornl.gov/sesa/environment/policy/hmta.html. Accessed March 2015.

CERCLA was to provide authorities with the ability to respond to uncontrolled releases of hazardous substances from inactive hazardous waste sites that endanger public health and the environment. CERCLA established prohibitions and requirements concerning closed and abandoned hazardous waste sites, provided for liability of persons responsible for releases of hazardous waste at such sites, and established a trust fund to provide for cleanup when no responsible party could be identified. Additionally, CERCLA provided for the revision and republishing of the National Contingency Plan (NCP) that provides the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The NCP also provides for the National Priorities List, a list of national priorities among releases or threatened releases throughout the United States for the purpose of taking remedial action."[8]

Superfund Amendments and Reauthorization Act (SARA)

"Superfund Amendments and Reauthorization Act SARA amended CERCLA on October 17, 1986. This amendment increased the size of the Hazardous Response Trust Fund to $8.5 billion, expanded EPA's response authority, strengthened enforcement activities at Superfund sites; and broadened the application of the law to include federal facilities. In addition, new provisions were added to the law that dealt with emergency planning and community right to know. SARA also required EPA to revise the Hazard Ranking System to ensure that the system accurately assesses the relative degree of risk to human health and the environment posed by sites and facilities subject to review for listing on the National Priorities List."[9]

State Agencies & Regulations

Hazardous Substance Account Act (1984), California Health and Safety Code Section 25300 ET SEQ (HSAA)

"This act, known as the California Superfund, has three purposes: 1) to respond to releases of hazardous substances; 2) to compensate for damages caused by such releases; and 3) to pay the state's 10 percent share in CERCLA cleanups. Contaminated sites that fail to score above a certain threshold level in the EPA's ranking system may be placed on the California Superfund list of hazardous wastes requiring cleanup."[10]

California Environmental Protection Agency (Cal/EPA) Department of Toxic Substance Control (DTSC)

"Cal/EPA has regulatory responsibility under Title 22 of the California Code of Regulations (CCR) for administration of the state and federal Superfund programs for the management and cleanup of hazardous materials. The DTSC is responsible for regulating hazardous waste facilities and overseeing the cleanup of hazardous waste sites in California. The Hazardous Waste Management Program (HWMP) regulates hazardous waste through its permitting, enforcement and Unified Program activities. HWMP maintains the EPA authorization to

[8] Tulare County General Plan 2030 Update Background Report, page 8-27
[9] Ibid. Page 8-27
[10] Tulare County General Plan 2030 Update Background Report, page 8-28 to 8-29

implement the RCRA program in California, and develops regulations, policies, guidance and technical assistance/ training to assure the safe storage, treatment, transportation and disposal of hazardous wastes. The State Regulatory Programs Division of DTSC oversees the technical implementation of the state's Unified Program, which is a consolidation of six environmental programs at the local level, and conducts triennial reviews of Unified Program agencies to ensure that their programs are consistent statewide and conform to standards."[11]

California Occupational Safety and Health Administration (Cal/OSHA)

"Cal/OSHA and the Federal OSHA are the agencies responsible for assuring worker safety in the handling and use of chemicals in the workplace. Pursuant to the Occupational Safety and Health Act of 1970, Federal OSHA has adopted numerous regulations pertaining to worker safety, contained in the Code of Federal Regulations Title 29 (29 CFR). These regulations set standards for safe workplaces and work practices, including standards relating to hazardous material handling. Cal/OSHA assumes primary responsibility for developing and enforcing state workplace safety regulations. Because California has a federally General Plan Background Report December 2007 approved OSHA program, it is required to adopt regulations that are at least as stringent as those identified in 29 CFR. Cal/OSHA standards are generally more stringent than federal regulations."[12]

Hazardous Materials Transport Regulations

"California law requires that Hazardous Waste (as defined in California Health and Safety Code Division 20, Chapter 6.5) be transported by a California registered hazardous waste transporter that meets specific registration requirements. The requirements include possession of a valid Hazardous Waste Transporter Registration, proof of public liability insurance, which includes coverage for environmental restoration, and compliance with California Vehicle Code registration regulations required for vehicle and driver licensing."[13]

Cal/EPA Cortese List

"The provisions in Government Code Section 65962.5 are commonly referred to as the "Cortese List" (after the Legislator who authored the legislation that enacted it). The list, or a site's presence on the list, has bearing on the local permitting process as well as on compliance with the California Environmental Quality Act (CEQA)."[14] The Cortese List identifies the following:

- Hazardous Waste and Substance Sites
- Cease and desist order Sites
- Waste Constituents above Hazardous Waste Levels outside the Waste Management Unit Sites
- Leaking Underground Tank (LUST) Cleanup Sites
- Other Cleanup Sites

[11] Ibid. Page 8-29
[12] Ibid. 8-30 and 8-31
[13] Ibid. 8-31
[14] Cal/EPA Cortese List background, http://www.calepa.ca.gov/sitecleanup/corteselist/Background.htm. Accessed March 2015.

- Land Disposal Sites
- Military Sites
- WDR Sites
- Permitted Underground Storage Tank (UST) Facilities Sites
- Monitoring Wells Sites
- DTSC Cleanup Sites
- DTSC Hazardous Waste Permit Sites

Local Policy & Regulations

Kingsburg Fire Department

The City of Kingsburg Fire Department also provides oversight of hazardous materials. The Fire Department is responsible for conducting inspections for code compliance and fire-safe practices, and for scene management and investigation of fire and hazardous materials incidents. The Fire Department regulates explosive and hazardous materials under the Uniform Fire Code, and permits the handling, storage and use of any explosives or other hazardous material.

Tulare County Office of Emergency Services

"The Tulare County Office of Emergency Services (OES) is Tulare County's comprehensive emergency management program. The discipline of emergency management aims to create partnerships, plans, and systems to build capabilities and coordinate the efforts of government, industry, and voluntary organizations in all phases of an emergency.

The activities of Tulare County OES can be categorized under the four phases of the emergency management cycle: Preparedness, Response, Recovery, and Mitigation. The day-to-day activities of the program center around Preparedness and Mitigation phases, in order to combat potential hazards and minimize community impacts during the Response and Recovery phases. The following descriptions offer more detail about the activities in each phase of emergency management.

Preparedness

- Public Education
- Training & Exercise for responders
- Grants for public safety & health agencies

Response

Tulare County OES maintains the Emergency Operations Center (EOC) for the County and Operational Area. Tulare County OES also administers the AlertTC notification system and WebEOC crisis information management system.

Recovery

After the emergency is over, there is still considerable work to be done to help the community return to a pre-disaster state. Recovery often takes several years, perhaps even decades, to fully complete.

Mitigation

Mitigation is the process by which hazards and vulnerabilities are identified, and measures taken to decrease the potential for occurrence of the hazard, the vulnerability to the hazard should it occur, or both. Tulare County Office of Emergency Services implements the 2011 Tulare County Hazard Mitigation Plan."[15]

Tulare County Health and Human Services Agency, Environmental Health Services Division

"Broadly speaking, the purpose of the Tulare County Health and Human Services Agency (HHSA) is to provide a wide array of services that enhance the lives of Tulare County residents of all ages. Included under the umbrella of HHSA are programs and services that touch upon nearly every aspect of life. These programs and services are all aimed at protecting, promoting, and supporting, in a holistic manner, the physical, mental, and social well-being of the people of Tulare County.

Divided into four branches, each comprised of numerous divisions and programs, HHSA includes individual and public health services, mental health services, protective services and supports for the young and the elderly, and numerous social services for the underserved. To facilitate the development and delivery of these services, HHSA employs a workforce of approximately 1,800 employees and maintains administrative units to support that workforce, including human resources, project management, and fiscal administration. Working together, the branches of HHSA provide services in a caring, collaborative, and culturally respectful manner—services that address the well-being of not only the needy but also of all residents of Tulare County."[16]

Tulare County General Plan Policies

The General Plan has a number of policies that apply to projects within Tulare County. General Plan policies that relate to the proposed Project are listed as follows:

HS-4.1 Hazardous Materials - The County shall strive to ensure hazardous materials are used, stored, transported, and disposed of in a safe manner, in compliance with local, State, and Federal safety standards, including the Hazardous Waste Management Plan, Emergency Operations Plan, and Area Plan.

[15] County of Tulare Office of Emergency Services, What is OES? http://tularecounty.ca.gov/oes/index.cfm/what-is-oes/ Accessed May 2016.
[16] 2014-15 County of Tulare Recommended Budget Fiscal Year 2014/15 Mission Statement provided by Cheryl L. Duerksen, Ph.D., HHSA Director. Page 249. Accessed on December 30, 2015 at: http://tularecounty.ca.gov/cao/index.cfm/budget/fiscal-year-2014-15/.

HS-4.3 Incompatible Land Uses - The County shall prevent incompatible land uses near properties that produce or store hazardous waste.

HS-4.4 Contamination Prevention - The County shall review new development proposals to protect soils, air quality, surface water, and groundwater from hazardous materials contamination.

City of Kingsburg General Plan Policies

City of Kingsburg General Plan policies that relate to the proposed Project are listed as follows:

Goal No. 8 – Seismic Hazards

Policy 2 – All new building construction shall conform to the latest seismic requirements of the Uniform Building Code as a minimum standard.

Policy 5 – Soil compaction tests, and geotechnical analysis of soil conditions and behavior under seismic conditions shall be required of all subdivisions and of all commercial, industrial and institutional structures over 6,000 square feet in area (or in the case of institutional structures, those which hold 100 or more people).

Policy 7 – All lines which are part of the domestic water distribution system should be looped to assure adequate pressure in the event of major fire, earthquake, or explosion. Adequate emergency standby power generation capability should be available at water wells to assure water availability in the event of a major power failure.

Goal No. 9 – Public Safety Hazards

Policy 3 – The City will continue to maintain and update emergency service plans, including plans for managing emergency operations, the handling of hazardous materials and the rapid cleanup of hazardous material spills.

Policy 7 – Neighborhood watch programs will be encouraged in all residential areas of the City.

IMPACT EVALUATION

Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Project Impact Analysis: ***Less Than Significant***

Construction

Construction-related activities associated with construction of the residential development would require the use and transport of hazardous materials, including fuels, oils, and other chemicals (e.g., paints, adhesives, etc.) typically used during construction. It is likely that these hazardous materials and vehicles would be stored by the contractor(s) on-site during construction-related activities. Improper use and transportation of hazardous materials could result in accidental releases or spills, potentially posing health risks to workers, the public, and the environment. However, a Storm Water Pollution Prevention Plan (SWPPP) is required for the proposed Project and shall include emergency procedures for incidental hazardous materials releases. The SWPPP also includes Best Management Practices which includes requirements for hazardous materials storage. In addition, all use, storage, transport and disposal of hazardous materials during construction shall be performed in accordance with existing local, state and federal hazardous materials regulations.

Operational

The operational phase of the proposed Project would occur after construction is completed and residents move in to occupy the structures on a day-to-day basis. The proposed Project includes land uses that are considered compatible with the surrounding uses, including single and multi-family residential uses, open space and natural drainage areas. None of these land uses routinely transport, use, or dispose of hazardous materials, or present a reasonably foreseeable release of hazardous materials, with the exception of common residential grade hazardous materials such as cleaners, paint, etc. The proposed Project would not create a significant hazard through the routine transport, use, or disposal of hazardous materials, nor would a significant hazard to the public or to the environment through the reasonably foreseeable upset and accidental conditions involving the likely release of hazardous materials into the environment occur.

All businesses transporting, storing, using or disposing of hazardous materials (including wastes) must comply with applicable local, state and federal regulations for hazardous materials management. These include regulations and programs administered by the Tulare County Health & Human Services Agency, Environmental Health Services Division as well as other requirements of state and federal laws and regulations, including compliance with the Uniform Fire Code for hazardous material storage. This impact will result in ***Less Than Significant Impacts.***

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

With ***Less Than Significant*** Project-specific impacts, ***Less Than Significant Cumulative Impacts*** will also occur.

Mitigation Measure(s): ***None Required***

Conclusion: ***Less Than Significant Impact***

Potential Project-specific impacts related to this Checklist Item will be ***Less Than Significant***.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Project Impact Analysis: ***Less Than Significant Impact***

See Response a) above. Any accumulated hazardous construction or operational wastes will be collected and transported away from the site in compliance with all federal, state and local regulations.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

With ***Less Than Significant*** Project-specific impacts, ***Less Than Significant Cumulative Impacts*** will also occur.

Mitigation Measure(s): ***None Required***

Conclusion: ***Less Than Significant Impact***

Project-specific impacts related to this Checklist item will be reduced to a level of ***Less Than Significant.***

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Project Impact Analysis: ***Less Than Significant Impact***

The proposed Project site is approximately 100 feet east of the playing fields of Lincoln Elementary School. The other school in the vicinity is Kingsburg High School, which is approximately ¼ mile northwest of the proposed Project site.

Based on the current proposed Project description of a residential development, it is not reasonably foreseeable that the proposed Project will cause a significant impact by emitting

hazardous waste or bringing hazardous materials within one-quarter mile of an existing or proposed school. These land uses do not generate, store, or dispose of significant quantities of hazardous materials. Such uses also do not normally involve dangerous activities that could expose persons onsite or in the surrounding areas to large quantities of hazardous materials. See the responses to a) and b) above regarding hazardous material handling. Any impacts would be ***Less Than Significant*** to this Checklist Item.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

With ***Less Than Significant*** Project-specific impacts, ***Less Than Significant Cumulative Impacts*** will also occur.

Mitigation Measure(s): ***None Required***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** to this Checklist Item will occur.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Project Impact Analysis: ***No Impact***

As of May 5, 2015, the proposed Project site was not located on a Cortese List site. Moreover, the proposed Project will not include elements that will require listing on the Cortese List. Therefore, ***No Project-specific Impacts*** to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

The proposed Project site is not located on any Cortese List of hazardous materials. The proposed Project includes the construction and operation of a residential development and will not cause other properties to be included in the Cortese List. As such ***No Cumulative Impacts*** to this Checklist Item will occur.

Mitigation Measure(s): ***None Required***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** to this Checklist Item will occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

Project Impact Analysis: ***No Impact***

The proposed Project is not located within an airport land use area and is located further than two miles from the nearest public or public use airport (the Selma Airport is approximately 8 miles northwest of the Project site), and from the nearest private airstrip (Central Valley Aviation Inc. Airport is approximately 7 miles northwest of the proposed Project site). The proposed Project would not create an aircraft safety hazard for people residing or working in the proposed Project area. Implementation of the proposed Project would result in ***No Impact*** relative to this Checklist Item.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

There are no significant project level impacts and therefore ***No Cumulative Impacts*** to this Checklist Item will occur.

Mitigation Measure(s): ***None Required***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** to this Checklist Item will occur.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

Project Impact Analysis: ***No Impact***

There are no private air strips in the proposed Project vicinity and as such, there is ***No Impact*** to this Checklist Item.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

There are no project level impacts and therefore ***No Cumulative Impacts*** to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Project Impact Analysis: ***No Impact***

As identified in Goal No. 9 – Public Safety Hazards, Policy 3 – The City will continue to maintain and update emergency service plans, including plans for managing emergency operations, the handling of hazardous materials and the rapid cleanup of hazardous material spills.

"Tulare County has in place an emergency plan to cope with natural disasters that are statewide or happen locally. The County Fire Department and local stationed California Department of Forestry (CDF) are well prepared to fight fires locally as well as statewide. The United States Forest Service (USFS) is in charge of fires that happen in the national parks and Tulare County assists with the fire management process as needed."[17]

"In the event of a disaster, certain facilities are critical to serve as evacuation centers, provide vital services, and provide for emergency response. Existing critical facilities in Tulare County include hospitals, county dispatch facilities, electrical, gas, and telecommunication facilities, water storage and treatment systems, wastewater treatment systems, schools, and other government facilities. This plan also addresses evacuation routes, which include all freeways, highways, and arterials that are located outside of the 100-year flood plain."[18]

The proposed Project does not involve a change to any emergency response plan. There are several entrances into the Project site, with the most prominent being on Kern Street and Road 16. ***No Project-specific Impacts*** related to this Checklist Item will occur.

[17] Tulare County Association of Governments Regional Transportation Plan, Page 1-11
[18] Tulare County General Plan 2030 Update Background Report, pages 8-35 to 8-36

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

The proposed Project does not include alterations to an emergency plan or include reductions of site accessibility by emergency vehicles. ***No Cumulative Impacts*** to this Checklist Item will occur.

Mitigation Measure(s): ***None required***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Project Impact Analysis: ***No Impact***

The proposed Project site is currently actively maintained with agricultural uses and is completely surrounded by active agriculture or urban uses. With this environmental context, the proposed Project site is not located within a wildlands area. Therefore, the proposed Project will not expose people or structure to wildland fires. ***No Project-specific impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, and the Tulare County 2030 General Plan EIR, the 1990 City of Kingsburg General Plan.

The Project site in not located in wildlands and will result in ***No Impact*** to the growth of wildlands. ***No Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** to this Checklist Item will occur.

ACRONYMS

(CDF/CalFire) California Department of Forestry
CERCLA) Comprehensive Environmental Response, Compensation and Liability Act
(DOE) Department of Energy
(DTSC) Cal/EPA Department of Toxic Substance Control
(HMTA) Hazardous Materials Transportation Act of 1975
(HWMP) Hazardous Waste Management Program
(HWTS) Hazardous Waste Tracking System
(LUST) Leaking Underground Tank
(NCP) National Contingency Plan
(USFS) United States Forest Service

DEFINITIONS

Hazardous Waste Generators - Hazardous waste generators can be classified in three groups depending on the quantity of waste generated in any month. A Conditionally Exempt Small Quantity Generator (CESQG) is defined in regulation as a generator of less than 100 kilograms of hazardous waste in a calendar month. A Small Quantity Generator (SQG) is a generator of greater than 100 kg and less than 1000 kg of hazardous waste in a calendar month. A Large Quantity Generator (LQG) generates greater than 1000 kg of hazardous waste in a calendar month. Determination of whether a facility is a CESQG, SQG, or LQG is the responsibility of the generator. The designation may change during the year, based on the quantity of hazardous waste produced during a particular month. Specific hazardous waste materials may also be exempt from the monthly total quantity. Therefore, the Certified Unified Program Agencies (CUPA) cannot authoritatively designate the number of generators within each of the earlier categories.

Small Quantity Generators - CUPA has designated 58 active and 30 inactive small quantity generators (SQG's). The total estimated quantities of hazardous waste generated within Tulare County by active and inactive SQG's during calendar year 2002 were 121.7 and 56.3 tons, respectively.

Large Hazardous Waste Producers - CUPA has designated 23 active and 3 inactive large quantity generators (LQG's). The total estimated quantities of hazardous waste generated within Tulare County by active and inactive LQG's during calendar year 2002 were 559.7 and 121.6 tons, respectively.

Storage Facilities - According to available information from the agencies (Department of Toxic Substances Control [DTSC] and RWQCB) that oversee treatment, storage and disposal facilities (TSDFs), there are no facilities authorized for the storage of hazardous waste in Tulare County.

Disposal Facilities - According to available information from the agencies (DTSC and RWQCB) that oversee treatment, storage and disposal facilities (TSDFs), there are no facilities authorized for the disposal of hazardous waste in Tulare County.

Planned Treatment, Storage and Disposal Facilities - According to information available to the CUPA, there are no new treatment, storage and disposal facilities proposed in Tulare County.

REFERENCES

Cal/EPA Cortese List background, https://calepa.ca.gov/sitecleanup/corteselist/Background/ Accessed November, 2017.
CEQA Guidelines, Section 15126.2 (a)

Tulare County Association of Governments Regional Transportation Plan, Page 1-11

Tulare County Environmental Health Webpage, https://tularecountyeh.org/eh/ Accessed November, 2017.

Tulare County General Plan 2030 Update Background Report, page 8-26, -27, -28, -29, -30, -31, -32. http://generalplan.co.tulare.ca.us/documents/GeneralPlan2010/BackgroundReport.pdf Accessed November, 2017.

Tulare County General Plan 2030 Update Draft 2008 Background Report, pages 8-31 and 8-32 http://generalplan.co.tulare.ca.us/documents/GeneralPlan2008/Background%20Report%20(Part%205).pdf Accessed November, 2017.

US Department of Energy, The Office of Health, Safety and Security, https://energy.gov/ehss/environment-health-safety-security Accessed November, 2017.

Hydrology and Water Quality
Chapter 3.9

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts with Mitigation*** related to Hydrology and Water Quality. A detailed review of potential impacts is provided in the following analysis.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to Hydrology and Water Quality. As required in Section 15126, all phases of the proposed Project will be considered was part of the potential environmental impact.

As noted in 15126.2 (a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area, as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1]

The environmental setting provides a description of the Hydrology and Water Quality in the County. The regulatory setting provides a description of applicable Federal, State and Local regulatory policies that were developed in part from information contained in the Tulare

[1] CEQA Guidelines, Section 15126.2 (a)

County 2030 General Plan, Tulare County General Plan Background Report and/or Tulare County General Plan Revised DEIR incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

Thresholds of Significance

The thresholds of significance for this section are established by the CEQA checklist item questions. The following are potential thresholds for significance.

- Project not in compliance with the regulations outlined by the State Water Resources Control Board.
- Project not in compliance with the regulations by the Regional Water Quality Control Board.
- Design of stormwater facilities will not adequately protect surface water quality.
- Project will cause erosion.
- Project will alter watercourse and increase flooding impacts.
- Project's water usage not assessed in the Tulare County 2030 General Plan (General Plan Amendment, Zone Change, etc.).
- Project that will impact service levels of a Water Services District.
- Project includes or requires an expansion of a Water Service District.
- Project in flood zone.
- Project will create a flood safety hazard.
- Project located immediately downstream of a dam.
- Project violate any water quality standards or waste discharge requirements.
- Project will substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
- Project will substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
- Project will substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.
- Project will create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

- Project will otherwise substantially degrade water quality; place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Project will place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- Project will expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; and/or be subject to inundation by seiche, tsunami, or mudflow.

ENVIRONMENTAL SETTING

"The Tulare Lake Hydrologic Region covers approximately 10.9 million acres (17,050 square miles) and includes all of Kings and Tulare counties and most of Fresno and Kern counties (Figure TL-1 [of the California Water Plan Update 2013 and Figure 3.9-1 in this DEIR]). The San Joaquin Valley is divided into the San Joaquin River and the Tulare Lake regions by the San Joaquin River with the Tulare Lake region in the southern portion. Historically, the valley floor in this region had been a complex series of interconnecting natural sloughs, canals, and marshes.

The economic development of the region is closely linked to the surface water and groundwater resources of the Tulare Lake region. Major rivers draining into the Tulare Lake region include the Kings, Kaweah, Tule, and Kern rivers. The original ecological character of the area has been changed dramatically, largely from the taming of local rivers for farming. In the southern portion of the region, significant geographic features include the lakebeds of the former Buena Vista/ Kern and Tulare lakes, comprising the southern half of the region; the Coast Ranges to the west; the Tehachapi Mountains to the south; and the southern Sierra Nevada to the east.

The Tulare Lake region is one of the nation's leading agricultural production areas, growing a wide variety of crops on about 3 million irrigated acres. Agricultural production has been a mainstay of the region since the late 1800s. However, since the mid-1980s, other economic sectors, particularly the service sector, have been growing."[2]

The Tulare Lake Hydrologic Region has watershed areas (surface water) and groundwater sub-basin areas as seen in **Figures 3.9-1 and 3.9-2**.

Watershed (Surface Water)

"The Tulare Lake region is divided into several main hydrologic subareas: the alluvial fans from the Sierra foothills and the basin subarea (in the vicinity of the Kings, Kaweah, and Tule rivers and their distributaries); the Tulare Lake bed; and the southwestern uplands. The alluvial fan/basin subarea is characterized by southwest to south flowing rivers, creeks, and irrigation canal systems that convey surface water originating from the Sierra Nevada. The dominant hydrologic features in the alluvial fan/basin subarea are the Kings, Kaweah, Tule, and Kern

[2] Water Quality Control Plan for the Tulare Lake Basin, page I-1

rivers and their major distributaries from the western flanks of the Sierra."[3] "The largest river in terms of runoff is the Kings River, which originates high in Kings Canyon National Park and generally trends southwest into Pine Flat Lake. Downstream of Pine Flat Dam, the river flows south and west toward Tulare Lake.[4] The Kaweah River begins in Sequoia National Park, flows west and southwest, and is impounded by Terminus Dam. It subsequently spreads into many distributaries around Visalia and Tulare trending toward Tulare Lake. The Tule River begins in Sequoia National Forest and flows southwest through Lake Success toward Tulare Lake."[5]

"Groundwater Aquifers and Wells

Groundwater resources in the Tulare Lake region are supplied by both alluvial and fractured rock aquifers. Alluvial aquifers are composed of sand and gravel or finer grained sediments, with groundwater stored within the voids, or pore space, between the alluvial sediments. Fractured-rock aquifers consist of impermeable granitic, metamorphic, volcanic, and hard sedimentary rocks, with groundwater being stored within cracks, fractures, or other void spaces. The distribution and extent of alluvial and fractured-rock aquifers and water wells vary significantly within the region. A brief description of the aquifers for the region is provided below.

Alluvial Aquifers

The Tulare Lake Hydrologic Region contains 12 groundwater basins and 7 subbasins recognized in California Department of Water Resources (DWR) *Bulletin 18-2003* (California Department of Water Resources 2003) and underlie approximately 8,400 square miles, or about 50 percent of the region. The majority of the groundwater in the region is stored in alluvial aquifers. Figure TL-3 [of the California Water Plan Update 2013] shows the location of the alluvial groundwater basins and subbasins and Table TL-1 [of the California Water Plan Update 2013] lists the associated names and numbers. Pumping from the alluvial aquifers in the region accounts for about 38 percent of California's total average annual groundwater extraction. The most heavily used groundwater basins in the region include Kings, Westside, Kaweah, Tulare Lake, Tule, and Kern County. These basins account for approximately 98 percent of the average 6.3 million acre-feet (maf) of groundwater pumped annually during the 2005-2010 period. Groundwater wells in the San Joaquin Valley extend to depths of more than 1,000 feet (Page 1986). Based on a series of irrigation pump tests, groundwater pumping rates in the various subbasins were determined to range from about 650 gallons per minute (gpm) to about 1,650 gpm (Burt 2011).

The 12 alluvial basins outside the San Joaquin Valley Basin are Panoche Valley and Vallecitos Creek Valley in the Coast Ranges; Kern River Valley and Walker Basin Creek Valley in the Sierra Nevada; and Cummings Valley, Tehachapi Valley West, Castaic Lake Valley, Brite Valley, Cuddy Canyon Valley, Cuddy Ranch Area, Cuddy Valley, and Mil Potrero Area in the Tehachapi Mountains.

[3] Department of Water Resources California Water Plan Update 2013 Regional Reports Volume 2, Tulare Lake Hydrologic Region Groundwater Update (California Water Plan Update 2013). Page TL-11.
[4] Op. Cit. TL-12.
[5] Op. Cit.

Figure 3.9-1 – Groundwater Basins and Subbasins Within the Tulare Lake Hydrologic Region

Figure 3.9-2 Tulare Lake Hydrologic Region

Fractured-Rock Aquifers

Fractured-rock aquifers are generally found in the mountain and foothill areas adjacent to alluvial groundwater basins. Due to the highly variable nature of the void spaces within fractured-rock aquifers, wells drawing from fractured-rock aquifers tend to have less capacity and less reliability than wells drawing from alluvial aquifers. On average, wells drawing from fractured-rock aquifers yield 10 gpm or less. Although fractured-rock aquifers are less productive compared to alluvial aquifers, they commonly are the critical sole source of water for many communities. Information related to fractured-rock aquifers in the region was not developed as part of Update 2013.

More detailed information regarding the aquifers in the Tulare Lake Hydrologic Region is available online from Update 2013, Volume 4, *Reference Guide*, the article, "California's Groundwater Update 2013," and in DWR *Bulletin 118-2003* (California Department of Water Resources 2003)."[6]

Surface Water Quality

"Surface water quality in the Basin is generally good, with excellent quality exhibited by most eastside streams. The Regional Water Board intends to maintain this quality."[7] Specific objectives outlined in the Water Quality Control Plan are listed below: [8]

- **Ammonia:** Waters shall not contain un-ionized ammonia in amounts which adversely affect beneficial uses. In no case shall the discharge of wastes cause concentrations of un-ionized ammonia (NH3) to exceed 0.025 mg/l (as N) in receiving waters.
- **Bacteria:** In waters designated REC-1, the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the total number of samples taken during any 30-day period exceed 400/100 ml.
- **Biostimulatory Substances:** Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.
- **Chemical Constituents:** Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.
- **Color:** Waters shall be free of discoloration that causes nuisance or adversely affects beneficial uses.
- **Dissolved Oxygen:** Waste discharges shall not cause the monthly median dissolved oxygen concentrations (DO) in the main water mass (at centroid of flow) of streams and above the thermocline in lakes to fall below 85 percent of saturation concentration, and the 95 percentile concentration to fall below 75 percent of saturation concentration.

[6] Op. Cit. TL-13 thru TL-17.
[7] Water Quality Control Plan for the Tulare Lake Basin, page III-3
[8] Ibid. III-2 to III-7

- **Floating Material:** Waters shall not contain floating material, including but not limited to solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.
- **Oil and Grease:** Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
- **pH:** The pH of water shall not be depressed below 6.5, raised above 8.3, or changed at any time more than 0.3 units from normal ambient pH.
- **Pesticides:** Waters shall not contain pesticides in concentrations that adversely affect beneficial uses.
- **Radioactivity:** Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life
- **Salinity:** Waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use of the water resources.
- **Sediment:** The suspended sediment load and suspended sediment discharge rate of waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
- **Settleable Material:** Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
- **Tastes and Odors:** Waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance, adversely affect beneficial uses, or impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to domestic or municipal water supplies.
- **Temperature:** Natural temperatures of waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.
- **Toxicity:** All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life…
- **Turbidity:** Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.

Specific objectives outlined in the Water Quality Control Plan are listed as follows:

- **"Bacteria:** In ground waters designated MUN, the concentration of total coliform organisms over any 7-day period shall be less than 2.2/100 ml.
- **Chemical Constituents:** Ground waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.
- **Pesticides:** No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.

- **Radioactivity:** Radionuclides shall not be present in ground waters in concentrations that are deleterious to human, plant, animal, or aquatic life, or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.
- **Salinity:** All ground waters shall be maintained as close to natural concentrations of dissolved matter as is reasonable considering careful use and management of water resources.
- **Tastes and Odors:** Ground waters shall not contain taste- or odor producing substances in concentrations that cause nuisance or adversely affect beneficial uses.
- **Toxicity:** Ground waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial use(s)."[9]

According to the California Water Plan, the key ground water quality issues include the following.

> **"Salinity:** Salinity is the primary contaminant affecting water quality and habitat in the Tulare Lake region. Because the groundwater basin in the San Joaquin Valley portion of the region is an internally drained and closed basin, salts, much of which are introduced into the basin with imported water supplies, build up in the soil and groundwater. Salt contained in the imported water supply is the primary source of salt circulating in the Tulare Lake region. The California Aqueduct, Friant-Kern Canal, and to a less extent Delta Mendota Canal supply most of the higher quality surface irrigation water in the Tulare Lake region. The quality of this supply may be impaired by the recirculation of salts from the San Joaquin River to the Delta Mendota Canal intake pump, leading to a greater net accumulation of salts in the basin. Delivery data from the two major water projects in California indicate there is a substantial amount of salt being transported from the Delta to other basins throughout the state. Annual import of salt into the Tulare Lake region is estimated to be 1,206 thousand tons of salt. In situ dissolution of salts and pumping from the underlying confined aquifer are important secondary sources.
>
> **Sedimentation and Erosion:** In the Central Valley, erosion is occurring from the headwaters down to the valley floor. Although naturally occurring, erosion can be accelerated by timber harvest activities, land use conversion, rural development, and grazing. Excessive soil erosion and sediment delivery can impact the beneficial uses of water by (1) silting over fish spawning habitats; (2) clogging drinking water intakes; (3) filling in pools creating shallower, wider, and warmer streams and increasing downstream flooding; (4) creating unstable stream channels; and (5) losing riparian habitat. Timber harvesting in the riparian zone can adversely affect stream temperatures by removing stream shading, a concern for spawning and rearing habitat for salmonids. Thousands of miles of streams are potentially impacted, and the lack of resources has prevented a systematic evaluation of these impacts.

[9] *Water Quality Control Plan for the Tulare Lake Basin. Pages III-7 and III-8.*

Nitrates and Groundwater Contaminates: Groundwater is a primary water supply, but in many places it is impaired or threatened because of elevated levels of nitrates and salts that are derived principally from irrigated agriculture, dairies, discharges of wastewater to land, and from disposal of sewage from both community wastewater systems and septic tanks. As population has grown, many cities have struggled to fund improvements in wastewater systems. High TDS content of west-side water is due to recharge of streamflow originating from marine sediments in the Coast Range.

Naturally occurring arsenic and human-made organic chemicals—pesticides and industrial chemicals—in some instances have contaminated groundwater that is used as domestic water supplies in this region. In some cases, nitrates are from natural sources. Agricultural pesticides and herbicides have been detected throughout the valley, but primarily along the east side where soil permeability is higher and depth to groundwater is shallower. The most notable agricultural contaminant is DBCP, a now-banned soil fumigant and known carcinogen once used extensively on grapes."[10]

Surface Water Supply

"Surface water supplies for the Tulare Lake Basin include developed supplies from the Central Valley Project (CVP), the State Water Project (SWP), rivers, and local projects. Surface water also includes the supplies for required environmental flows. Required environmental flows are comprised of undeveloped supplies designated for wild and scenic rivers, supplies used for instream flow requirements, and supplies used for Bay-Delta water quality and outflow requirements. Finally, surface water includes supplies available for reapplication downstream. Urban wastewater discharges and agricultural return flows, if beneficially used downstream, are examples of reapplied surface water."[11]

"Along the eastern edge of the valley, the Friant-Kern Canal is used to divert San Joaquin River water from Millerton Lake for delivery to agencies extending into Kern County. All of the Tulare Lake region's streams are diverted for irrigation or other purposes, except in the wettest years. Historically, they drained into Tulare Lake, Kern Lake, or adjacent Buena Vista Lake. The latter ultimately drained to Tulare Lake, which is about 30 feet lower in elevation."[12]

"The Kings, Kaweah, Tule, and Kern Rivers, which drain the west face of the Sierra Nevada Mountains, are of excellent quality and provide the bulk of the surface water supply native to the Basin. Imported surface supplies, which are also of good quality, enter the Basin through the San Luis Canal/California Aqueduct System, Friant-Kern Canal, and the Delta- Mendota Canal. Adequate control to protect the quality of these resources is essential, as imported surface water supplies contribute nearly half the increase of salts occurring within the Basin."[13]

[10] California Water Plan Update 2009, Tulare Lake. Ppage TL-22 to TL-24.
[11] Tulare County General Plan 2030 Update, Background Report. Page 10-7
[12] California Water Plan Update 2009, Tulare Lake. Page TL-5
[13] Water Quality Control Plan for the Tulare Lake Basin. Page I-1

Groundwater Supply

"Surface water supplies tributary to or imported for use within the Basin are inadequate to support the present level of agricultural and other development. Therefore, ground water resources within the valley are being mined to provide additional water to supply demands."[14]
"Tulare Lake region's groundwater use rises and falls contingent on the availability of both local and imported surface supplies. The management of water resources within this region is a complex activity and critical to the region's agricultural operations. Local annual surface supplies are determined by the amount of runoff from the Sierra Nevada watersheds, the flows captured in local reservoirs, and carryover storage over a series of years. Imported surface supply availability is contingent not only on runoff in any year or series of years but also by regulations determining the amount of water that can be pumped month to month from the Sacramento-San Joaquin River Delta due to fishery and other concerns. The recent San Joaquin River settlement will reduce the overall volume of water available for diversion into the Friant-Kern Canal. The new biological opinion on the Operating Criteria and Plan (OCAP) for the SWP and CVP will impact surface water supplies to south-of-Delta water users."[15]

"Groundwater in Tulare County occurs in an unconfined state throughout, and in a confined state beneath its western portion. Extensive alluvial fans associated with the Kings, Kaweah, and Tule Rivers provide highly permeable areas in which groundwater in the unconfined aquifer system is readily replenished. Interfan areas between the streams contain less permeable surface soils and subsurface deposits, impeding groundwater recharge and causing well yields to be relatively low. The mineral quality of groundwater in Tulare County is generally satisfactory for all uses."[16]
"Groundwater recharge is primarily from natural streams, other water added to streambeds, from deep percolation of applied irrigation water, and from impoundment of surface water in developed water bank/percolation ponds."[17]

"The Tulare Lake region has experienced water-short conditions for more than 100 years, which has resulted in a water industry that has consciously developed—through careful planning, management and facility design—the possibility of a shortage occurring in any year. Water demand is more or less controlled by available, reliable long-term water supplies. Over the years, agricultural acreage has risen and dropped largely based on water supplies. The region initially developed with surface water supplies; but local water users learned these supplies could widely vary in volume from year to year and drought conditions could quickly develop. The introduction of deep well turbines resulted in a dramatic rise in groundwater use in the early 1900s, subsequently resulting in dropping groundwater levels and land subsidence. Surface water storage and conveyance systems built to alleviate the overuse of groundwater provided an impounded supply of water that could be used during years with deficient surface water. This resulted in a regional reliance on conjunctive water use in the development of the local water economy. Efforts to address Delta environmental issues and the subsequent loss of surface water to the region is increasing groundwater use and creating concern that additional pumping will increase subsidence."[18]

[14] Water Quality Control Plan for the Tulare Lake Basin, page I-1
[15] Ibid. Pages TL-15 to TL-17
[16] Tulare County General Plan 2030 Update Background Report, page 10-11
[17] California Water Plan Update 2009, Tulare Lake, page TL-17
[18] California Water Plan Update 2009, Tulare Lake. TL-19

According to the 2013 California Water Plan, water storage has fluctuated between 2003 and 2010. The data suggests that variations occur as a result of changing precipitation levels as seen in Figure 3.9-2.

Table 3.9-1
Tulare Lake Hydrologic Water Balance for 2003-2010 (thousand acre-feet)[19]

Tulare Lake Region	Water Year							
	2003	2004	2005	2006	2007	2008	2009	2010
Water Entering the Region								
Precipitation	12,137	11,964	19,939	17,135	7,031	10,724	9,945	16,185
Inflow from Oregon/Mexico	0	0	0	0	0	0	0	0
Inflow from Colorado River	0	0	0	0	0	0	0	0
Imports from Other Regions	3,696	4,239	5,174	5,944	4,434	2,797	2,704	4,456
Total	**17,311**	**16,780**	**22,848**	**23,079**	**11,465**	**13,521**	**12,649**	**20,641**
Water Leaving the Region								
Consumptive Use of Applied Water	7,667	8,221	6,953	7,376	8,214	8,592	8,684	7,668
Outflow to Oregon/Nevada/Mexico	0	0	0	0	0	0	0	0
Exports to Other Regions	1,898	1,961	1,724	2,269	2,053	1,215	1,204	1,502
Statutory Required Outflow to Salt Sink	0	0	0	0	0	0	0	0
Additional Outflow to Salt Sink	458	457	300	468	456	514	456	456
Evaporation, Evapotranspiration of Native Vegetation, Groundwater Subsurface Outflows, Natural and Incidental Runoff, Ag Effective Precipitation & Other Outflows	10,090	10,342	13,297	13,241	5,303	8,528	7,667	13,095
Total	**20,113**	**20,981**	**22,274**	**23,350**	**16,026**	**18,849**	**18,011**	**22,721**
Storage Changes in Region: [+] Water added to storage, [-] Water removed from storage								
Change in Surface Reservoir Storage	173	-199	680	-108	-473	-59	101	259
Change in Groundwater Storage	-2975	-4,002	-106	163	-4,088	5,269	5,463	2,339
Total	**-2,802**	**-4,201**	**574**	**-4,256**	**-4,088**	**-5,329**	**-5,362**	**-2,080**

"Groundwater overdraft is expected to decline statewide by 2020. The reduction in irrigated acreage in drainage problem areas on the west side of the San Joaquin Valley is expected to reduce groundwater demands in the Tulare Lake region by 2020."[20] According to the 2009 California Water Plan Update, it is anticipated that there will be a 550,000 acre-feet reduction in

[19] Ibid.
[20] Department of Water Resources California Water Plan Update 2013, Tulare Lake/ Page TL-54.

the water demand in the Tulare Lake Hydrologic Area under Current Growth trends. Slow & Strategic Growth trends may further decrease water demand, while Expansive Growth trends may increase water demand.

"There are 19 entities in Tulare County with active programs of groundwater management. These management programs include nearly all types of direct recharge of surface water. Groundwater recovery is accomplished primarily through privately owned wells. Among the larger programs of groundwater management are those administered by the Kaweah Delta Water Conservation District, the Kings River Water Conservation District, the Tulare Irrigation District, the Lower Tule Water Users Association, and the Alta Irrigation District, utilizing water from the Friant-Kern Canal and local streams. The Kings River Water Conservation District covers the western county."[21]

Irrigation Districts in Tulare County

"The Tulare County Resource Management Agency maintains a list of special districts that provide sewer and/or water service that cannot currently meet the demand of new development projects. The list provided by Tulare County RMA (last updated April 30, 2007) indicates that following water and/or sewer districts are either under a temporary cease and desist order by the Regional Water Control Board prohibiting any new connections, or have other limitations for water and sewer connections."[22]

- Alpaugh Joint Powers Authority Water District;
- Cutler Public Utility District;
- Delft Colony Zone of Benefit (County RMA);
- Earlimart Public Utility District;
- El Rancho Zone of Benefit (County RMA);
- Orosi Public Utility District;
- Pixley Public Utility District;
- Pratt Mutual Water Company;
- Richgrove Public Utility District;
- Seville Zone of Benefit (County RMA);
- Seville Water Company;
- Springville Public Utility District;
- Tooleville Zone of Benefit (County RMA);
- Traver Zone of Benefit (County RMA); and
- Well Tract Zone of Benefit (County RMA)"[23]

[21] Ibid. Page 10-12
[22] California Water Plan Update 2009, Tulare Lake, page TL-17
[23] Department of Water Resources, 2009. California Water Plan Update, Tulare Lake. Page TL-17.

Table 3.9-2
Irrigation Districts in Tulare County[24]

Entity	Surface Water	Imported Water Source	Groundwater Extraction
Alpaugh Irrigation District	NA	Friant-Kern Canal (1,000af average)	19,000 af
Alta Irrigation District	King River	Friant-Kern Canal (surplus)	230,000 af
Delano-Earlimart Irrigation District	NA	Friant-Kern Canal (146,050 af average)	8,000 af
Exeter Irrigation District	NA	Friant-Kern Canal (1,000 af average)	14,000 af
Hills Valley Irrigation District	NA	Cross Valley Canal (2,000 af average)	1,000 af
Ivanhoe Irrigation District	Kaweah River	Friant-Kern Canal (11,650 af average)	15,000 af
Kaweah Delta Water Cons. District	Kaweah River	Friant-Kern Canal (24,000 af average)	130,000 af
Kern-Tulare Water District	Kern River	Cross Valley Canal (41,000 af average)	33,000 af
Lindmore Irrigation District	NA	Friant-Kern Canal (44,000 af average)	28,000 af
Lower Tulare River Irrigation Dist.	Tule River	Friant-Kern Canal (180,200 af average) Cross Valley Canal (31,000 af average)	NA
Lindsay-Strathmore Irrigation District	NA	Friant-Kern Canal (24,150 af average)	NA
Orange Cove Irrigation District	NA	Friant-Kern Canal (39,200 af average)	30,000 af
Pioneer Water Irrigation District	Tule River		3,000 af
Pixley Irrigation District	NA	Friant-Kern Canal (1,700 af average) Cross Valley Canal (31,000 af average)	130,000 af
Porterville Irrigation District	Tule River	Friant-Kern Canal (31,000 af average)	15,000 af
Rag Gulch Water District	Kern River	Friant-Kern Canal (3,700 af average) Cross Valley Canal (13,300 af average)	
Saucelito Irrigation District	Tule River	Friant-Kern Canal (37,600 af average)	15,000 af
Stone Corral Irrigation District	NA	Friant-Kern Canal (10,000 af average)	5,000 af
Teapot Dome Irrigation District	NA	Friant-Kern Canal (5,600 af average)	
Terra Bella Irrigation District	NA	Friant-Kern Canal (29,000 af average)	2,000 af
Tulare Irrigation District	Kaweah River	Friant-Kern Canal (100,500 af average)	65,000 af

[24] Bookman-Edmonston Engineering Inc. Water Resources Management in the Southern San Joaquin Valley, Table A-1.

Flooding

"Flooding is a natural occurrence in the Central Valley because it is a natural drainage basin for thousands of watershed acres of Sierra Nevada and Coast Range foothills and mountains. Two kinds of flooding can occur in the Central Valley: general rainfall floods occurring in the late fall and winter in the foothills and on the valley floor; and snowmelt floods occurring in the late spring and early summer. Most floods are produced by extended periods of precipitation during the winter months. Floods can also occur when large amounts of water (due to snowmelt) enter storage reservoirs, causing an increase in the amount of water that is released."[25]

"Floods in the Tulare Lake Hydrologic Region can be caused by heavy rainfall; by dams, levees, or other engineered structures failing; or by extreme wet-weather patterns. Historically, in the Tulare Lake region flooding originates principally from melting of the Sierra snowpack and from rainfall. Flooding from snowmelt typically occurs in the spring and has a lengthy runoff period. Flooding in the region was intermittent, with severe flooding some years and drought in other years. Flash and slow-rise flooding are the most commonly experienced types of flooding in this hydrologic region. Floods that occur in the Tulare Lake region take a variety of forms and can be classified into flash, alluvial fan, debris flow, stormwater, slow-rise, and engineered structure failure flooding. For a complete record of floods, refer *California Flood Future Report, Attachment C: Flood history of California* technical memorandum (California Department of Water Resources and the U.S. Army Corps of Engineers 2013a)."[26]

"Official floodplain maps are maintained by the Federal Emergency Management Agency (FEMA). FEMA determines areas subject to flood hazards and designates these areas by relative risk of flooding on a map for each community, known as the Flood Insurance Rate Map (FIRM). A 100-year flood is considered for purposes of land use planning and protection of property and human safety. The boundaries of the 100-year floodplain are delineated by FEMA on the basis of hydrology, topography, and modeling of flow during predicted rainstorms."[27]

"The flood carrying capacity in rivers and streams has decreased as trees, vegetation, and structures (e.g., bridges, trestles, buildings) have increased along the Kaweah, Kings, and Tule Rivers. Unsecured and uprooted material can be carried down a river, clogging channels and piling up against trestles and bridge abutments that can, in turn, give way or collapse, increasing blockage and flooding potential. Flooding can force waters out of the river channel and above its ordinary floodplain. Confined floodplains can result in significantly higher water elevations and higher flow rates during high runoff and flood events."[28]

"Dam failure can result from numerous natural or human activities, such as earthquakes, erosion, improper siting, rapidly rising flood waters, and structural and design flaws. Flooding due to dam failure can cause loss of life, damage to property, and other ensuing hazards. Damage to electric-generating facilities and transmission lines associated with hydro-electric dams could also affect life support systems in communities outside the immediate hazard area."[29]

[25] Tulare County General Plan 2030 Update Background Report, page 8-13
[26] Department of Water Resources California Water Plan Update 2009, Tulare Lake. Page TL-30
[27] Tulare County General Plan 2030 Update Background Report, page 8-14
[28] Ibid.
[29] Ibid. Page 8-17

REGULATORY SETTING

Federal Agencies & Regulations

Clean Water Act/NPDES

"The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters. The basis of the CWA was enacted in 1948 and was called the Federal Water Pollution Control Act, but the Act was significantly reorganized and expanded in 1972. "Clean Water Act" became the Act's common name with amendments in 1972… Under the CWA, EPA has implemented pollution control programs such as setting wastewater standards for industry. We have also set water quality standards for all contaminants in surface waters… The CWA made it unlawful to discharge any pollutant from a point source into navigable waters, unless a permit was obtained. EPA's National Pollutant Discharge Elimination System (NPDES) permit program controls discharges. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters."[30]

Safe Drinking Water Act

"The Safe Drinking Water Act (SDWA) is the main federal law that ensures the quality of Americans' drinking water. Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards… SDWA was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. (SDWA does not regulate private wells which serve fewer than 25 individuals.)"[31]

Environmental Protection Agency

The mission of EPA is to protect human health and the environment.
"EPA's purpose is to ensure that:

- all Americans are protected from significant risks to human health and the environment where they live, learn and work;
- national efforts to reduce environmental risk are based on the best available scientific information;
- federal laws protecting human health and the environment are enforced fairly and effectively;

[30] U.S. Environmental Protection Agency. Summary of the Clean Water Act – http://www.epa.gov/lawsregs/laws/cwa.html. Accessed June, 2014.
[31] U.S. Environmental Protection Agency. Summary of the Safe Drinking Water Act – http://water.epa.gov/lawsregs/rulesregs/sdwa/index.cfm. Accessed June, 2014.

- environmental protection is an integral consideration in U.S. policies concerning natural resources, human health, economic growth, energy, transportation, agriculture, industry, and international trade, and these factors are similarly considered in establishing environmental policy;
- all parts of society -- communities, individuals, businesses, and state, local and tribal governments -- have access to accurate information sufficient to effectively participate in managing human health and environmental risks;
- environmental protection contributes to making our communities and ecosystems diverse, sustainable and economically productive; and
- the United States plays a leadership role in working with other nations to protect the global environment."[32]

Army Corps of Engineers (Corps)

"The Department of the Army Regulatory Program is one of the oldest in the Federal Government. Initially it served a fairly simple, straightforward purpose: to protect and maintain the navigable capacity of the nation's waters. Time, changing public needs, evolving policy, case law, and new statutory mandates have changed the complexion of the program, adding to its breadth, complexity, and authority.

The Regulatory Program is committed to protecting the Nation's aquatic resources, while allowing reasonable development through fair, flexible and balanced permit decisions. The Corps evaluates permit applications for essentially all construction activities that occur in the Nation's waters, including wetlands."[33]

National Flood Insurance Program

"In 1968, Congress created the National Flood Insurance Program (NFIP) to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding."[34]

State Agencies & Regulations

The Porter-Cologne Water Quality Control Act

"Under the Porter-Cologne Water Quality Control Act (Porter-Cologne), the State Water Resources Control Board (State Board) has the ultimate authority over State water rights and water quality policy. However, Porter-Cologne also establishes nine Regional Water Quality

[32] U.S. Environmental Protection Agency. What we do. http://www.epa.gov/aboutepa/whatwedo.html. Accessed June, 2014.
[33] Army Corps of Engineers http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx. Accessed June, 2014.
[34] National Flood Insurance Program Summary: http://www.floodsmart.gov/floodsmart/pages/about/nfip_overview.jsp. Accessed June, 2014.

Control Boards (Regional Boards) to oversee water quality on a day-to-day basis at the local/regional level."[35]

State Water Quality Control Board

"The State Water Resources Control Board (State Water Board) was created by the Legislature in 1967. The joint authority of water allocation and water quality protection enables the State Water Board to provide comprehensive protection for California's waters. The State Water Board consists of five full-time salaried members, each filling a different specialty position. Board members are appointed to four-year terms by the Governor and confirmed by the Senate."[36]

Regional Water Quality Control Board

"There are nine Regional Water Quality Control Boards (Regional Boards). The mission of the Regional Boards is to develop and enforce water quality objectives and implementation plans that will best protect the State's waters, recognizing local differences in climate, topography, geology and hydrology. Each Regional Board has seven part-time members appointed by the Governor and confirmed by the Senate. Regional Boards develop "basin plans" for their hydrologic areas, issue waste discharge requirements, take enforcement action against violators, and monitor water quality."[37]

"The primary duty of the Regional Board is to protect the quality of the waters within the Region for all beneficial uses. This duty is implemented by formulating and adopting water quality plans for specific ground or surface water basins and by prescribing and enforcing requirements on all agricultural, domestic and industrial waste discharges. Specific responsibilities and procedures of the Regional Boards and the State Water Resources Control Board are contained in the Porter-Cologne Water Quality Control Act."[38]

California Department of Water Resources

"This Department's primary mission is to manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments. Other goals include:

Goal 1 - Develop and assess strategies for managing the State's water resources, including development of the California Water Plan Update.

Goal 2 - Plan, design, construct, operate, and maintain the State Water Project to achieve maximum flexibility, safety, and reliability.

Goal 3 - Protect and improve the water resources and dependent ecosystems of statewide significance, including the Sacramento-San Joaquin Bay-Delta Estuary.

[35] California Department of Water Resources. Porter-Cologne Water Quality Control Act Summary, http://ceres.ca.gov/wetlands/permitting/Porter_summary.html. Accessed June, 2014.
[36] State Water Board, http://www.waterboards.ca.gov/about_us/water_boards_structure/mission.shtml. Accessed June, 2014.
[37] California State Water Resources Control Board, http://www.waterboards.ca.gov/about_us/water_boards_structure/mission.shtml. Accessed June, 2014.
[38] Central Valley Water Quality Control Board, http://www.swrcb.ca.gov/centralvalley/about_us/. Accessed June, 2014.

Goal 4 - Protect lives and infrastructure as they relate to dams, floods, droughts, watersheds impacted by fire and disasters, and assist in other emergencies.

Goal 5 - Provide policy direction and legislative guidance on water and energy issues and educate the public on the importance, hazards, and efficient use of water.

Goal 6 - Support local planning and integrated regional water management through technical and financial assistance.

Goal 7 - Perform efficiently all statutory, legal, and fiduciary responsibilities regarding management of State long-term power contracts and servicing of power revenue bonds.

Goal 8 - Provide professional, cost-effective, and timely services in support of DWR's programs, consistent with governmental regulatory and policy requirements.[39]

SB 610 (Costa, 2001)

This Bill requires additional information to be included as part of an urban water management plan if groundwater is identified as a source of water available to the supplier. This law also requires an urban water supplier to include in the plan a description of all water supply projects and programs that may be undertaken to meet total projected water use.

SB 221 (Kuehl, 2001)

This Bill prohibits approval of a tentative subdivision map, or a parcel map for which a tentative subdivision map is not required, or a development agreement for a subdivision of property of more than 500 dwelling units unless the city or county provides written verification from the applicable public water system that a sufficient water supply is available. In addition, the law requires the city or county make a finding that sufficient water supplies are, or will be, available prior to completion of the project.

Local Policy & Regulations

Tulare County Environmental Health Services

"The Environmental Health Services Division regulates retail food sales and hazardous waste storage and disposal; inspects contaminated sites and monitors public water systems, which protects and reduces the degradation of groundwater. The Division regulates the production and shipping of milk for Tulare and Kings Counties and also serves as staff to the Tulare County Water Commission appointed by the Board of Supervisors. The goal of HHSA's Environmental Health division is to protect Tulare County's residents and visitors by ensuring that our environment is kept clean and healthy."[40] This division requires water quality testing of public water systems. Any project that involves septic tanks and water wells within Tulare County is subject to approval by this agency. All recommendations provided by this division will be added as mitigation measures to ensure reduction of environmental impacts.

[39] California Department of Water Resources website, http://www.water.ca.gov/about/mission.cfm. Accessed June, 2014.
[40] Tulare County Environmental Health Division, http://www.tularehhsa.org/index.cfm/public-health/environmental-health/. Accessed June, 2014.

Tulare County General Plan Policies

The Tulare County General Plan has a number of policies that apply to projects within County of Tulare. General Plan policies that relate to the proposed Project are listed as follows:

PF-4.14 Compatible Project Design - The County may ensure proposed development within CACUABs is compatible with future sewer and water systems, and circulation networks as shown in city plans.

AG-1.17 Agricultural Water Resources - The County shall seek to protect and enhance surface water and groundwater resources critical to agriculture.
The County shall seek to protect and enhance surface water and groundwater resources critical to agriculture.

HS-4.4 Contamination Prevention - The County shall review new development proposals to protect soils, air quality, surface water, and groundwater from hazardous materials contamination.

HS-5.2 Development in Floodplain Zones - The County shall regulate development in the 100-year floodplain zones as designated on maps prepared by FEMA in accordance with the following:

1. Critical facilities (those facilities which should be open and accessible during emergencies) shall not be permitted.
2. Passive recreational activities (those requiring non-intensive development, such as hiking, horseback riding, picnicking) are permissible.
3. New development and divisions of land, especially residential subdivisions, shall be developed to minimize flood risk to structures, infrastructure, and ensure safe access and evacuation during flood conditions.

HS-5.4 Multi-Purpose Flood Control Measures - The County shall encourage multipurpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the County's streams, creeks, and lakes. Where appropriate, the County shall also encourage the use of flood and/or stormwater retention facilities for use as groundwater recharge facilities.

HS-5.9 Floodplain Development Restrictions - The County shall ensure that riparian areas and drainage areas within 100-year floodplains are free from development that may adversely impact floodway capacity or characteristics of natural/riparian areas or natural groundwater recharge areas.

HS-5.11 Natural Design - The County shall encourage flood control designs that respect natural curves and vegetation of natural waterways while retaining dynamic flow and functional integrity.

WR-2.1 Protect Water Quality - All major land use and development plans shall be evaluated as to their potential to create surface and groundwater contamination hazards from point and non-point sources. The County shall confer with other appropriate agencies, as necessary, to assure adequate water quality review to prevent soil erosion; direct discharge of potentially harmful substances; ground leaching from storage of raw materials, petroleum products, or wastes; floating debris; and runoff from the site.

WR-2.2 National Pollutant Discharge Elimination System (NPDES) Enforcement - The County shall continue to support the State in monitoring and enforcing provisions to control non-point source water pollution contained in the U.S. EPA NPDES program as implemented by the Water Quality Control Board.

WR-2.3 Best Management Practices (BMPs) - The County shall continue to require the use of feasible BMPs and other mitigation measures designed to protect surface water and groundwater from the adverse effects of construction activities, agricultural operations requiring a County Permit and urban runoff in coordination with the Water Quality Control Board.

WR-2.4 Construction Site Sediment Control - The County shall continue to enforce provisions to control erosion and sediment from construction sites.

WR-2.5 Major Drainage Management - The County shall continue to promote protection of each individual drainage basin within the County based on the basins unique hydrologic and use characteristics.

WR-2.6 Degraded Water Resources - The County shall encourage and support the identification of degraded surface water and groundwater resources and promote restoration where appropriate.

WR-2.8 Point Source Control - The County shall work with the Regional Water Quality Control Board to ensure that all point source pollutants are adequately mitigated (as part of the California Environmental Quality Act review and project approval process) and monitored to ensure long-term compliance.

WR-3.3 Adequate Water Availability - The County shall review new development proposals to ensure the intensity and timing of growth will be consistent with the availability of adequate water supplies. Projects must submit a Will-Serve letter as part of the application process, and provide evidence of adequate and sustainable water availability prior to approval of the tentative map or other urban development entitlement.

WR-3.5 Use of Native and Drought Tolerant Landscaping - The County shall encourage the use of low water consuming, drought-tolerant and native landscaping and emphasize the importance of utilizing water conserving techniques, such as night watering, mulching, and drip irrigation.

WR-3.6 Water Use Efficiency - The County shall support educational programs targeted at reducing water consumption and enhancing groundwater recharge.

WR-3.10 Diversion of Surface Water - Diversions of surface water or runoff from precipitation should be prevented where such diversions may cause a reduction in water available for groundwater recharge.

IMPACT EVALUATION

Would the project:

a) Violate any water quality standards or waste discharge requirements?

Project Impact Analysis: ***Less Than Significant Impact With Mitigation***

Constituents found in urban runoff may degrade both surface water quality and eventually groundwater quality. Development of urban uses on the proposed project site would result in alteration in the existing site conditions and the introduction of urban pollutant sources. Urban runoff typically contains oils, grease, fuel, antifreeze, byproducts of combustion (such as lead, cadmium, nickel, and other metals) and other household pollutants. Precipitation early in the rain season displaces these pollutants into storm water resulting in high pollutant concentrations in initial wet weather runoff. This initial runoff with peak pollutant levels can be referred to as the "first flush" of storm events.

A stormwater plan was prepared by 4Creeks Engineering which analyzed the Project's hydrologic characteristics, stormwater runoff and collection system. The amount of runoff generated by the proposed project would be greater than the runoff occurring under existing conditions due to a significant increase in impervious surfaces. There would be a corresponding increase in urban runoff pollutants and "first flush" roadway contaminants such as heavy metals, oil, grease, as well as an increase in nutrients (i.e., fertilizers), and other chemicals from landscaped areas. These constituents will result in water quality impacts that have the potential to be significant.

The proposed project will be served by an onsite storm water system which is subject to the requirements of the NPDES Storm Water Permit adopted by the SWRCB. This permit requires that discharges of pollutants from areas of new development be reduced to the maximum extent practicable. Compliance with this standard requires that control measures be incorporated into the design of new development to reduce pollution discharges in site runoff over the life of the project.

The CVRWQCB is responsible for administering NPDES permit requirements, such as the use of construction and operational BMPs, to ensure that projects are in compliance with water quality standards as set forth in the CWA. The SWRCB through the creation of a Storm Water Quality Task Force has published the California Storm Water Best Management Practice Construction Handbook, which identifies a listing of acceptable BMPs to be used in meeting water standards as outlined by the CWA.

In addition, the Project will generate typical wastewater (sewer) associated with residential developments. See Section 3.18 – Utilities for a discussion regarding waste discharge requirements, wastewater characteristics and water quality standards pertaining to Project-related wastewater. The Project is within the SOI of the Selma-Kingsburg-Fowler County Sanitation District (SKF) will be connecting to this sewer system. As identified in the Will Serve letter (See Appendix I), SKF has adequate capacity and is able to accept wastewater from the proposed Project. The Project will not result in a violation of any water quality standards or waste discharge requirements. Therefore, with Mitigation, impacts related to this specific resource result in a ***Less Than Significant Impact***.

Cumulative Impact Analysis: ***Less Than Significant Impact with Mitigation***

The geographic area of this cumulative analysis is the Tulare Lake Basin. This cumulative analysis is based on information provided in the Water Quality Control Plan for the Tulare Lake Basin and the requirements of Tulare County Environmental Health.

The proposed Project will be required to comply with the all requirements of the Central Valley Water Board and Tulare County Health Services Division (TCHSD). The proposed Project will be required to comply with Central Valley Water Board and TCHSD rules/regulations and permit requirements as a component of project design features, the proposed Project will not contribute to any cumulative impacts related to this Checklist Item.

Mitigation Measure(s):

9-1 The Project applicant shall prepare a Storm Water Pollution Prevention Plan (SWPPP) according to the latest regulations to be retained onsite. The SWPPP must include best management practices that, when implemented, prevent storm water quality degradation to the extent practical by preventing sediments and other pollutants from leaving the Project site.

9-2 New sewage disposal systems shall be designed by an Engineer, Registered Environmental Health Specialist, Geologist, or other competent persons, all of whom must be registered and/or licensed professionals knowledgeable and experienced in the field of sewage disposal system and design. The specifications and engineering data for the system shall be submitted to the TCEHSD for review and approval prior to the issuance of a building permit.

Conclusion: ***Less Than Significant Impact With Mitigation***

With implementation of design features and the above mentioned Mitigation Measures, potential Project-specific and cumulative impacts related to this Checklist Item will be reduced to a ***Less Than Significant Impact***.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells

would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Project Impact Analysis: ***Less Than Significant Impact With Mitigation***

A Water Supply / Water Quality Technical Memorandum was prepared for the project (See Appendix D) and the analysis herein is based on the technical information in the Memo.

The Project site is currently in agricultural production and draws groundwater from a well on site for purposes of irrigation. However, when the Project is implemented, the existing well will be capped (and will be rendered inactive), as the Project will tie into the City of Kingsburg's water system. The Project applicant has obtained a Will-Serve letter from the water purveyor (See Appendix I).

A description of water demands is included below.

"Water use on site will be primarily from single-family homes, a multi-family component and landscaping. Water use assumptions are as follows:

- 160 single family residential units and 40 multi-family units
- 54.07 acres:
  - 47.8 for residential lots,
  - 2.54 landscaped open space/parks,
  - Remainder of acreage for roadways, etc.

Project Water Demands Based on Kingsburg UWMP

To calculate projected water use, the Kingsburg UWMP assumes 330 gallons [of water] per day per person and 2.82 persons per household (page 3-2 of the *Kingsburg Urban Water Management Plan*). This equates to 186,120 gallons [of water] per day (200 X 2.82 X 330) or 67,933,800 gallons per year, or approximately 209 acre feet [of water] per year. In addition, the 2.52 acres of landscaped open space/parks would use approximately 10 acre feet [of water] per year for a total of 219 acre feet [of water] per year. According to the California Department of Water Resources *California Single Family Water Use Efficiency Study*, approximately 53% of residential water use is used for outdoor landscape irrigation. Using this figure, if drought tolerant landscaping reduces water use 75%, then the daily per capita water use would be reduced by approximately 131 gallons per day for a total of approximately 199 gallons per day per person (330 X 53% = 174.9 reduced by 75% = 43.7 added to 330 X 47% = 198.8 gallons per day). This equates to 112,236 gallons per day or 40,966,140 gallons per year, or approximately 126 acre feet per year (plus the 10 for parks/exterior landscaping). Total water use is estimated to be 136 acre feet of water per year assuming a 75% reduction in outdoor water use using the Kingsburg UWMP assumptions.

Water Demands Based on Tulare County General Plan

The Tulare County General Plan assumes 3.5 acre feet [of water] per acre per year for single family residential units (page 11 of the General Plan *Phase I Water Supply Evaluation).* Based on 47.8 acres, this equates to approximately 168 acre feet [of water] per year. Using the same assumption of 53% of total use is for outdoor landscape irrigation, a reduction of 75% of outdoor irrigation would result in total water use of 101 acre feet per year. In addition, the 2.54 acres of landscaped open space/parks would use approximately 10 acre feet per year. Total is 111 acre feet of water per year assuming a 75% reduction in outdoor water use.

Estimated Water Use Using Kingsburg UWMP Assumptions

Estimated water use using Kingsburg UWMP	**With 50% outdoor reduction**	**With 75% outdoor reduction**	**Existing site water use***
209 acre/feet/year	154 acre/feet/year	136 acre/feet/year	121 acre/feet/year

* only takes into account the 38 acres currently in ag production, not the historical production of the entire 57 acres

Estimated Water Use Using Tulare County General Plan Assumptions

Estimated water use using County GP	**With 50% outdoor reduction**	**With 75% outdoor reduction**	**Existing site water use***
168 acre/feet/year	124 acre/feet/year	101 acre/feet/year	121 acre/feet/year

* only takes into account the 38 acres currently in ag production, not the historical production of the entire 57 acres

Water Use Comparison

The information below provides a comparison of existing (baseline) conditions versus potential water use based on full buildout of the proposed project. Existing agricultural water use is based on crop information contained in Tulare County's *Phase I Water Supply Evaluation.* The site has historically been farmed, but most recently, only 38 acres of the entire site has been farmed as follows:

- Grapes – 14 acres X 2.5 ac/ft = 35 ac/ft
- Plums – 14 acres X 3.6 ac/ft = 50.4 ac/ft
- Nectarines – 6 acres X 3.6 ac/ft = 21.6 ac/ft
- Peaches – 4 acres X 3.6 ac/ft = 14.4 ac/ft

  Total: 121.4 ac/ft

It is estimated that current farming of the 38 acres on site requires approximately 121 acre feet per year which is slightly less than Project water demands as calculated using the assumptions in Kingsburg's UWMP and slightly more than the Project water demands as calculated using the assumptions in the Tulare County General Plan."[41]

[41] Hash Farms - Water Supply Technical Memorandum (Appendix D). Pages 4-6.

In order to further reduce the demand for water from the proposed Project the following Mitigation Measures have been established to limit flows for human consumption and landscaping. Standard water conservation measures have been added as Mitigation Measures 9-9 through 9-11. In addition, per Tulare County Ordinance 3029, water efficient landscaping is required to conserve water. As noted in the Mitigation Measures 9 and10, the proposed Project shall conform to this Water Efficient Landscaping Ordinance. With the implementation of these Mitigation Measures, proposed Project impacts related to to this Checklist Item (specific to the facility expansion) will be reduced to a ***Less Than Significant Impact With Mitigation***.

Cumulative Impact Analysis: ***Less Than Significant Impact With Mitigation***

The geographic area of this cumulative analysis is the Tulare Lake Basin. This cumulative analysis is based on the information provided in the California Water Plan Update 2009, Regional Report 3, Tulare Lake.

As part of the Tulare County General Plan 2030, a number of large projects were identified in the General Plan Draft EIR. After considering these projects, it was noted in the General Plan Draft EIR that a cumulative unavoidable impact to ground water supply would occur.

As noted previously, the proposed Project will use similar amounts of water than what was historically used on the site. In addition, as Mitigation Measures 9-9 thru 9-11 (including water conservation measures) will be implemented to reduce water use, the cumulative impacts related to this Checklist Item are ***Less Than Significant With Mitigation.***

Mitigation Measure(s):

9-3 All new construction shall have water conserving fixtures (water closets, low flow showerheads, low flow sinks, etc.) New urinals shall also conserve water through waterless, zero flush, or other water conservation technique and/or technology.

9-4 The proposed Project shall conform to the Tulare County Water Efficient Landscaping Ordinance.

9-5 No ground water shall be transported off-site for any use.

Conclusion: ***Less Than Significant Impact With Mitigation***

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Project Impact Analysis: ***Less Than Significant Impact***

The proposed Project site is not located along a natural water feature such as a lake, river or stream. There is an irrigation ditch owned by Consolidated Irrigation District (CID) adjacent to the site; however, the ditch will be undergrounded and changes to the drainage pattern will not result in any impact to the irrigation ditch. The Project Applicant will be required to comply with CID requirements, standards, procedures, etc., regarding the steps necessary to underground the ditch. Additional discussion regarding undergrounding of the ditch can be found in Section 3.4 (Biological Resources). ***Less Than Significant Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County. Alteration of a stream or river would be subject to the regulations of the U.S. Army Corps of Engineers and the California Department of Fish and Wildlife.

As the proposed Project will have a *Less Than Significant Impact* on the drainage pattern of any off-site parcels, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Project Impact Analysis: ***Less Than Significant Impact***

See Response a). In addition, the proposed Project site is not located along a natural water feature such as a lake, river or stream. As noted earlier, there is an irrigation ditch owned by CID adjacent to and east of the site; however, the changes to the drainage pattern will not impact the irrigation ditch. As such, ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County. Alteration of a stream or river would be subject to the regulations of the U.S. Army Corps of Engineers and the California Department of Fish and Wildlife. As noted earlier, additional discussion regarding undergrounding of the irrigation ditch located along the eastern border of the site can be found in See Section 3.4 (Biological Resources).

The proposed Project will not affect the drainage pattern of any off-site parcels, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Project Impact Analysis: ***Less Than Significant Impact***

As noted earlier, implementation of a Storm Water Pollution Prevention Plan (SWPPP) will be required. In addition, the Project stormwater collection and storage system has been designed to provide adequate stormwater handling capacity as described in the Stormwater Master Plan. As such, ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the requirements of the Central Valley Regional Water Quality Control Board.

As noted in the SWPPP, storm water will be retained on site. As such, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

f) Otherwise substantially degrade water quality?

Project Impact Analysis: ***Less Than Significant Impact***

The proposed Project does not include elements that could degrade water quality beyond what was discussed in Item 3.9 a). ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the requirements of the Central Valley Regional Water Quality Control Board.

As noted earlier, the proposed Project does not include elements that could degrade water quality beyond what was discussed in Item 3.9 a). ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Project Impact Analysis: ***No Impact***

As identified in the FIRM Flood Insurance Rate Map for Tulare County, Panel 293 of 2550, the proposed Project and surrounding areas are located in Flood Zone X which is a flood insurance rate zone that correspond to areas outside of 100-year floodplains, areas of 100-year sheet flow flooding where average depths are less than 1 foot, areas of 100-year stream flooding where the contributing drainage area is less than 1 square mile, or areas protected from the 100-year flood by levees. ***No Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, General Plan Background Report, and/or Tulare County 2030 General Plan EIR.

The proposed Project does not include any housing units. Therefore, ***No Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Project Impact Analysis: ***No Impact***

As described earlier, the proposed Project is located in Zone X (0.2 percent chance flood). The proposed Project will not place any structures within a 100-year flood hazard area. Therefore, ***No Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, General Plan background Report, and/or Tulare County 2030 General Plan EIR.

The proposed Project will not have off site impacts related to flooding. In addition, the proposed Project will not induce additional flooding hazards. ***No Cumulative Impacts*** related to this Checklist Item will occur.

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Project Impact Analysis: ***Less Than Significant Impact***

According to the City of Kingsburg General Plan EIR, the City is located within the dam inundation zone of Pine Flat Dam which stores the waters of the Kings River (approximately 25 miles northeast of the Project's location). However, the risk of dam inundation is low and annual inspections of the dams and detention basins are conducted by Fresno Metropolitan Flood Control District personnel and by CA Division of Safety of Dams. The General Plan determined that potential impacts resulting from the effects of dam or levee failure is less than significant.

The proposed Project is not located near a major levee or dam. In addition, the proposed Project does not involve significant water storage or changing the alignment of an established watercourse. ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, General Plan background Report, and/or Tulare County 2030 General Plan EIR.

As noted earlier, the proposed Project is not located near a major levee or dam. The proposed Project will not have any impacts related to this Checklist Item on other off-site parcels. Therefore, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

j) Inundation by seiche, tsunami, or mudflow?

Project Impact Analysis: ***No Impact***

The Project site is relatively flat and is not located near a large body of water, the coast or hillsides. As such, the proposed Project is not subject to inundation by seiche, tsunami, or mudflow. ***No Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, General Plan background Report, and/or Tulare County 2030 General Plan EIR.

As noted earlier, the proposed Project is not located near a large body of water, the coast or hillsides. The proposed Project will not have any impacts related to this Checklist item on other off-site parcels. ***No Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

ACRONYMS

AF	Acre-feet
AMP	Agricultural Management Plan
CIMIS	California Irrigation Management Information System
DWR	State of California Department of Water Resources
M&I	Municipal and Industrial
MW	Megawatts
O&M	Operation and Maintenance
TDS	Total Dissolved Solids
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment

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Land Use and Planning
Chapter 3.10

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts*** to Land Use and Planning. A detailed review of potential impacts is provided in the following analysis.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to Land Use and Planning. As required in Section 15126, all phases of the proposed Project will be considered as part of the potential environmental impact.

As noted in Section 15126.2 (a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed Project. In assessing the impact of a proposed Project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the Project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the Project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision will have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1]

The environmental setting provides a description of the Land Use and Planning setting in the County. The regulatory setting provides a description of applicable Federal, State and Local regulatory policies that were developed in part from information contained in the Tulare County 2030 General Plan, Tulare County General Plan Background Report and/or Tulare County General Plan Revised DEIR incorporated by reference and summarized below. Additional

[1] CEQA Guidelines, Section 15126.2

documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

Thresholds of Significance

- Divide Community
- Conflict with applicable land use pan policy, or regulation of an agency with jurisdiction over the Project
- Conflict with applicable habitat conservation plan

ENVIRONMENTAL SETTING

Tulare County

"Tulare County is located in a geographically diverse region with the majestic peaks of the Sierra Nevada framing its eastern region, while its western portion includes the San Joaquin Valley floor, which is very fertile and extensively cultivated. In addition to its agricultural production, the County's economic base also includes agricultural packing and shipping operations. Small and medium size manufacturing plants are located in the western part of the county and are increasing in number. Tulare County contains portions of Sequoia National Forest, Sequoia National Monument, Inyo National Forest, and Kings Canyon National Park. Sequoia National Park is entirely contained within the county."[2]

"The County encompasses approximately 4,840 square miles of classified lands (lands with identified uses) and can be divided into three general topographical zones: a valley region; a foothill region east of the valley area; and a mountain region just east of the foothills. The eastern half of the county is generally comprised of public lands, including the Mountain Home State Forest, Golden Trout Wilderness area, and portions of the Dome Land and south Sierra Wilderness areas. Federal lands, which include wilderness, national forests, monuments and parks, along with County parks, make up 52 percent of the County, the largest percentage found in the County. Agricultural uses, which include row crops, orchards, dairies, and grazing lands on the Valley floor and in the foothills total over 2,020 square miles or about 43 percent of the entire County. Urban uses such as incorporated cities, communities, hamlets, other unincorporated urban uses, and infrastructure rights-of-way make up the remaining land in the County."[3]

As indicated in the 2014 Regional Transportation Plan & Sustainable Communities Strategy, Draft Environmental Impact Report (SCH #2012081070); "Tulare County is predominantly rural, and settlement patterns reflect this fact. Approximately 32% of the county's population of 455,599 people, live outside the county's eight incorporated areas (California Department of Finance, 2013). There are 21 unincorporated communities in Tulare County. Recent trends have led to housing, jobs, shopping, and recreational opportunities developing in separate locations. As a result of the separated development of jobs and housing, the urban area has grown in a way

[2] Tulare County General Plan 2030 Update RDEIR, Page 3.1-5
[3] Ibid. Page 3.1-6

that forces people to travel from one area to another. The relatively large distances between the county's population centers require well-maintained rural highways, many of which are the focus of RTP projects.

As of December 2012, about 174,900 people were employed in Tulare County and the unemployment rate was 15.7% (California Employment Development Department, 2013). By comparison, the statewide unemployment rate was 9.7% during that month, while the national rate was only 7.6%.

TCAG Traffic Model projections indicate that population in the Tulare County region is expected to grow from 466,008 people in 2010 to 700,832 by the year 2035 for an increase of approximately 50 percent. Between 2010 and 2035 employment is expected to increase by over 85,000 jobs or by almost 46 percent (TCAG, April 2010)."[4]
The proposed Project is located wholly within the City of Kingsburg Sphere of Influence.

City of Kingsburg

"The environmental setting of the Kingsburg planning area is dominated by residential, commercial and industrial use, with supporting public and semi-public facilities such as schools, churches, a hospital, government offices and public utilities… The developed urban complex encompasses an area of approximately 1,270 gross acres of land, including streets, or 2.00 square miles, and is surrounded by prime agricultural land devoted almost exclusively to vineyards and orchards."[5]

REGULATORY SETTING

Federal Agencies & Regulations

Federal Endangered Species Act

"Through federal action and by encouraging the establishment of state programs, the 1973 Endangered Species Act provided for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend. The Act:

- authorizes the determination and listing of species as endangered and threatened;
- prohibits unauthorized taking, possession, sale, and transport of endangered species;
- provides authority to acquire land for the conservation of listed species, using land and water conservation funds;
- authorizes establishment of cooperative agreements and grants-in-aid to States that establish and maintain active and adequate programs for endangered and threatened wildlife and plants;
- authorizes the assessment of civil and criminal penalties for violating the Act or regulations;

2014 Regional Transportation Plan & Sustainable Communities Strategy Program Environmental Impact Report. Page 4.10-2.
[5] Comprehensive General Plan and Environmental Impact Report for the Swedish Village of Kingsburg, July 1992. Page 23.

- authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction for any violation of the Act or any regulation issued there under."[6]

State Agencies & Regulations

California Department of Fish and Wildlife

The Mission of the Department of Fish and Wildlife (CDFW) is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public.[7] The Department of Fish and Game maintains native fish, wildlife, plant species and natural communities for their intrinsic and ecological value and their benefits to people. This includes habitat protection and maintenance in a sufficient amount and quality to ensure the survival of all species and natural communities. The department is also responsible for the diversified use of fish and wildlife including recreational, commercial, scientific and educational uses. CDFW also regulates the modification of the bed, bank, or channel of a waterway under Sections 1601-1607 of the California Fish and Game Code.[8]

California Endangered Species Act

"The California Endangered Species Act (CESA) states that all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation, will be protected or preserved. The Department will work with all interested persons, agencies and organizations to protect and preserve such sensitive resources and their habitats."[9]

Local Policy & Regulations

Tulare County Association of Governments

"[The Tulare County Association of Governments] TCAG is committed to improving the quality of life for residents and visitors throughout Tulare County. We prove our commitment by addressing congestion using a preventative approach. We coordinate regional transit programs to make getting around easy and convenient. We have improved air quality and strive to continue to meet national standards. We responsibly use the extra hard earned tax dollars that the people of Tulare County bring in to us from the passage of Measure R under the supervision of the board and citizen's review committee. We address current and future rail needs and possibilities with a forward thinking approach. We gather important data which is used by the census and the public to properly forecast housing and transit needs. We also manage the abandoned vehicle program for the county, and do a whole lot more. We are thrilled to be a part of one of the largest agricultural centers in the world, and are preparing the region for forecasted growth predicted to

[6] U.S. Fish and Wildlife Service. Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service. https://www.fws.gov/laws/lawsdigest/esact.html. Accessed March, 2015.
[7] California Department of Fish and Wildlife. Explore: Mission Statement. https://www.wildlife.ca.gov/Explore.aspx. Accessed March 2015.
[8] Tulare County General Plan 2030 Update, Background Report, Page 9-7.
[9] California Department of Fish and Wildlife. California Endangered Species Act. http://www.dfg.ca.gov/habcon/cesa/. Accessed March 2015.

make Tulare County the fastest growing region in California."[10] TCAG's 2009 Regional Blueprint includes a goal of a 25% increase in land use densities facilitated with urban growth and expansion of transportation facilities.

Tulare County General Plan Policies

The Tulare County General Plan has a number of policies that apply to projects within County of Tulare. General Plan policies that relate to the proposed Project are listed below.

PF-1.2 Location of Urban Development - The County shall ensure that urban development only takes place in the following areas:

1. Within incorporated cities and County Adopted City Urban Development Boundaries (CACUDBs);
2. Within the UDBs of adjacent cities in other counties, unincorporated communities, planned community areas, and HDBs of hamlets;
3. Within foothill development corridors as determined by procedures set forth in Foothill Growth Management Plans;
4. Within areas set aside for urban use in the Mountain Framework Plan and the mountain sub-area plans; and
5. Within other areas suited for non-agricultural development, as determined by the procedures set forth in the in the Rural Valley Lands Plan.

PF-4.1 CACUABs for Cities - The County shall establish CACUABs which define the area where land uses are presumed to have an impact upon the adjacent incorporated city, and within which the cities' concerns may be given consideration as part of the land use review process. The lands within the UAB are considered to be the next logical area in which urban development may occur and the area within which UDBs may ultimately be expanded.

PF-4.13 City Design Standards - Where the Board of Supervisors finds that it is consistent with General Plan objectives to approve development within the UDBs of incorporated cities, the County may require the project to substantiate sufficient water supply and meet the County adopted city development standards of the city in question.

PF-4.14 Compatible Project Design - The County may ensure proposed development within CACUABs is compatible with future sewer and water systems, and circulation networks as shown in city plans.

PF-4.15 Coordination with Cities on Development Proposals - The County shall ensure that urban development only take place in CACUDBs if one of the following has occurred:

1. The adjacent city does not consent to annex the property for development purposes (as evidenced through pre-zoning, development agreements, etc.); it shall be conclusively presumed that a city has not consented if it has not submitted an annexation proposal to LAFCo within six months from the date a request to annex is submitted to the city; or

[10] Tulare County Council of Governments (TCAG) Website, http://www.tularecog.org/aboutus/. Accessed May 2016.

2. Annexation is not possible under the provisions of State law, but it is determined by the County that development of the site does not constitute incompatible development.

PF-4.17 Cooperation with Individual Cities - The County may use the policies set forth under this goal (PF-4A:Cities:Continued) to work with individual cities to further manage development within that CACUDB or CACUAB to the extent that the financial needs of the County are met and the County's ability to provide facilities and County services used by all of the residents in the County and cities is enhanced. The County and cities will establish a working committee to facilitate the policies identified in this section 4A.

PF-4.27 Impacts of Development within the County on City Facilities and County Facilities - The County may work with a city to consider the adoption, imposition and collection for payment to the city pursuant to agreement in Development Impact Fees within the CACUDB, as may be proposed by the city from time to time to offset the impacts of development in the County on city facilities. Reciprocally and under the same conditions, the city will consider the collection of Development Impact Fees within the city to offset the impacts of development within the city on County facilities.

LU-3.1 Residential Developments - The County shall encourage new major residential development to locate near existing infrastructure or employment centers, services, and recreation.

LU-3.8 Rural Residential Interface - The County shall minimize potential land use conflicts at the interface between urban development and existing developed rural-residential areas.

LU-7.10 Gateways/Entry-points - The County shall identify key entry points on the edges of the communities and support programs and projects that enhance gateways and transitional zones between communities to make each community more distinctive and inviting for residents and visitors.

LU-7.16 Water Conservation - The County shall encourage the inclusion of "extra-ordinary" water conservation and demand management measures for residential, commercial, and industrial indoor and outdoor water uses in all new urban development.

PFS-1.4 Standards of Approval - The County should not approve any development unless the following conditions are met:

1. The applicant can demonstrate all necessary infrastructure will be installed and adequately financed;
2. Infrastructure improvements ae consistent with adopted County infrastructure plans and standards; and
3. Funding mechanisms are provided to maintain, operate, and upgrade the facilities throughout the lie of the project.

City of Kingsburg General Plan Policies

The City of Kingsburg General Plan has a number of policies that apply to projects within the City of Kingsburg. General Plan policies that relate to the proposed Project are listed below.

Goal 2 – Policy 3: Residential expansion should reflect the considerable variety of housing types that comprise the residential market of the region. In addition to conventional single-family detached housing, there is a strong market for small lot detached and attached (townhouse) single-family purchase housing for entry level buyers as an alternative to multi-family rentals. As an alternative to large multi-family rental projects, there also is a market for owner-occupied multi-plexes. Other alternatives are the purchase and rental condominium, the single story garden apartment and well-designed mobile home park. As an overall standard, the City will seek to maintain a 70% to 30% ratio in the combined variety of single-family units provided as compared to the combined variety of multi-family units. This percentage is a fair reflection of regional characteristics of housing market demand, and will assure that Kingsburg will meet its fair share of the regional market for housing to meet the needs of low and low-moderate income households.

Goal 4 – Policy 2, Residential Areas: Multi-family projects shall include landscaped open space in addition to yard areas required by the zoning ordinance, to be developed for the common recreation use of tenants. Minimum facilities may be required for common recreation areas. Examples include totlots for pre-school children, and passive recreation areas for lounging, dun bathing, barbecuing, quiet conversation and reading, including area to be shaded by trees and shade structures.

Goal 4 – Policy 4, Residential Areas: Multi-family site development and maintenance shall be in accordance with a comprehensive landscape development plan, including automatic irrigation.

Goal 6 – Policy 3: The City Building Department shall issue building permits consistent with the phasing of residential development established by the Planning Commission in approving subdivisions, parcel maps, PUD's and site plans.

IMPACT EVALUATION

Would the project:

a) Physically divide an established community?

Project Impact Analysis: ***No Impact***

The proposed Project is a residential subdivision on 54 acres of agricultural land immediately adjacent to the City of Kingsburg. The site is completely within the City of Kingsburg's Sphere of Influence along with Tulare County's County Approved City Urban Development Boundary (CACUDB). As such, ***No Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

With ***No*** *Project-specific Impacts*, ***No Cumulative Impacts*** will also occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Project Impact Analysis: ***Less Than Significant Impact***

Tulare County is located in the Central Valley and does not border a coastline. As such, projects located within Tulare County could not possibly impact a local coastal program.

The Project area has been in active agricultural production and is proposed for a 200-unit single and multi-family residential development, with the approval of the following actions:

- Annexation of approximately two (2) acres from Fresno County to the City of Kingsburg
- Annexation of approximately 49 acres of land in Tulare County into the Selma-Kingsburg-Fowler County Sanitation District
- Formation of a Community Facilities District and a Tulare County Service Area
- Tulare County approval of a Tentative Map
- Tulare County approval of a Special Use Permit or a Specific Plan
- City of Kingsburg approval of a Master Plan
- City of Kingsburg approval of a Tentative Map
- Detachment from Consolidated Irrigation District

Table 3.10-1 summarizes the proposed Project's consistency with all applicable objectives, goals, and policies of the Tulare County and City of Kingsburg General Plans.

Table 3.10-1 General Plan Consistency Analysis			
Chapter – Element	**No.**	**Goal/Objective/Policy Text**	**Consistency Determination**
TULARE COUNTY			
Planning Framework	**1.2**	**Location of Urban Development:** The County shall ensure that urban development only takes place in the following areas: 1. Within incorporated cities and County Adopted City Urban Development Boundaries (CACUDBs); 2. Within the UDBs of adjacent cities in other counties, unincorporated communities, planned community areas, and HDBs of hamlets; 3. Within foothill development corridors as determined by procedures set forth in Foothill Growth Management Plans; 4. Within areas set aside for urban use in the Mountain Framework Plan and the mountain sub-area plans; and 5. Within other areas suited for non-agricultural development, as determined by the procedures set forth in the in the Rural Valley Lands Plan.	**Yes:** The proposed Project will be located within the Adopted City of Kingsburg Urban Development Boundary.
Planning Framework	**4.1**	**CACUABs for Cities:** The County shall establish CACUABs which define the area where land uses are presumed to have an impact upon the adjacent incorporated city, and within which the cities' concerns may be given consideration as part of the land use review process. The lands within the UAB are considered to be the next logical area in which urban development may occur and the area within which UDBs may ultimately be expanded.	**Yes:** The proposed Project will be located within the Adopted City of Kingsburg Urban Development Boundary and as such, potential impacts are analyzed with regards to resources in Tulare County as well as the City of Kingsburg.
Planning Framework	**4.13**	**City Design Standards:** Where the Board of Supervisors finds that it is consistent with General Plan objectives to approve development within the UDBs of incorporated cities, the County may require the project to substantiate sufficient water supply and	**Yes:** The proposed Project applicant will provide a will-serve letter from the City of Kingsburg to substantiate sufficient water supply and the Project will meet the City of Kingsburg Development

Table 3.10-1 General Plan Consistency Analysis			
Chapter – Element	**No.**	**Goal/Objective/Policy Text**	**Consistency Determination**
		meet the County adopted city development standards of the city in question.	Standards.
Planning Framework	**4.14**	The County may ensure proposed development within CACUABs is compatible with future sewer and water systems, and circulation networks as shown in city plans.	**Yes:** The proposed Project will be compatible with future sewer and water systems and circulation networks as shown in the City of Kingsburg plans.
Planning Framework	**4.15**	**Coordination with Cities on Development Proposals:** The County shall ensure that urban development only take place in CACUDBs if one of the following has occurred: 1. The adjacent city does not consent to annex the property for development purposes (as evidenced through pre-zoning, development agreements, etc.); it shall be conclusively presumed that a city has not consented if it has not submitted an annexation proposal to LAFCo within six months from the date a request to annex is submitted to the city; or 2. Annexation is not possible under the provisions of State law, but it is determined by the County that development of the site does not constitute incompatible development.	**Yes:** The City of Kingsburg does not consent to annex the proposed Project site for development purposes.
Planning Framework	**4.17**	**Cooperation with Individual Cities:** The County may use the policies set forth under this goal (PF-4A:Cities:Continued) to work with individual cities to further manage development within that CACUDB or CACUAB to the extent that the financial needs of the County are met and the County's ability to provide facilities and County services used by all of the residents in the County and cities is enhanced. The County and cities will establish a working committee to facilitate the policies identified in this section 4A.	**Yes:** The City of Kingsburg and the County will ensure that the financial needs of the County are met through the development of a Community Facilities District along with a Tulare County Service Area.
Planning	**4.27**	**Impacts of Development within the**	**Yes:** The County will develop a

Table 3.10-1 General Plan Consistency Analysis			
Chapter – Element	**No.**	**Goal/Objective/Policy Text**	**Consistency Determination**
Framework		**County on City Facilities and County Facilities:** The County may work with a city to consider the adoption, imposition and collection for payment to the city pursuant to agreement in Development Impact Fees within the CACUDB, as may be proposed by the city from time to time to offset the impacts of development in the County on city facilities. Reciprocally and under the same conditions, the city will consider the collection of Development Impact Fees within the city to offset the impacts of development within the city on County facilities.	Community Facilities District and a Tulare County Service Area to financially support the proposed development. Additionally, the developer will be required to pay development impact fees for services such as sewer, water, police, fire, and schools.
Land Use	**3.1**	**Residential Developments:** The County shall encourage new major residential development to locate near existing infrastructure or employment centers, services, and recreation.	**Yes.** The proposed Project is located immediately adjacent to the City of Kingsburg and will connect to the existing infrastructure.
Land Use	**3.8**	**Rural Residential Interface:** The County shall minimize potential land use conflicts at the interface between urban development and existing developed rural-residential areas.	**Yes.** The proposed Project will be an extension of the urbanized existing City of Kingsburg. Agricultural land currently surrounds the City of Kingsburg.
Land Use	**7.10**	**Gateway/Entry-point:** The County shall identify key entry points on the edges of the communities and support programs and projects that enhance gateways and transitional zones between communities to make each community more distinctive and inviting for residents and visitors.	**Yes.** The proposed Project will be located adjacent to the southeast portion of the City of Kingsburg. It will have landscaping and signage in accordance with City of Kingsburg to enhance the aesthetics of the development.
Land Use	**7.16**	**Water Conservation:** The County shall encourage the inclusion of "extra-ordinary" water conservation and demand management measures for residential, commercial, and industrial indoor and outdoor water uses in all new urban development.	**Yes.** The proposed Project will implement a "Low Impact Development" design which will conserve water on-site.
Public Facilities and Services	**1.4**	**Standards of Approval:** The County should not approve any development unless the following conditions are met: 1. The applicant can demonstrate all necessary infrastructure	**Yes.** All criteria will be met prior to Project approval.

Table 3.10-1 General Plan Consistency Analysis			
Chapter – Element	**No.**	**Goal/Objective/Policy Text**	**Consistency Determination**
		will be installed and adequately financed; 2. Infrastructure improvements ae consistent with adopted County infrastructure plans and standards; and 3. Funding mechanisms are provided to maintain, operate, and upgrade the facilities throughout the lie of the project.	
CITY OF KINGSBURG			
Goal 2	**Policy 3**	Residential expansion should reflect the considerable variety of housing types that comprise the residential market of the region. In addition to conventional single-family detached housing, there is a strong market for small lot detached and attached (townhouse) single-family purchase housing for entry level buyers as an alternative to multi-family rentals. As an alternative to large multi-family rental projects, there also is a market for owner-occupied multi-plexes. Other alternatives are the purchase and rental condominium, the single story garden apartment and well-designed mobile home park. As an overall standard, the City will seek to maintain a 70% to 30% ratio in the combined variety of single-family units provided as compared to the combined variety of multi-family units. This percentage is a fair reflection of regional characteristics of housing market demand, and will assure that Kingsburg will meet its fair share of the regional market for housing to meet the needs of low and low-moderate income households.	**Yes.** The Project includes a portion of small lot attached single family purchase housing for entry level buyers.
Goal 4	**Policy 2**	**Residential Areas:** Multi-family projects shall include landscaped open space in addition to yard areas required by the zoning ordinance, to be developed for the common recreation use of tenants. Minimum facilities may be required for common recreation areas. Examples include totlots for pre-	**Yes.** Over two acres of landscaped open space will be developed as a part of this Project.

Table 3.10-1 General Plan Consistency Analysis			
Chapter – Element	**No.**	**Goal/Objective/Policy Text**	**Consistency Determination**
		school children, and passive recreation areas for lounging, dun bathing, barbecuing, quiet conversation and reading, including area to be shaded by trees and shade structures.	
Goal 4	**Policy 4**	**Residential Area:** Multi-family site development and maintenance shall be in accordance with a comprehensive landscape development plan, including automatic irrigation.	**Yes.** The proposed project will be developed in accordance with a landscape development plan and maintained by a Community Facilities District.
Goal 6	**Policy 3**	The City Building Department shall issue building permits consistent with the phasing of residential development established by the Planning Commission in approving subdivisions, parcel maps, PUD's and site plans.	**Yes.** The development within the City of Kingsburg will be constructed in accordance with all applicable residential development requirements of the City of Kingsburg.

The proposed Project is an appropriate use for the site, and as demonstrated in Table 3.10-1, the proposed Project will be consistent with applicable objectives, goals and policies outlined in the Tulare County General Plan 2030 Update as well as the 1992 Comprehensive General Plan for the Swedish Village of Kingsburg (Kingsburg General Plan).

Additionally, the Kingsburg General Plan summarizes its major policies by creating major statements of policy. The Annexation to the Urban Limit Line major statement of policy states:

> "Kingsburg has two boundaries which have served to limit and determine the pattern of urban expansion a southern City limit line which is coterminous with the Fresno/Tulare County boundary line, and a major irrigation canal along the east side of Madsen Avenue. The Fresno/Tulare County boundary has been particularly limiting to the City's efforts to achieve a rational urban pattern. This boundary passes diagonally through an existing residence on 21st Avenue, through the east end of the Lincoln School site, through an existing vineyard east of 21st Avenue within the City's Sphere of Influence, and through the 18th Avenue interchange with Freeway 99. Limited annexation to Fresno County and the City in these areas is proposed as a major policy of the General Plan to create opportunities for residential expansion and highway commercial development which is consistent with sound principles of urban form and municipal service. This policy is being pursued actively through a cooperative effort among affected agencies of the two counties and the City of Kingsburg."[11]

As such, ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

[11] Comprehensive General Plan and Environmental Impact Report for the Swedish Village of Kingsburg, July 1992. Page 37.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

The proposed issuance of a Special Use Permit does not include any variances and will not result in significant impact related to a conflict with a policy or plan. ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific and Cumulative Impacts*** related to this Checklist Item will occur.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

Project Impact Analysis: ***No Impact***

As noted in Chapter 3.4 Biological Resources, there are two habitat conservation plans that apply in Tulare County. The Kern Water Habitat Conservation Plan only applies to an area near Allensworth (located in southwestern Tulare County), thus the proposed Project site is not subject to this Plan. The Recovery Plan for Upland Species in the San Joaquin Valley outlines a number of species that are important to the San Joaquin Valley. None of these species were identified on the Project site. As such, ***No Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

There are ***No Impacts*** related to habitat conservation plans, and, therefore, there are ***No Cumulative Impacts*** that will conflict with local policies or ordinances.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

REFERENCES

California Department of Fish and Wildlife. California Endangered Species Act. http://www.dfg.ca.gov/habcon/cesa/. Accessed January 2016.

California Department of Fish and Wildlife. Explore: Mission Statement. https://www.wildlife.ca.gov/Explore.aspx. Accessed January 2016.

CEQA Guidelines, Section 15126.2

Comprehensive General Plan and Environmental Impact Report for the Swedish Village of Kingsburg, July 1992. Page 23, 37.

Tulare County Association of Governments. History. http://www.tularecog.org/Index.aspx?NID=103. Accessed March 2015.
Tulare County Association of Governments Regional Transportation Plan, 2011. Page 1-4, 11

Tulare County General Plan 2030 Update, Background Report, Page 9-7.
Tulare County General Plan 2030 Update RDEIR, Page 3.1-5, 6

U.S. Fish and Wildlife Service. Digest of Federal Resource Laws of Interest to the U.S. Fish and Wildlife Service. http://www.fws.gov/laws/lawsdigest/esact.html. Accessed March, 2015.

Mineral Resources
Chapter 3.11

SUMMARY OF FINDINGS

The proposed Project will result in ***No Impacts*** related to Mineral Resources, as the proposed Project site is not located near a known mineral resource area. No mitigation measures will be required. A detailed review of potential impacts is provided in the following analysis.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to Mineral Resources. As required in Section 15126, all phases of the proposed Project will be considered as part of the potential environmental impact.

As noted in 15126.2(a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1]

The "Environmental Setting" provides a description of the Mineral Resources in the County. The "Regulatory Setting" provides a description of applicable Federal, State and Local regulatory policies that were developed in part from information contained in the Tulare

[1] CEQA Guidelines, Section 15126.2 (a)

County General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, and/or Tulare County General Plan 2030 Update Recirculated Draft EIR (RDEIR) incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

Thresholds of Significance

The Tulare County General Plan 2030 Update identifies known Mineral Resource areas.[2] The threshold of significance for this section will include the following:

- Impact a known Mineral Resource
- Site located in a Mineral Resource Zone area (as noted in the General Plan)

ENVIRONMENTAL SETTING

"There is estimated to be a total of 932 million tons of aggregate resources in Tulare County. This figure includes 219 million tons of reserves available for mining and 200 million tons that are located in the hard rock quarries southeast of Porterville. Of that total, 19 million tons are located in Northern Tulare County, which is expected to be depleted by the year 2010 unless new resources are permitted for mining. Lemon Cove has been the most highly extracted area for PCC quality aggregate supplies."[3]

"Economically, the most important minerals that are extracted in Tulare County are sand, gravel, crushed rock and natural gas. Other minerals that could be mined commercially include tungsten, which has been mined to some extent, and relatively small amounts of chromite, copper, gold, lead, manganese, silver, zinc, barite, feldspar, limestone, and silica. Minerals that are present but do not exist in the quantities desired for commercial mining include antimony, asbestos, graphite, iron, molybdenum, nickel, radioactive minerals, phosphate, construction rock, and sulfur... The majority of these activities appear to occur in the Sierra Foothill Area."[4]

Figure 3.11-1 is taken from the Tulare County General Plan 2030 Update and depicts the identified Mineral Resources in Tulare County.

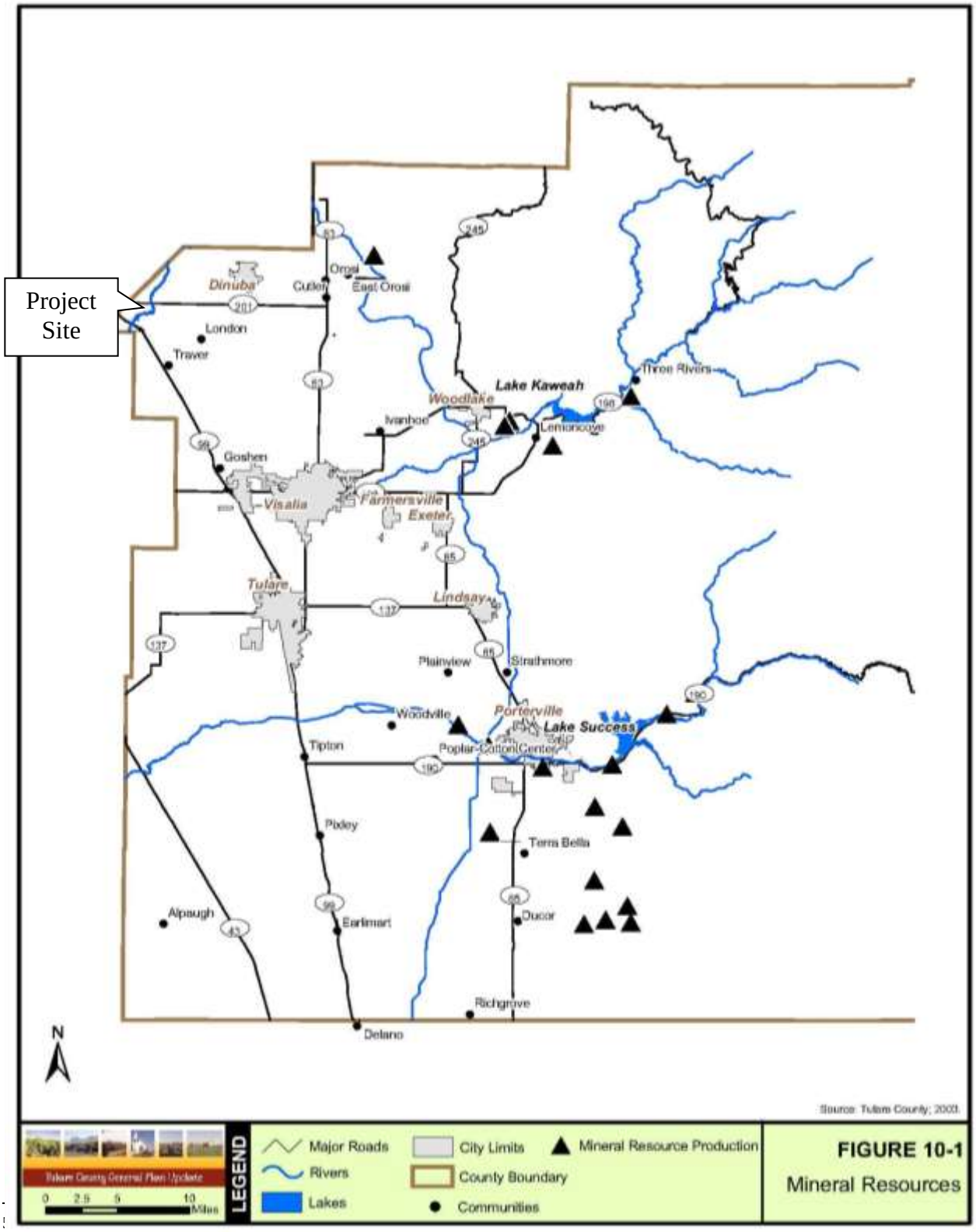
"The following MRZ categories are used by the State Geologist in classifying the State's lands. The geologic and economic data and the arguments upon which each unit MRZ assignment is based are presented in the mineral land classification report transmitted by the State Geologist to the SMGB…

A. *MRZ-1*—Areas where adequate geologic information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence. This zone is applied where well developed lines of reasoning,

[2] Tulare County General Plan 2030 Update Background Report, Figure 10-1
[3] Tulare County General Plan 2030 Update Background Report, page 10-18
[4] Ibid. Page 10-17

Figure 3.11-1

Tulare County Mineral Resource Zones[5]



based on economic-geologic principles and adequate data, indicate that the likelihood for occurrence of significant mineral deposits is nil or slight.

B. *MRZ-2a*—Areas underlain by mineral deposits where geologic data show that significant measured or indicated resources are present. As shown on the diagram of the California Mineral Land Classification System, MRZ-2 is divided on the basis of both degree of knowledge and economic factors. Areas classified MRZ-2a contain discovered mineral deposits that are either measured or indicated reserves as determined by such evidence as drilling records, sample analysis, surface exposure, and mine information. Land included in the MRZ-2a category is of prime importance because it contains known economic mineral deposits. A typical MRZ-2a area would include an operating mine, or an area where extensive sampling indicates the presence of a significant mineral deposit.

C. *MRZ-2b*—Areas underlain by mineral deposits where geologic information indicates that significant inferred resources are present. Areas classified MRZ-2b contain discovered deposits that are either inferred reserves or deposits that are presently sub-economic as determined by limited sample analysis, exposure, and past mining history. Further exploration work and/or changes in technology or economics could result in upgrading areas classified MRZ-2b to MRZ-2a. A typical MRZ-2b area would include sites where there are good geologic reasons to believe that an extension of an operating mine exists or where there is an exposure of mineralization of economic importance.

D. *MRZ-3a*—Areas containing known mineral deposits that may qualify as mineral resources. Further exploration work within these areas could result in the reclassification of specific localities into the MRZ-2a or MRZ-2b categories. MRZ-3a areas are considered to have a moderate potential for the discovery of economic mineral deposits. As shown on the diagram of the California Mineral Land Classification System, MRZ-3 is divided on the basis of knowledge of economic characteristics of the resources. An example of a MRZ-3a area would be where there is direct evidence of a surface exposure of a geologic unit, such as a limestone body, known to be or to contain a mineral resource elsewhere but has not been sampled or tested at the current location.

E. *MRZ-3b*—Areas containing inferred mineral deposits that may qualify as mineral resources. Land classified MRZ- 3b represents areas in geologic settings which appear to be favorable environments for the occurrence of specific mineral deposits. Further exploration work could result in the reclassification of all or part of these areas into the MRZ-3a category or specific localities into the MRZ-2a or MRZ-2b categories. MRZ-3b is applied to land where geologic evidence leads to

the conclusion that it is plausible that economic mineral deposits are present. An example of a MRZ-3b area would be where there is indirect evidence such as a geophysical or geochemical anomaly along a permissible structure which indicates the possible presence of a mineral deposit or that an ore-forming process was operative.

F. *MRZ-4*—Areas where geologic information does not rule out either the presence or absence of mineral resources. The distinction between the MRZ-1 and MRZ-4 categories is important for land-use considerations. It must be emphasized that MRZ-4 classification does not imply that there is little likelihood for the presence of mineral resources, but rather there is a lack of knowledge regarding mineral occurrence. Further exploration work could well result in the reclassification of land in MRZ-4 areas to MRZ-3 or MRZ-2 categories."[6]

REGULATORY SETTING

Federal Agencies & Regulations

None that apply to the proposed Project.

State Agencies & Regulations

Surface Mining and Reclamation Act of 1975 (SMARA)

"The Surface Mining and Reclamation Act (SMARA), Chapter 9, Division 2 of the Public Resources Code, requires the State Mining and Geology Board to adopt State policy for the reclamation of mined lands and the conservation of mineral resources. These policies are prepared in accordance with the Administrative Procedures Act, (Government Code) and are found in California Code of Regulations, Title 14, Division 2, Chapter 8, Subchapter 1.

The Surface Mining and Reclamation Act of 1975 (SMARA, Public Resources Code, Sections 2710-2796) provides a comprehensive surface mining and reclamation policy with the regulation of surface mining operations to assure that adverse environmental impacts are minimized and mined lands are reclaimed to a usable condition. SMARA also encourages the production, conservation, and protection of the state's mineral resources. Public Resources Code Section 2207 provides annual reporting requirements for all mines in the state, under which the State Mining and Geology Board is also granted authority and obligations."[7]

State Mining & Geology Board (SMGB)

"The SMGB serves as a regulatory, policy, and appeals body representing the State's interests in geology, geologic and seismologic hazards, conservation of mineral resources and reclamation of lands following surface mining activities. The SMGB operates within the Department of Conservation, and is granted certain autonomous responsibilities and obligations under several statutes including the Alquist-Priolo Earthquake Fault Zoning Act, the Seismic Hazards Mapping Act, and the Surface Mining and Reclamation Act."[8]

[6] California Department of Conservation, Division of Mines and Geology, "Guidelines for Classification and Designation of Mineral Lands", http://www.conservation.ca.gov/smgb/Guidelines/Documents/ClassDesig.pdf. Accessed February 2015.
[7] California Surface Mining And Reclamation Act Description, http://www.conservation.ca.gov/smgb/Regulations/Pages/regulations.aspx. Accessed February 2015.
[8] California State Mining & Geology Board, http://www.conservation.ca.gov/smgb/Pages/Index.aspx. Accessed February 2015.

The Office of Mine Reclamation (OMR)

"Created in 1991 to administer the Surface Mining and Reclamation Act of 1975 (SMARA). Established to meet the Act's requirement, OMR provides assistance to cities, counties, state agencies and mine operators for reclamation planning and promotes cost-effective reclamation. OMR strives to reclaim mined lands to a beneficial end-use through the implementation of SMARA, prevent or minimize the adverse environmental effects of mining by providing assistance to lead agencies and miners in the review of reclamation plans, and minimize residual hazards to public health and safety through the Abandoned Mine Lands program."[9]

Local Policy & Regulations

Tulare County General Plan Policies

The General Plan has a number of policies that apply to projects within Tulare County. General Plan policies that relate to the proposed Project are listed below.

ERM-2.1 Conserve Mineral Deposits - The County will encourage the conservation of identified and/or potential mineral deposits, recognizing the need for identifying, permitting, and maintaining a 50 year supply of locally available PCC grade aggregate.

ERM-2.3 Future Resource Development - The County will provide for the conservation of identified and/or potential mineral deposits within Tulare County as areas for future resource development. Recognize that mineral deposits are significantly limited within Tulare County and that they play an important role in support of the economy of the County.

ERM-2.10 Incompatible Development - Proposed incompatible land uses in the County shall not be on lands containing or adjacent to identified mineral deposits, or along key access roads, unless adequate mitigation measures are adopted or a statement of overriding considerations stating public benefits and overriding reasons for permitting the proposed use are adopted.

IMPACT EVALUATION

Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Project Impact Analysis: ***No Impact***

The proposed Project area is not located in a known mineral resource zone (MRZ)[10]. The nearest MRZ is over 17 miles northeast of the proposed Project site, according to Google Maps. Due to the distance separation between the identified MRZ and proposed Project area,

[9] California Office of Mine Regulation, http://www.conservation.ca.gov/OMR/Pages/Index.aspx. Accessed February 2015.
[10] Tulare County General Plan 2030 Update Background Report, Page 10-19

there will be no loss of availability of a known mineral resource due to Project implementation. There will be ***No Impacts*** related to this resource.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, the Tulare County General Plan 2030 RDEIR, and the 1990 City of Kingsburg General Plan.

The proposed Project does not include mining operations and is not located within a known mineral resource zone. ***No Cumulative Impacts*** related to this checklist item will occur.

Mitigation Measures: ***None Required***

Conclusion: ***No Impact***

As noted above, ***No Project-specific*** or ***Cumulative Impacts*** related to this resource will occur.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Project Impact Analysis: ***No Impact***

As noted in the Response to 3.11 a), the proposed Project does not include a mining operation and the proposed Project site is not located in or near a known mineral resource zone. There will be no significant loss of local important mineral resource recovery site. According to U.S. Geological Survey, the nearest active mine and mineral production plant to the proposed Project is Kaweah River Rock sand and gravel plant located approximately 27 miles southeast of the proposed Project site within Tulare County[11]. The mine facility is located east of State Route 245 and south of State Route 216, near the Sierra Mountains foothills. The Kaweah River Rock mine site is identified by U.S. Geological Survey Record ID, 4081. There will be ***No Impacts*** related to this resource.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, the Tulare County General Plan 2030 Update RDEIR, and the 1990 City of Kingsburg General Plan.

[11] USGS Mineral Resources On-Line Spatial Data, Active mines and mineral plants in the US. http://mrdata.usgs.gov/mineral-resources/active-mines.html. Accessed February, 2015.

As noted in the Response to 3.11 a), the proposed Project does not include a mining operation and is not located within a mineral resource zone. As such, ***No Cumulative Impacts*** related to this resource will occur.

Mitigation Measures: ***None Required***

Conclusion: ***No Impact***

As noted above, no Project-specific or cumulative impacts related to this resource will occur.

DEFINITIONS/ACRONYMS

Acronyms

MRZ	Mineral Resource Zone
OMR	Office of Mine Reclamation
SMGB	State Mining & Geology Board
SMARA	Surface Mining and Reclamation Act

REFERENCES

California Department of Conservation, Division of Mines and Geology, "Guidelines for Classification and Designation of Mineral Lands", which can be accessed at: http://www.conservation.ca.gov/smgb/Guidelines/Documents/ClassDesig.pdf. Accessed February 2015.

California Office of Mine Regulation, which can be accessed at: http://www.conservation.ca.gov/OMR/Pages/Index.aspx. Accessed February 2015.

California State Mining & Geology Board, http://www.conservation.ca.gov/smgb/Pages/Index.aspx. Accessed February 2015.

California Surface Mining And Reclamation Act Description, which can be accessed at: http://www.conservation.ca.gov/smgb/Regulations/Pages/regulations.aspx. Accessed February 2015.

CEQA Guidelines, Section 15126.2 (a)

Tulare County General Plan 2030 Update, August 2012

Tulare County General Plan 2030 Update Background Report, Pages 10-17, 10-18, 10-19. February 2010

Tulare County General Plan 2030 Update Recirculated Draft Environmental Impact Report (RDEIR), February 2010

Noise
Chapter 3.12

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts*** related to Noise. A detailed review of potential impacts is provided in the following analysis.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts related to Noise. As required in Section 15126, all phases of the proposed Project will be considered as part of the potential environmental impact.

As noted in Section 15126.2 (a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1]

The environmental setting provides a description of the Noise Setting in Tulare County. The regulatory setting provides a description of applicable Federal, State, and Local regulatory policies that were developed in part from information contained in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, and/or Tulare County 2030 General Plan EIR

[1] CEQA Guidelines, Section 15126.2 (a)

incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

Thresholds of Significance

- Exceed Tulare County Standards for Noise Levels
- Expose people of excessive ground-borne vibration
- Expose people to excessive airport/airstrip noise

ENVIRONMENTAL SETTING

"Noise. Noise level (or volume) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound power levels to be consistent with that of human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz). In addition to the actual instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. One of the most frequently used noise metrics that considers both duration and sound power level is the equivalent noise level (Leq). The Leq is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time. Typically, Leq is summed over a one-hour period.

Sound pressure is measured on a logarithmic scale with the 0 dB level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dB and a sound that is 10 dB less than the ambient sound level has no effect on ambient noise. Because of the nature of the human ear, a sound must be about 10 dB greater than the reference sound to be judged as twice as loud. In general, a 3 dBA change in community noise levels is noticeable, while 1-2 dBA changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40 to 50 dBA, while noise levels along arterial streets are generally in the 50 to 60+ dBA range. Normal conversational levels are in the 60-65 dBA range, and ambient noise levels greater than that can interrupt conversations.

Noise levels typically attenuate at a rate of 6 dBA per doubling of distance from point sources such as industrial machinery. Noise from lightly traveled roads typically attenuates at a rate of about 4.11 dBA per doubling of distance. Noise from heavily traveled roads typically attenuates at about 3 dBA per doubling of distance.

The actual time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than that which occurs during the daytime. To evaluate community noise on a 24-hour basis, the day-night average sound level was developed (Ldn). Ldn is the time average of all A-weighted levels for a 24-hour period with a 10 dB upward adjustment added to

those noise levels occurring between 10:00 PM and 7:00 AM to account for the general increased sensitivity of people to nighttime noise levels. The Community Noise Equivalent Level (CNEL) is identical to the Ldn with one exception. The CNEL adds 5 dB to evening noise levels (7:00 PM to 10:00 PM). Thus, both the Ldn and CNEL noise measures represent a 24-hour average of A-weighted noise levels with Ldn providing a nighttime adjustment and CNEL providing both an evening and nighttime adjustment.

Vibration. Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration can be a serious concern, causing buildings to shake and rumbling sounds to be heard. In contrast to noise, vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings and is usually measured in inches per second. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (VdB) is commonly used to measure RMS. The decibel notation acts to compress the range of numbers required to describe vibration.

High levels of vibration may cause physical personal injury or damage to buildings. However, groundborne vibration levels rarely affect human health. Instead, most people consider groundborne vibration to be an annoyance that can affect concentration or disturb sleep. In addition, high levels of groundborne vibration can damage fragile buildings or interfere with equipment that is highly sensitive to groundborne vibration (e.g., electron microscopes).

In contrast to noise, groundborne vibration is not a phenomenon that most people experience every day. The background vibration velocity level in residential areas is usually 50 RMS or lower which is well below the threshold of perception for humans (human perception is around 65 RMS). Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel- wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

> **b. Noise Sources**. Ambient noise levels in Tulare County vary widely depending upon proximity to noise generators…"[2]

As noted in the 2014 TCAG RTP/SCS Draft EIR, "Tulare County contains a number of different industrial operations that produce noise, including food processing plants as well as sand and gravel extraction and processing facilities. Noise measurements were conducted for the General Plan 2030 Update at a sand and gravel extraction and processing facility operated by the Kaweah River Rock Company southeast of Woodlake. Excavation equipment that can generate noise at this facility consists of backhoes, graders, loaders, a drag line and off-road haul trucks. At anyone

[2] 2014 TCAG RTP/SCS Draft EIR. Page 4.11-2.

time, it is common to have the drag line, backhoe or one of the loaders working in conjunction with the off-road haul trucks. Noise levels at 700 feet from such an excavation operation would be expected to range approximately from 47.5 to 66.5 dBA. The processing area of the operation noise levels of approximately 77 dBA at a distance of 200 feet from the source (Tulare County, 2007)."[3]

The Health and Safety section of Tulare County's 2030 General Plan serves as the primary policy statement for the County for implementing policies to maintain and improve the noise environment in Tulare County. **Table 3.12-1** shows Tulare County's Land Use Compatibility for Community Noise Environments.

"Noise level data collected during continuous monitoring included the hourly Leq and Lmax and the statistical distribution of noise levels over each hour of the sample period. The community noise survey results indicate that typical noise levels in noise-sensitive areas of the unincorporated areas of Tulare County are in the range of 29-65 dB Ldn. As would be expected, the quietest areas are those that are removed from major transportation-related noise sources and industrial or stationary noise sources."[4]

The Project site is located on the edge of an urban area adjacent to existing development on the north, east and west. Sensitive noise receptors in the area include:

North: Single-family residential neighborhood and a Medical Clinic further north.

East: Approximately 10 rural type single-family homes and a mobile home park (consists of 2 rows of mobile homes west to east with approximately 32 units).

South: Rural residential home.

West: Single-family residential neighborhood and Lincoln Elementary School further to the west.

REGULATORY SETTING

Federal Agencies & Regulations

Federal Highways Administration (FHWA) Highway Traffic Noise Prediction methodology

"In March 1998, the Federal Highway Administration (FHWA) released the Traffic Noise Model, Version 1.0 (FHWA TNM®). It was developed as a means for aiding compliance with policies and procedures under FHWA regulations. Since its release in March 1998, Version 1.0a was released in March 1999, Version 1.0b in August 1999, Version 1.1 in September 2000, Version 2.0 in June 2002, Version 2.1 in March 2003 and the current version, Version 2.5 in April 2004. The FHWA TNM is an entirely new, state-of-the-art computer program used for predicting noise impacts in the vicinity of highways. It uses advances in personal computer hardware and software

[3] Ibid. 4.11-4.
[4] Tulare County General Plan 2030 Update Background Report, page 8-77.

to improve upon the accuracy and ease of modeling highway noise, including the design of effective, cost-efficient highway noise barriers."[5]

Federal Aviation Administration (FAA)

"Aircraft operated in the U.S. are subject to certain federal requirements regarding noise emissions levels. These requirements are set forth in Title 14 CFR, Part 36. Part 36 establishes maximum acceptable noise levels for specific aircraft types, taking into account the model year, aircraft weight, and number of engines. Pursuant to the federal Airport Noise and Capacity Act of 1990, the FAA established a schedule for complete transition to Part 36 "Stage 3" standards by year 2000. This transition schedule applies to jet aircraft with a maximum takeoff weight in excess of 75,000 pounds, and thus applies to passenger and cargo airlines, but not to operators of business jets or other general aviation aircraft."[6]

Federal Railway Administration (FRA) and the Federal Transit Administration (FTA)

"The Federal Railway Administration (FRA) and the Federal Transit Administration (FTA) have published guidance relative to vibration impacts. According to the FRA, fragile buildings can be exposed to groundborne vibration levels of 0.5 PPV without experiencing structural damage. The FTA has identified the human annoyance response to vibration levels as 80 VdB."[7]

State Agencies & Regulations

California Noise Insulation Standards

"The California Noise Insulation Standards found in the California Code of Regulations, Title 24, set requirements for new multi-family residential units, hotels, and motels that may be subject to relatively high levels of transportation-related noise. For exterior noise, the noise insulation standard is DNL 45 dB in any habitable room and requires an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than DNL 60 dB."[8]

Local Policy & Regulations

Tulare County General Plan Policies

The General Plan has a number of policies that apply to projects within Tulare County. General Plan policies that relate to the proposed Project are listed below and the land use compatibility for community noise environments within Tulare County are depicted in **Table 3.12-1**.

[5] U.S. Department of Transportation. Federal Highway Administration website, Traffic Noise Model, http://www.fhwa.dot.gov/environment/noise/traffic_noise_model/. Accessed March 2015.
[6] Tulare County Association of Governments 2011 Regional Transportation Plan Draft Subsequent EIR, page 152
[7] Ibid.
[8] Ibid. Page 153.

HS-8.2 Noise Impacted Areas - The County shall designate areas as noise-impacted if exposed to existing or projected noise levels that exceed 60 dB Ldn (or Community Noise Equivalent Level (CNEL)) at the exterior of buildings.

HS-8.3 Noise Sensitive Land Uses - The County shall not approve new noise sensitive uses unless effective mitigation measures are incorporated into the design of such projects to reduce noise levels to 60 dB Ldn (or CNEL) or less within outdoor activity areas and 45 dB Ldn (or CNEL) or less within interior living spaces.

HS-8.4 Airport Noise Contours - The County shall ensure new noise sensitive land uses are located outside the 60 CNEL contour of all public use airports.

HS-8.6 Noise Level Criteria - The County shall ensure noise level criteria applied to land uses other than residential or other noise-sensitive uses are consistent with the recommendations of the California Office of Noise Control (CONC).

HS-8.11 Peak Noise Generators - The County shall limit noise generating activities, such as construction, to hours of normal business operation (7 a.m. to 7 p.m.). No peak noise generating activities shall be allowed to occur outside of normal business hours without County approval.

HS-8.13 Noise Analysis - The County shall require a detailed noise impact analysis in areas where current or future exterior noise levels from transportation or stationary sources have the potential to exceed the adopted noise policies of the Health and Safety Element, where there is development of new noise sensitive land uses or the development of potential noise generating land uses near existing sensitive land uses. The noise analysis shall be the responsibility of the project applicant and be prepared by a qualified acoustical engineer (i.e., a Registered Professional Engineer in the State of California, etc.). The analysis shall include recommendations and evidence to establish mitigation that will reduce noise exposure to acceptable levels (such as those referenced in Table 10-1 of the Health and Safety Element).

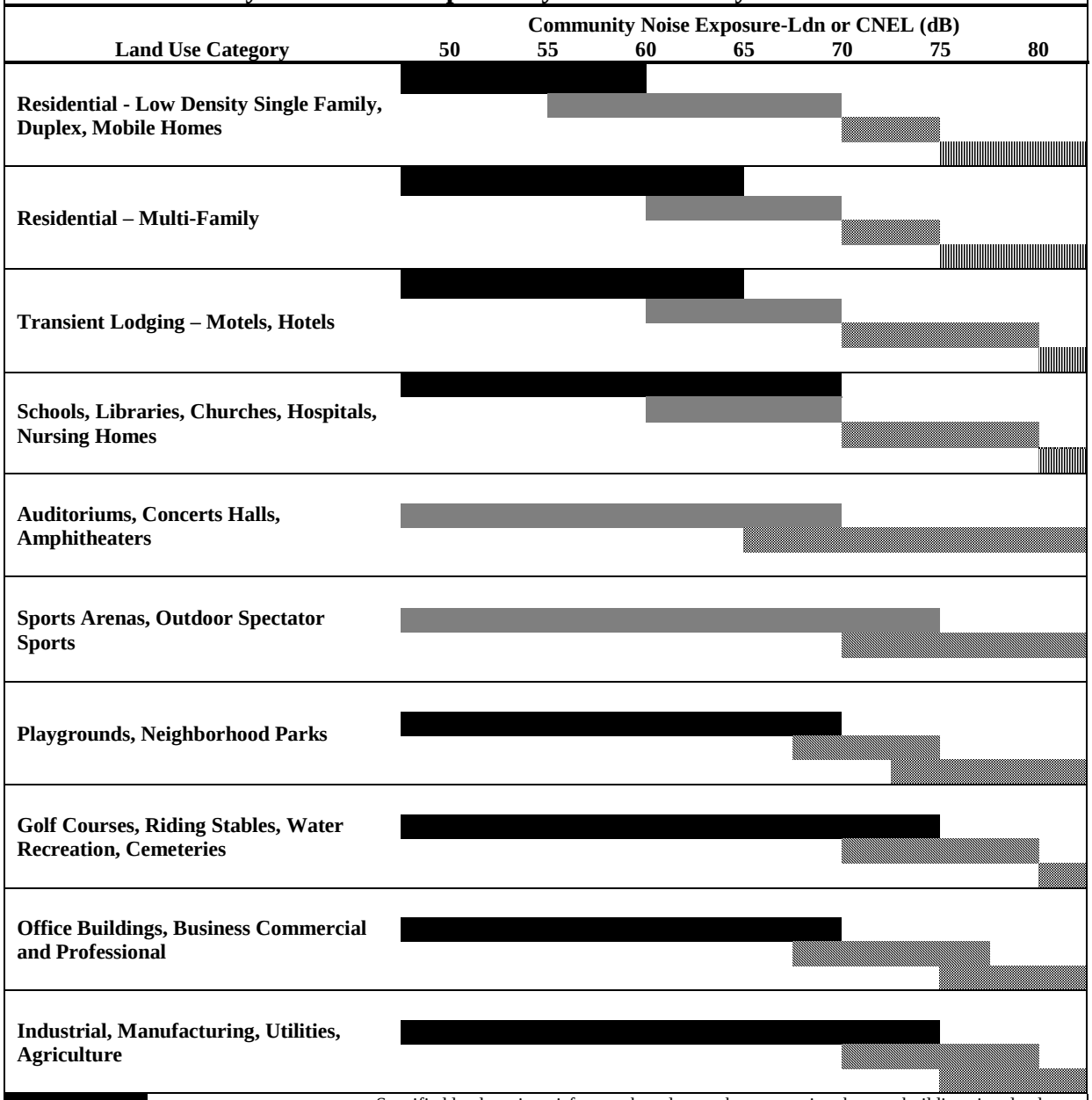
HS-8.14 Sound Attenuation Features - The County shall require sound attenuation features such as walls, berming, heavy landscaping, between commercial, industrial, and residential uses to reduce noise and vibration impacts.

HS-8.16 State Noise Insulation - The County shall enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code.

HS-8.18 Construction Noise - The County shall seek to limit the potential noise impacts of construction activities by limiting construction activities to the hours of 7 am to 7pm, Monday through Saturday when construction activities are located near sensitive receptors. No construction shall occur on Sundays or national holidays without a permit from the County to minimize noise impacts associated with development near sensitive receptors.

HS-8.19 Construction Noise Control - The County shall ensure that construction contractors implement best practices guidelines (i.e. berms, screens, etc.) as appropriate and feasible to reduce construction-related noise-impacts on surrounding land uses.

Table 3.12-1
Tulare County Land Use Compatibility for Community Noise Environments[9]



	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
	Normally Unacceptable	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

[9] Tulare County 2030 General Plan Update, Part 1 Goals and Policies Report, Table 10.1,. Page 10-25.

City of Kingsburg General Plan Policies

The City of Kingsburg has adopted applicable sections of the Noise Element of the Fresno County General Plan, first prepared by the County in 1975.[10]

IMPACT EVALUATION

Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Project Impact Analysis: ***Less Than Significant Impact***

Construction Noise Impacts

Proposed Project construction related activities will involve temporary noise sources and will be periodic in nature due to the phased buildout of the Project. Typical construction related equipment include compressors, nail guns, graders, trenchers, small tractors and excavators. During the proposed Project construction, noise from construction related activities will contribute to the noise environment in the immediate vicinity. Activities involved in construction will generate maximum noise levels, as indicated in **Table 3.12-2**, ranging from 79 to 91 dBA at a distance of 50 feet, without feasible noise control (e.g., mufflers) and ranging from 75 to 80 dBA at a distance of 50 feet, with feasible noise controls.

Table 3.12-2
Typical Construction Noise Levels

Type of Equipment	**dBA at 50 ft**	
	Without Feasible Noise Control	**With Feasible Noise**
Dozer or Tractor	80	75
Excavator	88	80
Scraper	88	80
Front End Loader	79	75
Backhoe	85	75
Grader	85	75
Truck	91	75

The City of Kingsburg's General Plan EIR found that construction noise associated with buildout of the General Plan would result in less than significant impacts with adherence to Office of Noise Control and State Department of Public Health Guidelines as well as General Plan mitigation measures. The distinction between short-term construction noise impacts and

[10] City of Kingsburg General Plan. Page 110

long-term operational noise impacts is a typical one in both CEQA documents and local noise ordinances, which generally recognize the reality that short-term noise from construction is inevitable and cannot be mitigated beyond a certain level. Thus, local agencies frequently tolerate short-term noise at levels that they would not accept for permanent noise sources. A more severe approach would be impractical and might preclude the kind of construction activities that are to be expected from time to time in urban environments. Most residents of urban areas recognize this reality and expect to hear construction activities on occasion.

Although impacts are considered less than significant, the Project will be required to adhere to the County's noise policies to ensure that impacts remain less than significant, as follows:

HS-8.11 Peak Noise Generators - The County shall limit noise generating activities, such as construction, to hours of normal business operation (7 a.m. to 7 p.m.). No peak noise generating activities shall be allowed to occur outside of normal business hours without County approval.

HS-8.18 Construction Noise - The County shall seek to limit the potential noise impacts of construction activities by limiting construction activities to the hours of 7 am to 7pm, Monday through Saturday when construction activities are located near sensitive receptors. No construction shall occur on Sundays or national holidays without a permit from the County to minimize noise impacts associated with development near sensitive receptors.

HS-8.19 Construction Noise Control - The County shall ensure that construction contractors implement best practices guidelines (i.e. berms, screens, etc.) as appropriate and feasible to reduce construction-related noise-impacts on surrounding land uses.

Operational Noise Impacts

The proposed Project site is located on the edge of an urban area adjacent to existing development on the north, east and west. Operational noise from the Project will be generated from typical residential uses such as vehicles, landscape maintenance equipment, air conditioners, dogs barking, children playing and other similar noise sources. However, the primary source of noise will be from Project-related vehicular trips.

"Noise generated by mobile sources typically attenuates (is reduced) at a rate between 3.0 and 4.5 dBA per doubling of distance. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver. Hard and flat surfaces, such as concrete or asphalt, have an attenuation rate of 3.0 dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, have an attenuation rate of about 4.5 dBA per doubling of distance. Noise generated by stationary sources typically attenuates at a rate between 6.0 and about 7.5 dBA per doubling of distance."[11]

[11] Environmental Impact Report for Tulare County South County Detention Facility, Appendix "G", Noise Study Report (page 6), prepared by VRPA Technologies. May 2013.

Sensitive noise receptors in the area include:

North: Single-family residential neighborhood and a Medical Clinic further north.

East: Approximately 10 rural type single-family homes and a mobile home park (consists of 2 rows of mobile homes west to east with approximately 32 units).

South: Rural residential home.

West: Single-family residential neighborhood and Lincoln Elementary School further to the west.

As described earlier, the Project includes the development of a single-family residential neighborhood with a multi-family component on the southwestern corner of the Project site. Noise receptors to the north and west (existing single-family residential neighborhoods) will experience an increase in ambient noise due to the Project; however, the noise will be similar to existing conditions and will consist of typical residential noise (lawn mowers, leaf blowers, children playing, vehicles, air conditioners, etc.) and vehicular noise. As described in the traffic study (see Appendix E), the majority of the Project-related vehicle traffic will occur at the main access points along Road 16 and Avenue 396 and will therefore not result in significant traffic related noise impacts to the existing neighborhoods to the north and west of the Project site. Under existing conditions, the traffic related noise level from existing traffic volumes is estimated to be 55-60 CNEL/Ldn based on noise prediction methods used in the Fresno County General Plan, Kingsburg General Plan and the Tulare County General Plan. This is within the limits described in Table 3.12-1 above.

According to Figure 4 of the Traffic Study, the Project would add approximately 190 Average Daily Trips (ADT) to Kern Street (a 1.8% increase over the existing traffic levels on Kern, and 110 ADT to Madsen (a 40% over existing ADT on Madsen). In addition, the noise generated from the proposed Project will be similar to and will not be entirely distinguishable from existing noise sources within those neighborhoods. The increase in the traffic volume on Kern will not lead to a measure increase in traffic related noise because a doubling of the traffic volume on Kern would be required to make a perceptible 3 decibel increase in the noise level. The percentage increase is less than two percent and no perceptible increase in noise would occur along Kern.

The noise level along Madsen is estimated to be 50 to 55 decibels (Ldn) based on the 250 vehicles per day under existing conditions. The addition of project traffic would increase this total to 360 vehicles per day, which may increase noise levels up to one decibel. There would not a perceptible increase in noise along Madsen.

Noise receptors to the south and west (rural residential and mobile home park) will experience an increase in ambient noise due mainly to increases in vehicles traveling along Road 16 and Avenue 396, as noted above. This increase, however, is not anticipated to be significant because of the relatively small percentage of increase along Kern Street, and the current low traffic volumes on Madsen compared to existing conditions and future conditions. At buildout with the Project, Kern Street is projected to have 330 additional vehicle trips, a 30 percent increase (as demonstrated in the Traffic Study, Appendix E). This increase will not materially change the noise contours along this corridor, and the proposed Project will not result in a

contribution to or exacerbation of unacceptable noise conditions. Likewise, Madsen will have a total of 450 vehicles per day at buildout and noise impacts would be ***Less Than Significant***.

As identified in the Traffic Study, the roadway level of service (LOS) for Road 16 is currently A during both AM and PM peak hours. This roadway will continue to have an LOS A during both AM and PM peak hours with implementation of the Project and in the future (2035) scenario. The roadway LOS for Avenue 396 is currently A during both AM and PM peak hours and will move to LOS B for both scenarios with implementation of the Project and in the future (2035) scenario. This indicates that there will not be a substantial increase in traffic on either roadway and the corresponding noise impacts will not substantially increase.

The intersections near the proposed Project site, which are impacted by Project-related traffic, are located in areas that are already heavily impacted by vehicle noise. Although the proposed Project will contribute additional vehicles to these impacted areas, as shown in the Traffic Study, the incremental increase is not enough to significantly impact noise levels compared to existing conditions and compared to future scenarios (2035).

As described in the analysis above, any impacts to this Checklist Item would be ***Less Than Significant.***

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County 2030 General Plan Draft Environmental Impact Report and the 1990 City of Kingsburg General Plan.

As discussed in Impact a, implementation of the proposed Project would not contribute to a significant increase in projected future cumulative traffic noise levels along area roadways. In addition, no major off-site stationary sources of noise were identified in the Project area that would adversely affect nearby land uses. As a result, the proposed Project would not result in a cumulative contribution to noise levels that would adversely affect nearby land uses. This impact would be ***Less Than Significant***.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact.***

As noted above, ***Less Than Significant Project-specific*** or ***Cumulative Impacts*** related to this resource will occur.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Project Impact Analysis: ***Less than Significant Impact***

Typical outdoor sources of perceptible ground borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. Construction vibrations can be transient, random, or continuous. Increases in groundborne vibration levels attributable to the proposed Project would be primarily for grading and construction activities. Such activities would likely require the use of various off-road equipment, such as tractors, concrete mixers, graders, and haul trucks. The use of major groundborne vibration-generating construction equipment, such as pile drivers, would not be required for this Project. Once operational, the proposed Project will not result in the on-going use of equipment that produces groundbourne vibration, as vibration from vehicles is dependent upon vehicle speed. Since this is a residential project, vehicle speed is not likely to exceed 25-30 miles per hour. As such, any operational vibrations will be ***Less Than Significant.***

There are no federal or state standards that address construction noise or vibration. Additionally, Tulare County does not have regulations that define acceptable levels of vibration. One reference suggesting vibration standards is the Federal Transit Administration (FTA) publication concerning noise and vibration impact assessment from transit activities. Although the FTA guidelines are to be applied to transit activities and construction, they may be reasonably applied to the assessment of the potential for annoyance or structural damage resulting from other activities. To prevent vibration annoyance in residences, a level of 80 VdB (vibration velocity level in dB) or less is suggested when there are fewer than 70 vibration events per day. A level of 100 VdB or less is suggested by the FTA guidelines to prevent damage to fragile buildings.

Groundborne vibration levels associated with representative off-road equipment are summarized in **Table 3.12-3**. While these construction-related activities would result in minor amounts of groundborne vibration (when compared to the 80-100VdB level as suggested by the FTA guidelines noted earlier), such groundborne noise or vibration would attenuate rapidly from the source and would not be generally perceptible outside of the construction areas. Therefore, based on the vibration levels presented in **Table 3.12-3**, ground vibration generated by off-road equipment would not be anticipated to exceed approximately 0.08 inches per second ppv at 25 feet. Estimated vibration levels at the nearest structures (which is 50 feet west of the nearest Project activity area) would not exceed the minimum recommended criteria for structural damage or human annoyance (0.2 in/sec ppv). As a result, this impact would be ***Less Than Significant.***"

Table 3.12-3 Vibration Levels for Varying Construction Equipment[12]	
Type of Equipment	**Peak Particle Velocity @ 25 Feet (inches/second)**
Large Bulldozer	0.089
Loaded Trucks	0.076
Small Bulldozer	0.003
Jackhammer	0.035
Vibratory Hammer	0.070
Vibratory Compactor/roller	0.210

Cumulative Impact Analysis: ***Less than Significant Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County 2030 General Plan Draft Environmental Impact Report and the 1990 City of Kingsburg General Plan.

Project-generated ground-borne vibration levels, whether construction or operations related, would not result in a significant impact to nearby land uses. No existing sources of ground-borne vibration or proposed projects that would adversely affect nearby land uses were identified in the Project area. As a result, the proposed Project would not result in a cumulative contribution to ground-borne vibration levels that would adversely affect nearby land uses. This impact would be ***Less Than Significant.***

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Project Impact Analysis: ***Less Than Significant Impact***

As discussed in Response a), potential long-term increases in ambient noise levels within the proposed Project area would be associated with increases in vehicle traffic on area roadways; as well as, on-site operational activities; however, these increases would remain below any significance thresholds. As such, these impacts are ***Less Than Significant.***

Cumulative Impact Analysis ***Less Than Significant Impact***

[12] Ibid.

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan and the Tulare County 2030 General Plan Draft Environmental Impact Report and the 1990 City of Kingsburg General Plan.

As shown in Response a), the Project will not result in significant increases in ambient noise levels in the near term or in the future (2035) scenario. As a result, the proposed Project's cumulative contribution to non-transportation noise sources in the Project area would be ***Less Than Significant***.

Mitigation Measure(s): ***None Required***

Conclusion: ***Less Than Significant Impact***

As noted above, ***Less Than Significant Project-specific*** or ***Cumulative Impacts*** related to this resource will occur.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Project Impact Analysis***:*** ***Less Than Significant Impact***

As discussed in Response a), potential long-term increases in ambient noise levels within the proposed Project area would be associated with increases in vehicle traffic on area roadways. These impacts are ***Less Than Significant.***

Cumulative Impact Analysis ***Less Than Significant***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan and the Tulare County 2030 General Plan Draft Environmental Impact Report and the 1990 City of Kingsburg General Plan.

As shown in Response a), the Project will not result in significant increases in ambient noise levels in near term or in the future (2035) scenario. As a result, the proposed Project's cumulative contribution to non-transportation noise sources in the Project area would be ***Less Than Significant***.

Mitigation Measure(s): ***None Required***

Conclusion: ***Less Than Significant***

As noted above, ***Less Than Significant Project-specific*** or ***Cumulative Impacts*** related to this resource will occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Project Impact Analysis: ***No Impact***

The Project is not located within an airport land use plan or within two miles of an airport. The nearest public or public use airport to the project site is the Visalia Municipal Airport located approximately 17 miles south of the Project site. Therefore, there are ***No Impacts*** to this resource**.**

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan and the Tulare County 2030 General Plan Draft Environmental Impact Report and the 1990 City of Kingsburg General Plan.

The proposed Project would not subject people to excessive airport related noise. Therefore, ***No Impact*** to cumulative impacts related to this Checklist item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact.***

As noted earlier, ***No Project-specific or Cumulative Impacts*** to this Checklist Item will occur.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Project Impact Analysis: ***No Impact***

The Project is not located within the vicinity of a private airstrip nor would the project expose people residing or working in the Project area to excessive noise levels. The nearest airstrip is the Central Valley Aviation Incorporated Airport located approximately 7 miles west of the site at E. Conejo Avenue and S. Temperance Avenue. The nearest public or public use airport to the Project site is the Visalia Municipal Airport located approximately 17 miles south of the Project site. Therefore, there are ***No Impacts*** to this resource**.**

Mitigation Measure(s): ***None Required***

Conclusion: ***No Impact.***

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan and the Tulare County 2030 General Plan Draft Environmental Impact Report and the 1990 City of Kingsburg General Plan.

There are no private airstrips within the Project vicinity. Therefore, there would be ***No Cumulative Impacts*** related to this Checklist item.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

DEFINITIONS

"Noise is often described as unwanted sound, and thus is a subjective reaction to characteristics of a physical phenomenon. Researchers have generally agreed that A-weighted sound pressure levels (sound levels) are well correlated with subjective reaction to noise. Variations in sound levels over time are represented by statistical descriptors, and by time-weighted composite noise metrics such as the Day/Night Average Level (Ldn)."[13] In addressing noise impacts, the following key terms are outlined and explained below:

Ambient Noise - "The total noise associated with a given environment and usually comprising sounds from many sources, both near and far."

Attenuation - "Reduction in the level of sound resulting from absorption by the topography, the atmosphere, distance, barriers, and other factors.

A-weighted decibel (dBA) - A unit of measurement for noise based on a frequency weighting system that approximates the frequency response of the human ear.

Community Noise Equivalent Level (CNEL) - Used to characterize average sound levels over a 24-hour period, with weighting factors included for evening and nighttime sound levels. Leq values (equivalent sound levels measured over a 1-hour period - see below) for the evening period (7:00 p.m. to 10:00 p.m.) are increased by 5 dB, while Leq values for the nighttime period (10:00 p.m. to 7:00 a.m.) are increased by 10 dB. For a given set of sound measurements, the CNEL value will usually be about 1 dB higher than the Ldn value (see below). In practice, CNEL and Ldn are often used interchangeably.

Decibel (dBA) - A unit of measurement describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure (which is 20 micronewtons per square meter).

Day-Night Average Sound Level (Ldn) - Average sound exposure over a 24-hour period. Ldn values are calculated from hourly Leq values, with the Leq values for the nighttime period (10:00 p.m. to 7:00 a.m.) increased by 10 dB to reflect the greater disturbance potential from nighttime noises."

Equivalent Sound Level (Leq). - The level of a steady-state sound that, in a stated time period and at a stated location, has the same sound energy as the time-varying sound (approximately equal to the average sound level). The equivalent sound level measured over a 1-hour period is called the hourly Leq or Leq (h).

Lmax and Lmin - The maximum and minimum sound levels, respectively, recorded during a measurement period. When a sound meter is set to the "slow" response setting, as is typical for most community noise measurements, the Lmax and Lmin values are the maximum and minimum levels recorded typically for 1-second periods.

[13] TCAG 2011 Regional Transportation Plan Draft Subsequent EIR, page 150

Percentile-Exceeded Sound Level (Lx) - The sound level exceeded during a given percentage of a measurement period. Examples include L10, L50, and L90. L10 is the A-weighted sound level that is exceeded 10% of the measurement period, L50 is the level exceeded 50% of the period, and so on. L50 is the median sound level measured during the measurement period. L90, the sound level exceeded 90% of the time, excludes high localized sound levels produced by nearby sources such as single car passages or bird chirps. L90 is often used to represent the background sound level. L50 is also used to provide a less conservative assessment of the background sound level.

Sensitive Receptors - Sensitive receptors are defined to include residential areas, hospitals, convalescent homes and facilities, schools, and other similar land uses."[14]

REFERENCES

CEQA Guidelines, Section 15126.2 (a)

City of Kingsburg General Plan. Page 110.

Environmental Impact Report for Tulare County South County Detention Facility, Appendix "G", Noise Study Report (page 6), prepared by VRPA Technologies. May 2013.

Tulare County Association of Governments RTP/SCS 2014 Draft EIR. Page 4.11-2, 4.11-4.

Tulare County Association of Governments 2011 Regional Transportation Plan Draft Subsequent EIR, Pages 152, 153.

Tulare County 2030 General Plan Update Background Report, Pages 8-46, 8-47 and 8-77.

Tulare County 2030 General Plan Update, Part 1 Goals and Policies Report, Table 10.1, Page 10-25.

U.S. Department of Transportation. Federal Highway Administration website, Traffic Noise Model, http://www.fhwa.dot.gov/environment/noise/traffic_noise_model/. Accessed March 2015.

[14] Tulare County General Plan 2030 Update Background Report, pages 8-46 to 8-47

Population and Housing
Chapter 3.13

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts*** related to Population and Housing and therefore, no mitigation measures are required. A detailed review of potential impacts is provided in the following analysis.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to Population and Housing. As required in Section 15126, all phases of the proposed Project will be considered as part of the potential environmental impact.

As noted in 15126.2 (a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed Project. In assessing the impact of a proposed Project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the Project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the Project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision will have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1] The environmental setting provides a description of the Population and Housing in the County. The regulatory setting provides a description of applicable Federal, State and Local regulatory policies that were developed in part from information contained in the Tulare County General Plan 2030 Update, Tulare County General Plan Background Report and/or Tulare County

[1] CEQA Guidelines, Section 15126.2 (a)

General Plan 2030 Update Revised DEIR incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

Thresholds of Significance

- Induce Substantial Population Growth
- Displace Housing or People

ENVIRONMENTAL SETTING

Tulare County

"Tulare County, California is one of the largest counties in the great and fertile San Joaquin Valley. Geographically it is situated about midway between San Francisco and Los Angeles, the two principal cities of the Pacific Slope… Within the confines of Tulare County are now 4,863 square miles, or 3,158,400 acres."[2]

Tulare County Regional Housing Needs Assessment Plan 2014-2023 (TCAG, June 2014)

State housing element law assigns the responsibility for preparing the Regional Housing Needs Assessment (RHNA) for the Tulare County region to the Tulare County Association of Governments (TCAG). The RHNA is updated prior to each housing element cycle. The current RHNA, adopted on June 30, 2014, covers a 9.75-year projection period (January 1, 2014 to September 30, 2023). The growth projections applied in the Housing Element Update are based upon growth projections developed by the State of California. The RHNA housing allocations for Tulare County were incorporated into **Table 3.13-1**. "A Regional Housing Needs Assessment Plan" provides a general measure of each local jurisdiction's responsibility in the provision of housing to meet those needs. The Tulare County Association of Governments (TCAG) was responsible for allocating the State's projections to each local jurisdiction within Tulare County including the County unincorporated area, which is reflected in this Housing Element.

The Sustainable Communities and Climate Protection Act of 2008 (SB 375) was passed to support the State's climate action goals…to reduce greenhouse gas (GHG) emissions through coordinated transportation and land use planning. The bill mandates each of California's Metropolitan Planning Organizations (MPO) prepare a *sustainable communities strategy* as part of its regional transportation plan (RTP). The SCS contains land use, housing and transportation strategies that, if implemented, would allow the region to meet its GHG reduction targets. In the past, the RHNA was undertaken independently from the RTP. SB 375 requires that the RHNA and RTP/SCS processes be undertaken together to better integrate housing, land use, and transportation planning. In addition to the RHNA

[2] Tulare County Association of Governments. Tulare County Regional Blueprint. May 2009. Pages 4-5. http://valleyblueprint.org/files/Tulare050109.pdf. Accessed July, 2014.

requirements, SB 375 requires that TCAG address the region's housing needs in the SCS of the RTP, to include sections on state housing goals (Government Code Section 65080(b)(2)(B)(vi)); identify areas within the region sufficient to house all the population of the region (including all economic segments of the population) over the course of the planning period for the RTP (out to 2040 for the 2040 RTP/SCS); and identify areas within the region sufficient to meet the regional housing needs

The RHNA housing results are summarized in **Table 3.13-1**. The Tulare County RHNA Plan recommends that the County provide land use and zoning for approximately 7,081 units per year in the unincorporated portions of the County. The County administratively agreed to a housing share of 7,081 units (726 units per year over the 9.75-year RHNA planning period). The RTP allocates 30% of population to the County. The RHNA bases the housing needs assessment on this percentage.

Table 3.13-1 Regional Housing Needs Assessment Plan
January 1, 2014 – September 30, 2023

	Income Category				
Jurisdiction	Very Low	Low	Moderate	Above Moderate	Total
Dinuba	211	163	121	470	965
Exeter	143	125	85	272	625
Farmersville	74	65	68	259	466
Lindsay	80	80	82	348	590
Porterville	623	576	566	1,431	3,196
Tulare	920	609	613	1,452	3,594
Visalia	2616	1,931	1,802	3,672	10,021
Woodlake	71	41	69	191	372
Unincorporated Area	1,477	1,065	1,169	3,370	7,081
Total Tulare County	6,215	4,655	4,575	11,465	26,910

Source: Table 1: "2014-2023 Final RHNA Allocations by Income Category," Final Regional Housing Needs Plan for Tulare County 2014-2023. Page 19 (TCAG, 2014)

According to the Tulare County Regional Housing Needs Plan, the number of household in Tulare County's was 110,356 in 2000. In 2007 the number of households was 125,836. The 2014 household projection was 159,514. **Table 3.13-2** summarizes Tulare County's population between 1980 and 2010 according to the 1980-2010 U.S. Census.

Table 3.13-2
Tulare County Population[3,4,5]

	1980	1990	2000	2008	2010	2015
Tulare County Population	245,738	311,921	368,021	435,254	442,182	459,863

[3] 1980, 1990, 2000 U.S. Census, State of California, Department of Finance, E-1 Population Estimates.
[4] 2010 U.S. Census, United States, http://www.census.gov/2010census/popmap/ipmtext.php?fl=06. Accessed June, 2014.
[5] 2015 U.S. Census, United States QuickFacts, Tulare County, California. http://www.census.gov/quickfacts/table/PST045215/06107. Accessed January, 2016.

"Housing costs continue to rise significantly. The 2010 Census reports the median rent has increased 10.72% from $727 in 2000 to $805 in 2010. The median monthly owner costs for housing units with a mortgage have seen a minor decrease going from $1,518 to $1,471 which is a -3.09% decrease. The monthly owner costs for those housing units without a mortgage increased by less than 1%, going from $330 to $361."[6]

City of Kingsburg

Kingsburg's annual average population growth rate since 1980 has been approximately 4.09%, as compared to an annual average housing growth rate of 3.57%. These rates are relatively low as compared to the decade of 1970's when the rate of population growth was nearly 8%. This is due in part to the serious recession in the housing market that occurred during the early 1980's (and which again adversely affecting the housing market in the early 1990's)."[7] The City of Kingsburg population can be seen in Table 3.13-3.

Table 3.13-3
City of Kingsburg Population[8,9]

	1980	1990	2000	2008	2010	2015
City of Kingsburg Pop.	5,115	7,205	9,199	--	11,382	11,824

"Housing quality within the community is perhaps the best of any City in the County. There are no dilapidated units (units unfit for human habitation). The number of deteriorating units, while not great, has been decreasing as a result of the overall increase in residential property values and the demand for older homes by first-time buyers.

During the 1980-1990 decade, the City's housing inventory increased by 685 units, with an annual average rate of housing growth at 3.58%. During this same period, the housing vacancy rate decreased from 3.9% to 3.0%."[10] "Maintaining an average annual housing growth rate of approximately 3.0% is a major policy of the General Plan."[11]

REGULATORY SETTING

Federal Agencies & Regulations

US Department of Housing and Urban Development (HUD)

[6] Op Cit. Page 3-26
[7] Comprehensive General Plan and Environmental Impact Report for the Swedish Village of Kingsburg, July 1992. Page 37.
[8] California Department of Finance. Demographic Reports, Census and Surveys. 2016. http://www.dof.ca.gov/Reports/Demographic_Reports/. Accessed October, 2016.
[9] 2015 U.S. Census, United States QuickFacts, Kingsburg City, California. http://www.census.gov/quickfacts/table/PST045215/0638562,06107 . Accessed October, 2016.
[10] Comprehensive General Plan and Environmental Impact Report for the Swedish Village of Kingsburg, July 1992. Page 39.
[11] Ibid.

"HUD's mission is to create strong, sustainable, inclusive communities and quality affordable homes for all. HUD is working to strengthen the housing market to bolster the economy and protect consumers; meet the need for quality affordable rental homes: utilize housing as a platform for improving quality of life; build inclusive and sustainable communities free from discrimination; and transform the way HUD does business."[12]

State Agencies & Regulations

California Department of Housing and Community Development (HCD)

HCD's mission is to "[p]rovide leadership, policies and programs to preserve and expand safe and affordable housing opportunities and promote strong communities for all Californians."[13] "In 1977, the State Department of Housing and Community Development (HCD) adopted regulations under the California Administrative Code, known as the Housing Element Guidelines, which are to be followed by local governments in the preparation of local housing elements. AB 2853, enacted in 1980, further codified housing element requirements. Since that time, new amendments to State Housing Law have been enacted. Each of these amendments has been considered during development of this Housing Element."[14]

California Relocation Assistance Act

The State of California adopted the California Relocation Assistance Act (*California Government Code* §7260 et seq.) in 1970. This State law, which follows the federal Uniform Relocation Assistance and Real Property Acquisition Act, requires public agencies to provide procedural protections and benefits when they displace businesses, homeowners, and tenants in the process of implementing public programs and projects. This State law calls for fair, uniform, and equitable treatment of all affected persons through the provision of relocation benefits and assistance to minimize the hardship of displacement on the affected persons.

Local Policy & Regulations

Tulare County 2014 Regional Housing Needs Assessment Plan

"It is the responsibility of the Tulare County Association of Governments (TCAG) to determine how to allocate to local jurisdictions the basic housing needs provided by the State Department of Housing and Community Development. The determination of household needs by income category is designed for the equitable distribution of households by income category within the region. The presumptive goal is to promote greater housing opportunities throughout the County. In 2014 the Regional Housing Needs Assessment Plan (RHNA) allocated a disproportionate amount of low and very low housing to the unincorporated area of Tulare County. In 2014, the RHNA plan provides a more equitable distribution of the regional housing needs allocation, as required by Section 65584 of the government Code, thereby providing greater affordable housing

[12] U.S. Department of Housing and Urban Development, Mission, http://portal.hud.gov/hudportal/HUD?src=/about/mission. Accessed June, 2014.
[13] California Department of Housing and Community Development, Mission, http://www.hcd.ca.gov/mission.html. Accessed June, 2014.
[14] Tulare County Housing Element 2015 Update, Page 1-3.

opportunities through the entire County including unincorporated areas as well as within the cities'."[15]

As such, as noted earlier, the Tulare County RHNA Plan recommends that the County provide land use and zoning for approximately 7,081 units per year in the unincorporated portions of the County. The County administratively agreed to a housing share of 7,081 units (726 units per year over the 9.75-year RHNA planning period). The RTP allocates 30% of population to the County. The RHNA bases the housing needs assessment on this percentage. Also as noted earlier, the RHNA housing results are summarized in **Table 3.13-1**.

Tulare County Regional Blueprint 2009

This Blueprint includes the following preferred growth scenario principals:

- Increase densities county-wide by 25% over the status quo densities.
- Establish light rail between cities.
- Extend Highway 65 north to Fresno County.
- Expand transit throughout the county.
- Maintain urban separators around cities.
- Growth would be directed toward incorporated cities and communities where urban development exists and where comprehensive services and infrastructure are or will be provided.

Tulare County Housing Authority

"The Housing Authority of the County of Tulare (HATC) has been officially designated as the local public housing agency for the County of Tulare by the Board of Supervisors and was created pursuant to federal and state laws. …HATC is a unique hybrid: a public sector agency with private sector business practices. Their major source of income is the rents from residents. The HATC mission is "to provide affordable, well-maintained rental housing to qualified low- and very low-income families. Priority shall be given to working families, seniors and the disabled. Tenant self sufficiency and responsibility shall be encouraged. Programs shall be self-supporting to the maximum extent feasible." HATC provides rental assistance to very low and moderate-income families, seniors and the handicapped throughout the county. HATC offers many different programs, including the conventional public housing program, the housing choice voucher program (Section 8), the farm labor program for families with farm labor income, senior housing programs, and other programs. They also own or manage some individual subsidized rental complexes that do not fall under the previous categories, and can provide information about other affordable housing that is available in Tulare County. All programs are handicap accessible. Almost all of the complexes have 55-year recorded affordability covenants."[16]

[15] Ibid. Page 3-74.
[16] Op. Cit. Page 1-12

2015 Tulare County Housing Element Policies

Policy 1.11 - Encourage the development of a broad range of housing types to provide an opportunity of choice in the local housing market.

Policy 1.14 - Pursue an equitable distribution of future regional housing needs allocations, thereby providing a greater likelihood of assuring a balance between housing development and the location of employment opportunities.

Policy 1.16 – Review community plans and zoning to ensure they provide for adequate affordable residential development.

Policy 1.61 – Encourage an open exchange of ideas between the County and the private sector, including but not limited to developers, employers, nonprofit organizations, and the general public.

Policy 2.12 – Increase opportunities for technical assistance to public utility districts and community service districts and mutual water companies in an effort to educate and assist them in attaining the necessary public infrastructure.

Policy 2.25 – The County shall encourage special districts, including community service districts and public utility districts to: 1. Institute impact fees and assessment districts to finance improvements, 2. Take on additional responsibilities for services and facilities within their jurisdictional boundaries up to the full extent allowed under State law, and 3. Investigate feasibility of consolidating services with other districts and annexing systems in proximity to promote economies of scale, such as annexation to city systems and regional wastewater treatment systems.

Policy 2.27 – The County shall work with special districts, community service districts, public utility districts, mutual water companies, private water purveyors, sanitary districts, and sewer maintenance districts to provide adequate public facilities and to plan/coordinate, as appropriate, future utility corridors in an effort to minimize future land use conflicts.

Policy 3.13 – Encourage subdivision and housing unit design, which provides for a reasonable level of safety and security.

Policy 3.111 – The County shall require where feasible, the development of parks, open space, sidewalks and walking and biking paths that promote physical activity and discourage automobile dependency in all future communities.

Policy 3.113 – The County shall promote the principles of smart growth and healthy communities in UDBs and HDBs, including:

1. Creating walkable neighborhoods,
2. Providing a mix of residential densities,
3. Creating a strong sense of place,

4. Mixing land uses,
5. Directing growth toward existing communities,
6. Building compactly,
7. Discouraging sprawl,
8. Encouraging infill,
9. Preserving open space,
10. Creating a range of housing opportunities and choices,
11. Utilizing planned community zoning to provide for the orderly pre-planning and long term development of large tracks of land which may contain a variety of land uses, but are under unified ownership or development control, and
12. Encouraging connectivity between new and existing development.

Policy 3.114 – The County shall promote flexibility and innovation through the use of planned unit developments, development agreements, specific plans, Mixed Use projects, and other innovative development and planning techniques.

Policy 3.115 – The County shall encourage the development of parks near public facilities such as schools, community halls, libraries, museums, prehistoric sites, and open space areas and shall encourage joint-use agreements whenever possible.

Policy 3.116 – The County shall consider the use of existing entities or the creation of assessment districts, landscape and lighting districts, County service areas, community facilities districts, homeowners associations, or other types of districts to generate funds for the acquisition and development of parkland and/or historical properties as development occurs in the County.

Policy 4.11 – Review residential projects for environmental impacts and impose conditions to reduce those impacts.

Policy 4.13 – Promote energy efficiency and water conservation.

Policy 4.15 – Enforce energy efficiency standards for residential and non-residential properties.

Policy 4.23 – Consider and include information regarding trip generation in to staff reports and/or environmental assessments for development.

<u>City of Kingsburg Regional Housing Needs Assessment Plan 2015-2023</u>

"…Kingsburg has been assigned a RHNA of 374 units, including 113 very low-income units, 70 low-income units, 60 moderate-income units, and 131 above moderate-income units."[17]

[17] City of Kingsburg Housing Element 2015-2023 Initial Study/Mitigated Negative Declaration. Page 11. http://www.fresnocog.org/sites/default/files/publications/Housing/CEQA_Items/Initial_Study_Neg_Dec/Kingsburg_HE_D_IS.pdf. Accessed January 2017.

IMPACT EVALUATION

Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Project Impact Analysis: ***Less Than Significant Impact***

The proposed Project would allow the development of 200 residential units on the proposed Project site. The City of Kingsburg Urban Water Management Plan estimates 2.82 persons per household, which would result in the proposed Project generating a population increase of 564. The proposed Project site is within the City of Kingsburg's adopted Sphere of Influence and is designated for residential development. The Tulare County General Plan and Urban Boundaries Element has adopted the Kingsburg Urban Development Boundary, and has designated this area for future residential growth. Finally, the Selma-Kingsburg-Fowler Sanitation District has designated the site as part of it Sphere of Influence since approximately 1980, which was recently confirmed as part of the Fresno County LAFCo Municipal Service Review for SKF in 2014. The site has been designated for local residential growth and associated population increase is in accordance with the housing parameters set forth in the City of Kingsburg General Plan. Additionally, the RHNA for the City of Kingsburg is determined to be 374 units while the RHNA for Tulare County is determined to be 26,910 units over the course of the projection period. The proposed Project will assist both the City of Kingsburg and Tulare County in reaching its RHNA goals. As such, ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

Less Than Significant Cumulative Impacts related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Project Impact Analysis: ***No Impact***

There are no existing occupied homes on the proposed Project site and no homes in the immediate vicinity would be displaced because of Project implementation, as Project implementation would be contained to the proposed Project site. As such, there would be ***No Impact*** related to this Checklist Item.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

As noted earlier, there are no existing homes on the proposed Project site and the proposed Project will not displace any additional housing units. ***No Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted above, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Project Impact Analysis: ***No Impact***

As noted earlier, there are no existing occupied houses on the proposed Project site and as such, no people will be displaced as a result of Project implementation. ***No Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

The proposed Project will not result in the conversion of any inhabited housing on-site or off-site. As such, ***No Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted above ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

REFERENCES

California Department of Finance. Demographic Reports, Census and Surveys. 2016. http://www.dof.ca.gov/Reports/Demographic_Reports/. Accessed October, 2016.

California Department of Housing and Community Development, Mission, http://www.hcd.ca.gov/mission.html. Accessed June, 2014.

CEQA Guidelines, Section 15126.2 (a)

City of Kingsburg Housing Element 2015-2023 Initial Study/Mitigated Negative Declaration. Page 11. http://www.fresnocog.org/sites/default/files/publications/Housing/CEQA_Items/Initial_Study_Neg_Dec/Kingsburg_HE_D_IS.pdf. Accessed January 2017.

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Tulare County Housing Element 2015 Update, Page 1-3, 1-12, 1-17, 3-21, 3-26, 7-1

Final Tulare County 2008 Regional Housing Needs Assessment Plan**,** page II-2

Final Tulare County 2014 Regional Housing Needs Assessment Plan, Table 4, Page 18, Appendix A. http://www.tularecog.org/wp-content/uploads/2015/07/Final-Regional-Housing-Needs-Plan-for-Tulare-County-2014-2023.pdf. Accessed January, 2016.

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Public Services
Chapter 3.14

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts*** related to Public Services. A detailed review of potential impacts is provided in the analysis below.

INTRODUCTION

California Environmental Quality Act (CEQA)

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to Land Use and Recreation. As required in Section 15126, all phases of the proposed Project will be considered was part of the potential environmental impact.

As noted in Section 15126.2 (a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1]
The environmental setting provides a description of the Public Services Setting in Tulare County. The regulatory setting provides a description of applicable Federal, State, and Local regulatory policies that were developed in part from information contained in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, and/or Tulare County 2030 General Plan EIR incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project

[1] CEQA Guidelines, Section 15126.2

is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

Thresholds of Significance

The thresholds of significance for this section are established by the CEQA Checklist Item questions. The following are potential thresholds for significance.

- Result in the need for new fire facilities that would have impacts
- Result in the need for new Police Services
- Result in the need for new schools or physically overcrowded schools
- Result in the overuse of Parks
- Result in the need for other new Public Facilities

ENVIRONMENTAL SETTING

Fire Protection

Tulare County

The [formerly titled] California Department of Forestry and Fire Protection/Tulare County Fire Department (now CalFire/TCFD) serve 145,128 of Tulare County's population and in 2002, averaged 38.4 calls per day.[2] Fire occurrence data generated by the department indicate a direct relationship between high use areas of the county and fire occurrence. The population increase in the mountain areas have caused increased wildland urban interface problems as well. Structures are being built throughout wildland areas wherein vegetation fires can spread rapidly. Providing adequate fire protection to those structures has become a major undertaking.[3]

The Tulare County Fire Department's 2013 Annual Report provides a summary of Incident Reports by major incident type as shown in **Table 3.14-1**[4]

Table 3.14-1 Summary of Incidents

MAJOR INCIDENT TYPE	# INCIDENTS	% OF TOTAL
Fires	1484	12.2
Overpressure, Rupture, …	3	0.3
Rescue & Emergency Medical	7234	59.8
Hazardous Conditions	32	2.6
Service Calls	66	5.5
Good Intent	1892	15.6
False Alarm	35	2.9
Severe Weather	3	0.0
Special Type	8	0.7
TOTAL	**12,084**	**100**

[2] Tulare County General Plan 2030 Update, *Background Report*, Table 7-6
[3] Ibid. Page 7-73
[4] Tulare County Fire Department's 2013 Annual Report, page 9, accessed on January 9, 2014 and available at: http://tularecounty.ca.gov/fire/index.cfm/department-information-for-the-field/annual-report-2013/

As shown in **Table 3.14-1**, the Tulare County Fire Department responded to 12,084 calls for service in 2012; a majority of the calls were for rescue and medical emergencies (59.8 percent) followed by fire calls (12.28 percent) and "good intent" (15.6 percent) as the top three incident types. The County of Tulare's Dinuba #3 Fire Station is approximately eight miles east of the proposed Project site and serves northern Tulare County. The station is backed up by fire stations located in Visalia, Dinuba and Fresno County.

CalFire/TCFD uses an "attack" time protocol of less than ten minutes to respond to 90 percent of the calls on the valley floor and less than 15 minutes on 75 percent of calls in the foothill and mountain areas. The proposed Project site is in the 15 minute response area. Such response times are feasible from each of the stations mentioned.[5]

City of Kingsburg

The City of Kingsburg Fire Department provides fire services to the planning area. The main station is located at 1460 Marion Street, and a satellite station is located at 1880 Bethel Avenue. The Fire Department provides 24/7 fire and ambulance services not only to citizens of Kingsburg but also to those citizens in the surrounding unincorporated areas of Fresno, Kings, and Tulare Counties. The Department has one full-time Fire Chief, three full-time Captains/Paramedics, six full-time Firefighter/Paramedics, and up to twenty paid Call Firefighters. Kingsburg Fire and Ambulance is equipped with one 1250 GPM Engine, one 1000 GPM Engine, one 1000 GMP Engine, a 55-foot ladder truck, two ALS ambulances, and one BLS ambulance.[6] The main station is approximately 0.6 miles west of the proposed Project site.

Police Protection

Tulare County

"In 2007, the Tulare County Sheriff's Department currently had 448 sworn officers serving its unincorporated population (145,128), and generates a level of service ratio of 3.2 officers per 1,000 residents. The ratio is above the accepted standard of 2.0 officers per 1,000 residents set by the Federal Bureau of Investigation. The Sheriff's Department also has 186 non-sworn clerical and support staff amounting to total Sheriff's Department staff personnel of 633 employees."[7]

"Law enforcement protection for the unincorporated county is divided into 22 areas with four stations… [T]he Porterville substation serves the largest number of areas with 10 patrols, followed by the headquarters in Visalia with six, and Cutler-Orosi and Pixley, each with three areas."[8] The Cutler-Orosi patrol substation is approximately 14 miles to the east of the proposed Project site.

[5] Ibid.
[6] City of Kingsburg Housing Element 2015-2023 Initial Study/Mitigated Negative Declaration. Page 12. http://www.fresnocog.org/sites/default/files/publications/Housing/CEQA_Items/Initial_Study_Neg_Dec/Kingsburg_HE_D_IS.pdf. Accessed January 2017.
[7] Tulare County General Plan 2030 Update, *Background Report*, Pages 7-71 to 7-72
[8] Ibid. Page 7-72

According to the Tulare County Sheriff's Department 2014-2015 Annual Report (page 6), there are currently 592 allocated sworn officers serving the unincorporated population of 146,651 resulting in a service ratio of 2.47%. This ratio is still above the accepted standard of 2.0 officers per 1,000 residents set by the Federal Bureau of Investigation. The Sheriff's Department also has allocated 252 non-sworn clerical and support staff amounting to the Sheriff's Department staff personnel of 844 total employees.[9]

City of Kingsburg

The City of Kingsburg Police Department, located at 1300 California Street, provides police services to planning area. The Police Department is staffed with 15 sworn and 6 non-sworn officer positions within the Records and Communications Division and also includes a Records Supervisor, four dispatchers and one Administrative Assistant.[10] The Police Department is approximately 0.4 miles to the west of the proposed Project site.

Schools

Tulare County

"A total of 48 school districts provide education throughout Tulare County... Of the 48 school districts, seven are unified districts providing educational services for kindergarten through 12th grade. The remaining 41 districts consist of 36 elementary school districts and four high school districts. Many districts only have one school."[11]

"Total enrolment in Tulare County public schools has increased from about 80,000 to 88,300 students during a nine-year span from 1993 to 2002. On average, the growth rate has remained steady with annual increases approximating two percent."[12]

City of Kingsburg

The Kingsburg Elementary Charter School District (KECSD) and the Kingsburg Joint Union High School District (KJUHSD) provide K-12 school services to the City of Kingsburg. KJUHSD includes one high school and an alternative continuation school while the KECSD includes one junior high school and eight elementary schools.[13] The proposed Project site is within the service area of both school districts and is immediately adjacent to Lincoln Elementary School.

[9] Tulare County Sheriff's Department 2014-2015 Annual Report, page 6, accessed on January 31, 2016 and available at: http://www.tularecounty.ca.gov/sheriff/index.cfm/community/2014-2015-annual-report/
[10] City of Kingsburg Housing Element 2015-2023 Initial Study/Mitigated Negative Declaration. Page 12. http://www.fresnocog.org/sites/default/files/publications/Housing/CEQA_Items/Initial_Study_Neg_Dec/Kingsburg_HE_D_IS.pdf. Accessed January 2017.
[11] Tulare County General Plan 2030 Update, *Background Report*, Pages 7-75 to 7-76
[12] Ibid. Page 7-76
[13] City of Kingsburg Housing Element 2015-2023 Initial Study/Mitigated Negative Declaration. Page 12. http://www.fresnocog.org/sites/default/files/publications/Housing/CEQA_Items/Initial_Study_Neg_Dec/Kingsburg_HE_D_IS.pdf. Accessed January 2017.

Parks

Tulare County

There are a number of Federal, State, and local parks within Tulare County. There are 13 park and recreational facilities operated by Tulare County. A list of the nearest local park facilities is provided in Table **3.14-2**.

Table 3.14-2
Nearest Recreational Areas to Project Site in Tulare County

Recreation Area	Location	Acres	Type of Use/Features
Cutler Park	5 miles east of Visalia on Highway 216 to Ivanhoe.	50	Reservations for picnic areas are taken. Entrance fee for vehicles.
Elk Bayou Park	6 miles SE of Tulare on Avenue 200.	60	Reservations for picnic areas are taken. No fee for day use.
Kings River Nature Preserve	2 miles east of Highway 99 on Road 28	85	This park is only for school environmental programs.
Ledbetter Park	1 mile northwest of Cutler on Road 124/Hwy 63	11	Reservations for picnic areas are taken. No fee.
Mooney Grove Park	2 Miles south of Caldwell Avenue on Mooney Blvd. In South Visalia.	143	Reservations for picnic areas are taken. Paddle boats, playground, baseball diamonds. Home of the End Trail statue. One of the largest oak woodlands in Tulare County. Location of the Agriculture and Farm Labor Museum.
Tulare County Museum	In Mooney Grove Park, South Visalia.	8.5	Free admission with park fee. Museum is opened Thursday thru Monday (closed Tuesday and Wednesday).
West Main Street Park	2 blocks west of County Courthouse on Main Street in Downtown Visalia.	5	Day use no entrance fee.

A more detailed discussion of Recreational facilities is provided in Chapter 3.15.

City of Kingsburg

The Planning and Community Services Division provides parks and recreation services to the Kingsburg community. There are four parks located within the planning area that provide a diverse array of outdoor recreation opportunities including picnic tables, playground equipment, benches, bar-b-ques, arbors, meeting halls, and open space. Historical Park is a unique, 4.7-acre site consisting of historical buildings and dedicated to preserving the area's historic character.

The Park includes the Olson Ball House, Clay School, a band stand, a barn, a fire department, a gas station, a Hall of Fame, a harvester, a Heritage Building, a Historical Park Hall, a medical building, a jail, the Olson Bottle Shop, the Olson Building, a tank house, Rieffel's Store, and a tractor barn.[14]

Library

Tulare County

"The Tulare County Public Library System comprises of interdependent branches, grouped by services, geography and usage patterns to provide efficient and economical services to the residents of the county. At present, there are 14 regional libraries and one main branch."[15] The nearest libraries to the Project are identified in **Table 3.14-3.**

Table 3.14-3
Tulare County Libraries

Branch	Address	*Service Hours (2014)*[16]
Dinuba	150 South "I" Street Dinuba, CA 93618-2399	Tuesday through Friday: 9 a.m. - 1 p.m., 2 p.m. - 6 p.m. Saturday through Monday: Closed.
Orosi	12646 Avenue 416 Orosi, CA 93647-2018	Wednesday, Thursday and Friday: 9 a.m. – 1 p.m., 2 p.m. - 6 p.m.
Visalia	Main Branch 200 West Oak Avenue Visalia, CA 93291-4993	Tuesdays, Wednesdays, Thursdays: 9 a.m. - 8 p.m.; Fridays: 12 p.m. – 6 p.m. Saturdays: 9 a.m. - 5 p.m.

City of Kingsburg

The Kingsburg Branch Library is part of the Fresno County Public Library system. The Kingsburg Branch opened in 1910 and moved to its current location at 1399 Draper Street, Kingsburg, 93631, in 2000. The Library is open on Monday, Tuesday, and Wednesday from 10 a.m. to 6 p.m., Thursday from noon to 8 p.m., Friday from 1 p.m. to 5 p.m., and Saturday from 10 a.m. to 2 p.m. Sunday the Library is closed.[17] The Kingsburg Library is approximately one-half mile to the west of the proposed Project site.

[14] City of Kingsburg Housing Element 2015-2023 Initial Study/Mitigated Negative Declaration. Page 12. http://www.fresnocog.org/sites/default/files/publications/Housing/CEQA_Items/Initial_Study_Neg_Dec/Kingsburg_HE_D_IS.pdf. Accessed January 2017.
[15] Tulare County General Plan 2030 Update, *Background Report*, Page 7-96
[16] Tulare County Library. Library hours as of 2017. Locations: http://www.tularecountylibrary.org/index.html. Accessed January, 2017.
[17] Fresno County Public Library. Kingsburg Branch Library. Library hours as of 2017. http://www.fresnolibrary.org/branch/kbrg.html. Accessed January 2017.

REGULATORY SETTING

Federal Agencies & Regulations

None that apply to the proposed Project.

State Agencies & Regulations

None that apply to the proposed Project.

Local Policy & Regulations

Tulare County General Plan Policies

The Tulare County General Plan has several policies that apply to projects within County of Tulare. General Plan policies that relate to the proposed Project are listed as follows:

PFS-7.1 Fire Protection - The County shall strive to expand fire protection service in areas that experience growth in order to maintain adequate levels of service.

PFS-7.2 Fire Protection Standards - The County shall require all new development to be adequately served by water supplies, storage, and conveyance facilities supplying adequate volume, pressure, and capacity for fire protection.

PFS-7.3 Visible Signage for Roads and Buildings - The County shall strive to ensure all roads are properly identified by name or number with clearly visible signs.

The County shall strive to ensure all roads are properly identified by name or number with clearly visible signs.

PFS-7.5 Fire Staffing and Response Time Standards - The County shall strive to maintain fire department staffing and response time goals consistent with National Fire Protection Association (NFPA) standards, and as provided in **Table 3.14-4.**

Table 3.14-4
Fire Staffing and Reponses Time Standards[18]

	Demographics	**Staffing/Response Time**	***% of Calls***
Urban	> 1,000 people/sq. mi.	15 FF/9 min.	*90*
Suburban	500-100 people/sq. mi.	10 FF/10 min.	*80*
Rural	< 500 people/sq. mi.	6 FF/14 min.	*80*
Remote*	Travel Dist. > 8 min.	4 FF/no specific response time	*90*

**Upon assembling the necessary resources at the emergency scene, the fire department should have the capacity to safety commence an initial attach within 2 minutes, 90% of the time. (FF = Fire Fighters)*

[18] Tulare County General Plan 2030 Update, Policy PFS – 7.5.

PFS-7.6 Provision of Station Facilities and Equipment - The County shall strive to provide sheriff and fire station facilities, equipment (engines and other apparatus), and staffing necessary to maintain the County's service goals. The County shall continue to cooperate with mutual aid providers to provide coverage throughout the County.

PFS-7.8 Law Enforcement Staffing Ratios - The County shall strive to achieve and maintain a staffing ratio of 3 sworn officers per 1,000 residents in unincorporated areas.

PFS-7.9 Sheriff Response Time - The County shall work with the Sheriff's Department to achieve and maintain a response time of:

1. Less than 10 minutes for 90 percent of the calls in the valley region; and
2. 15 minutes for 75 percent of the calls in the foothill and mountain regions.

PFS-7.12 Design Features for Crime Prevention and Reduction - The County shall promote the use of building and site design features as means for crime prevention and reduction.

PFS-8.1 Work with Local School Districts - The County shall work with local school districts to develop solutions for overcrowded schools and financial constraints of constructing new facilities.

PFS-8.4 Library Facilities and Services - The County shall encourage expansion of library facilities and services as necessary to meet the needs (e.g., internet access, meeting rooms, etc.) of future population growth.

IMPACT EVALUATION

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
Fire protection?

Project Impact Analysis: ***Less Than Significant Impact***

The proposed Project is within the service area of the City of Kingsburg Fire Department, as it is within the Urban Development Boundary of the Kingsburg General Plan. "According to the General Plan EIR, the Fire Department does not estimate needing to construct any new stations upon buildout of the Planning Area."[19] Additionally, per the proposed Specific Plan and "Memorandum of Understanding: Hash Subdivision Financing and Tax Sharing Plan" (see Appendix H) that has been conceptually approved by the City and County, and is part of

[19] City of Kingsburg Housing Element 2015-2023 Initial Study/Mitigated Negative Declaration. Page 52. http://www.fresnocog.org/sites/default/files/publications/Housing/CEQA_Items/Initial_Study_Neg_Dec/Kingsburg_HE_D_IS.pdf. Accessed January 2017.

the Project application, the proposed Project applicant will be required to pay an impact fee to the City of Kingsburg for fire services; however, no new fire facilities are required.

Project-specific impacts related to this Checklist Item will not likely occur as the proposed Project is not increasing the service area for the Kingsburg Fire Department.

Less Than Significant Project-specific Impacts related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

The proposed Project will not significantly impact the fire department's response times, as the applicant is required to pay an impact fee to the City of Kingsburg for fire services. Therefore, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As the Project will be required to comply with applicable Building, Fire, Mechanical, Electrical and Plumbing Codes, and Fire Department approval, the Project-specific impacts related to this Checklist item will be ***Less Than Significant*** level. ***No Cumulative Impacts*** related to this Checklist Item will occur.

Police protection?

Project Impact Analysis: ***Less Than Significant Impact***

The City of Kingsburg Police Department will provide police protection services to the proposed Project upon development, as the site is within the adopted Urban Development Boundary of the City of Kingsburg. "According to the General Plan EIR, the Police Department does not estimate needing to construct any new stations upon build-out of the Planning Area."[20] Additionally, per the proposed Specific Plan and "Memorandum of Understanding: Hash Subdivision Financing and Tax Sharing Plan" that has been conceptually approved by the City and County, and is part of the Project application, the proposed Project applicant will be required to pay an impact fee to the City of Kingsburg for police services. The Project will not result in the need for new Police facilities.

Less Than Significant Project-specific Impacts related to this Checklist Item will occur.

[20] Ibid.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

The proposed Project will not significantly impact the police department's response times. Therefore, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

Schools?

Project Impact Analysis: ***Less Than Significant Impact***

The Kingsburg Elementary Charter School District and the Kingsburg Joint Union High School District will provide school services to the proposed Project site. The Districts have approximately 3,700 students.[21] The nearest school, Lincoln Elementary School, is located adjacent to the western boundary of the proposed Project site.

"The effects of schools that can result in environment impacts are specific and include peak traffic levels occurring tin the morning and early afternoon, playground noise, and field lighting. Furthermore, analyses of school impacts are unique in that any impact resulting from the effects of schools are considered fully mitigated through the payment of development impact fees pursuant to the Leroy F. Green School Facilities Act; therefore, pursuant to State law and the payment of development impact fees, impacts will be less than significant." [22] As such, ***Less Than Significant Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the

[21] City of Kingsburg Housing Element 2015-2023 Initial Study/Mitigated Negative Declaration. Page 52. http://www.fresnocog.org/sites/default/files/publications/Housing/CEQA_Items/Initial_Study_Neg_Dec/Kingsburg_HE_D_IS.pdf. Accessed January 2017.
[22] City of Kingsburg Housing Element 2015-2023 Initial Study/Mitigated Negative Declaration. Page 53. http://www.fresnocog.org/sites/default/files/publications/Housing/CEQA_Items/Initial_Study_Neg_Dec/Kingsburg_HE_D_IS.pdf. Accessed January 2017.

Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

As noted earlier, the proposed Project will have a less than significant impact on Schools. As such, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

Parks?

Project Impact Analysis: ***Less Than Significant Impact***

As discussed in Chapter 3.15 Recreation, the City of Kingsburg Neighborhood Park Standards will be implemented with the proposed Project development, which states that 2.7 acres of developed park land is needed for every 1,000 people. The proposed Project includes the construction of 160 residential lots (with one unit per lot) and up to 40 multi-family units, which could have a total population of 564 (based on the City of Kingsburg Urban Water Management Plan's 2.82 person per household estimate, multiplied by 200). This would equate to a need for 1.54 acres of parkland based on the City's standard of 2.7 acres of parkland for every 1,000 people. The proposed Project would create over 2.54 acres of parks. As such, any impacts would be ***Less Than Significant***.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

As noted earlier, the proposed Project will have a less than significant impact to Recreational Services. As such, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

Other public facilities?

Project Impact Analysis: ***Less Than Significant Impact***

Other public facilities that may be impacted include water treatment plants, libraries, and solid waste disposal facilities. Water and wastewater treatment facilities and solid waste disposal facilities are discussed in Chapter 3.17 – Utilities and Service Systems. Residents of the proposed Project will likely utilize the Kingsburg Branch of the Fresno County Public Library system. As discussed in the Parks subsection of this Chapter, full Project build-out will potentially have a population of 601 residents, which would not significantly impact the existing Library system.

As such, ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

As noted earlier, the proposed Project will not impact other public facilities. As such, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

REFERENCES

CEQA Guidelines, Section 15126.2

City of Kingsburg Housing Element 2015-2023 Initial Study/Mitigated Negative Declaration. Page 12, 52, 53. See: http://www.fresnocog.org/sites/default/files/publications/Housing/CEQA_Items/Initial_Study_Neg_Dec/Kingsburg_HE_D_IS.pdf. Accessed January 2017.

Fresno County Public Library. Kingsburg Branch Library. Library hours as of 2017. http://www.fresnolibrary.org/branch/kbrg.html. Accessed January 2017.

Tulare County General Plan 2030 Update, *Background Report*, Table 7-6, Page 7-71, 72, 73, 74, 75, 76, 96, 4-4

Tulare County General Plan 2030 Update, Policy PFS – 7.5.

Tulare County Library. Library hours as of 2017. Locations information can be found at: http://www.tularecountylibrary.org/index.html. Accessed January, 2017.

Recreation
Chapter 3.15

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts*** related to Recreation. No mitigation measures will be required. A detailed review of potential impacts is provided in the following analysis.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to Recreation. As required in Section 15126, all phases of the proposed Project will be considered as part of the potential environmental impact.

As noted in Section 15126.2(a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1]

The "Environmental Setting" provides a description of the Recreational Resources in the County. The "Regulatory Setting" provides a description of applicable Federal, State and Local regulatory policies that were developed in part from information contained in the Tulare County

[1] 2013 CEQA Guidelines, Section 15126.2(a)

General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, and/or Tulare County General Plan 2030 Update Recirculated Draft Environmental Impact Report (RDEIR) incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

Thresholds of Significance

The thresholds of significance for this section are established by the CEQA Checklist item questions. The following are potential thresholds for significance:

- Increase use of existing recreational facilities
- Include or require additional recreational facilities

ENVIRONMENTAL SETTING

"Tulare County contains several county, state, and federal parks. Aside from parks in the county, there are many open space areas as well. This section will highlight these various parks and open space areas and identify recreational opportunities within them."[2] In addition to the 13 parks and recreation facilities that are owned and operated by the County of Tulare, there are State Parks and Forests, National Parks and National Forests, and trails and recreational areas. See Table 3.15-1 for a list of Recreational areas and facilities in Tulare County.

Table 3.15-1
Recreational Areas in Tulare County[3]

ID	Recreation Area	Location	Acres	Type of Use/Features
County				
1	Alpaugh Park	Located in Alpaugh on Road 40.	3	Reservations for picnic areas are taken. No entrance fee.
2	Balch Park Campgrounds	20 miles NE of Springville in the Sierras.	160	71 Campsites. No reservations taken; first come first serve basis. Entrance fee for vehicles.
3	Bartlett Park	8 miles east of Porterville on North Drive.	127.5	Reservations for picnic areas are taken. Entrance fee for vehicles.
4	Camp COTYAC	Near Ponderosa in Eastern Tulare County.	8	County of Tulare Youth Adventure Camp (Camp COTYAC). Cabins, lodge with kitchen, restrooms and showers.
5	Cutler Park	5 miles east of Visalia on Highway 216 to Ivanhoe.	50	Reservations for picnic areas are taken. Entrance fee for vehicles.
6	Elk Bayou Park	6 miles SE of Tulare on Avenue 200.	60	Reservations for picnic areas are taken. No fee for day use.

[2]Tulare County General Plan 2030 Update Background Report, February 2010. Page 4-1
[3] Ibid. Table 4-1. Page 4-4.

Table 3.15-1 Recreational Areas in Tulare County[3]				
7	Kings River Nature Preserve	2 miles east of Highway 99 on Road 28	85	This park is only for school environmental programs.
8	Ledbetter Park	1 mile northwest of Cutler on Road 124/Hwy 63	11	Reservations for picnic areas are taken. No fee.
9	Mooney Grove Park	2 Miles south of Caldwell Avenue on Mooney Blvd. In South Visalia.	143	Reservations for picnic areas are taken. Paddle boats, playground, baseball diamonds. Home of the End Trail statue. One of the largest oak woodlands in Tulare County. Location of the Agriculture and Farm Labor Museum.
10	Pixley Park	1 mile NE of Pixley on Road 124.	22	Reservations for picnic areas are taken. No fee.
11	Tulare County Museum	In Mooney Grove Park, South Visalia.	8.5	Free admission with park fee. Museum is opened Thursday thru Monday (closed Tuesday and Wednesday).
12	Woodville Park	Located in Avenue 166 in Woodville.	10	Reservations for picnic areas are taken. Day use no entrance fee.
13	West Main Street Park	2 blocks west of County Courthouse on Main Street in Downtown Visalia.	5	Day use no entrance fee.
State				
14	Colonel Allensworth State Historic Park	7 miles west of Earlimart on County Road J22.	3,715	15 campsites, open year round.
15	Mountain Home State Forest	Located in Sequoia National Forest	4,807	No reservations taken for campgrounds.
Federal				
16	Lake Kaweah	25 miles east of Visalia on Highway 198.	2,558	Horse Creek Campground, boat ramps, picnic areas, swimming, and hiking.
17	Lake Success	10 miles SE of Porterville on Highway 198.	2,450	Tule Campground, boating, fishing, picnic areas, playgrounds, and softball field. Hunting is permitted in the Wildlife Management Area.
18	Sequoia National Forest	Southeastern portion of Tulare County.	na	Campgrounds include Gray's Meadow, Oak Creek, Onion Valley, Stony Creek, Sunset, and Whitney Portal with over 300 campsites.
19	Giant Sequoia National Monument	Covers areas north and south of Sequoia and Kings Canyon National Parks.	na	
20	Sequoia and Kings Canyon National Parks (SEKI)	Northeastern portion of Tulare County.	na	Campgrounds include Atwell Mill Campground, Buckeye Flat, Cold Springs, Crystal Springs, Dorst Campground, Lodgepole, Moraine, Potwisha, Sheep Creek, and South Fork with over 800 campsites.
Total Acres				**5,701**

Federal Recreation Areas

Lake Kaweah

"Lake Kaweah was formed after the construction of the Terminus Dam on the Kaweah River in 1962. The lake offers many recreational opportunities including fishing, camping, and boating. Lake Kaweah is located 20 miles east of Visalia on Highway 198 and was constructed by the U.S. Army Corps of Engineers for flood control and water conservation purposes. The lake has a maximum capacity to store 143,000 acre-feet of water. There are a total of 80 campsites at the lake's Horse Creek Campground, which contains toilets, showers and a playground. Campfire programs are also available. Aside from camping, boat ramps are provided at the Lemon Hill and Kaweah Recreation Areas. Both Kaweah and Horse Creek provide picnic areas, barbecue grills and piped water. Swimming is allowed in designated areas. In addition, there is a one-mile hiking trail between Slick Rock and Cobble Knoll, which is ideal for bird watching."[4]

Lake Success

"Lake Success was formed by construction of the Success Dam on the Tule River in 1961. The lake offers many recreational activities including fishing, boating, waterskiing, and picnicking. The U.S. Army Corps of Engineers (USACOE) constructed this reservoir for both flood control and irrigation purposes. The lake has a capacity of 85,000 acre-feet of water. The lake is located eight miles east of Porterville in the Sierra Nevada foothills area. Recreational opportunities include ranger programs, camping at the Tule campground, which provides 104 sites, boating, fishing, picnic sites, playgrounds and a softball field. Seasonal hunting is also permitted in the 1,400-acre Wildlife Management Area."[5]

National Parks and National Forests

"Most of the recreational opportunities in the county are located in Sequoia National Forest, Giant Sequoia National Monument, and in Sequoia and Kings Canyon National Parks (SEKI). Although these parks span adjacent counties, they make a significant contribution to the recreational opportunities that Tulare County has to offer."[6] See Table 3.15-2 for a list of National Park and Forest facilities.

Table 3.15-2
National Park and Forest Facilities[7]

Recreation Area	Location	Camping Sites
Sequoia National Forest		
Gray's Meadow	5 miles West of Independence on Onion Valley Road.	52 tent/RV sites
Oak Creek	4 ½ miles NW of Independence off Highway 395.	21 tent/RV sites
Onion Valley	14 miles West of Independence on Onion Valley Road.	29 tent/RV sites
Stony Creek	14 miles SE of Grant Grove on Generals Highway.	49 tent/RV sites
Whitney Portal	13 miles West of Lone Pine on Whitney Portal Road.	43 tent/RV sites
Total		**194 sites**

[4] Op. Cit. Page 4-7
[5] Op. Cit.
[6] Op. Cit. Page 4-8.
[7] Op. Cit. Table 4-2. Page 4-8.

Table 3.15-2 National Park and Forest Facilities[7]		
Kings Canyon and Sequoia National Park		
Atwell Mill	Sequoia, 19 miles from Highway 198 on Mineral King Road.	21 tent sites
Azalea	Kings Canyon, 3 ½ miles from Kings Canyon Park entrance.	110 tent sites
Buckeye Flat	Sequoia, 11 miles South of Giant Forest of Generals Highway.	28 tent sites
Canyon View	Cedar Grove in Kings Canyon	23 tent sites
Cold Springs	Sequoia, Mineral King Area.	25 tent sites
Crystal Springs	Kings Canyon, ½ mile North of Grant Grove.	67 tent/RV sites
Dorst Creek	Sequoia, 9 miles North of Lodgepole off Generals Highway.	210 tent/RV sites
Lodgepole	Sequoia, 4 miles NE of Cedar Grove.	203 tent/RV sites
Moraine	Kings Canyon, 1 mile East of Cedar Grove.	120 tent/RV sites
Potwisha	Sequoia, 4 miles NE of Ash Mountain entrance off Generals Highway.	42 tent/RV sites
Sentinel	In the Cedar Grove area near the Kings River.	82 tent sites
Sheep Creek	Kings Canyon, 1/2-mile West of Cedar Grove.	111 tent/RV sites
South Fork	Sequoia, 13 miles on South Fork from Highway 198.	10 tent sites
Sunset	In the Grant Grove area 3 miles from Kings Canyon park entrance.	157 tent sites
Total		**1,209 sites**

Sequoia National Forest

"Sequoia National Forest takes its name from the Giant Sequoia, which is the world's largest tree. There are more than 30 groves of sequoias in the lower slopes of the park. The park includes over 1,500 miles of maintained roads, 1,000 miles of abandoned roads and 850 miles of trails for hikers, off-highway vehicle users and horseback riders. The Pacific Crest Trail connecting Canada and Mexico, crosses a portion of the forest, 78 miles of the total 2,600 miles of the entire trail. It is estimated that 10 to 13 million people visit the forest each year."[8]

Giant Sequoia National Monument

"The Giant Sequoia National Monument was created in 2000 by President Clinton in an effort to preserve 34 groves of ancient sequoias located in the Sequoia National Forest. The Monument includes a total of 327,769 acres of federal land, and provides various recreational opportunities, including camping, picnicking, fishing, and whitewater rafting. According to the Giant Sequoia National Monument Management Plan EIS, the Monument includes a total of 21 family campgrounds with 502 campsites and seven group campgrounds. In addition, there are approximately 160 miles of system trails, including 12 miles of the Summit National Recreation Trail."[9]

Sequoia and Kings Canyon National Parks (SEKI)

"The U.S. Congress created the Kings Canyon National Park in 1940 and Sequoia National Park in 1890. Because they share many miles of common boundaries, they are managed as one park. The extreme large elevation ranges in the parks (from 1,500 to 14,491 feet above sea level),

[8]Tulare County General Plan, 2030 Update, Background Report, February 2010. Page 4-9
[9] Op. Cit.

provide for a wide range of vegetative and wildlife habitats. This is witnessed from exploring Mt. Whitney, which rises to an elevation of 14,491 feet, and is the tallest mountain in the contiguous United States. During the summer months, park rangers lead walks through the parks, and tours of Crystal and Boyden Caves. During the winter, visitors explore the higher elevations of the parks via cross country skis or snowshoes, or hike the trails in the foothills. The SEKI also contains visitor lodges, the majority of which are open year round. According to the National Parks Conservation Association, a combined total of approximately 1.4 million people visit the two parks on an annual basis."[10]

State Parks and Forests

Colonel Allensworth State Park

"The only State Park in Tulare County is Colonel Allensworth State Historic Park discussed in Section 9.3 [of the General Plan Background Report]. The park contains a museum and a visitor center addressing the town's history, as well as camping facilities. Allensworth is the only California town to be founded, financed and governed by African Americans. The small farming community was founded in 1908 by Colonel Allen Allensworth and a group of others dedicated to improving the economic and social status of African Americans. Uncontrollable circumstances, including a drop in the area's water table, resulted in the town's demise. With continuing restoration and special events, the town is coming back to life as a state historic park. The park's visitor center features a film about the site. A yearly rededication ceremony reaffirms the vision of its pioneers."[11]

Mountain Home State Forest

"The Mountain Home State Forest is a State Forest managed by the California Department of Forestry and Fire Protection (CDF). The Forest consists of 4,807 acres of parkland containing a number of Giant Sequoias, and is located just east of Porterville. The Forest is a Demonstration Forest, which is considered timberland that is managed for forestry education, research, and recreation. Fishing ponds, hiking trails, and campsites are some of the amenities that can be found in the Forest."[12]

Other Recreational Facilities

Other recreational resources available in Tulare County include portions of the Pacific Crest Trail, South Sierra Wilderness Area, Dome Land Wilderness Area, Golden Trout Wilderness Area, International Agri-Center, and the Tulare County Fairgrounds.[13]

In addition, there are several nature preserves open to the public which are owned and operated by non-profit organizations, including the Kaweah Oaks Preserve and Dry Creek- Homer Ranch preserves, both owned and operated by Sequoia Riverlands Trust.

[10] Op. Cit.
[11] Op. Cit. Page 4-3
[12] Op. Cit. Page 4-7.
[13] Ibid. Page 3.9-32.

Incorporated cities in the County also have a number of recreational facilities including neighborhood parks, play lots, pocket parks and other recreation facilities."[14]

REGULATORY SETTING

Federal Agencies & Regulations

United States National Park Service (NPS)

"The National Park Service (NPS) is a bureau of the U.S. Department of the Interior. The NPS manages the 409 parks of the National Park System. The NPS also helps administer dozens of affiliated sites, the National Register of Historic Places, National Heritage Areas, National Wild and Scenic Rivers, National Historic Landmarks, and National Trails."[15]

State Agencies & Regulations

California Department of Parks and Recreation

"California Department of Parks and Recreation manages 280 park units, which contain the finest and most diverse collection of natural, cultural, and recreational resources to be found within California. These treasures are as diverse as California: From the last stands of primeval redwood forests to vast expanses of fragile desert; from the lofty Sierra Nevada to the broad sandy beaches of our southern coast; and from the opulence of Hearst Castle to the vestiges of colonial Russia. California State Parks contains the largest and most diverse natural and cultural heritage holdings of any state agency in the nation. The State Park System includes State Parks, State Natural Reserves, State Historic Parks, State Historic Monuments, State beaches, State Recreation Areas, State Vehicular Recreation Areas, State Seashores and State Marine Parks. Within the system are Natural and Cultural Preserves, lakes and reservoirs, coastal beaches, historic homes, Spanish era adobe buildings, lighthouses, ghost towns, museums, visitor centers, conference centers, and off-highway vehicle recreation areas. Together, State Park System lands protect and preserve an unparalleled collection of culturally and environmentally sensitive structures and habitats, threatened plant and animal species, ancient Native American sites, historic structures and artifacts... the best of California's natural and cultural history."[16]

Local Policy & Regulations

Tulare County General Plan Policies

ERM-5.2 Park Amenities - The County shall provide a broad range of active and passive recreational opportunities within community parks. When possible, this should include active sports fields and facilities, community center/recreation buildings, children's play areas, multi-use areas and trails, sitting areas, and other specialized uses as appropriate.

[14] Op. Cit. 3.9-29.
[15] National Park Service Overview Brochure, Updated July 13, 2015.
[16] California Dept. of Parks and Recreation, http://www.parks.ca.gov/?page_id=91. Accessed November, 2015.

ERM-5.3 Park Dedication Requirements - The County shall require the dedication of land and/or payment of fees, in accordance with local authority and State law (for example the Quimby Act), to ensure funding for the acquisition and development of public recreation facilities.

ERM-5.5 Collocated Facilities - The County shall encourage the development of parks near public facilities such as schools, community halls, libraries, museums, prehistoric sites, and open space areas and shall encourage joint-use agreements whenever possible.

City of Kingsburg General Plan

According to the City of Kingsburg General Plan (1990), Neighborhood Park Standards, an overall standard of 2.7acres/1,000 population of developed park land is needed to meet the needs of the future population.

IMPACT EVALUATION

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Project Impact Analysis: ***Less Than Significant Impact***

The City of Kingsburg Neighborhood Park Standards will be implemented with the proposed Project development, which states that 2.7 acres of developed park land is needed for every 1,000 people. The proposed Project includes the construction of 160 single family residential units and up to 40 multi-family units, which could have a total population of 564 (based on the City of Kingsburg Urban Water Management Plan's 2.82 person per household estimate, multiplied by 200). This would equate to a need for 1.52 acres of parkland based on the City's standard of 2.7 acres of parkland for every 1,000 people. The proposed Project would create over 2.54 acres of park area, and 1.8 acres of landscape pedestrian and bike trails acres dedicated to open space/parks. Park would be provided at approximately 4.5 acres/1,000 persons, and as such, the impacts would be ***Less Than Significant***.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, the Tulare County General Plan 2030 Update RDEIR, and the 1990 City of Kingsburg General Plan.

The proposed Project includes over four acres of park and open space to serve the residents and the surrounding community of the proposed Project. As such, impacts to off-site recreational facilities are anticipated to be ***Less Than Significant***.

Mitigation Measures: ***None Required***

Conclusion***:*** ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Project Impact Analysis: ***Less Than Significant Impact***

The proposed Project does include just over two acres of open space/park space, in addition to the housing units. Impacts associated with the construction of recreational facilities included in the proposed Project have been analyzed in the Draft EIR under various topical sections. Any impacts related to this Checklist Item will be ***Less Than Significant***.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, the Tulare County General Plan 2030 Update RDEIR, and the 1990 City of Kingsburg General Plan.

As noted earlier, any impacts to this Checklist Item will be ***Less Than Significant***.

Mitigation Measures: ***None Required***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

REFERENCES

California Dept. of Parks and Recreation, http://www.parks.ca.gov/?page_id=91. Accessed November 2015.

CEQA Guidelines, Section 15126.2(a)

National Park Service Overview Brochure, Updated July 13, 2015

Tulare County General Plan 2030 Update, August 2012

Tulare County General Plan 2030 Update Background Report, February 2010

Tulare County General Plan 2030 Update Recirculated Draft Environmental Impact Report (DEIR), February 2010

Transportation/Traffic
Chapter 3.16

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts with Mitigation*** related to Transportation and Traffic. A Traffic Study report prepared by consultant Ruettgers & Schuler Civil Engineers, is included as Appendix "E" of this document which is used as the basis for determining this Project will result in Less Than Significant Impacts with mitigation incorporated. A detailed review of potential impacts is provided in the following analysis.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to Transportation and Traffic. As required in Section 15126, all phases of the proposed Project will be considered as part of the potential environmental impact.

As noted in Section 15126.2 (a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1]

[1] 2013 CEQA Guidelines, Section 15126.2 (a)

The environmental setting provides a description of the Transportation and Traffic in the County. The regulatory setting provides a description of applicable Federal, State and Local regulatory policies that were developed in part from information contained in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, and/or Tulare County 2030 General Plan EIR incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

Thresholds of Significance

The thresholds of significance for this section are established by the CEQA Checklist item questions. The following are potential thresholds for significance:

- Result in a Level of Service (LOS) less than "D"
- Unsafe roadway/circulation design
- Impact Air Traffic
- Dangerous Site Design
- Inadequate Access
- Need for additional Public Transit
- Need for additional Bike Facilities
- Need for additional Pedestrian Facilities

ENVIRONMENTAL SETTING

The proposed Project is located adjacent to the southeast border of the City of Kingsburg in an area that is a mix of residential housing, rural housing and agriculture. The traffic study area for the Project extends from Road 16 in the east, to State Route 99 in the west, and State Route 201 in the North, to Kern Street in the south. A total of seven intersections are included in the study, seven of which are stop controlled, and one that is signalized. More specific roadway and intersection information is included in the description under the heading "Study Area" later in this section. Existing land uses in the vicinity of the proposed development include agricultural land uses to the east and south, and residential development to the west and north. Kingsburg High School is also located northwest of the site, and Lincoln Elementary School is located immediately to the west of the site along Kern Street.

"The purpose of the highway, streets and roads section is to identify the existing regional circulation system and determine both feasible short-term and long-range improvements. Tulare County's planned circulation system consists of an extensive network of regional streets and roads, local streets and State Highways. The system is designed to provide an adequate [Level of Service] LOS that satisfies the transportation needs of County residents. However, Tulare County has experienced a large increase in population and is beginning to outgrow portions of the circulation system. The need for major improvements to the State Highways, streets and roads network is an important issue.

The existing State Highway system was completed in the 1950's and 60's. The average design life of a State Highway is approximately 20 years and many Tulare County's highways were constructed 50 years ago. The Agricultural and commercial industry continue to utilize the circulation system to get products to market. With industry intensification and other development, many facilities are beginning to show structural fatigue (e.g., surface cracks, potholes, and broken pavement)."[2]

"Caltrans and the Tulare County region will be placing more emphasis on corridors as an important element of the transportation system. The analysis of the regional circulation system in this [2014-2040 Regional Transportation Plan & Sustainable Communities Strategy] 2014 RTP emphasizes people movement through transportation corridors. Caltrans defines a corridor as a "broad geographic area that includes various modes of transportation, local roads and State Highways." Corridors may be defined as terms of the number of people or tonnage of freight moved in any particular direction, regardless of the facility.

Caltrans, [Regional Transportation Planning Agencies] RTPAs, local transit agencies and local governments have developed the analysis of corridor needs. Caltrans developed a System Management Plan to reflect individual corridors and the relationship to each other. The emphasis on corridor planning will require open communication between the District and locals in order to develop a common database and consistent planning practices.

The 2014 RTP contains goals aimed at protecting and enhancing various corridors. The objective provides guidance toward coordination of local planning processes along the corridors. The policy supports limitation of direct access along regionally significant corridors. The data to be analyzed will include volume, length, type, destination, and modal split of person trips. Analysis of this data will help TCAG determine transportation corridor conditions and needs. In Tulare County major travel corridors often closely mirror regionally significant roadways. Figures 3-18 and 3-19 [in the RTP] identify major corridors identified by Caltrans and [Tulare County Association of Governments] TCAG:

- SR- 99 (including UP rail line);
- SR-43 (including BNSF rail line);
- City of Visalia to the City of Tulare including Mooney Boulevard, Demaree/Blackstone/Hillman, Akers Road and transit links;
- SR-65 from SR-198 to the City of Lindsay;
- City of Lindsay to City of Porterville, including SR-65 and Orange Belt Dr.;
- SR-65 from the City of Porterville to the Kern County line;
- SR-198/Sequoia National Park/Exeter/Hanford;
- SR-190/Road 152 from the Kings County line to the City of Porterville; and
- SR-137 from the Kings County line to the City of Lindsay."[3]

[2] 2014-2040 Regional Transportation Plan &Sustainable Communities Strategy, Tulare County Association of Governments (TCAG), June 2014. Page 3-54.
[3] Ibid. 3-54 and 3-55.

"Tulare County has interregional connections along the SR 198 corridor with Kings County, SR 99 with Kern and Fresno County, and SR 65 with Kern County and Ave 416 with Fresno County. The main corridors are currently running at capacity or near capacity. TCAG has coordinated with surrounding counties to improve these significant corridors By way of Proposition 1B funds, and other local and state funds, the SR-198 corridor has been widened between the cities of Visalia and Hanford. Segments of SR-99 have begun widening at the north end of Tulare County. TCAG will continue to move forward on these major projects, in close partnership with Caltrans and neighboring jurisdictions."[4]

As indicated in the 2014 RTP, capacity and level of service are two significant criteria used to measure the ability of a roadway to handle volume and the speed of volume flow; respectively. Following are discussion excerpted from the 2014 RTP:

"Capacity

According to the 2010 Highway Capacity Manual (HCM), capacity is defined as "the maximum sustainable hourly flow rate at which persons or vehicles reasonably can be expected to traverse a point or a uniform section of a lane or roadway during a given time period under prevailing roadway, environmental, traffic and control conditions, usually expressed as vehicles per hour or persons per hour." The ratio of the roadway volume to its capacity, V/C, can be useful in determining the preliminary Level of Service (LOS) of a roadway.

Volume =	Actual number of vehicles.
Capacity =	Maximum number of vehicles on a particular segment of roadway during a specific time frame.

Level of Service

LOS is categorized by two parameters, uninterrupted flow and interrupted flow. Uninterrupted flow facilities have no fixed elements, such as traffic signals, that cause interruptions in traffic flow (e.g., freeways, highways, and controlled access, some rural roads). Interrupted flow facilities have fixed elements that cause an interruption in the flow of traffic such as stop signs and signalized intersections. The definitions and measurements used for determining level of service in interrupted and uninterrupted conditions are shown below:

Uninterrupted Traffic Flow Facilities

LOS A: Describes free-flow operations. Free-Flow Speed (FFS) prevails on the freeway, and vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The effects of incidents or point breakdowns are easily absorbed.

LOS B: Represents reasonably free-flow operations, and FFS on the freeway is maintained. The ability to maneuver within the traffic stream is only slightly restricted, and the general level of physical and psychological comfort provided to drivers is still high. The effects of minor incidents and point breakdowns are still easily absorbed.

[4] Op. Cit. 3-55.

LOS C: Provides for flow with speeds near the FFS of the freeway. Freedom to maneuver within the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver. Minor incidents may still be absorbed, but the local deterioration in service quality will be significant. Queues may be expected to form behind any significant blockages.

LOS D: At this level speeds begin to decline with increasing flows, with density increasing more quickly. Freedom to maneuver within the traffic stream is seriously limited and drivers experience reduced physical and psychological comfort levels. Even minor incidents can be expected to create queuing, because the traffic stream has little space to absorb disruptions.

LOS E: Describes operation at capacity. Operations on the freeway at this level are highly volatile because there are virtually no useable gaps within the traffic stream, leaving little room to maneuver within the traffic stream. Any disruption to the traffic stream, such as vehicles entering from a ramp or changing lanes, can establish a disruption wave that propagates throughout the upstream traffic flow. At capacity, the traffic stream has ability for serious breakdown and substantial queuing. The physical and psychological comfort afforded to drivers is poor.

LOS F: Describes breakdown, or unstable flow. Such conditions exist within queues forming behind bottlenecks. Breakdowns occur for a number of reasons:

Traffic incidents can temporarily reduce the capacity of a short segment, so that the number of vehicles arriving at a point is greater than the number of vehicles that can move through it.

Points of recurring congestion, such as merge or weaving segments and lane drops, experience very high demand in which the number of vehicles arriving is greater than the number of vehicles that can be discharged.

In analyses using forecast volumes, the projected flow rate can exceed the estimated capacity of a given location.

Interrupted Traffic Flow Facilities

LOS A: Describes operations with a control delay of 10 s/veh or less and a volume-to- capacity ratio no greater than 1.0. This level is typically assigned when the volume-to- capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

LOS B: Describes operations with a control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to- capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A, with reasonably unimpeded travel between intersections.

LOS C: Describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable

or the cycle length is moderate. Individual cycle failures (i.e.one or more queued vehicles are not able to depart as a result of the insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping. May be longer queues and operations between locations may be more restricted.

LOS D: Describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. Travel speeds are about 40 percent below free flow speeds. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E: Describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to- capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent. Average travel speed is one-third of free flow speeds. The facility is generally at full capacity.

LOS F: Describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue. Extremely slow speeds with average delay of 80 seconds or more. Frequent stop and go conditions.

Caltrans policy defines LOS D as an acceptable operating condition when planning for future state facilities in urbanized areas. TCAG monitors traffic levels of service on the regional roads. An LOS of D or better is the goal on urban roads, and C on rural roads."[5]

"***Public Transit***

An inexpensive and clean alternative to adding additional lanes to highways, streets and roads is to provide mass transit systems. Transit service in the County is currently provided by both local agencies and contracted private operators. Mass transportation is an economical mode of transportation. In Tulare County, all public mass transportation is provided by fixed route buses and dial-a-ride services that meet all reasonable needs in the region. Tulare County is not directly serviced by passenger rail facilities although it is accessible to Hanford's Amtrak station by bus. Furthermore, inter-agency transfer points are becoming part of Tulare County's overall circulation system, in an effort to coordinate transit systems between adjacent agencies. TCAG will be leading the development of the first-ever Tulare County Regional Long Range Transit Plan. The plan will begin in late 2014."[6]

"Mass transportation provides transportation to large numbers of people to designated destinations by bus or train. In Tulare County, buses are the primary mode of public transportation. Amtrak, California's only operating interregional passenger rail service, doesn't

[5] Op. Cit. 3-1 thru 3-4.
[6] Op. Cit. 3-52.

directly serve Tulare County. The closest Amtrak stations are in the Cities of Hanford and Corcoran in Kings County. However, Amtrak does coordinate with Visalia Transit to provide a feeder bus linking Visalia from the city's transit center with the Hanford Station in Kings County. Public transportation in Tulare County also takes the form of shared-ride taxis, carpools and vanpools; dial-a-ride and specialized handicapped accessible services. Public transportation needs are met by either a fixed route or demand responsive (dial-a-ride) transit system. Fixed routes are generally used in the more populated urban areas while demand responsive transit and fixed route deviation are often used in rural areas and communities.

Social service transportation in Tulare County is being guided in a direction consistent with the Social Service Improvement Act of 1979 (AB 120). The law was enacted to promote the consolidation of such transportation services. The Act was established to improve efficient social service transportation by:

- Combining purchasing of necessary equipment
- Insure adequate training of vehicle drivers for reduced insurance rates
- Centralized dispatching of vehicles
- Centralized maintenance of vehicles
- Centralized administration
- Identification and consolidation of all existing sources of funding.

In Tulare County, social service transportation is provided by the following: local transit agencies, demand responsive operators and city/county special programs for senior citizens, and mental health organizations and programs for citizens with disabilities. TCAG reaches out to transportation providers identified in the Coordinated Transportation plan and ensures that calls for projects are communicated with social service providers. Many of these programs are funded and subsidized through state and federal grants, Transportation Development Act (TDA) funds, and local funds including Measure R."[7]

"Public transportation provides an economical and efficient alternative for getting people to work, school and other chosen destinations. In Tulare County, buses are the primary mode of public transportation. Public transportation also takes the form of shared ride taxi, automobile and vanpools; dial-a-ride, and specialized handicapped accessible services. In Tulare County, social service transportation is provided by the following: local transit agencies, demand responsive operators and city/county special programs for senior citizens, mental health organizations and disabled citizens programs. These programs are funded and subsidized through State and federal grants, Local Transportation Funds (LTF), State Transit Assistance Funds (STAF), and local transportation sales tax revenues."[8]

"Tulare County has two major regional highways, State Highway 99 and 198. State Highway 99 connects Tulare County to Fresno and Sacramento to the north and Bakersfield to the south. State Highway 198 connects from U.S. Highway 101 on the west and continues eastward to Tulare County, passing through the City of Visalia and into Sequoia National Park. The highway

[7] Op. Cit. 3-57 thru 3-58.
[8] Tulare County General Plan 2030 Update Background Report. Page 1-14.

system in the County also includes State highways, County-maintained roads, and local streets within each of the eight cities."[9]

"Tulare County's transportation system is composed of several State Routes, including three freeways, multiple highways, as well as numerous county and city routes. The county's public transit system also includes two common carriers (Greyhound and Orange Belt Stages), the AMTRAK Service Link, other local agency transit and Para transit services, general aviation, limited passenger air service and freight rail service."[10]

"Some prominent county roadways include, but are not limited to, Alta Avenue (Road 80), Caldwell Avenue/Visalia Road (Avenue 280), Demaree Road/Hillman Street (Road 108), Tulare Avenue (Avenue 232), Olive Avenue (Avenue 152), Spruce Road (Road 204), El Monte Way (Avenue 416), Paige Avenue (Avenue 216), Farmersville Boulevard (Road 164), Road 192, and Road 152. Additionally, the highway system includes numerous county-maintained local roads, as well as local streets and highways within each of the eight cities and several unincorporated communities."[11]

"Travel within Tulare County is a function of the size and spatial distribution of its population, economic activity, and the relationship to other major activity centers within the Central Valley (such as Fresno and Bakersfield) as well as more distant urban centers such as Los Angeles, Sacramento, and the Bay Area. In addition, there is considerable travel between the northwest portions of Tulare County and southern Fresno County and travel to/from Kings County to the west. Due to the interrelationship between urban and rural activities (employment, housing, services, etc.) and the low average density/ intensity of land uses, the private automobile is the dominant mode of travel for residents in Tulare County."[12]

"Public transportation provides an economical and efficient alternative for getting people to work, school and other chosen destinations. In Tulare County, buses are the primary mode of public transportation. Public transportation also takes the form of shared ride taxi, automobile and vanpools; dial-a-ride, and specialized handicapped accessible services. In Tulare County, social service transportation is provided by the following: local transit agencies, demand responsive operators and city/county special programs for senior citizens, mental health organizations and disabled citizens programs. These programs are funded and subsidized through State and federal grants, Local Transportation Funds (LTF), State Transit Assistance Funds (STAF), and local transportation sales tax revenues."[13]

Airport

"There are nine public use airports in Tulare County. These include six publicly owned and operated facilities (Porterville Municipal, Sequoia Field, Tulare Municipal [Mefford Field], Visalia Municipal, Woodlake, and Harmon Field [currently closed]) and three privately owned and operated airports (Alta Airport [currently closed], Thunderhawk Field, and Eckert Field).

[9] Ibid. 13-2
[10] Op. Cit. 5-4.
[11] Op. Cit. 5-7.
[12] Op. Cit. 5-4.
[13] Op. Cit. 1-14.

Badger Field is under consideration for Federal Aviation Administration (FAA) recertification as a restricted private airfield (as of August 2006)."[14]

Design for Emergency Access

According to § 21060.3 and § 15359 of the CEQA Guidelines, an "Emergency" means a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services. "Emergency" includes such occurrences as fire, flood, earthquake, or other soil or geologic movements, as well as such occurrences as riot, accident, or sabotage. A Proposed Project could potentially generate impacts through inadequate design for emergency access.

Alternative Transportation/Tulare County Area Transit (TCaT)

"TCAT has been providing rural route service between various cities and towns in Tulare County since 1981. TCAT retains MV Transportation to provide all of its transit services, which includes fixed route and demand responsive services for inter-city and intra-city service in many small communities throughout the County. TCAT is the most extensive transit system in Tulare County and connects with Dinuba Area Regional Transit (DART), Visalia City Coach (VCC), Tulare InterModal Express (TIME), Porterville City Operated Local Transit (COLT), Kings Area Rural Transit (KART), Kern Regional Transit, Orange Belt and Greyhound bus."[15] "TCaT provides reliable and convenient public transit service between cities and within many small communities throughout Tulare County. Fixe route service is offered every day. Demand-response Dial-A-Ride is offered Monday through Friday…"[16] The nearest fixed route service area is in the unincorporated community of Traver approximately five (5) miles south of the Project site. Traver is part of Route 50 (Dinuba-London-Traver-Delft Colony Route). Although fixed-route service is not available within the proposed Project site, demand responsive (Dial-A-Ride) service is available to transport General fare riders to the nearest route. Also, TCaT provides a summary of how their fixed route service is available in their "Catching a Ride" information, to wit; "For your safety we recommend catching the bus at designated bus stops. You may board or leave the bus at any point along the route where the driver can make a safe stop. Wave or flag down the bus at a safe pullout location. For your convenience, you may call a day in advance to let us know you will be waiting for the bust somewhere other than a bus stop."[17] To provide a reasonable accommodation, TCaT provides Americans Disability Act (ADA)-eligible riders curb-to-curb or door-to-door service when service is requested a day to fourteen days in advance; if scheduling can accommodate, same day service is also available.[18]

[14] Op. Cit. 13-2.
[15] TCAG Transportation Plan. Page 1-14.
[16] TCaT website which can be accessed at: http://www.tularecounty.ca.gov/rma/index.cfm/public-works/tulare-county-area-transit-tcat/route-50-dinuba-london-traver/
[17] Ibid.
[18] Ibid.

Traffic Impact Study Requirement

As it was anticipated that the proposed Project would generate more than 100 peak hour trips, it was determined that a traffic impact study was required. "The following criterion is a starting point in determining when a TIS is needed. When a project:

1. Generates over 100 peak hour trips assigned to a State highway facility
2. Generates 50 to 100 peak hour trips assigned to a State highway facility – and, affected State highway facilities are experiencing noticeable delay; approaching unstable traffic flow conditions (LOS "C" or "D").
3. Generates 1 to 49 peak hour trips assigned to a State highway facility – the following are examples that may require a full TIS or some lesser analysis[4]:
    a. Affected State highway facilities experiencing significant delay; unstable or forced traffic flow conditions (LOS "E" or "F").
    b. The potential risk for a traffic incident is significantly increased (i.e., congestion related collisions, non-standard sight distance considerations, increase in traffic conflict points, etc.).
    c. Change in local circulation networks that impact a State highway facility (i.e., direct access to State highway facility, a non-standard highway geometric design, etc.)."[19]

Study Area

"The study area extends from Road 16 in the east, to State Route 99 in the west, and State Route 201 in the north, to Kern Street in the south."[20] The streets and intersections in the proposed Project vicinity are described below:

- "Kern Street (Avenue 396) – an east-west roadway that provides access to industrial and agricultural land uses. It is also the southern boundary of the proposed Project site and provides one of the sites access points. In the proposed Project area, Kern Street exists as a two-lane roadway with graded shoulders.
- Madsen Avenue – a north-south roadway that provides access to agricultural and residential land uses. In the proposed Project area, Madsen Avenue exists as a two-lane roadway with graded shoulders.
- Road 16 – a north-south roadway that provides access to agricultural and limited residential land uses. It is also the eastern boundary of the proposed Project site and provides one of the project's access points. In the proposed Project area, Road 16 exists as a two-lane roadway with graded shoulders.
- State Route 201 (Sierra Street) – an east-west route in the Central Valley that connects State Route 99 in the City of Kingsburg to State Route 245. In the proposed Project area, it transitions from a 2-lane facility to a 4-lane fully developed facility with a canter 2-way left turn lane. State Route 201 provides access to residential and commercial land uses

[19] Guide for the Preparation of Traffic Impact Studies, California Department of Transportation, December 2002. Page 2. http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf
[20] Traffic Study Hash Farms Proposed Residential Development (Traffic Study Report or TSR). January 2017. Page 1.

across the City of Kingsburg as well as Kingsburg High School.

- State Route 99 – a major north-south route through the Central Valley, extending from Interstate 5 south of Bakersfield to Sacramento. State Route 99 operates as a 4-lane freeway through the City of Kingsburg and has interchanges at 18th Avenue and Sierra Street (SR 201) in the proposed Project vicinity.
- 18th Avenue – a north-south roadway that provides access to residential areas, Kingsburg High School, Lincoln Elementary School, and State Route 99. In the proposed Project area, 18th Avenue exists as a 2-lane roadway with curb and gutter adjacent to developments."[21]

A Traffic Study, January 2017, was prepared for the Proposed Project by consultant Ruettgers & Schuler Civil Engineers. Within this Traffic Study, the consultant outlined a number of roadways and intersections that may be affected. These are listed as follows:

- Sierra Street (SR 201) & 18th Avenue
- Sierra Street (SR 201) & Madsen Avenue
- Sierra Street (SR 201) & Rd 16
- Kern Street (Ave 396) & 18th Avenue
- Kern Street (Ave 396) & Rd 16
- SR 99 NB On/Off Ramps & 18th Avenue
- SR 99 SB On/Off Ramps & 18th Avenue

REGULATORY SETTING

Federal Agencies & Regulations

None that apply to the proposed Project.

State Agencies & Regulations

Caltrans: Transportation Concept Reports

Caltrans has prepared a number concept reports for State Routes, Interstate Routes, and U.S. Routes. Tulare County is located in Caltrans District 6. As identified in the Project Traffic Study, the Project will not significantly impact or require modifications to any Concept Reports.

Caltrans Guide for the Preparation of Traffic Impact Studies

"The California Department of Transportation (Caltrans) has developed this "Guide for the Preparation of Traffic Impact Studies" in response to a survey of cities and counties in California. The purpose of that survey was to improve the Caltrans local development review process (also known as the Intergovernmental Review/California Environmental Quality Act or IGR/CEQA process). The survey indicated that approximately 30 percent of the respondents

[21] Ibid. 4.

were not aware of what Caltrans required in a traffic impact study (TIS)."[22] As identified on page one of the Traffic Study for the Project, the scope of the study is based on the guidelines contained in Caltrans' Guide for the Preparation of Traffic Impact Studies.

Local Policy & Regulations

Tulare County Transportation Control Measures (TCM)

"Transportation Control Measures (TCM) are designed to reduce vehicle miles traveled, vehicle idling, and/or traffic congestion in order to reduce vehicle emissions. Currently, Tulare County is a nonattainment region under the Federal Clean Air Act (CAA) and the California Clean Air Act (CCAA). Both of these acts require implementation of TCMs. These TCMs for Tulare County are as follows:

- Rideshare Programs;
- Park and Ride Lots;
- Alternate Work Schedules;
- Bicycle Facilities;
- Public Transit;
- Traffic Flow Improvement; and
- Passenger Rail and Support Facilities."[23]

Tulare County Association of Governments (TCAG)

"… [W]ith the passage of Assembly Bill (AB) 69 State law has required the preparation of Regional Transportation Plans (RTPs) to address transportation issues and assist local and state decision makers in shaping California's transportation infrastructure."[24] The Tulare County Association of Government has prepared the 2014 Regional Transportation Plan. Specific policies that apply to the Proposed Project are listed as follows:

System Performance - Objective: Develop an efficient regional road and circulation system that provides maximum achievable mobility and accessibility for vehicles, bicycles, pedestrians, and public transportation.

Policy 1 – Maintain a Level of Service C or better on rural roads and Level of Service D or better on urban roads.

Air Quality and Greenhouse Gases - Objective: Encourage coordinated development to achieve an improved jobs-housing balance in the region.

Policy 1 – Encourage mixed-use developments in urbanized areas and existing small communities, both incorporated and unincorporated.

[22] Caltrans Guide for the preparation of traffic studies. Page ii.
[23] Tulare County General Plan 2030 Update Recirculated Draft Environmental Impact Report. Page 3.2-2.
[24] TCAG Transportation Plan. Page 1-11.

Tulare County General Plan Policies

The Tulare County General Plan has a number of policies that apply to projects within County of Tulare. General Plan policies that relate to the proposed Project are listed below.

LU-7.4 Streetscape Continuity - The County shall ensure that streetscape elements (e.g., street signs, trees, and furniture) maintain visual continuity and follow a common image for each community.

TC-1.13 Land Dedication for Roadways and Other Travel Modes - As required by the adopted County Improvement Standards, the County shall require, where warranted, an irrevocable offer of dedication to the right-of-way for roadways and other travel modes, as part of the development review process.

TC-1.14 Roadway Facilities - As part of the development review process, new development shall be conditioned to fund, through impact fees, tonnage fees, and/or other mechanism, the construction and maintenance of roadway facilities impacted by the project. As projects or locations warrant, construction or payment of pro-rata fees for planned road facilities may also be required as a condition of approval.

TC-1.15 Traffic Impact Study - The County shall require an analysis of traffic impacts for land development projects that may generate increased traffic on County roads. Typically, applicants of projects generating over 100 peak hour trips per day or where LOS "D" or worse occurs, will be required to prepare and submit this study. The traffic impact study will include impacts from all vehicles, including truck traffic.

TC-1.16 County Level Of Service (LOS) Standards - The County shall strive to develop and manage its roadway system (both segments and intersections) to meet a LOS of "D" or better in accordance with the LOS definitions established by the Highway Capacity Manual.

City of Kingsburg General Plan Policies

Arterial and Collector Street Policy 9 – Direct access to Arterials and Collectors from residential develo9pment is to be discouraged except where physic al conditions do not allow for other design solutions. In commercial and multi-family areas, access may be required from an alley or from a continuous driveway along the rear of adjacent commercial lots. Access from the street side yard of a corner lot which sides onto an Arterial shall be prohibited in new subdivisions or on undeveloped lots in existing subdivisions.

IMPACT EVALUATION

Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant

components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Project Impact Analysis: ***Less Than Significant Impact With Mitigation***

"The trip generation and design hour volumes shown in **Table 3.16-1** [Table 1 in the TSR] were calculated using the Institute of Transportation Engineers (ITE) Trip Generation, 9th Edition, as well as data provided in the project proposal."[25] "The peak hour of adjacent street traffic was determined to be from 7:30 A.M. to 8:30 A.M. and 4:30 P.M. to 5:30 P.M."[26] This is based on typical high roadway activity times in "small towns" and around schools.

Table 3.16-1
Project Trip Generation

General Information			Daily Trips		AM Peak Hour Trips			PM Peak Hour Trips		
ITE Code	Development Type	Variable	ADT RATE	ADT	Rate	In % Split/ Trips	Out % Split/ Trips	Rate	In % Split/ Trips	Out % Split/ Trips
210	Single-Family detached Housing	185 Dwelling Units	eq	1850	eq	25% 35	75% 104	eq	63% 115	37% 68
220	Apartment	28 Dwelling Units	eq	293	eq	20% 3	80% 14	eq	65% 21	35% 12
Total				2,143		38	118		136	80

"The Project trip distribution was based on the most logically traveled routes for traffic accessing the Project and a review of the potential draw from population centers within the region as well as the types of land uses involved. For the purposes of this study, it was assumed that a majority of Project traffic will travel north and south along State Route 99."[27]

It is noted that the Project's impacts have been slightly reduced from the impacts associated with the Traffic Study in Appendix E of this EIR. Under the final configuration of the Project, the total average daily trips for the Project is estimated to be 2,019 compared to the Traffic Report of 2,143, a 5.8% reduction. Likewise, AM Peak Hour trips are estimated to be 144 trips compared to 156 shown in **Table 3.16-1**, and PM Peak Hour trips are estimated to be 205 compared to 216 shown in **Table 3.16-1**. Consequently, the TIS provides a quantitatively conservative assessment of the impacts of the Project.

"Existing weekday peak hour turning movement volumes were field measured at the following intersections…:

[25] Traffic Study Hash Farms Proposed Residential Development (Traffic Study Report or TSR). January 2017. Page 5. Appendix E of this DEIR.
[26] Ibid.
[27] Op. Cit.

- Sierra Street (SR 201) & 18th Avenue
- Sierra Street (SR 201) & Madsen Avenue
- Sierra Street (SR 201) & Rd 16
- Kern Street (Ave 396) & 18th Avenue
- Kern Street (Ave 396) & Rd 16
- SR 99 NB On/Off Ramps & 18th Avenue
- SR 99 SB On/Off Ramps & 18th Avenue"[28]

"In order to determine future traffic volumes, an average annual growth rate of 1% was applied to existing traffic volumes for the 2020 assumed build year and the 2035 future year analyses."[29]

Intersection Analysis

"A capacity analysis of the study intersections was conducted using Synchro 9 software from Trafficware. This software utilizes the capacity analysis methodology in the Transportation Research Board's Highway Capacity Manual. The analysis was performed for the following AM and PM Peak Hour traffic scenarios:

- Existing
- Build Year (2020)
- Build Year + Project (2020)
- Future (2035)
- Future (2035) + Project"[30]

Level of service for the study intersections (Unsignalized) for both A.M. and P.M. peak hours is presented in **Table 3.16-2** [Table 3a in the TSR] (A.M. Peak Hour) and **3.16-3** [Table 3b in the TSR] (P.M. Peak Hour). Level of service for the study intersections (Signalized) for both A.M. and P.M. peak hours is presented in **Table 3.16-4** [Table 4a in the TSR] (A.M. Peak Hour) and **Table 3.16-5** [Table 4b in the TSR] (P.M. Peak Hour).

[28] Op. Cit. 6.
[29] Op. Cit.
[30] Op. Cit. 13.

Table 3.16-2[31]
Unsignalized Intersection Level of Service
AM Peak Hour

#	Intersection	Movement	Existing	Build Year 2020	Build Yr+Proj 2020	2035	2035+ Project	2035+ Project w/Mit[1]
2	Madsen Ave & Sierra St (SR-201)	SB	B	B	B	B	B	-
3	Road 16 & Sierra St (SR-201)	NB	B	B	B	B	B	-
4	18th Ave & Kern St (Ave 396)	EB WB	A C	A C	A E	A D	A F	B
5	Road 16 & Kern St (Ave 396)	SB	A	A	A	A	A	-
6	18th Ave & SR 99 NB Off Ramp	EB WB	C C	C C	C C	C C	D C	-
7	18th Ave & SR 99 SB Off Ramp	EB	E	E	F	F	F	B

Table 3.16-3[32]
Unsignalized Intersection Level of Service
PM Peak Hour

#	Intersection	Movement	Existing	Build Year 2020	Build Yr+Proj 2020	2035	2035+ Project	2035+ Project w/Mit[1]
2	Madsen Ave & Sierra St (SR-201)	SB	B	B	B	B	C	-
3	Road 16 & Sierra St (SR-201)	NB	B	B	B	B	B	-
4	18th Ave & Kern St (Ave 396)	EB WB	A C	A C	A C	A C	A D	B[2]
5	Road 16 & Kern St (Ave 396)	SB	A	A	A	A	A	-
6	18th Ave & SR 99 NB Off Ramp	EB WB	B B	B B	B B	B B	C C	-
7	18th Ave & SR 99 SB Off Ramp	EB	B	B	C	C	C	B[2]

[31] Op. Cit. 14.
[32] Op. Cit.

Table 3.16-4[33]
Signalized Intersection Level of Service
AM Peak Hour

#	Intersection	Existing	Build Year 2020	Build Yr+Proj 2020	2035	2035+ Project
1	18th Ave & Sierra St (SR-201)	C	C	C	C	C

.

Table 3.16-5[34]
Signalized Intersection Level of Service
PM Peak Hour

#	Intersection	Existing	Build Year 2020	Build Yr+Proj 2020	2035	2035+ Project
1	18th Ave & Sierra St (SR-201)	C	C	C	C	C

.

Roadway Analysis

"A capacity analysis of the study roadways was conducted using HCS software from McTrans. This software utilizes the capacity analysis methodology in the Transportation Research Board's Highway Capacity Manual. The City of Kingsburg Traffic Impact Study Guidelines states that the peak hour level of service for roadways shall be no lower than LOS "D" for urban areas for the existing and future scenarios. The analysis was performed for the following A.M. and P.M. traffic scenarios: The analysis was performed for the following A.M. and P.M. Peak Hour traffic scenarios:

- Existing
- Build Year (2020)
- Build Year + Project (2020)
- Future (2035)
- Future (2035) + Project"[35]

Level of service for the study roadways is presented in **Table 3.16-6** (Table 5 in the TSR).

[33] Op. Cit. 15.
[34] Op. Cit.
[35] Op. Cit. 14.

Table 3.16-6
Roadway Level of Service[36]

Street	Existing Directional LOS		Build Year 2020 Directional LOS		2020+Project Directional LOS		2035 Directional LOS		2035+Project Directional LOS	
	E/S AM/PM	W/N AM/PM	E/S AM/PM	W/N AM/PM	E/S AM/PM	W/N AM/PM	E/S AM/PM	W/N AM/PM	E/S AM/PM	W/N AM/PM
18th Ave: Kern St (Ave 396) - SR 99	B/C	C/C	C/B	C/C	C/C	D/D	D/C	D/C	D/C	D/D
18th Ave: Sierra st - Kern St (Ave 396)	C/B	C/C	C/B	C/C	C/B	C/C	C/B	C/C	C/B	C/C
18th Ave: SR 99 Ramp - SR 99 Ramp	C/B	C/C	C/B	C/C	C/C	D/C	C/C	D/C	C/C	D/C
Kern St (Ave 396): 18th Ave - Rd 16	A/A	A/A	A/A	A/A	B/B	B/B	B/A	B/A	B/B	B/B
Road 16: Sierra St - Kern St (Ave 396)	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A
Sierra St: 18th Ave - Rd 16	C/C	C/C	C/C	C/C	C/C	C/C	C/C	C/C	C/C	C/D

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"Traffic Signal Warrant Analysis

Peak hour signal warrants were evaluated for each of the unsignalized intersections within the study based on the California Manual on Uniform Traffic Control Devices (MUTCD). Peak hour signal warrants assess delay to traffic on the minor street approaches when entering or crossing a major street. Signal warrant analysis results for A.M. and P.M. peak hours are shown Tables 6a [**Table 3.16-7** of the DEIR] and Table 6b [**Table 3.16-8** of the DEIR].

It is important to note that a signal warrant defines the minimum condition under which signalization of an intersection might be warranted. Meeting this threshold does not suggest traffic signals are required, but rather, that other traffic factors and conditions be considered in order to determine whether signals are truly justified.

It is also noted that signal warrants do not necessarily correlate with level of service. An intersection may satisfy a signal warrant condition and operate at or above an acceptable level of service, or operate below an acceptable level of service and not meet signal warrant criteria."[37]

[36] Op. Cit.
[37] Op. Cit. 17.

Table 3.16-7
AM Traffic Signal Warrants[38]

		Existing			Build Year 2020			2020+Project			2035			2035+Project		
#	Intersection	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
2	Madison Ave at Sierra St (SR-201)	483	122	NO	503	127	NO	531	131	NO	583	147	NO	611	151	NO
3	Road 16 at Sierra St (SR-201)	488	23	NO	507	24	NO	518	60	NO	589	28	NO	600	64	NO
4	18th Ave at Kern St (Ave 398)	761	95	NO	793	99	NO	819	181	YES	920	115	NO	946	197	YES
5	Road 16 at Kern St (Ave 398)	113	23	NO	117	24	NO	123	26	NO	136	27	NO	142	29	NO
6	18th Ave at SR 99 NB Off Ramp	760	148	NO	790	154	NO	868	164	YES	918	179	YES	996	189	YES
7	18th Ave at SR 99 SB Off Ramp	683	178	NO	710	185	NO	740	196	YES	824	216	YES	854	227	YES

Table 3.16-8
PM Traffic Signal Warrants[39]

		Existing			Build Year 2020			2020+Project			2035			2035+Project		
#	Intersection	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
2	Madison Ave at Sierra St (SR-201)	602	63	NO	626	66	NO	658	82	NO	726	77	NO	758	93	NO
3	Road 16 at Sierra St (SR-201)	548	15	NO	570	15	NO	612	39	NO	662	18	NO	704	42	NO
4	18th Ave at Kern St (Ave 398)	579	83	NO	603	87	NO	697	143	NO	699	100	NO	793	156	NO
5	Road 16 at Kern St (Ave 398)	95	11	NO	100	11	NO	104	18	NO	115	13	NO	119	20	NO
6	18th Ave at SR 99 NB Off Ramp	509	212	NO	529	221	NO	615	255	YES	615	256	YES	701	290	YES
7	18th Ave at SR 99 SB Off Ramp	514	119	NO	534	124	NO	554	165	NO	621	143	NO	641	184	NO

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Mitigation Measure(s):

"Table 7 [**Table 3.16-9** of the DEIR] lists the intersection improvements needed by the year 2035 in order to maintain an acceptable operational level of service for the street system within the Project scope [and the associated percent share attributable to the Project]."[40] As part of the Specific Plan for the Project, the Project will pay City of Kingsburg traffic fees including $769 for each single family residential unit, and $499 per multifamily dwelling unit for a total of fee payments of $143,000. Estimate costs for the improvements in **Table 3.16-11** are approximately $175,000, based on a cost of $275,000 for Intersection 4 and $350,000 for Intersection 7. To fully mitigate the Project's impacts, an additional traffic mitigation fee totaling $25,600 (or $175 per dwelling unit) is required.

[38] Op. Cit.
[39] Op. Cit.
[40] Op. Cit. 18.

Table 3.16-9
Project Percent Share for Local Mitigation[41]

#	Intersection	Total Improvements Required by 2035	Project % Share for Local Mitigation
4	18th Ave & Kern St (Ave 396)	Install Signal Add 1 Westbound Left Turn	37.63%
7	18th Ave & SR 99 SB Off Ramp	Install Signal*	18.64%

*As an alternate improvement option, Caltrans should also explore the possibility of constructing a roundabout.

16-1 The Project Applicant will be responsible for paying fair share fees as identified in Table 3.16-9 through payment of standard City traffic impact fees and an additional ad hoc mitigation fee of $175 per dwelling unit. The Applicant will pay the fee amounts at building permit. This shall be made a condition of Project approval.

Conclusion: ***Less Than Significant Impact With Mitigation***

Potential Project-specific impacts related to this Checklist item are ***Less Than Significant With Mitigation***.

Cumulative Impact Analysis: ***Less Than Significant Impact With Mitigation***

The geographic area of this cumulative analysis is Tulare County. In order to determine future traffic volumes, an average annual growth rate of 1%[42] was applied to existing traffic volumes for the 2020 assumed build year and the 2035 future year analyses. This rate was discussed and approved by the County of Tulare Planning Department. Investigation was also done in order to determine if any other proposed projects would impact the roadways within the scope of this study. No other known projects where found in the area. Future peak hour volumes are shown in **Table 3.16-6** (Table 5 in the TRS) through **Table 3.16-9** (Table 7 in the TRS) (see Appendix E). As shown in **Table 3.16-9**, the Project will contribute to impacts at two study intersections requiring mitigation in order to maintain acceptable levels of service.

Mitigation Measure(s): ***Implement Mitigation Measure 16-1.***

Conclusion: ***Less Than Significant Impact With Mitigation***

Potential Project-specific and cumulative impacts related to this Checklist item are ***Less Than Significant With Mitigation.***

[41] Op. Cit.
[42] Personal Communication with David Peters, City of Kingsburg Engineer

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Project Impact Analysis: ***Less Than Significant Impact***

The County's General Plan Policy: TC-1.16 Tulare County LOS Standards calls for an LOS of "D" or better. Caltrans endeavors to maintain a target LOS at the transition between LOS "C" and LOS "D" on State highway facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE should be maintained. As noted in the Traffic report, the Proposed Project would not lower the LOS of intersections in the area below "D". Additionally, the 2014 Regional Transportation Plan & Sustainable Communities Strategy, adopted by the TCAG, notes that; "The Cities of Visalia, Tulare, Dinuba and Lindsay have the most congested corridors (or segments of corridors) in Tulare County and are candidates for TSM strategies."[43] As the project site is located immediately outside of the City of Kingsburg (with a small portion inside the City and another small portion within Fresno County), the Proposed Project would not have an immediate impact on high congestion areas of Tulare County. Potential Project-specific impacts related this Checklist Item will be ***Less Than Significant***.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Traffic Study report, Tulare County General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, Tulare County General Plan 2030 Update RDEIR, and the TCAG 2014 Regional Transportation Plan.

As noted above, the proposed Project would not lower the LOS of intersections in the area below "D" and would not have an immediate impact on high congestion areas of Tulare County. Less Than Significant Cumulative Impact related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted above, potential Project-specific and cumulative impacts related to this Checklist Item are ***Less Than Significant Impact***.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?

[43] Tulare County Association of Governments *2014-2040 Regional Transportation Plan and Sustainable Communities Strategy*. Page 3-51

Project Impact Analysis: ***No Impact***

The nearest airstrip is the Central Valley Aviation Incorporated Airport located approximately 7 miles west of the site at E. Conejo Avenue and S. Temperance Avenue. The nearest domestic airport to the project site is the Visalia Municipal Airport located approximately 17 miles south of the Project site. Due to the distance from the airports, the Project will have no impact on air traffic patterns or result in any safety risks. Therefore, the Project will not conflict with Tulare County Airport Land Use Plan (CALUP) policies ***No Project-specific impact*** will occur as a result of the proposed Project.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, General Plan background Report, and/or Tulare County 2030 General Plan EIR.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, the nearest airstrip is located approximately 7 miles west of the Project site, while the nearest domestic airport is the Visalia Municipal Airport located approximately 17 miles south of the Project site. However, because there are no Project-specific impacts, there will also be ***No Project-specific or Cumulative Impacts*** related to this Checklist Item.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Project Impact Analysis: ***Less Than Significant Impact***

The proposed Project has been designed for ease of access, adequate circulation/movement and is typical of residential neighborhoods in Tulare County. On-site circulation patterns do not involve high speeds, sharp curves or dangerous intersections. In addition, the Project is composed entirely of residential uses and therefore there are no incompatible uses such as farm equipment.

Although there will be an increase in the volume of vehicles accessing the site and surrounding areas, the Project will not present a substantial increase in hazards. Therefore, a ***Less Than Significant Project-specific Impact*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, General Plan Background Report, and/or Tulare County 2030 General Plan EIR.

As noted earlier, no significant design changes that would result in a hazard are proposed. As such, ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

e) Result in inadequate emergency access?

Project Impact Analysis: ***Less Than Significant Impact***

"In the event of a disaster, certain facilities are critical to serve as evacuation centers, provide vital services, and provide for emergency response. Existing critical facilities in Tulare County include hospitals, county dispatch facilities, electrical, gas, and telecommunication facilities, water storage and treatment systems, wastewater treatment systems, schools, and other government facilities. This plan also addresses evacuation routes, which include all freeways, highways, and arterials that are located outside of the 100-year flood plain."[44]

The proposed Project does not involve a change to any emergency response plan. Multiple access/egress points to and from the Project area will be located along the eastern, western, and southern boundaries. Therefore, emergency access to the site will be adequate. The site is currently and will remain accessible to emergency vehicles of all sizes. Due to the number and size of access points to the Project site, the proposed Project will result in ***Less Than Significant Impact*** related to this Checklist item.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, General Plan Background Report, and/or Tulare County 2030 General Plan EIR. The site will have adequate access for emergency vehicles.

As previously noted, multiple access/egress points will be constructed as part of the Project which will allow adequate access/egress for emergency vehicles. The Project will not limit access/egress to any of the surrounding properties. Therefore, ***No Cumulative Impact*** to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

[44] *Tulare County General Plan 2030 Update Background Report. Page 8-45.*

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Project Impact Analysis: ***Less Than Significant Impact***

Pedestrian and bicycle amenities are available within the vicinity of the Project site. The site is adjacent to an existing residential neighborhood and will be accessible to pedestrians and bicycles at all site access points.

The City of Kingsburg offers a transit van to the community that is available from 8:00 A.M. to 4:30 P.M. Monday through Friday and 9:00 A.M. to 3:00 P.M. on Saturdays. [45] As noted earlier, Tulare County provides transit service via the Tulare County Area Transit (TCaT). However, TCaT does not provide service to or within the City of Kingsburg.[46] It is anticipated that Kingsburg transit services will be able offer service to the Project via a memorandum of understanding or other arrangement.

The Project encourages alternate transportation such as walking and biking, and will not conflict with any established plans or routes, nor will it decrease the performance or safety of such facilities. Therefore, the proposed Project will result in ***Less Than Significant Impact*** related to this Checklist item.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Traffic Report, Tulare County General Plan 2030 Update, Tulare County General Plan 2030 Update Background Report, and Tulare County General Plan 2030 Update RDEIR, and the TCAG 2014-2040 Regional Transportation Plan and Sustainable Communities Strategy.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

Potential Project-specific and cumulative impacts related to this Checklist Item are ***Less Than Significant***.

[45] http://www.ruraltransit.org/kingsburgtransit.htm (Accessed Jan 2017)
[46] http://tularecounty.ca.gov/rma/index.cfm/public-works/tulare-county-area-transit-tcat/ (Accessed Jan 2017)

ACRONYMS

AWSC	All-Way Stop-Controlled
HCM	Highway Capacity Manual
LOS	Level of Service
TWSC	Two-Way Stop-Controlled

REFERENCES

Tulare County 2030 General Plan, August 2012

Tulare County General Plan Background Report, February 2010

Guide for the Preparation of Traffic Impact Studies, California Department of Transportation (Caltrans), December 2002

2010 Tulare County Regional Bicycle Transportation Plan, Tulare County Association of Governments (TCAG)

Tulare County Association of Governments 2014-2040 Regional Transportation Plan and Sustainable Communities Strategy which can be accessed at: http://www.tularecog.org/wp-content/uploads/2015/06/Final-2014-Regional-Transportation-Plan-Sustainable-Communities-Strategy-FULL-DOCUMENT.pdf, Accessed November, 2017.

2017 CEQA Guidelines

Tulare County General Plan 2030 Update, Recirculated Draft Environmental Impact Report (RDEIR), February 2010

Traffic Study, Hash Farms Proposed Residential Development. Ruettgers & Schuler Civil Engineers. January 2017. Appendix E of this DEIR.

Tribal Cultural Resources
Chapter 3.17

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts With Mitigation*** to Tribal Cultural Resources. The Southern San Joaquin Valley Historical Resources Information Center, Bakersfield (Center) conducted a cultural resources records search on March 30, 2015 at the request of RMA Planning Branch staff, which is included as Appendix "C". In addition to the Center's search, the Native American Heritage Commission (NAHC) conducted a Sacred Lands File (SLF) search and provided their results on August 25, 2016 (see Appendix "C"). This information, and additional analysis in the resource discussion item, are used as the basis for determining that this Project will result in Less Than Significant Impacts With Mitigation.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

Several CEQA statutes and guidelines address requirements for cultural resources, including historic and archaeological resources.[1] If a proposed Project may cause a substantial adverse effect on the significance of a historical resource, then the Project may be considered to have a significant effect on the environment, and the impacts must be evaluated under CEQA (Section 21084.1). The definition of "historical resources" is included in Section 15064.5 of CEQA Guidelines, and includes both historical and archaeological resources. "Substantial adverse change" is defined as "physical demolition, destruction, relocation, or alteration of the resource…"

Section 15064.5 also provides guidelines when there is a probable likelihood of Native American remains existing in the Project site. Provisions for the accidental discovery of historical or unique archaeological resources encountered during construction include a recommendation for evaluation by a qualified archaeologist, with follow up as necessary.

Public Resources Code Section 5097.5 prohibits excavation or removal of any "vertebrate paleontological site…or any other archaeological, paleontological or historical feature, situated on public lands, except with express permission of the public agency having jurisdiction over such lands."

This section of the Draft Program/Project Environmental Impact Report (DEIR) for the Project meets CEQA requirements by addressing potential impacts to cultural resources on the proposed Project site. The "Environmental Setting" section provides a description of cultural resources in resources in the region, with special emphasis on the proposed Project site and vicinity. The

[1] *"CEQA and Historical Resources" "CEQA Technical Advice Series"* http://ohp.parks.ca.gov/?page_id=21721. Accessed September, 2017.

"Regulatory Setting" section provides a description of applicable State and local regulatory policies. Results of cultural resources reports from CHRIS are included in Appendix "C" of this DEIR. A description of potential impacts is provided, along with feasible mitigation measures to reduce the impacts to less than significant.

CEQA Thresholds of Significance

"Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

- Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources a defined in Public Resources Code section 5020.1(k), or
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe."[2]

ENVIRONMENTAL SETTING

Records Search Results

The California Historical Resources Information Center (CHRIS), Southern San Joaquin Valley Information Center (SSJVIC) located at California State University, Bakersfield conducted a cultural resources records search and provided results dated March 30, 2015 to Tulare County RMA. According to search results, there have been no previous cultural resource studies conducted within the proposed Project area. There have been five studies conducted within the one-half mile radius. There is one recorded cultural resources within the one-half mile radius of the Project area (P-54-004611 – the historic Fresno/Tulare County Line marker post) and there are 52 historic properties within the one-half mile radius that have been given a National Register Status Code of 2S2, indicating that these individual properties have been determined eligible in the National Register of Historic Places by a consensus through the Section 106 process. They are also listed in the California Register of Historical Resources. There are no other recorded cultural resources within the Project area or radius that are listed in the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historical Interest, California Inventory of Historic Resources, or the California State Historic Landmarks.[3]

2 CEQA Guidelines Appendix "G" Item XVII. Tribal Cultural Resources.
3 California Historical Resources Information Center (CHRIS), Southern San Joaquin Valley Information Center (SSJVIC) located at California State University, Bakersfield; March 30, 2015. Included as Appendix "C" of this DEIR.

Native American Consultation

The Office of Planning and Research, State Clearinghouse (OPR/SCH), received a submittal from the Tulare County RMA on September 7, 2016, regarding a Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the Hash Farms Development Project. The Native American Heritage Commission (NAHC) was included in the list of agencies to be notified by OPR/SCH as the NAHC maintains a contact list of Native American Tribes as having traditional lands located within the County's jurisdiction. The NAHC provided a response to the NOP on September 12, 2016 and recommended a list of four Native American Tribes the County should consult with regarding the proposed Project. Additionally, the Tulare County RMA submitted a Sacred Lands File Search (SLF) to the NACH and received a reply on August 25, 2016 indicating "negative results" of the SLF and provided a recommended list of 22 Native American Tribes the County should consult with regarding the Project. As such, on August 24, 2016, and September 6, 2016, the County mailed (via certified-mail) tribal consultation letters to the tribes recommended by the NAHC as a result of both the NOP and the SLF, 26 in total (see Appendix "C").

REGULATORY SETTING

Federal Agencies & Regulations

The National Historic Preservation Act

The National Historic Preservation Act of 1966 (NHPA) established federal regulations for the purpose of protecting significant cultural resources. The legislation established the National Register of Historic Places and the National Historic Landmarks Program. It mandated the establishment of the State Historic Preservation Office (SHPO), responsible for implementing statewide historic preservation programs in each state. A key aspect of SHPO responsibilities include surveying, evaluating and nominating significant historic buildings, sites, structures, districts and objects to the National Register. The NHPA also established requirements for federal agencies to consider the effects of proposed federal Projects on historic properties (Section 106, NHPA). Federal agencies and recipients of federal funding are required to initiate consultation with the SHPO as part of the Section 106 review process.[4]

State Agencies & Regulations

California State Office of Historic Preservation (OHP)

The California State Office of Historic Preservation (OHP) is responsible for administering federally and state mandated historic preservation programs to further the identification, evaluation, registration and protection of California's irreplaceable archaeological and historical resources under the direction of the State Historic Preservation Officer (SHPO), appointed by the governor, and the State Historical Resources Commission, a nine-member state review board appointed by the governor.

[4] Advisory Council on Historic Preservation, National Historic Preservation Program: Overview, http://www.achp.gov/overview.html, accessed November 23, 2016.

"State Historic Preservation Officers (SHPOs) administer the national historic preservation program at the State level, review National Register of Historic Places nominations, maintain data on historic properties that have been identified but not yet nominated, and consult with Federal agencies during Section 106 review. SHPOs are designated by the governor of their respective State or territory."[5]

Among OHP's responsibilities are identifying, evaluating, and registering historic properties; and ensuring compliance with federal and state regulations. The OHP administers the State Register of Historical Resources and maintains the California Historical Resources Information System (CHRIS) database. The CHRIS database includes statewide Historical Resources Inventory (HRI) database. The records are maintained and managed under contract by eleven independent regional Information Centers. Tulare, Fresno, Kern, Kings and Madera counties are served by the Southern San Joaquin Valley Information Center (Center), located in Bakersfield, CA. The Center provides information on known historic and cultural resources to governments, institutions and individuals.[6]

A historical resource may be eligible for inclusion in the California Register of Historical Resources (CRHR) if it:

- Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- Is associated with the lives of persons important to our past;
- Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- Has yielded, or may be likely to yield, information important in prehistory or history.[7]

Tribal Consultation Requirements: SB 18 (Burton, 2004) [8]

On September 29, 2004, Governor Schwarzenegger signed Senate Bill 18, Tribal Consultation Guidelines, into law. This bill amended Section 815.3 of the Civil Code, to amend Sections 65040.2, 65092, 65351, 65352, and 65560 of, and to add Sections 65352.3, 65352.4, and 65562.2 to, the Government Code, relating to traditional tribal cultural Places. SB 18, enacted March 1, 2005, creates a mechanism for California Native American Tribes to identify culturally significant sites that are located within public or private lands within the city or county's jurisdiction. SB 18 requires cities and counties to contact, and offer to consult with, California Native American Tribes before adopting or amending a General Plan, a Specific Plan, or when designating land as Open Space, for the purpose of protecting Native American Cultural Places (PRC 5097.9 and 5097.993). The Native American Heritage Commission (NAHC) provides local governments with a consultation list of tribal governments with traditional lands or cultural

[5] Advisory Council on Historic Preservation, State Historic Preservation Officers, http://www.achp.gov/shpo.html, accessed November 23, 2016.
[6] California Office of Historic Preservation, Mission and Responsibilities, http://ohp.parks.ca.gov/?page_id=1066, accessed November 23, 2016.
[7] California Office of Historic Preservation, California Register: Criteria for Designation, http://www.ohp.parks.ca.gov/?page_id=21238, accessed November 23, 2016.
[8] Senate Bill No. 18, Chapter 905, http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200320040SB18, accessed November 23, 2016

places located within the Project Area of Potential Effect. Tribes have 90 days from the date on which they receive notification to request consultation, unless a shorter timeframe has been agreed to by the tribe.

Tribal Consultation Requirements: AB 52 (Gatto, 2014)[9]

This bill was approved by Governor Brown on September 25, 2014 and became effective July 1, 2015. This bill amended Section 5097.94 of, and to add Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3 to, the Public Resources Code, relating to Native Americans. The bill specifies that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource, as defined, is a project that may have a significant effect on the environment. This bill requires a lead agency to begin consultation with a California Native American tribe that is traditionally and culturally affiliated (can be a tribe anywhere within the State of California) with the geographic area of the proposed project, if the tribe requested to the lead agency, in writing, to be informed by the lead agency of proposed projects in that geographic area and the tribe requests consultation, prior to determining whether a negative declaration, mitigated negative declaration, or environmental impact report is required for a project.

Existing law establishes the Native American Heritage Commission (NAHC) and vests the commission with specified powers and duties. This bill required the NAHC to provide each California Native American tribe, as defined, on or before July 1, 2016, with a list of all public agencies that may be a lead agency within the geographic area in which the tribe is traditionally and culturally affiliated, the contact information of those agencies, and information on how the tribe may request those public agencies to notify the tribe of projects within the jurisdiction of those public agencies for the purposes of requesting consultation.

The NAHC provides protection to Native American burials from vandalism and inadvertent destruction, provides a procedure for the notification of most likely descendants regarding the discovery of Native American human remains and associated grave goods, brings legal action to prevent severe and irreparable damage to sacred shrines, ceremonial sites, sanctified cemeteries and place of worship on public property, and maintains an inventory of sacred places.[10]

CEQA Guidelines: Archaeological Resources

Section 15064.5(c) of CEQA Guidelines provides specific guidance on the treatment of archaeological resources as noted below.

"(1) When a Project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource, as defined in subdivision (a).

(2) If a lead agency determines that the archaeological site is an historical resource, it shall refer to the provisions of Section 21084.1 of the Public Resources Code, and this section,

[9] Assembly Bill No. 52, Chapter 532, http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB52, accessed November 22, 2016
[10] Native American Heritage Commission, About the Native American Heritage Commission, http://nahc.ca.gov/about/, accessed November 23, 2016.

Section 15126.4 of the Guidelines, and the limits contained in Section 21083.2 of the Public Resources Code do not apply.

(3) If an archaeological site does not meet the criteria defined in subdivision (a), but does meet the definition of a unique archeological resource in Section 21083.2 of the Public Resources Code, the site shall be treated in accordance with the provisions of section 21083.2. The time and cost limitations described in Public Resources Code Section 21083.2 (c–f) do not apply to surveys and site evaluation activities intended to determine whether the Project location contains unique archaeological resources.

(4) If an archaeological resource is neither a unique archaeological nor an historical resource, the effects of the Project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or EIR, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process."[11]

CEQA Guidelines: Human Remains

Public Resources Code Sections 5097.94 and 5097.98 provide guidance on the disposition of Native American burials (human remains), and fall within the jurisdiction of the Native American Heritage Commission:

"(d) When an initial study identifies the existence of, or the probable likelihood, of Native American human remains within the Project, a lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission as provided in Public Resources Code Section 5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any Items associated with Native American burials with the appropriate Native Americans as identified by the Native American Heritage Commission. Action implementing such an agreement is exempt from:

(1) The general prohibition on disinterring, disturbing, or removing human remains from any location other than a dedicated cemetery (Health and Safety Code Section 7050.5).

(2) The requirements of CEQA and the Coastal Act."[12]

"(e) In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

(1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

(A) The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required, and

(B) If the coroner determines the remains to be Native American:

[11] CEQA Guidelines, Section 15064.5(c)
[12] Ibid. Section 15064.5(d)

1. The coroner shall contact the Native American Heritage Commission within 24 hours.

2. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.

3. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98, or

(2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

(A) The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.

(B) The descendant identified fails to make a recommendation; or

(C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner."[13]

"(f) As part of the objectives, criteria, and procedures required by Section 21082 of the Public Resources Code, a lead agency should make provisions for historical or unique archaeological resources accidentally discovered during construction. These provisions should include an immediate evaluation of the find by a qualified archaeologist. If the find is determined to be an historical or unique archaeological resource, contingency funding and a time allotment sufficient to allow for implementation of avoidance measures or appropriate mitigation should be available. Work could continue on other parts of the building site while historical or unique archaeological resource mitigation takes place."[14]

Local Policy & Regulations

Tulare County General Plan Policies

The Tulare County General Plan has a number of policies that apply to projects within the County of Tulare.[15] General Plan policies that relate to the proposed Project are listed below.

[13] Ibid. Section 15064.5(e)
[14] Ibid. Section 15064.5(f)
[15] Tulare County General Plan 2030 Update, Part 1 – Goals and Policies Report

ERM-6.1 Evaluation of Cultural and Archaeological Resources - The County shall participate in and support efforts to identify its significant cultural and archaeological resources using appropriate State and Federal standards.

ERM-6.2 Protection of Resources with Potential State or Federal Designations - The County shall protect cultural and archaeological sites with demonstrated potential for placement on the National Register of Historic Places and/or inclusion in the California State Office of Historic Preservation's California Points of Interest and California Inventory of Historic Resources. Such sites may be of Statewide or local significance and have anthropological, cultural, military, political, architectural, economic, scientific, religious, or other values as determined by a qualified archaeological professional.

ERM-6.3 Alteration of Sites with Identified Cultural Resources - When planning any development or alteration of a site with identified cultural or archaeological resources, consideration should be given to ways of protecting the resources. Development can be permitted in these areas only after a site specific investigation has been conducted pursuant to CEQA to define the extent and value of resource, and Mitigation Measures proposed for any impacts the development may have on the resource.

ERM-6.4 Mitigation - If preservation of cultural resources is not feasible, every effort shall be made to mitigate impacts, including relocation of structures, adaptive reuse, preservation of facades, and thorough documentation and archival of records.

ERM-6.9 Confidentiality of Archaeological Sites - The County shall, within its power, maintain confidentiality regarding the locations of archaeological sites in order to preserve and protect these resources from vandalism and the unauthorized removal of artifacts.

ERM-6.10 Grading Cultural Resources Sites - The County shall ensure all grading activities conform to the County's Grading Ordinance and California Code of Regulations, Title 20, § 2501 et. seq.

IMPACT EVALUATION

Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?

Project Impact Analysis: ***Less Than Significant Impact With Mitigation***

Although no historical, cultural, or tribal cultural resources were identified by the CHRIS or Sacred Lands Files (SLF) searches within the proposed Project site, and all work will be limited to previously disturbed land, it is possible that subsurface discoveries could occur. Also, no responses were received from the tribes that were notified in compliance with AB 52 requirements through a list of potentially affected tribes provided by the NAHC. As such, it is not anticipated that Native American tribal cultural resources or remains will be found at any site within the Project planning area. However, **Mitigation Measures 17-1 and 17-2** are included in the unlikely event that Native American remains or tribal cultural resources are unearthed during any ground disturbance activities. These measure require that all work will immediately halt and the NAHC will be contacted to assess the findings and make appropriate mitigation recommendations. Therefore, there will be a ***Less Than Significant Cumulative Impacts With Mitigation*** related to this Checklist Item.

Cumulative Impact Analysis: ***Less Than Significant Impact With Mitigation***

As previously discussed, based on the analysis noted earlier, impacts to Tribal Cultural Resources will be reduced to a level of ***Less Than Significant Project-specific and Cumulative Impacts With Mitigation*** with the implementation of Mitigation Measures 17-1 and 17-2.

Mitigation Measure(s): ***See Below***

17-1 In the event that historical, archaeological or paleontological resources are discovered during site excavation, the County shall require that grading and construction work on the Project site be immediately suspended until the significance of the features can be determined by a qualified archaeologist or paleontologist. In this event, the property owner shall retain a qualified archaeologist/paleontologist to provide recommendations for measures necessary to protect any site determined to contain or constitute an historical resource, a unique archaeological resource, or a unique paleontological resource or to undertake data recover, excavation analysis, and curation of archaeological or paleontological materials. County staff shall consider such recommendations and implement them where they are feasible in light of Project design as previously approved by the County.

17-2 Consistent with Section 7050.5 of the California Health and Safety Code and (CEQA Guidelines) Section 15064.5, if human remains of Native American origin are discovered during Project construction, it is necessary to comply with State laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (Public Resources Code Sec. 5097). In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

a. The Tulare County Coroner/Sheriff must be contacted to determine that no investigation of the cause of death is required; and

b. If the coroner determines the remains to be Native American:

i. The coroner shall contact the Native American Heritage Commission within 24 hours.

ii. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.

iii. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code section 5097.98, or

2. Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

a. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.

b. The descendant fails to make a recommendation; or

c. The landowner or his authorized representative rejects the recommendation of the descendent.

Therefore, as noted earlier, in the unlikely event that Tribal Resource are discovered, implementation of **Mitigation Measures 17-1 and 17-2** would result in ***Less Than Significant Project-specific With Mitigation*** because of this Project.

Conclusion: ***Less Than Significant Impact With Mitigation***

As previously discussed, based on the analysis noted earlier, impacts to Tribal Cultural Resources will be reduced to a level of ***Less Than Significant Project-specific and Cumulative Impacts With Mitigation*** with the implementation of **Mitigation Measures 17-1 and 17-2**.

b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe?

Project Impact Analysis: ***Less Than Significant Impact With Mitigation***

See earlier discussion at Item a).

Cumulative Impact Analysis: ***Less Than Significant Impact With Mitigation***

See earlier discussion at Item a).

Mitigation Measure(s): ***See Mitigation Measures 3.17-1 and 3.17-2***

See earlier discussion at Item a).

Conclusion: ***Less Than Significant Impact With Mitigation***

See earlier discussion at Item a).

ACRONYMS

CHRIS	California Historic Resources Information System
CRHR	California Register of Historical Resources
HABS/HAER	Historic American Building Survey/Historic American Engineering Record
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act of 1966
OHP	California State Office of Historic Preservation
SHPO	State Historic Preservation Officers

REFERENCES

Advisory Council on Historic Preservation, National Historic Preservation Program: Overview, http://www.achp.gov/overview.html, accessed November 23, 2016.

Advisory Council on Historic Preservation, State Historic Preservation Officers, http://www.achp.gov/shpo.html, accessed November 23, 2016.

Assembly Bill No. 52, Chapter 532, http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB52, accessed November 22, 2016

California Historical Resources Information Center (CHRIS), Southern San Joaquin Valley Information Center (SSJVIC) located at California State University, Bakersfield; March 30, 2015. Included as Appendix "C" of this DEIR.

California Office of Historic Preservation, California Register: Criteria for Designation, http://www.ohp.parks.ca.gov/?page_id=21238, accessed November 23, 2016.

California Office of Historic Preservation, Mission and Responsibilities, http://ohp.parks.ca.gov/?page_id=1066, accessed November 23, 2016.

"CEQA and Historical Resources" CEQA Technical Advice Series" http://ohp.parks.ca.gov/?page_id=21721. Accessed September, 2017.

CEQA Guidelines Appendix "G" Item XVII. Tribal Cultural Resources.

CEQA Guidelines, Section 15064.5(c)(d)(e)(f)

Native American Heritage Commission, About the Native American Heritage Commission, http://nahc.ca.gov/about/, accessed November 23, 2016.

Senate Bill No. 18, Chapter 905, http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=200320040SB18, accessed November 23, 2016

Tulare County General Plan 2030 Update, Part 1 – Goals and Policies Report

Utilities and Service Systems
Chapter 3.18

SUMMARY OF FINDINGS

The proposed Project will result in ***Less Than Significant Impacts*** to Utilities and Service Systems. A detailed review of potential impacts is provided in the following analysis.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

This section of the Draft Environmental Impact Report (DEIR) addresses potential impacts to Utilities and Service Systems. As required in Section 15126, all phases of the proposed Project will be considered as part of the potential environmental impact.

As noted in Section 15126.2 (a), "[a]n EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced. Direct and indirect significant effects of the project on the environment shall be clearly identified and described, giving due consideration to both the short-term and long-term effects. The discussion should include relevant specifics of the area, the resources involved, physical changes, alterations to ecological systems, and changes induced in population distribution, population concentration, the human use of the land (including commercial and residential development), health and safety problems caused by the physical changes, and other aspects of the resource base such as water, historical resources, scenic quality, and public services. The EIR shall also analyze any significant environmental effects the project might cause by bringing development and people into the area affected. For example, an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision. The subdivision would have the effect of attracting people to the location and exposing them to the hazards found there. Similarly, the EIR should evaluate any potentially significant impacts of locating development in other areas susceptible to hazardous conditions (e.g., floodplains, coastlines, wildfire risk areas) as identified in authoritative hazard maps, risk assessments or in land use plans addressing such hazards areas."[1]

The environmental setting provides a description of the Utilities and Service Systems setting in the County. The regulatory setting provides a description of applicable Federal, State and Local regulatory policies that were developed in part from information contained in the Tulare County

[1] CEQA Guidelines, Section 15126.2 (a)

2030 General Plan, Tulare County General Plan Background Report, and/or County 2030 General Plan EIR incorporated by reference and summarized below. Additional documents utilized are noted as appropriate. A description of the potential impacts of the proposed Project is provided and includes the identification of feasible mitigation measures (if necessary and feasible) to avoid or lessen the impacts.

Thresholds of Significance

- Increase wastewater beyond existing treatment capacity per the RWQCB
- Result in the need for waste water infrastructure that would cause impacts
- Result in the need for waste water infrastructure that would cause impacts
- Result in the need for water supplies or entitlements
- Result in the determination by the wastewater provider that it has adequate capacity
- Served by a landfill with sufficient permitted capacity to Project's needs
- Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs

ENVIRONMENTAL SETTING

"Tulare County and special districts provide many important services to County residents and businesses in unincorporated communities and hamlets such as water, wastewater, storm drainage, solid waste removal, utilities, communications, fire protection, law enforcement, and a number of other community facilities and services (schools, community centers, etc.)."[2]

"Water districts supply water to communities and hamlets throughout the County. Most communities and some hamlets have wastewater treatment systems; however, several communities including Three Rivers, Plainview, Alpaugh, and Ducor rely on individual septic systems. Storm drainage facilities are generally constructed and maintained in conjunction with transportation improvements or new subdivisions in communities. Solid waste collection in the County is divided into service areas, as determined by the Board of Supervisors, with one license for each area. Southern California Edison provides electric service to the south and central areas of Tulare County while PG&E provides electric service in the north. The [Southern California] Gas Company is the primary provider of natural gas throughout the County."[3]

The existing site is currently served by PG&E for electrical service and Southern California Ga Company for Gas Service.

[2] Tulare County General Plan 2030 Update, page 14-3
[3] Ibid.

REGULATORY SETTING

Federal Agencies & Regulations

Resource Conservation and Recovery Act (RCRA)[4]

Congress passed RCRA on October 21, 1976 to address the increasing problems the nation faced from our growing volume of municipal and industrial waste. RCRA, which amended the Solid Waste Disposal Act of 1965, set national goals for:

- Protecting human health and the environment from the potential hazards of waste disposal.
- Conserving energy and natural resources.
- Reducing the amount of waste generated.
- Ensuring that wastes are managed in an environmentally-sound manner.

To achieve these goals, RCRA established three distinct, yet interrelated, programs:

- The solid waste program, under RCRA Subtitle D, encourages states to develop comprehensive plans to manage nonhazardous industrial solid waste and municipal solid waste, sets criteria for municipal solid waste landfills and other solid waste disposal facilities, and prohibits the open dumping of solid waste.
- The hazardous waste program, under RCRA Subtitle C, establishes a system for controlling hazardous waste from the time it is generated until its ultimate disposal — in effect, from "cradle to grave."
- The underground storage tank (UST) program, under RCRA Subtitle I, regulates underground storage tanks containing hazardous substances and petroleum products.

RCRA banned all open dumping of waste, encouraged source reduction and recycling, and promoted the safe disposal of municipal waste. RCRA also mandated strict controls over the treatment, storage, and disposal of hazardous waste.

State Agencies & Regulations

California Global Warming Solutions Act of 2006 (AB 32)

With the passage of AB 32, the State Board Air Resources Board was required to adopt a statewide greenhouse gas emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020. To achieve this requirement, a scoping plan was adopted in 2008 that includes high recycling and zero waste as a way to reduce greenhouse gas emissions from landfills. "As virgin raw materials are replaced with recyclables, a large reduction in energy consumption should be realized. Implementing programs with a systems approach that

[4] U.S. Environmental Protection Agency. Wastes – Laws & Regulations. http://www.epa.gov/epawaste/laws-regs/rcrahistory.htm. Accessed December, 2014.

focus on consumer demand, manufacturing, and movement of products will result in the reduction of greenhouse gas emissions and other co-benefits."[5]

Local Policy & Regulations

Tulare County General Plan Policies

The General Plan has a number of policies that apply to projects within Tulare County. General Plan policies that relate to the proposed Project are listed below.

PFS-2.3 Well Testing - The County shall require new development that includes the use of water wells to be accompanied by evidence that the site can produce the required volume of water without impacting the ability of existing wells to meet their needs.

PFS-3.1 Private Sewage Disposal Standards - The County shall maintain adequate standards for private sewage disposal systems (e.g., septic tanks) to protect water quality and public health.

PFS-3.2 Adequate Capacity - The County shall require development proposals to ensure the intensity and timing of growth is consistent with the availability of adequate wastewater treatment and disposal capacity.

PFS-4.3 Development Requirements - The County shall encourage project designs that minimize drainage concentrations and impervious coverage, avoid floodplain areas, and where feasible, provide a natural watercourse appearance.

PFS-4.4 Stormwater Retention Facilities - The County shall require on-site detention/retention facilities and velocity reducers when necessary to maintain existing (pre-development) storm flows and velocities in natural drainage systems. The County shall encourage the multi-purpose design of these facilities to aid in active groundwater recharge.

PFS-4.5 Detention/Retention Basins Design - The County shall require that stormwater detention/retention basins be visually unobtrusive and provide a secondary use, such as recreation, when feasible.

PFS-4.7 NPDES Enforcement - The County shall continue to monitor and enforce provisions to control non-point source water pollution contained in the U.S. Environmental Protection Agency National Pollution Discharge Elimination System (NPDES) program.

PFS-5.3 Solid Waste Reduction - The County shall promote the maximum feasible use of solid waste reduction, recycling, and composting of waste, strive to reduce commercial and industrial waste on an annual basis, and pursue financing mechanisms for solid waste reduction programs.

[5] California Air Resources Board Climate Change Scoping Plan. December, 2008. Page 62. http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed September, 2014.

PFS-5.4 County Usage of Recycled Materials and Products - The County shall encourage all industries and government agencies in the County to use recycled materials and products where economically feasible.

PFS-5.8 Hazardous Waste Disposal Capabilities - The County shall require the proper disposal and recycling of hazardous materials in accordance with the County's Hazardous Waste Management Plan.

IMPACT EVALUATION

Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Project Impact Analysis: ***Less Than Significant Impact***

The Project site within the Selma-Kingsburg-Fowler (SFK) Sanitation District's (SKF or District) Sphere of Influence of and will be annexed into the District. SKF has issued a Will-Serve letter. SKF currently processes an average of 2.7 million gallons per day (MGD) with a designated capacity of 8.0 MGD and with average flows of 4.5 MGD. No plant expansion in needed to serve the Project. A trunk line is also located in Kern Street just west of the Project entrance along Kern Street. No significant offsite construction is needed to extend sewer lines to the Project. ***Less Than Significant Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the requirements of the Central Valley Regional Water Quality Control Board.

The proposed Project will be served by SKF. ***Less Than Significant Cumulative Impacts*** related to this Checklist Item will occur.

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Project Impact Analysis: ***Less Than Significant Impact***

There is an existing City/SKF sewer trunk line in Kern Street just west of the Project entrance. There is also a City water main on Madsen north of the Madsen Project entrance, as well as well as water mains in Mariposa Avenue, Linquist Street, Orange Street, and Plumas Street. ***Less Than Significant Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the requirements of the Central Valley Regional Water Quality Control Board. The proposed Project does not require new or expansion of water or wastewater treatment facilities. ***Less Than Significant Cumulative Impacts*** will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impacts***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Project Impact Analysis: ***Less Than Significant Impact***

Storm water control will be provided by a system of onsite collector, drop inlets and surface flows to a one-acre, 11.7 acre-feet ponding basin south of Kern Street. The ponding basin will result in the loss of one acre of agricultural land, an impact which is accounted for in Section 3 - Agricultural Resources.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County and the City of Kingsburg. This cumulative analysis is based on the requirements of Central Valley Regional Water Quality Control Board.

The proposed Project will retain storm water on site. As no offsite storm water impacts will occur, ***Less Than Significant Cumulative*** impacts related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Project Impact Analysis ***Less Than Significant Impact***

Water supply for the proposed Project will come from the City of Kingsburg. No new or expansion of water facilities is anticipated since the City has peak production capacity of 150 million gallons (MG) and average monthly usage has been approximately 95 MG over the last six years. In the last three years, average usage has been substantially less at 80.2 MG. The Project will generate an estimated demand for 1.8 MG per month based on 300 gallons per day per dwelling unit would be 1.8 MG per month, as discussed in Section 3.9, and as detailed in the Water Supply / Water Quality Technical Memorandum (provided in Appendix D of this DEIR). Reasonable Groundwater Supply Yield for the well field and basin is 2,201 MG per year compared to 900 MG per year used in 2016. No new wells or water import is required. In addition current water usage on the site for the agricultural uses is estimated to be 3.1 MG per month. The proposed Project would result in a net reduction in groundwater usage. Therefore, no additional wells or facilities would be needed. ***Less Than Significant Project-specific Impacts*** related to this Checklist Item will occur. Also, see Item 3.9.b) which indicates that no new or expansion of water facilities is anticipated.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County and the City of Kingsburg. This cumulative analysis is based on the requirements of the Central Valley Regional Water Quality Control Board.

As noted in Section 3.9 Item b), the proposed Project will result in a ***Less than Significant Impact*** related to this Checklist Item.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

e) Result in a determination by the wastewater treatment provide near term, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Project Impact Analysis: ***No Impact***

The Project will be served by the SKF Sanitation District. The District has current flows of approximately 4.5 MGD with a hydraulic capacity of approximately 8.0 MGD. As such, the District has determined that it has adequate capacity and has provided a Will Serve letter to accommodate the Project.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County and the City of Kingsburg. This cumulative analysis is based on the requirements of Tulare County Environmental Health Services Department.

No Cumulative Impacts related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Project Impact Analysis: ***Less Than Significant Impact***

Solid waste service to the City of Kingsburg is provided under a franchise agreement with Waste Management, which utilizes active Class III landfills within Fresno County. Waste Management has capacity and will serve the solid waste disposal needs for the residential units proposed in the Project. The proposed Project does not include activities that will result in solid waste generation beyond typical residential use waste. As such, the proposed Project will have ***Less Than Significant Project-specific Impacts*** related to this Checklist item.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, Tulare County General Plan Background Report, the Tulare County 2030 General Plan EIR, and the 1990 City of Kingsburg General Plan.

As noted earlier, Project level solid waste generation will be limited to typical residential waste which will not result in a substantial increase in the amount of waste sent to landfills. Therefore, the proposed Project will result in ***Less Than Significant Impacts***.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

As noted earlier, ***Less Than Significant Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

Project Impact Analysis: ***No Impact***

The proposed Project does not include the creation or expansion of a solid waste facility. Therefore, ***No Project-specific Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***No Impact***

The geographic area of this cumulative analysis is Tulare County, Fresno County, the City of Kingsburg and the state of California. This cumulative analysis is based on the Federal, State, and Local requirements, including requirements of Cal Recycle, California Air Resources Board, and Tulare County Environmental Health and Human Services Agency (Environmental Health Division).

The proposed Project does not include the creation or expansion of a solid waste facility. Therefore, ***No Cumulative Impacts*** related to this Checklist Item will occur.

Mitigation Measure(s): ***None Required.***

Conclusion: ***No Impact***

As noted earlier, ***No Project-specific or Cumulative Impacts*** related to this Checklist Item will occur.

REFERENCES

California Air Resources Board Climate Change Scoping Plan. December, 2008. Page 62. http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed September, 2014.

CEQA Guidelines, Section 15126.2 (a)

Tulare County General Plan 2030 Update, page 14-3

U.S. Environmental Protection Agency. Wastes – Laws & Regulations. http://www.epa.gov/epawaste/laws-regs/rcrahistory.htm. Accessed December, 2014.

Mandatory Findings of Significance
Chapter 3.19

SUMMARY OF FINDINGS

None of the conditions stated below under Section 15065(a) (1)-(4) are present due to the impacts from the proposed Project. The impacts to the below resources are therefore ***Less Than Significant with Mitigation***.

INTRODUCTION

California Environmental Quality Act (CEQA) Requirements

CEQA Guidelines "Mandatory Findings of Significance" (Section 15065(a)) lists the following potential impacts that need to be addressed by a lead agency:

> 15065(a): *"A lead agency shall find that a project may have a significant effect on the environment and thereby require an EIR to be prepared for the project where there is substantial evidence, in light of the whole record, that any of the following conditions may occur:*
>
> > *(1) The project has the potential to: substantially degrade the quality of the environment; substantially reduce the habitat of a fish or wildlife species; cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; substantially reduce the number or restrict the range of an endangered, rare or threatened species; or eliminate important examples of the major periods of California history or prehistory.*
> >
> > *(2) The project has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals.*
> >
> > *(3) The project has possible environmental effects that are individually limited but cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.*
> >
> > *(4) The environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly."*

Under the California Environmental Quality Act (CEQA), an EIR must be prepared when certain specified impacts may result from construction or implementation/operation of a project. An EIR has been prepared for the proposed Project, which fully addresses all of the Mandatory Findings of Significance, as described below.

Under Section 15065(a) of the CEQA Guidelines, a finding of significance is required if a project "has the potential to substantially degrade the quality of the environment." In practice, this is the same standard as a significant effect on the environment, which is defined in Section 15382 of the CEQA Guidelines as "a substantial or potentially substantial adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance." This EIR, in its entirety, addresses and discloses potential environmental affects associated with construction and operation of the proposed Project, including direct, indirect, and cumulative impacts related to the following environmental factors:

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards-and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation/Traffic
- Tribal Resources
- Utilities and Service Systems

As summarized in Project Requirements/Mitigation Measures Section, this EIR discusses potential environmental resource impacts, the level of significance prior to mitigation, project requirements that are otherwise required by law or are incorporated as part of the project description, feasible mitigation measures, and the level of significance after the incorporation of mitigation measures.

This section of the Draft Environmental Impact Report (DEIR) meets CEQA requirements by making Mandatory Findings of Significance relative to impacts of the proposed Project site located in the San Joaquin Valley portion of Tulare County. The "Environmental Setting" section summarizes environmental resources in the region with special emphasis on the proposed Project site and vicinity. The "Regulatory Setting" provides a description of applicable State and

local regulatory policies. A description of the potential impacts of the proposed Project is also provided and includes the identification of feasible mitigation to avoid or lessen the impacts.

Long Term Impacts

As described in Section 15065(a)(2), a lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals. This document addresses the short-term and irretrievable commitment of natural resources to ensure that the consumption is justified on a long-term basis.

Cumulative Impacts

Under Section 15065(a)(1) of the CEQA Guidelines, a lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has the potential to (1) substantially reduce the habitat of a fish or wildlife species; (2) cause a fish or wildlife population to drop below self-sustaining levels; or (3) substantially reduce the number or restrict the range of an endangered, rare, or threatened species. Section 4.3 (Biological Resources) of the EIR fully addresses impacts related to the reduction of the fish or wildlife habitat, the reduction of fish or wildlife populations, and the reduction or restriction of the range of special-status species.

Impacts to Species

Section 15065(a)(1) of the CEQA Guidelines states that a lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has the potential to eliminate important examples of a major period of California history or prehistory. Section 15065(a)(1) amplifies Public Resources Code 21001(c) requiring that major periods of California history are preserved for future generations. It also reflects the provisions of Public Resource Code Section 21084.1 requiring a finding of significance for substantial adverse changes to historical resources.

Impacts to Historical Resources

Section 15064.5 of the CEQA Guidelines establishes standards for determining the significance of impacts to historical resources and archaeological sites that are an historical resource. Section 3.5 Cultural Resources of this EIR (which is supported by a Cultural Resources Technical Report) fully addresses impacts related to California history and prehistory, historic resources, archaeological resources, and paleontological resources.

Impacts on Human Beings

Consistent with Section 15065(a)(4) of the CEQA Guidelines, a lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has the potential to cause substantial adverse effects on human beings, either directly or indirectly. Under this standard, a change to the physical environment that might otherwise be

minor must be treated as significant if people will be significantly affected. This factor relates to adverse changes to the environment of human beings generally, and not to effects on particular individuals. While changes to the environment that could indirectly affect human beings will be represented by all of the designated CEQA issue areas, those that could directly affect human beings include air quality, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, population and housing, public services, transportation/traffic, and utilities, which are addressed in this EIR.

Thresholds of Significance

The geographical area may be countywide, statewide, or nationwide, depending on the nature of the impact. Thresholds of Significance for impacts to biological resources are addressed in detail in Chapter 3.4 Biological Resources of this document. Thresholds of Significance for impacts to cultural resources, including impacts to historic and prehistoric resources, are addressed in Chapter 3.5 Cultural Resources of this document.

ENVIRONMENTAL SETTING

"Tulare County… is located in a geographically diverse region with the majestic peaks of the Sierra Nevada framing its eastern region, while its western portion includes the San Joaquin valley floor, which is very fertile and extensively cultivated. Tulare County is the second-leading agricultural-producing county in the U.S. Fresno County is currently (2004) the top producer. In addition to its agricultural production, the county's economic base also includes agricultural packing and shipping operations."[1]

The 54-acre proposed Project site is located in agricultural lands of the San Joaquin Valley, with portions of the site in Tulare County, Fresno County and the City of Kingsburg. The site in its entirety is within the City of Kingsburg Sphere of Influence. The site is bordered to the east by Rd. 16, to the south by Avenue 396, to the west by City of Kingsburg urban uses, and to the north by urban and agricultural uses. The site is currently in agricultural production with minor portions intermittently fallowed.

Native Vegetation

The native vegetation of the Valley is predominately characterized by the purple needlegrass series, valley oak series, vernal pools and wetland communities, and blue oak series. Fauna associated with this section include mule deer (*Odocoileus hemionus*), black-tailed deer (*Odocoileus hemionus columbianus*), coyotes (*Canis latrans*), white-tailed jackrabbits (*Lepus townsendii*), kangaroo rats (*Dipodomys ingens*), kit fox (*Vulpes macrotis*), and muskrats (*Ondatra Zibethicus*). Birds include waterfowl, hawks, golden eagles (*Aquila chrysaetos*), owls, white-tailed kites (*Elanus leucurus*), herons, western meadowlark (*Sturnella neglecta*) and California quail (*Callipepla californica*).[2]

[1] Tulare County 2030 Update General Plan Background Report, page 1-2
[2] Ibid. Page 9-10

Existing Cultural and Historic Resources

"Tulare County's known and recorded cultural resources were identified through historical records, such as those found in the National Register of Historic Places, the Historic American Building Survey/Historic American Engineering Record (HABS/HAER), the California Register of Historic Resources, California Historical Landmarks, and the Tulare County Historical Society list of historic resources."[3]

Due to the sensitivity of many prehistoric, ethnohistoric, and historic archaeological sites, locations of these resources are not available to the general public. The Information Center at California State University, Bakersfield houses records associated with reported cultural resources surveys, including the records pertinent to sensitive sites, such as burial grounds, important village sites, and other buried historical resources protected under state and federal laws.

REGULATORY SETTING

Federal Agencies & Regulations

See Chapters 3.4 and 3.5 of this document for federal regulations related to biological and cultural resources; respectively.

State Agencies & Regulations

See Chapters 3.4 and 3.5 of this document for state regulations related to biological and cultural resources; respectively.

Local Policy & Regulations

See Chapters 3.4 and 3.5 of this document for local regulations related to biological and cultural resources; respectively.

IMPACT EVALUATION

Would the project:

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

[3] Op. Cit. 9-56.

Findings: Impacts to Biological Resources

Project Impact Analysis: ***Less Than Significant Impact with Mitigation***

A biological evaluation of the Project site was conducted by consultants Kamansky's Ecological Consulting (KEC) and is included in this DEIR as Appendix "B". Results of the assessment are based upon database and literature searches, as well as a site visit. The biological evaluation determined that:

3.4 a) ***Less Than Significant Impact With Mitigation:***

Based on the field survey and research, KEC concluded that the existing operations had rendered the site unsuitable for all but the most urban-tolerant species. Any native habitats once present on the site were completely transformed by agricultural activity; however, six special status species are known to forage and inhabit the Project vicinity. ***Less Than Significant with Mitigation Project-specific Impacts*** related to this Checklist Item will occur.

3.4 b) ***No Impact:***

Based upon the lack of riparian habitat, ***No Impacts*** related to this Checklist Item will occur.

3.4 c) ***No Impact:***

There is no wetland habitat for special study species located onsite. As such, ***No Impact*** related to this Checklist Item will occur.

3.4 d) ***Less Than Significant Impact:***

The Project site does not serve as a fish or wildlife movement corridor. The existing perimeter chain-link fence would restrict the movement of wildlife through the site. ***Less Than Significant Impacts*** related to this Checklist Item will occur.

3.4 e) ***No Impact:***

The proposed Project will not conflict with any policies or ordinances protecting biological resources. ***No Impacts*** related to this Checklist Item will occur.

3.4 f) ***No Impact:***

There are two habitat conservation plans that apply in Tulare County. The proposed Project does not conflict with these plans. ***No Impacts*** related to this Checklist Item will occur.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is the San Joaquin Valley, the State of California, and the Western United States. As noted in Chapter 3.4, cumulative impacts related to biological resources will be ***Less Than Significant***.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

Potential Project-specific and cumulative impacts to biological resources will be ***Less Than Significant***.

Findings: Impacts to examples of the major periods of California history or prehistory

Project Impact Analysis: ***Less Than Significant Impact With Mitigation***

Chapter 3.5, Cultural Resources, discusses impacts to historic or prehistoric resources in detail. One significant cultural resource was identified within 1/2 mile of the proposed Project site as a result of a records search conducted by the Southern San Joaquin Valley Information Center. Mitigation Measures have been included to address the potential of cultural resources being unearthed as a result of proposed Project-related ground excavation. Mitigation Measures 5-1 and 5-2 are included in the unlikely event that archaeological or paleontological resources are unearthed during Project-related ground excavation and Mitigation Measure 5-3 is included in the event that human remains are found.

Cumulative Impact Analysis: ***Less Than Significant Impact with Mitigation***

The geographic area of this cumulative analysis is Tulare County, Fresno County, and the City of Kingsburg.

The proposed Project would only contribute to cumulative impacts related to this Checklist Item if Project-specific impacts were to occur. The proposed Project will be mitigated to ***Less Than Significant Project-specific Impacts and Less Than Significant Cumulative Impacts With Mitigation***.

Mitigation Measure(s): ***See Mitigation Measures outlined in Chapters 3.4 and 3.5.***

Conclusion: ***Less Than Significant Impact with Mitigation***

Less Than Significant Project-specific and Cumulative Impacts with Mitigation to biological and cultural resources will occur.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Project Impact Analysis: ***See Chapter 5***

Cumulative impacts are discussed within the analysis of each Checklist Item. In addition, cumulative impacts are summarized in Chapter 5.

Cumulative Impact Analysis: ***See Chapter 5***

Cumulative impacts are discussed within the analysis of each Checklist Item. In addition, cumulative impacts are summarized in Chapter 5.

Mitigation Measure(s): ***See Mitigation Measures contained in Chapter 9.***

Conclusion: ***See Chapter 5***

Cumulative impacts are discussed within the analysis of each Checklist Item. In addition, cumulative impacts are summarized in Chapter 5.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Project Impact Analysis: ***Less Than Significant Impact***

The proposed Project would not result in any impacts to human beings beyond what has already been analyzed in Chapters 3.1 to 3.18.

There are no significant environmental adverse effects from this Project to human beings.

Cumulative Impact Analysis: ***Less Than Significant Impact***

The geographic area of this cumulative analysis is Tulare County. This cumulative analysis is based on the information provided in the Tulare County 2030 General Plan, General Plan background Report, Tulare County 2030 General Plan EIR and the 1990 City of Kingsburg General Plan.

There are no significant environmental adverse effects from this Project to human beings.

Mitigation Measure(s): ***None Required.***

Conclusion: ***Less Than Significant Impact***

There will be ***Less Than Significant*** environmental effects which will cause substantial adverse effects to impacts to human beings either directly or indirectly.

REFERENCES

Tulare County 2030 Update General Plan Background Report, pages 1-2, 9-10, 9-56

Chapter 4
Energy

INTRODUCTION

Per Appendix F of the CEQA Guidelines and Public Resources Code Section 21100(b)(2), an EIR must disclose and discuss the potential for the project to result in impacts on energy conservation and/or consumption. A project may have the potential to cause such impacts if it would result in the inefficient, wasteful, or unnecessary consumption of energy, including electricity, natural gas, or transportation fuel supplies and/or resources.

Energy Conservation

The Project's anticipated energy demand (including fuel consumption), energy conserving features, and required mitigation measures that have an effect on energy conservation are evaluated in this section to determine whether the Project would result in unnecessary or wasteful energy consumption. The discussion of the Project's anticipated energy demands includes natural gas, electricity, and fuel consumption during construction and operations of the Project.

Existing Energy Consumption

A description of existing energy sources, energy consumption in California, existing energy service providers serving the City, and existing energy infrastructure in the Project vicinity is provided in the *Utilities* section of the EIR.

As described in Section 3.13, *Utilities,* electrical and natural gas services for the City and Project area are provided by Pacific Gas and Electric Company (PG&E) and Southern California Gas Company (SoCal Gas), respectively. In 2015, PG&E provided 85,988.75 gigawatt-hours (GWh) of electricity to nearly 16 million customers across a service area of 700,000 square miles (CEC 2017; PG&E 2017). In the same year, SoCal Gas provided a total of 4,946.74 million therms of natural gas to nearly 21.6 million customers across its 20,000 square mile service area (CEC 2017; SoCal Gas 2017). Within the County, total demand for PG&E electrical services was 1,716.97 GWh, and total demand for SoCal Gas natural gas services was 77.7 million therms in 2015. Total state and countywide energy demands, including per capita calculations of energy demands based on 2015 populations, are provided in **Tables 4-1 and -2**.

Table 4-1 2016 County and State Energy Demands (All Users)[1,2]					
	2016 Population	Total 2016 Energy Demand		2016 Energy Demand Per Capita	
		Natural Gas Demand (therms)	Electricity Demand (MWh)	Natural Gas Demand (therms)	Electricity Demand (MWh)
Fresno County	984,541	284,289,115	7,628,851	288.8	7.75
Tulare County	466,339	151,402,333	4,422,585	324,7	9.5
State	39,144,818	10,054,479,145	282,896,292.3	256.6	7.2

Table 4-2 2016 County and State Energy Demands (Residential Only)					
	2016 Population	Total 2016 Energy Demand		2016 Energy Demand Per Capita	
		Natural Gas Demand (therms)	Electricity Demand (MWh)	Natural Gas Demand (therms)	Electricity Demand (MWh)
Fresno County	984,541	98,004,843	2,663,553	99.54	2.70
Tulare County	466,339	46,531,542	1,258,584	99.78	2.69
State	39,144,818	4,297,510,000	93,702,108	109.78	2.39

The California Department of Transportation (Caltrans) reports that approximately 24.4 million automobiles, 5.6 million trucks, and 880,588 motorcycles were registered in the state in 2016, resulting in a total estimated 334.7 billion vehicles miles traveled (VMT)[3] and 15.1 billion gallons of gasoline consumed[4]. Within Tulare County, an estimated 3.67 million vehicle miles were traveled in 2016[5]; in Fresno County there were 8.23 million vehicle miles traveled[6].

The State of California strongly supports production and use of renewable energy sources, including solar photovoltaic (PV), wind, hydrologic, and biomass. For example, in-state operating capacity of renewable resources was 27,500 MW as of June 19, 2017[7]. The state's renewable

[1] California Energy Commission. Energy Consumption Database. http://ecdms.energy.ca.gov/. Accessed December 2017.
[2] U.S. Census Bureau. 2015. California QuickFacts from the U.S. Census Bureau. San Luis Obispo City. http://www.census.gov/quickfacts/table/PST045215/0668154,00. Accessed December 2017.
[3] Caltrans. 2016. California Transportation Quick Facts.
[4] California Energy Commission. Energy Consumption Database. http://ecdms.energy.ca.gov/. Accessed December 2017.
[5] Caltrans. 2017. Tulare County Transportation Quick Facts. http://www.caltrans.ca.gov/drisi/library/qfco/tul/tul2017.pdf. Accessed December 2017.
[6] Caltrans. 2017. Fresno County Transportation Quick Facts. http://www.caltrans.ca.gov/drisi/library/qfco/fre/fre2017.pdf. Accessed December 2017.
[7] California Energy Commission – Tracking Progress. Updated August 2017. http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf. Accessed December 2017.

energy portfolio includes wind (5,600 MW), solar photovoltaic (PV) (14,700 MW), geothermal (2,700 MW), small hydrologic (1,700 MW), solar thermal (1,300 MW) and biomass (1,300 MW)[8].

REGULATORY SETTING

Federal Agencies & Regulations

Energy Policy Act of 2005

The Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Act, consumers and businesses can obtain federal tax credits for purchasing fuel efficient appliances and products, including buying hybrid vehicles, building energy-efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are available for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

State Agencies & Regulations

California Energy Commission

The California Energy Commission CEC was created in 1974 to serve as the state's primary energy policy and planning agency. The CEC is tasked with reducing energy costs and environmental impacts of energy use - such as greenhouse gas emissions - while ensuring a safe, resilient, and reliable supply of energy.

State of California Integrated Energy Policy (SB 1389)

In 2002, the Legislature passed Senate Bill 1389, which required the California Energy Commission (CEC) to develop an integrated energy plan every two years for electricity, natural gas, and transportation fuels, for the California Energy Policy Report. The plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for Zero Emission Vehicles and their infrastructure needs, and encouragement of urban designs that reduce vehicles miles traveled and accommodate pedestrian and bicycle access.
The CEC adopted the 2013 Integrated Energy Policy Report on February 20, 2014. The 2013 Integrated Energy Policy Report provides the results of the CEC's assessment of a variety of issues, including:

- Ensuring that the state has sufficient, reliable, and sage energy infrastructure to meet current and future energy demands;

[8] Op.Cit.

- Monitoring publicly-owned utilities' progress towards achieving 10-year energy efficiency targets; defining and including zero-net-energy goals in state building standards;
- Overcoming challenges to increased use of geothermal heat pump/ground loop technologies and procurement of biomethane;
- Using demand response to meet California's energy needs and integrate renewable technologies;
- Removing barriers to bioenergy development; planning for California's electricity infrastructure needs given potential retirement of power plants and the closure of the San Onofre Nuclear Generating Station;
- Estimating new generation costs for utility-scale renewable and fossil-fueled generation;
- Planning for new or upgraded transmission infrastructure;
- Monitoring utilities' progress in implementing past recommendations related to nuclear power plants;
- Tracking natural gas market trends;
- Implementing the Alternative and Renewable Fuel and Vehicle Technology Program; and,
- Addressing the vulnerability of California's energy supply and demand infrastructure to the effects of climate change; and planning for potential electricity system needs in 2030.

California Global Warming Solutions Act of 2006 (Assembly Bill 32)

Assembly Bill 32 (Health and Safety Code Sections 38500–38599; AB 32), also known as the California Global Warming Solutions Act of 2006, commits the state to achieving year 2000 GHG emission levels by 2010 and year 1990 levels by 2020. To achieve these goals, AB 32 tasked the California Public Utilities Commission and CEC with providing information, analysis, and recommendations to the California Air Resources Board regarding ways to reduce GHG emissions in the electricity and natural gas utility sectors.

California Energy Code (Title 24, Part 6, Building Energy Efficiency Standards)

California Code of Regulations Title 24, Part 6 comprises the California Energy Code, which was adopted to ensure that building construction, system design and installation achieve energy efficiency. The California Energy Code was first established in 1978 by the CEC in response to a legislative mandate to reduce California's energy consumption, and apply to energy consumed for heating, cooling, ventilation, water heating, and lighting in new residential and non-residential buildings. The standards are updated periodically to increase the baseline energy efficiency requirements. The 2013 Building Energy Efficiency Standards focus on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings and include requirements to enable both demand reductions during critical peak periods and future solar electric and thermal system installations. Although it was not originally intended to reduce greenhouse gas (GHG) emissions, electricity production by fossil fuels results in GHG emissions and energy efficient buildings require less electricity. Therefore, increased energy efficiency results in decreased GHG emissions.

California Green Building Standards Code (Title 24, Part II, CALGreen)

The California Building Standards Commission adopted the California Green Buildings Standards Code (CALGreen in Part 11 of the Title 24 Building Standards Code) for all new construction statewide on July 17, 2008. Originally a volunteer measure, the code became mandatory in 2010 and the most recent update (2013) went into effect on January 1, 2014. CALGreen sets targets for energy efficiency, water consumption, dual plumbing systems for potable and recyclable water, diversion of construction waste from landfills, and use of environmentally sensitive materials in construction and design, including eco-friendly flooring, carpeting, paint, coatings, thermal insulation, and acoustical wall and ceiling panels. The 2013 CALGreen Code includes mandatory measures for non-residential development related to site development; water use; weather resistance and moisture management; construction waste reduction, disposal, and recycling; building maintenance and operation; pollutant control; indoor air quality; environmental comfort; and outdoor air quality. Mandatory measures for residential development pertain to green building; planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; environmental quality; and installer and special inspector qualifications.

Clean Energy and Pollution Reduction Act (SB 350)

The Clean Energy and Pollution Reduction Act (SB 350) was passed by California Governor Brown on October 7, 2015, and establishes new clean energy, clean air, and greenhouse gas reduction goals for the year 2030 and beyond. SB 350 establishes a greenhouse gas reduction target of 40 percent below 1990 levels for the State of California, further enhancing the ability for the state to meet the goal of reducing greenhouse gas emissions by 80 percent below 1990 levels by the year 2050.

Renewable Portfolio Standard (SB 1078 and SB 107)

Established in 2002 under SB 1078, the state's Renewables Portfolio Standard (RPS) was amended under SB 107 to require accelerated energy reduction goals by requiring that by the year 2010, 20 percent of electricity sales in the state be served by renewable energy resources. In years following its adoption, Executive Order S-14-08 was signed, requiring electricity retail sellers to provide 33 percent of their service loads with renewable energy by the year 2020. In 2011, SB X1-2 was signed, aligning the RPS target with the 33 percent requirement by the year 2020. This new RPS applied to all state electricity retailers, including publicly owned utilities, investor-owned utilities, electrical service providers, and community choice aggregators. All entities included under the RPS were required to adopted the RPS 20 percent by year 2020 reduction goal by the end of 2013, adopt a reduction goal of 25 percent by the end of 2016, and meet the 33 percent reduction goal by the end of 2020. In addition, the Air Resources Board, under Executive Order S-21-09, was required to adopt regulations consistent with these 33 percent renewable energy targets.

PROJECT SPECIFIC ENERGY USAGE

Electricity and Natural Gas

Implementation of the proposed Project would result in the commitment of additional energy resources, including consumption of natural gas and electricity through operation of the Project. As provided in Appendix A, operation of the proposed Project is estimated to result in the demand for 41,652 therms per year (therms/yr) of natural gas, and 1,579 megawatt-hours per year (MWh/yr) of electricity (**Table 4-3**) based on CalEEMod modeling results.

Table 4-3
Estimated (mitigated) Project Electricity and Natural Gas Demands[9]

	Proposed Project[1]	
Proposed Land Use	Natural Gas Demand (therms/yr)[2]	Electricity Demand (MWh/yr)[3]
R-1 Single Family	35,475	1,353
R-3 Multi-Family	6,177	211
Park	0	15
Total	**41,652**	**1,579**
Per Capita/Year	**72.3**	**2.74**
Statewide Average (Residential)	**109.78**	**2.39**
Fresno County Average (Residential)	**99.54**	**2.70**

1 Proposed Project demand includes design features proposed by the Project and characterized as 'mitigation measures' in the CalEEMod runs.
2 1 therm = 100 thousand British Thermal Units (BTU)
3 1,000 megawatt-hours (MWh) = 1 gigawatt-hours (GWh)

Construction Diesel Fuel Consumption

The primary energy resource consumed during construction of the Project over a 10-year period would include diesel fuel for the operation of diesel powered construction equipment.

The total construction fuel consumption is calculated below as the sum of specific total fuel consumption calculated for each piece of equipment used in each phase of construction. To calculate total fuel consumption for specific equipment, Section 3.0, *Construction Detail* in the CalEEMod Worksheets located in Appendix A provides detailed construction phasing, construction equipment used in each phase, total number of days worked, equipment horsepower, equipment load factor, and equipment quantities. Total fuel consumption is then based on a fuel consumption factor of 0.05 gallons per horsepower per hour (gal/hp/hr) for diesel engines as

[9] See the CalEEMod output files provided in Appendix A of this DEIR.

derived from SCAQMD CEQA Handbook Table A9-3E. Calculation of fuel consumption involves the following steps:

Total Fuel Consumption = Fuel Consumption Rate x Duration

Where: Duration = Quantity of Equipment x Hours of Operation of Equipment each Day x Total Number of Days Worked

Where: Fuel Consumption Rate = Equipment Horse Power x Equipment Load Factor x Fuel Consumption Factor

Operational Vehicle Fuel Consumption

Operation of the Project would result in the daily consumption of vehicle fuel as residents, visitors, employees, or customers would travel to and from the Project site. As provided in **Table 4-4** and Appendix A, Project operation is anticipated to result in the generation of an additional 5,536,801 VMT annually, or approximately 0.4 percent of the County's 2016 annual VMT. Using vehicle fleet mix data provided in Appendix A and average fuel economy information provided by the Bureau of Transportation Statistics, the Project-generated annual VMT would result in the consumption of approximately 339,500 gallons of fuel per year, representing less than 0.0005 percent of the statewide vehicle fuel demand (see **Table 4-4**).

Table 4-5 shows the VMT outputs from the proposed Project in comparison to adjacent Counties and the State. VMT for the Project is shown to be comparable to the State average and the Fresno County average, and slightly higher than Tulare County average. VMT is used as an important indicator of the impact on the local circulation system and of a project's air quality impacts. Air quality impacts as described in the Air Quality section of this EIR showed the impacts to be less than significant, and that Greenhouse Gas impacts comply with the County's Climate Action Plan. Several Project features have been added to ultimately reduce VMT from the Project with the expected reduction shown in parenthesis, based on expected VMT reduction from the CAPCOA Air Quality Impact Assessment Handbook[10]:

1. Intersection Density (LUT-8). The Project has an intersection density of 100 intersections per square mile, including the open ended cul-de-sacs and interesting streets, in excess of the average of 36 for typical projects. (15%).[11]
2. Bike Facilities (LUT-7, LUT-8). The Project has bike facilities through and around the Project site. The Project will also extend sidewalks to 18th Street and Sierra. (1.25%).[12]
3. Integrated Street System (LUT-2). The project has an integrated street system, including through streets to the existing residential neighborhood to the west and north.(10%).[13]
4. Onsite Parks/Nearby Schools. The project has onsite parks at a greater than average ratio. This will also provide parks for existing residents. A high school and middle school are nearby. (9%)

[10] California Air Pollution Control Officers Association. Quantifying Greenhouse Gas Mitigation Measures. August, 2010. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf. Accessed December 2017.
[11] Ibid. Page 181
[12] Ibid. Page 179, 181
[13] Ibid. Page 159

These reductions are not additive, but would result in total VMT reductions ranging from 15% to 25%. For the purposes of this analysis, a reduction of 17.5% is estimated, reducing the estimated VMT from the Project to 3,869,312, or 6,717 per capita per year. This level is 16 percent below the Tulare County and Fresno County averages.

Table 4-4
Estimated Operational Fuel Consumption[14,15]

Vehicle Type	Percent of Vehicle Trips[1]	Mitigated Annual VMT[2]	Average Fuel Economy (miles/gallon)[3]	Total Annual Fuel Consumption (gallons)
Passenger Cars	45.7	1,768,278	23.3	75,891
Light/Medium Duty Vehicles	40.3	1,559,335	17.1	91,189
Heavy Duty Vehicles/Other	13.1	506,880	7.3	69,435
Motorcycles	0.9	34,824	43.4	802
Total	**100%**	**3,869,318**	--	**237,317**

[1] Percentage of Vehicle Trips and Fleet Mix information provided in Table 4.4, Fleet Mix of Appendix H. Passenger Cars is the sum of the LDA fleet mix trip percentage column; Light/Medium Duty Vehicles is the sum of the LDT1, LDT2, and MDV fleet mix trip percentage columns; Heavy Duty Vehicles/Other is the sum of the LHD1, LHD2, MHD, HHD, OBUS, UBUS, SBUS, and MH fleet mix trip percentage columns; and Motorcycles is the sum of the MCY fleet mix trip percentage column.

[2] Annual VMT calculated from total mitigated VMT, which incorporates Project design features.

[3] Average fuel economy based on average 2014 U.S. vehicle fuel efficiency (mpg) from Table 4-12: Average Light Duty Vehicle, Long Wheel Base Fuel Consumption and Travel, and Table 4-13: Single-Unit 2-Axle 6-Tire or More Truck Fuel Consumption and Travel of the National Transportation Statistics.

[14] See CalEEMod output files in Appendix A of this DEIR.
[15] U.S. Bureau of Transportation Statistics. National Transportation Statistics. https://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/index.html#chapter_4. Accessed December 2017.

Table 4-5 Per Capita Vehicle Miles Traveled[16,17,18]				
	Population	**Nominal Total Annual VMT**	**VMT with CAPCOA Reductions**	**Annual VMT per capita**
Tulare County	466,339	3,672,703,000		7,875
Fresno County	984,541	8,239,736,000		8,369
State	39,144,818	334,700,000,000		8,550
Proposed Project	576	4,690,083	3,869,318	6,717

CEQA Requirements and Energy Conservation Standards

In addition to the recommended thresholds for environmental analysis provided in Appendix G of the CEQA Guidelines, Appendix F requires that an EIR disclose and discuss the potential impacts of a project on energy resources and conservation. An EIR's discussion of impacts on energy resources should provide analysis and discussion of the project's potential to result in the wasteful, inefficient, or irretrievable commitment of energy resources, with particular attention towards electrical, natural gas, and transportation fuel supplies. While no specific thresholds are provided by the CEQA Guidelines, Appendix F offers several recommendations for inclusion in an analysis of impacts on energy resources to determine whether a project would:

a. Use large amounts of fuel or energy in an unnecessary, wasteful, or inefficient manner;

b. Constrain local or regional energy supplies, affect peak and base periods of electrical or natural gas demand, require or result in the construction of new electrical generation and/or transmission facilities, or necessitate the expansion of existing facilities, the construction of which could cause significant environmental effects; or

c. Conflict with existing energy standards, including standards for energy conservation.

Operation of the proposed Project would result in the demand for approximately 41,518 therms/yr of natural gas, 1,624 MWh/yr of electricity, and 339,590 gallons/yr of vehicle fuel. Further, construction of the proposed Project is anticipated to result in the total consumption of an additional 200,000 gallons of diesel fuel. Based on existing energy demands and capacity of service providers, estimated operational demand for electricity and natural gas as part of the Project would represent less than 0.001 percent of PG&E's and SoCal Gas' total 2015 energy demands for the County. Further, additional vehicle fuel demand under operation of the Project would result in an increase in statewide fuel demand by less than 0.001 percent.

[16] Caltrans. 2016. California Transportation Quick Facts.
[17] Caltrans. 2017. Tulare County Transportation Quick Facts. http://www.caltrans.ca.gov/drisi/library/qfco/tul/tul2017.pdf. Accessed December 2017.
[18] Caltrans. 2017. Fresno County Transportation Quick Facts. http://www.caltrans.ca.gov/drisi/library/qfco/fre/fre2017.pdf. Accessed December 2017.

Based on comparisons of the Project's energy demands with statewide and regional demand and service capacity in total and per capita (**Table 4-6**), the proposed Project is not expected to result in the use of a large amount of fuel or energy in an unnecessary, wasteful, or inefficient manner, nor would it affect regional supplies or peak/base periods of demand as the estimated energy demand is typical for a Project of this size, and would result in a negligible increase in regional energy demands. The Project is also shown to be more energy efficient than other residential units in Fresno County, Tulare County and the State. As such, the proposed Project would not necessitate the expansion of existing facilities or construction of new energy generation or transmission facilities beyond the onsite facilities proposed as part of the Project to serve the new development, as discussed in Section 3.13, *Utilities.*

Table 4-6
Comparison of Total and Per Capita Energy Demands[19,20,21]

		Total		Per Capita	
	Population	**Natural Gas Demand (therms/yr)**	**Electricity Demand (MWh/yr)**	**Natural Gas Demand (therms/yr)**	**Electricity Demand (MWh/yr)**
Fresno County	984,541	98,004,843	2,663,553	99.54	2.70
Tulare County	466,339	46,531,542	1,258,584	99.78	2.69
State	39,144,818	4,297,510,000	93,702,108	109.78	2.39
Proposed Project	576	41,652	1,579	72.3	2.74

Further, as described in Section 3.8, *Land Use*, the Project would be required to implement and be consistent with existing energy design standards at the local and state level. The Project would be subject to energy conservation requirements in the California Energy Code and CALGreen. Adherence to state code requirements would ensure that the project would not result in wasteful and inefficient use of non-renewable resources due to building operation.

In addition to standard required energy conservation requirements, the proposed Project includes a range of design features that proactively reduce the Project's energy demand during construction and operation. **Table 4-7** provides a list of Project design features provided in Section 2.0, *Project Description*, which would further reduce the Projects potential to result in the wasteful or inefficient use of energy resources, and promote the conservation of energy and fuel.

[19] Caltrans. 2016. California Transportation Quick Facts.
[20] Caltrans. 2017. Tulare County Transportation Quick Facts. http://www.caltrans.ca.gov/drisi/library/qfco/tul/tul2017.pdf. Accessed December 2017.
[21] Caltrans. 2017. Fresno County Transportation Quick Facts. http://www.caltrans.ca.gov/drisi/library/qfco/fre/fre2017.pdf. Accessed December 2017.

Table 4-7 Energy Conservation Project Design Features and Mitigation Measures	
Energy Conservation Project Design Features	Associated Energy Reduction
Exceedance of Title 24 Requirements by 15 Percent	Improved energy efficiency requirements above local and state requirements
Installation of Energy Efficient Features	Improve building energy efficiency

The design features and mitigation measures included in **Table 4-7** would have the effect of reducing overall Project consumption of energy and fuel resources during both construction and operation of the Project. The proposed Project will also offer optional solar panels as part of the marketing package. Implementation of the Project's proposed installation of solar photovoltaic panels on up 50 percent of the residential units can measurably reduce Project energy demands by a substantial, quantifiable amount. For example, installation of photovoltaic solar panels would provide a minimum of 25 percent of the average daily electricity demand. As a result, the Project would reduce total conventional electricity demand by approximately 43.5 percent, for a total demand of 1,877.4 MWh/yr (**Table 4-8**).

Table 4-8 Project Energy Savings Through Installation of Optional Photovoltaic Solar Panels			
Land Use	**Electricity Demand (MWh/yr)**	**Percent Electricity Provided by 50% Onsite Solar**	**Net Electricity Demand (MWh/yr)**
R-1 Single Family	1,392	40%	835
R-3 Multi-Family	211	40%	127
Park	15	100%	0
Total	**1,624**	41%	**962**

Based on this analysis, it can be concluded that the demand for energy (total equivalent BTUs for electrical and natural gas usage) as a result of the Project is lower than County and the state average energy demands, and VMT is 20 percent less than county and state averages; as such, the Project has been demonstrated to be more energy efficient. When considering the potential for the Project to result in greater conservation of electricity, natural gas, and transportation fuel through the implementation of proposed Project design features and required mitigation measures not quantified above, the proposed Project has a low potential to result in adverse impacts on energy resources and conservation. Therefore, the direct impacts to energy resources and conservation are ***Less Than Significant.***

Cumulative Impacts

The proposed Project would incrementally contribute to adverse impacts on energy resource demand and conservation when considering the cumulative impact of concurrently planned projects; however, like the proposed Project, discretionary actions requiring agency approval are required to comply with local, regional, state, and federal policies designed to reduce wasteful energy consumption, and improve overall energy conservation and sustainability. For instance, all local projects involving the development of new buildings must be designed to conform to CALGreen and the 2016 California Energy Code. Therefore, it is not anticipated that the Project's contribution to cumulative impacts generated with projects provided in Table 3.0-1 would result in a significantly considerable wasteful use of energy resources, such that the Project, and other cumulative projects, would have a cumulative effect on energy conservation. Cumulative impacts as of a result of the Project would be ***Less Than Significant.***

REFERENCES

CalEEMod output files provided in Appendix A of this DEIR.

California Air Pollution Control Officers Association. Quantifying Greenhouse Gas Mitigation Measures. August, 2010. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf. Accessed December 2017. Pages 159, 179, 181

California Energy Commission. Energy Consumption Database. http://ecdms.energy.ca.gov/. Accessed December 2017.

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Summary of Cumulative Impacts
Chapter 5

CUMULATIVE IMPACTS ANALYSIS UNDER CEQA

Section 15355 Cumulative Impacts

"Cumulative impacts" refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

(a) The individual effects may be changes resulting from a single project or a number of separate projects.

(b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."[1]

Section 15130 Discussion of Cumulative Impacts

"(a) An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065(a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

(1) As defined in Section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

(2) When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. A lead agency shall identify facts and analysis supporting the lead agency's conclusion that the cumulative impact is less than significant.

(3) An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the

[1] CEQA Guidelines Section 15355

project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. The lead agency shall identify facts and analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable.

(b) The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact. The following elements are necessary to an adequate discussion of significant cumulative impacts:

(1) Either:

(A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency, or

(B) A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program. Any such document shall be referenced and made available to the public at a location specified by the lead agency.

(2) When utilizing a list, as suggested in paragraph (1) of subdivision (b), factors to consider when determining whether to include a related project should include the nature of each environmental resource being examined, the location of the project and its type. Location may be important, for example, when water quality impacts are at issue since projects outside the watershed would probably not contribute to a cumulative effect. Project type may be important, for example, when the impact is specialized, such as a particular air pollutant or mode of traffic.

(3) Lead agencies should define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used.

(4) A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available, and

(5) A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

(c) With some projects, the only feasible mitigation for cumulative impacts may involve the adoption of ordinances or regulations rather than the imposition of conditions on a project-by-project basis.

(d) Previously approved land use documents, including, but not limited to, general plans, specific plans, regional transportation plans, plans for the reduction of greenhouse gas emissions, and local coastal plans may be used in cumulative impact analysis. A pertinent discussion of cumulative impacts contained in one or more previously certified EIRs may be incorporated by reference pursuant to the provisions for tiering and program EIRs. No further cumulative impacts analysis is required when a project is consistent with a general, specific, master or comparable programmatic plan where the lead agency determines that the regional or area wide cumulative impacts of the proposed project have already been adequately addressed, as defined in section 15152(f), in a certified EIR for that plan.

(e) If a cumulative impact was adequately addressed in a prior EIR for a community plan, zoning action, or general plan, and the project is consistent with that plan or action, then an EIR for such a project should not further analyze that cumulative impact, as provided in Section15183(j)."[2]

Tulare County is the geographic extent for most impact analysis. This geographic area is the appropriate extent because of the following reasons:

1. The proposed Project is in Tulare County and County of Tulare is the Lead Agency; and
2. Tulare County General Plan polices applies to the proposed Project.

The basis for other resource specific cumulative impact analysis includes:

- For Air Quality and Greenhouse Gas Emissions it is the San Joaquin Valley Air Basin;
- For Biological Resources it is the San Joaquin Valley; and
- For Hydrology it is the Tulare Lake Basin.

PAST, PRESENT, PROBABLE FUTURE PROJECTS

Tulare County Association of Governments (TCAG) Blueprint Scenario

Under the Tulare County Regional Blueprint Preferred Growth Scenario, TCAG suggested a 25% increase over the status quo scenario to overall density by 2050. The preferred growth scenario principles included directing growth towards incorporated cities and communities where urban development exists and where comprehensive services and infrastructure are/or will be provided. Another relevant preferred scenario is the creation of urban separators around cities. The proposed Project location is outside incorporated areas and would be consistent with the goal of separating urban boundaries.[3]

[2] CEQA Guidelines, Section 15130
[3] Tulare County Associated of Governments Blueprint 2050, Preferred Scenario (2009).

Tulare County 2030 General Plan

The Cumulative Analysis outlined in the Tulare County General Plan Update 2030 Recirculated Draft EIR notes regional population growth (which in part was developed by TCAG) and a number major projects. Regional population projections are provided in the **Table 5-1**.[4]

Table 5-1
Regional Population Projections and Planning Efforts

Jurisdiction	General Plan Planning Timeframe	General Plan Buildout Population	Significant Environmental Impacts
City of Dinuba	2006-2026	33,750	Farmland conversion; conflicts with agricultural zoning and Williamson Act contracts; conversion of agricultural soils to non-agricultural use; regional air quality impacts; and climate change-greenhouse gases.
City of Woodlake			Unavailable.
City of Visalia	1991-2020	165,000	Air quality; biological resources; land use conflicts; noise; transportation/traffic; mass transit; agricultural resources; water supply; and visual resources.
City of Tulare	2007-2030	134,910	Farmland conversion; aesthetics; water supply; traffic; air quality; global climate change; noise; flooding from levee or dam failure; biological resources; and cultural resources.
City of Farmersville	2002-2025	12,160	Agricultural resources; agricultural land use conflicts; air quality; and traffic circulation.
City of Exeter			Information unavailable at time of analysis.
City of Lindsay	1990-2010	17,500	Air quality and farmland land conversion.
City of Porterville	2006-2030	107,300	Farmland conversion; air quality; noise; and biological resources.
City of Kingsburg	1992-2012	16,740	Farmland conversion and air quality.
City of Delano	2005-2020	62,850	Air quality; noise; farmland conversion; disruption of agricultural production; and conversion of agricultural soils to non-agricultural use.

[4] Tulare County General Plan 2030 Update Recirculated Draft EIR. Page 5-4 to 5-5.

Table 5-1
Regional Population Projections and Planning Efforts

Jurisdiction	General Plan Planning Timeframe	General Plan Buildout Population	Significant Environmental Impacts
County of Fresno	2000-2020	1,113,790	Farmland conversion; reduction in agricultural production; cancellation of Williamson Act Contracts; traffic; transit; bicycle facilities; wastewater treatment facilities; storm drainage facilities; flooding; police protection; fire protection; emergency response services; park and recreation facilities; library services; public services; unidentified cultural resources; water supply; groundwater; water quality; biological resources; mineral resources; air quality; hazardous materials; noise; and visual quality.
County of Kern	2004-2020	1,142,000	Air quality; biological resources; noise; farmland conversion; and traffic.
County of Kings*	1993-2005	149,100 (low) 228,000 (high)	Biological resources; wildlife movement; and special status species.

** The adopted Kings County General Plan did not identify a projected population for 2005. The General Plan does include population projections for 2010, which is included in this table.*

SOURCE: City of Delano, 1999; City of Dinuba, 2008; City of Farmersville, 2003; City of Kingsburg, 1992; City of Lindsay, 1989; City of Porterville, 2007; City of Visalia, 2001, 1991; County of Fresno, 2000; County of Kern, 2004; County of Kings, 2009; DOF, 2007; TCAG, 2008.

In addition to the Regional Growth Projections used for the cumulative impact analysis, the Tulare County General Plan Update 2030 Recirculated Draft EIR noted the following Major Projects

- **Goshen**: Status – On-Going. On December 10, 2013, the Tulare County Board of Supervisors (BOS) approved the Planning Branch proposal to update the Goshen Community Plan. The Goshen Community Plan Update is being updated to implement the 2030 Tulare County General Plan (2012). The project Study Area Boundary will assess the potential project impacts from the proposed land use changes, for the areas north of Riggin Drive and Ave 320 to the North, Road 60 to the east, Avenue 304 to the South, and into the City of Visalia to the east. The project EIR is based on a projected annual population growth rate of 1.3%. Additional growth beyond the 1.3% annual growth rate will require further growth analysis pursuant to CEQA. The Goshen Community Plan Update will become consistent with the General Plan 2030 Update, and will include the following primary goals and objectives: (1) Land use and environmental planning - Promote development within planning areas next to the Regional State Route 99 Corridor; (2) Improvements for a "disadvantaged community"; and 3) Strengthening the relationship between the RMA the Tulare County Association of Governments (TCAG) which will help to facilitate the funding and implementation of several key transportation programs such as Safe Routes to

Schools, Complete Streets, and Bike/Pedestrian Projects. By pursuing these transportation programs through a heightened collaborative process, the likelihood of getting actual projects in the ground will be realized faster than historically achieved. In doing so, these communities and others can become safer and healthier by providing a more efficient transportation network. Some of the major components of the Community Plan Update are based on Caltrans reconstructing the over-crossing at Betty Drive and State Route 99 in the Community of Goshen. There are five additional projects that have been analyzed; three directly and two in relationship to the Project's impacts to these areas. The County is proposing more than 20 new land use and zoning designations, including a Mixed Use zone. Also in the process is an update to the Zoning Code to include a mixed use zoning district in compliance with the mixed use designation in the 2030 General Plan.

- **Yokohl Ranch**: Status – GPI allowed to proceed in February 2007. On September 13, 2005, the Tulare County Resource Management Agency received a request from the J.G. Boswell Company and the Eastlake Company, to initiate the formal process to amend the Tulare County General Plan, including the Foothill Growth Management Plan (FGMP), to change the land use designation for the 36,000 acre Yokohl Ranch property from 'Extensive Agriculture' to 'Planned Community Area'. According to the applicants, the proposed amendment will result in master planned communities that balance the needs for housing, neighborhood commercial uses, recreation, ranching operations and open space. As such, 40% (14,400 acres) of the ranch is proposed for development with 60% (21,600 acres) of the property to remain as untouched open space and ranchlands. The developed portions of the ranch will include the Village of Yokohl Ranch, an active adult community accessible to Yokohl Drive; and a Ranch Resort Lodge Enclave located in the northern reaches of the site, approximately four miles south of Lake Kaweah.

- **Rancho Sierra**: Status – GPA approved. The project site consists of 114.6 acres. The site was a golf course facility located on both sides of Liberty Avenue (Avenue 264), east of Road 124, south of the city of Visalia. There are 30 existing homes within the golf course area but not a part of this application. The intended use is to subdivide the site into 175 single family residential lots. The project has been approved.

- **Earlimart**: Status – On-Going. The Earlimart Community Plan Update (General Plan Amendment No. 14-005) is being updated to implement the Tulare County General Plan 2030 Update (2012). Among the entitlements to be updated are: (1) the General Plan Amendment, (2) changes to Zoning District Boundaries, and (3) changes to the Zoning Code Ordinance creating a New Mixed Use Zoning District only for the Earlimart Community Plan Update. Consistent with the General Plan and the Community Plan Update Study Area Boundary, the land uses and alternative land use patterns were considered based on expansion to the Urban Development Boundary (UDB) and their potential impacts to the environment. In addition, a Complete Streets Program was approved by the Board of Supervisors on December 15, 2015, for inclusion in the Circulation Element of this Community Plan Update. The Earlimart Complete Streets Program has thoroughly analyzed the alternative forms of transportation, including transit, bicycle ways, and pedestrian circulation. The three (3) projects that are being analyzed at the project level in this DEIR include: (1) the New High School Project, (2)

the Northern Earlimart Rezone Project, and (3) the Existing UDB Project. The County is proposing six (6) land use and zoning districts, including a Mixed Use zone. Also in the process is an update to the Zoning Code to include a mixed use zoning district in compliance with the mixed use designation in the 2030 General Plan. The Community Plan Update is intended to serve residents and business owners in the Project Area by providing necessary public improvements, encouraging rehabilitation and repair of deteriorating infrastructure and fostering economic development of the Project Area.

- **Traver Community Plan:** Status – GPA approved. On December 16, 2014 the Tulare County Board of Supervisors (BOS) approved an update to the Traver Community Plan. The Traver Community Plan Update is consistent with the recent approval of the General Plan 2030 Update, and will include the following primary goals and objectives.

- **Ducor:** Status – GPA approved. On November 3, 2015 the Tulare County Board of Supervisors (BOS) approved an update to the Ducor Community Plan. The Ducor Community Plan Update is consistent with the recent approval of the General Plan 2030 Update, and will include the following primary goals and objectives.

- **Terra Bella:** Status – GPA approved. On November 3, 2015 the Tulare County Board of Supervisors (BOS) approved an update to the Terra Bella Community Plan. The Terra Bella Community Plan Update is consistent with the recent approval of the General Plan 2030 Update, and will include the following primary goals and objectives.

- **Pixley:** Status – GPA approved. On June 17, 2015 the Tulare County Board of Supervisors (BOS) approved an update to the Pixley Community Plan. The Pixley Community Plan Update is consistent with the recent approval of the General Plan 2030 Update, and will include the following primary goals and objectives.

- **Tipton:** Status – GPA approved. On June 17, 2015 the Tulare County Board of Supervisors (BOS) approved the Tipton Community Plan. The Tipton Community Plan is consistent with the recent approval of the General Plan 2030 Update, and will include the following primary goals and objectives.

- **Strathmore:** Status – GPA approved. On June 17, 2015 the Tulare County Board of Supervisors (BOS) approved an update to the Strathmore Community Plan. The Strathmore Community Plan Update is consistent with the recent approval of the General Plan 2030 Update, and will include the following primary goals and objectives.

In addition to the Major Projects outlined in the Tulare County General Plan Update 2030 Recirculated Draft EIR, the approved projects listed as follows may produce cumulative impacts:

- **Pena's:** The project is for Peña's Material Recovery Facility (MRF) and Transfer Station (TS)' which currently sits on 18.01 acres that are being rezoned from AE 30 to M1 Light Industrial Zoning, and rezoning 6.7 acres and 11.3 acres from residential and industrial reserve zoning to industrial zoning. The land is currently operated by Peña's Disposal,

Inc. and has a previously permitted peak processing capacity of 500 tons per day (TPD). This existing facility serves the unincorporated northern portions of Tulare County and the unincorporated southern portions of Fresno County, and the City of Orange Cove in Fresno County. Within the County of Tulare, the facility serves the cities of Dinuba and Porterville, the communities of Cutler, Orosi, London, Sultana, Traver, Seville and other smaller communities in the area that may need to utilize the facility for the recycling of source-separated recyclables, commingled recyclables, commercial and industrial rubbish, green material and wood wastes, construction and demolition wastes, and inert debris to assist in reaching the diversion goals of the California Integrated Waste Management Act of 1989 (AB 939).

- **South County Correctional Detention Facility in Porterville:** The project will require a rezoning of the project site, which is half in the County and half in the City of Porterville. The proposed project contains a build-out "footprint" for the proposed facility of approximately 15.0 acres with a new maximum security Type II facility as the primary structure. The project will consist of 250-cell double occupancy units (500 beds) and 14 special use beds for a total of 514 beds. In addition to the main detention facility, the project will also include support service components.

  As the site is currently under agricultural production, the project will require new utilities infrastructure (such as electrical, gas, phone, etc.). It will also require streets/roads improvements, potable water systems, wastewater systems, and storm water drainage infrastructure. These will be constructed or expanded to meet facility demands. Where feasible, the project will be extended to connect with existing potable water, wastewater, and storm water drainage infrastructure provided by City of Porterville. However, possible new construction of the above mentioned infrastructure may be necessary, and as such, will be evaluated.

- **Pixley Biogas:** The project is for development of a biogas facility on 2.75 acre portion of an 8 acre parcel. The digester will extract methane gas, via an anaerobic manure digester. The facility will be used to produce 266 MMBTUS per day of biogas via an anaerobic digestion of manure feedstock from nearby dairies. The biogas produced will be used to fuel the Calgren bio-refinery facility, located adjacent and to the south of the project site, which will reduce the Calgren plant consumption of natural gas.

- **Harvest Power:** The project is for a Composting Expansion and Anaerobic Digester. The project will allow a maximum total tonnage for the composting to increase from 156,000 tons per year to a potential 216,000 tons per year. An additional 60,000 tons will be allowed at the proposed anaerobic digester facility. The facility will produce transportation fuel through a compressed natural gas (CNG) refueling station.

- **Orosi Rock:** The project includes concrete a recycling and surface mining operation on 35.13 acres where concrete from various construction projects around the region are delivered for recycling. The project includes transporting up to 800,000 tons of aggregate via 44,000 trips per year heavy-duty truck trips from the operation on an annual basis.

The amendment to the previous permit allows an increase of 1.9 million tons of rock and 2.1 million tons of imported recycled concrete. The total production of aggregate will be 10.8 million tons over the course of the existing 25 year period of the existing permit. Excavating will be limited to 400' Mean Sea Level (MSL) and the operation will continue blasting by a licensed blaster to break up larger rocks that cannot be moved or broken up by mechanical equipment.

- **Tulare Solar Center:** The project includes the construction of an 80 MW solar photovoltaic facility on up to 800 acres of an approximately 1,144 acre property historically used as agricultural farmland in Tulare County, California. Proposed Project construction generally requires a focus in three major areas. The areas of focus include: (1) The solar field with associated equipment, including solar PV panels/modules, racking systems, inverters, intermediate voltage transformers, access roads, and underground, above-ground, or overhead electrical systems to collect and consolidate power from across the Project; (2) A substation(s) that receives the solar field's electrical production and increases the voltage to match the voltage of the adjacent utility grid via a generator step-up transformer(s), with Project owned gen-tie lines, and (3) Any other electrical interconnection components necessary for the Project's production to reach the utility grid, including disconnect equipment, communications lines (e.g. fiber optics) and a sub-transmission tap line.

- **Deer Creek Mine:** This is a Project amendment to a Surface Mining Permit and Reclamation Plan to allow expanded operations at this site. The Applicant currently operates a rock and gravel surface mining operation on 98 acres. The Project will result in no increase in the maximum depth of the mine, as expansion will occur laterally within the existing mining footprint. The approval includes an increase in production by 450,000 tons per year (from a maximum of 500,000 tons per year to a maximum of 950,000 tons per year). Increase truck hauling by 176 round trips per day (from a maximum of 200 round trips per day to a maximum of 376 round trips per day). The Project will not result in any change to the estimated total rock production of 15,000,000 tons of rock material during the estimated 50 years of operation nor would it result in any change to the approved reclamation plan.'

- **Papich:** The Applicant received a Special Use Permit through Tulare County for the following: 1) Permanent establishment of the asphalt batch plant on the existing site; 2) Expansion of the existing operation from 3,700 tons/day to 8,000 tons/day of asphalt; and 3) To conduct retail/commercial sales of asphalt.

- **Derrel's Mini Storage** –Project includes a proposed General Plan Amendment (No. GPA 14-007) and proposed Change of Zone (No. PZ 14-001). GPA 14-007 received approval to amend the Tulare County Land Use Element of the General Plan by changing the land use designation on the 19.33-acre parcel from "Agriculture" to "Commercial or Light Industrial". PZ 14-001 was approved to re-zone the AE-20 (Exclusive Agricultural-20 acre minimum) Zone to C-3 (Service Commercial) Zone on the same

19.33 acres. The zone change allows, as noted in the Tulare County Zoning Ordinance, Mini-Warehouses – "Storage or warehousing service within a building or buildings primarily for individuals to store personal effects"[5]

The site consists of the phased construction of 19.33 acre mini- storage facility. Phase 1 consists of 129,550 square feet; Phase 2 consists of 148,950 square feet, and Phase 3 consists of 96,600 square feet. RV storage will be used on the Phase 2 portion of the site, moving to Phase 3 as the earlier phases are constructed with the eventuality of the entire site constructed as mini storage units (if necessary) to meet market demands. It is possible that Phase 3 will remain as RV storage. The applicant approximates a ten year full build-out of the entire proposed Project site.

SUMMARY OF CUMULATIVE IMPACTS

In this summary section, mitigated impacts and immitigable impacts will be discussed. Checklist Item criteria that would result in No Impacts or Less Than Significant Impacts are discussed in Chapter 3 and are not reiterated here.

Unavoidable Impacts

There are no significant and unavoidable impacts. All potentially significant cumulative impacts have been reduced below a level of significance through mitigation.

Less than Significant Impacts with Mitigation

All impacts that can be effectively mitigated are listed in the **Table 5-2**.

Table 5-2
Checklist Items with Less Than Significant Impacts with Mitigation

Impact Section	Checklist Item No.	Checklist Criteria
Biology	3.4 a)	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game [Wildlife] or U.S. Fish and Wildlife Service?
Cultural Resources	3.5 a)	Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?
Cultural Resources	3.5 b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?
Cultural Resources	3.5 c)	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

[5] Tulare County Zoning Ordinance. Page 13.

Table 5-2 Checklist Items with Less Than Significant Impacts with Mitigation		
Impact Section	**Checklist Item No.**	**Checklist Criteria**
Cultural Resources	3.5 d)	Disturb any human remains, including those interred outside of formal cemeteries?
Hydrology & Water Quality	3.9 a)	Violate any water quality standards or waste discharge requirements?
Hydrology & Water Quality	3.9 b)	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?
Transportation	3.16 a)	Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeway**s**, pedestrian and bicycle paths, and mass transit?
Tribal Cultural Resources	3.17 a)	Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?
Tribal Cultural Resources	3.17 b)	A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe?

See Chapter 9 Mitigation Monitoring and Reporting Program for a comprehensive list of Mitigation Measures to be implemented as part of the proposed Project.

Less Than Significant Impact

All impacts that are Less Than Significant are listed in **Table 5-3**.

Table 5-3 Checklist Items with Less Than Significant Impacts		
Impact Section	**Checklist Item No.**	**Checklist Criteria**
Aesthetics	3.1 a)	Have a substantial adverse effect on a scenic vista?
Aesthetics	3.1 c)	Substantially degrade the existing visual character or quality of the site and its surroundings

Table 5-3
Checklist Items with Less Than Significant Impacts

Impact Section	Checklist Item No.	Checklist Criteria
Aesthetics	3.1 d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?
Agricultural Lands & Forestry	3.2 a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural uses?
Air Quality	3.3 a)	Would the project conflict with or obstruct implementation of the applicable air quality plan?
Air Quality	3.3 b)	Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?
Air Quality	3.3 c)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?
Air Quality	3.3 d)	Expose sensitive receptors to substantial pollutant concentrations?
Air Quality	3.3 e)	Create objectionable odors affecting a substantial number of people?
Biological Resources	3.4 d)	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?
Geology & Soils	3.6 a)	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. ii) Strong seismic ground shaking? iii) Seismic-related ground failure, including liquefaction? iv) Landslides?
Geology & Soils	3.6 b)	Result in substantial soil erosion or the loss of topsoil?
Geology & Soils	3.6 c)	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Table 5-3
Checklist Items with Less Than Significant Impacts

Impact Section	Checklist Item No.	Checklist Criteria
Greenhouse Gas Emissions	3.7 a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
Greenhouse Gases	3.7 b)	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?
Hazards & Hazardous Materials	3.8 a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?
Hazards & Hazardous Materials	3.8 b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?
Hazards & Hazardous Materials	3.8 c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?
Hydrology & Water Quality	3.9 c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?
Hydrology & Water Quality	3.9 d)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?
Hydrology & Water Quality	3.9 e)	Create or contribute runoff water which will exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?
Hydrology & Water Quality	3.9 f)	Otherwise substantially degrade water quality?
Hydrology & Water Quality	3.9 i)	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?
Land Use & Planning	3.10 b)	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?
Noise	3.12 a)	Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
Noise	3.12 b)	Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Table 5-3
Checklist Items with Less Than Significant Impacts

Impact Section	Checklist Item No.	Checklist Criteria
Noise	3.12 c)	A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?
Noise	3.12 d)	A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?
Population & Housing	3.13 a)	Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?
Public Services	3.14 a)	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: **Fire protection?**
Public Services	3.14 a)	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: **Police protection?**
Public Services	3.14 a)	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: **Schools?**
Public Services	3.14 a)	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: **Parks?**

Table 5-3
Checklist Items with Less Than Significant Impacts

Impact Section	Checklist Item No.	Checklist Criteria
Public Services	3.14 a)	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: **Other Public Facilities?**
Recreation	3.15 a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?
Recreation	3.15 b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?
Transportation & Traffic	3.16 b)	Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?
Transportation	3.16 d)	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?
Transportation	3.16 e)	Result in inadequate emergency access?
Transportation	3.16 f)	Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?
Utilities	3.18 a)	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?
Utilities	3.18 b)	Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?
Utilities	3.18 c)	Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?
Utilities	3.18 d)	Have sufficient water supplies available to serve the project been identified from existing entitlements and resources, or are new or expanded entitlements needed?
Utilities	3.18 f)	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

No Impact

Checklist Items with No Impacts are listed in **Table 5-4**.

Table 5-4
Checklist Items with No Impacts

Impact Section	Checklist Item No.	Checklist Criteria
Aesthetics	3.1 b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
Agricultural Lands & Forestry	3.2 b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?
Agricultural Lands & Forestry	3.2 c)	Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code § 12220(q), timberland (as defined by Public Resources Code § 4526), or timberland zoned Timberland Production (as defined by Government Code § 51104(g))?
Agricultural Lands & Forestry	3.2 d)	Result in the loss of forest land or conversion of forest land to non-forest use?
Agricultural Lands & Forestry	3.2 e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of agricultural use or conversion of forest land to non-forest use?
Biological Resources	3.4 b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?
Biological Resources	3.4 c)	Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?
Biological Resources	3.4 e)	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?
Biological Resources	3.4 f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?
Geology & Soils	3.6 e)	Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Table 5-4
Checklist Items with No Impacts

Impact Section	Checklist Item No.	Checklist Criteria
Geology & Soils	3.6 d)	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?
Hazards & Hazardous Materials	3.8 d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?
Hazards & Hazardous Materials	3.8 e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?
Hazards & Hazardous Materials	3.8 f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?
Hazards & Hazardous Materials	3.8 g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?
Hazards & Hazardous Materials	3.8 i)	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?
Hydrology & Water Quality	3.9 g)	Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?
Hydrology & Water Quality	3.9 h)	Place within a 100-year flood hazard structures which will impede or redirect flood flows.
Hydrology & Water Quality	3.9 j)	Inundation by seiche, tsunami, or mudflow?
Land Use & Planning	3.10 a)	Physically divide an established community?
Land Use & Planning	3.10 c)	Conflict with any applicable habitat conservation plan or natural community conservation plan?
Mineral Resources	3.11 a)	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?
Mineral Resources	3.11 b)	Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?
Noise	3.12 e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Table 5-4 Checklist Items with No Impacts		
Impact Section	**Checklist Item No.**	**Checklist Criteria**
Noise	3.12 f)	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?
Population & Housing	3.13 b)	Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?
Population & Housing	3.13 c)	Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?
Transportation	3.16 c)	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?
Utilities	3.18 e)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?
Utilities	3.18 g)	Comply with federal, state, and local statutes and regulations related to solid waste?

REFERENCES

CEQA Guidelines, Sections 15130 (e) and 15355

Tulare County General Plan 2030 Update Recirculated Draft Environmental Impact Report (RDEIR)

Tulare County Associated of Governments Blueprint 2050, Preferred Scenario (2009)

Chapter 6

Alternatives

INTRODUCTION

CEQA Guidelines Section 15126.6 requires that a reasonable range of alternatives to the Preferred/Proposed Project be discussed in the EIR. Specific requirements include the following:

CEQA Guidelines §15126.6(a): Alternatives to the Proposed Project. An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. The Lead Agency is responsible for selecting a range of alternatives for examination and must publicly disclose its reasoning for selecting those alternatives.

CEQA Guidelines §15126.6 (b) Purpose. Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1), the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

CEQA Guidelines §15126.6 (c) Selection of a range of reasonable alternatives. The range of potential alternatives to the proposed project shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects. The EIR should briefly describe the rationale for selecting the alternatives to be discussed. The EIR should also identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination. Additional information explaining the choice of alternatives may be included in the administrative record. Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts.

CEQA Guidelines §15126.6(d) Evaluation of alternatives. The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed.

CEQA Guidelines §15126.6 (e) "No project" alternative.

(1) The specific alternative of "no project" shall also be evaluated along with its impact. The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The no project alternative analysis is not the baseline for determining whether the proposed project's environmental impacts may be significant, unless it is identical to the existing environmental setting analysis which does establish that baseline (see Section 15125).

(2) The "no project" analysis shall discuss the existing conditions at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services. If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

(3) A discussion of the "no project" alternative will usually proceed along one of two lines:

(A) When the project is the revision of an existing land use or regulatory plan, policy or ongoing operation, the "no project" alternative will be the continuation of the existing plan, policy or operation into the future. Typically this is a situation where other projects initiated under the existing plan will continue while the new plan is developed. Thus, the projected impacts of the proposed plan or alternative plans would be compared to the impacts that would occur under the existing plan.

(B) If the project is other than a land use or regulatory plan, for example a development project on identifiable property, the "no project" alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in its existing state against environmental effects which would occur if the project is approved. If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this "no project" consequence should be discussed. In certain instances, the no project alternative means "no build" wherein the existing environmental setting is maintained. However, where failure to proceed with the project will not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment.

(C) After defining the no project alternative using one of these approaches, the lead agency should proceed to analyze the impacts of the no project alternative by projecting what would reasonably be expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

CEQA Guidelines §15126.6(f): Rule of reason. The range of alternatives required in an EIR is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making.

(1) Feasibility. Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control or otherwise have access to the alternative site (or the site is already owned by the proponent). No one of these factors establishes a fixed limit on the scope of reasonable alternatives.

(2) Alternative locations.

(A) Key question. The key question and first step in analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR.

(B) None feasible. If the lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR. For example, in some cases there may be no feasible alternative locations for a geothermal plant or mining project which must be in close proximity to natural resources at a given location.

(C) Limited new analysis required. Where a previous document has sufficiently analyzed a range of reasonable alternative locations and environmental impacts for projects with the same basic purpose, the lead agency should review the previous document. The EIR may rely on the previous document to help it assess the feasibility of potential project alternatives to the extent the circumstances remain substantially the same as they relate to the alternative.

(3) An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative.

"CEQA Guidelines Section 15021. Duty to minimize environmental damage and balance competing public objectives

(a) CEQA establishes a duty for public agencies to avoid or minimize environmental damage where feasible.

(1) In regulating public or private activities, agencies are required to give major consideration to preventing environmental damage.
(2) A public agency should not approve a project as proposed if there are feasible alternatives or mitigation measures available that would substantially lessen any significant effects that the project would have on the environment.

(b) In deciding whether changes in a project are feasible, an agency may consider specific economic, environmental, legal, social, and technological factors.
(c) The duty to prevent or minimize environmental damage is implemented through the findings required by CEQA Guidelines Section 15091.
(d) CEQA recognizes that in determining whether and how a project should be approved, a public agency has an obligation to balance a variety of public objectives, including economic, environmental, and social factors and in particular the goal of providing a decent home and satisfying living environment for every Californian. An agency shall prepare a statement of overriding considerations as described in Section 15093 to reflect the ultimate balancing of competing public objectives when the agency decides to approve a project that will cause one or more significant effects on the environment."[1]

FACTORS CONSIDERED IN ANALYSIS OF ALTERNATIVES

In this Alternatives analysis the following evaluation criteria will be used:

Evaluation Criteria 1: Project Specific Elements

The purpose of the proposed Project is to implement a mixed-density master planned community in Tulare County (County) and the City of Kingsburg (City), consistent with the City's and County's Guiding Principles related to new development. The proposed Project is intended to provide for the orderly and systematic development of a residential community with the ultimate development pattern.

Evaluation Criteria 2: Project Objectives

The Project Specific Elements are guided by the following project objectives:

- **Complete Comprehensive Planning for the Hash Farm Specific Plan Area:** Formulate a specific plan, related land use planning documents, and regulatory approvals for the Hash Farm Specific Plan Area as a means of developing the City of Kingsburg and County of Tulare in an orderly manner, accommodating the areas share of future regional population growth, being compatible with surrounding land uses, complementing the pattern and intensity of existing development in the City, and providing new opportunities (i.e., shopping, housing, recreational, etc.) to the City and County.

[1] CEQA Guidelines, Section 15021

- **Existing Policies:** Satisfy the City of Kingsburg and Tulare County policies, regulations and expectations as defined in the Tulare County General Plan 2030 Update, City of Kingsburg General Plan, the City and Tulare County Zoning Ordinances, City and County Improvement Standards, and all other applicable plans, documents, and programs adopted by the City and County. As the project will ultimately need wastewater collection and treatment services, the project will also comply with Selma-Kingsburg-Fowler (SKF) Sanitation District policies, standards, etc.

- **Common Development Standards.** Since the project is located adjacent to the City of Kingsburg and will share the same water and sewer systems, a project objective is to adopt a specific plan that will establish development standards and urban improvement standards that are similar to those the City of Kingsburg. To this end, the Hash Farms Specific Plan will establish the City of Kingsburg's improvement standards as the appropriate standards for the project, and contain residential neighborhood standards that are similar to those established contained in the North Kingsburg Specific Plan.

- **Housing Opportunities:** Plan for an economically feasible residential project consisting of up to 200 residential units to provide housing choices in varying densities to respond to a range of market segments.

- **Regional Housing Needs Allocation:** Aid the County of Tulare and City of Kingsburg in meeting its obligation to accommodate a percentage of future population growth in the region (as embodied in the respective Regional Housing Needs Allocation) identified by the Tulare County Association of Governments, Council of Fresno County Governments, and the California Department of Housing and Community Development by increasing the residential holding capacity in an area identified as appropriate for such development.

- **Community Form:** Shape the physical form and character of development that is functional and creates a sense of place in order to:
    - Create a land use transition and connection between the City of Kingsburg and Tulare County.
    - Organize neighborhoods to be identifiable and walkable, and to incorporate gathering places such as parks and walking pathways.
    - Provide housing that is close to Downtown Kingsburg to support the economic viability of the downtown businesses.

- **Contribute to Regional Preserve Planning:** Create open space preserves which provide regional benefit for habitat, resources, and open space amenities.

Evaluation Criteria 3: Lessen (Reduce) Significant Impacts

According to CEQA, a valid Project alternative should be capable of meeting most of the Project objectives *and* reducing potential significant impacts associated with the Project. Reasonable alternatives are those that may reduce the extent and magnitude of Project, site, and cumulative significant impacts.

Each alternative should be analyzed to assess the potential to reduce significant impacts. (On a cumulative basis, alternative sites generally require the construction of duplicate buildings. The creation of additional buildings requires the use of additional resources, which on a cumulative basis would increase impacts to the environment in general.)

Evaluation Criteria 4: Physical Feasibility (Land Size and Configuration Constraints)

Physical feasibility is required because if a site for a particular alternative is too small or if the components of the proposed Project cannot be configured on the site, then the alternative would not be feasible and should be eliminated from review.

ALTERNATIVES ANALYSIS

In accordance with CEQA Guidelines Section 15126.6, the following alternatives were selected to be evaluated against the proposed Project:

Alternative 1 – Reduced Density (Same Footprint)
Alternative 2 – Increased Density (Smaller Footprint)
Alternative 3 – No Build / No Project

An alternative site was not chosen for evaluation for reasons identified in CEQA Guidelines §15126.6(f): Rule of reason. A review of available sites within the City of Kingsburg or its sphere of influence which conceivably possess all these attributes and none of the critical listed constraints, and can otherwise achieve or partially achieve the project objectives, disclosed no feasible alternative locations. The essential site attributes considered in this determination included site size and shape to accommodate the project, availability of infrastructure, and location within the City's Sphere of Influence. The project proponent has no ownership of or access to any alternative site. In addition, an alternative site would likely result in similar or greater environmental impacts in every environmental impact criteria listed in the CEQA Guidelines Appendix G checklist. Therefore, an alternative site was not evaluated.

Alternative 1: Reduced Density (Same Footprint)

Description of the Reduced Density Alternative: This alternative involves development of the site with reduced residential densities. It is assumed for purposes of analysis that the project would not include the multi-family developments (-40 individual multi-family units) and an approximate 25% reduction in density of single family units (-40 single-family units). The development footprint would remain the same, but the lot sizes would increase. The proposed project includes an average lot size of approximately 8,960 sq. ft. for single-family housing. Under the reduced density alternative, lot sizes would average approximately 13,000 sq. ft. and the proposed park would be increased from 2.54 acres to 5 acres. The resulting project would include 120 larger estate-type lots and a larger neighborhood park. Potential population of the project would be reduced from 564 (based on 2.82 persons per unit as described in Section 3.13 Population and Housing) to 339 people.

Alternative No. 1 Advantages and Disadvantages	
Advantages	**Disadvantages**
Slightly less impacts to air quality/GHG, noise, traffic, water use, utilities, and population/housing.	Lack of diversity of housing products.
More attractive product to higher-end estate type housing buyers.	Economic feasibility (e.g., housing affordability) in question due to potential lack of higher-end buyers.

Alternative 2: Increased Density (Smaller Footprint)

Description of Increased Density Alternative: This alternative consists of development of only part of the site with increased residential densities. It is assumed for purposes of this analysis that the project would triple the amount of multi-family developments (+80 individual multi-family units) and decrease the single-family units by 75% (-120 single-family units). Under the increased density alternative, the project's footprint would be reduced and would be located in the areas closest to the City limits. Lot sizes for the single-family units would be reduced to approximately 6,500 sq. ft. and the project would designate 16 more 20,000 sq. ft. lots for multi-family (5 multi-family units per lot). The park would remain at 2.54 acres. The resulting project would include 120 individual multi-family units on 24 lots and 40 single family lots. Project acreage would be reduced from 54 acres to approximately 22 acres. The remaining 32 acres would remain in agricultural production. Potential population of the project would be reduced from 564 (based on 2.82 persons per unit as described in Section 3.13 Population and Housing) to 452 people.

Alternative No. 2 Advantages and Disadvantages	
Advantages	**Disadvantages**
Slightly less impacts to air quality/GHG, noise, traffic, water use, utilities, and population/housing.	Does not provide for comprehensive planning of the specific plan area.
More lower/moderate income housing.	Lack of diversity of housing products.
Less impacts to agriculture, biological and cultural resources.	Lack of continuity with existing neighborhoods.
	Difficulty in farming a small remaining section of the land.

Alternative 3: No Build / No Project

Description of the No Build / No Project Alternative: Under this alternative, no housing or infrastructure would be built, and the project site would remain in its present condition (agriculture).

Alternative No. 3 Advantages and Disadvantages	
Advantages	**Disadvantages**
No environmental impacts beyond baseline conditions.	Does not meet any project objectives or project-specific elements.

Evaluation of Alternatives: Alternative 3 (No Project) is not considered a viable Alternative as it does not accomplish the main element of the Project, which is to implement a mixed-density master planned community. Factors considered in the comparisons of Alternatives 1 and 2 are limited to economic considerations and critical concerns such as an affordable mix of housing. Environmental considerations for CEQA purposes are discussed in the next section of this chapter.

In summary, the proposed Project is preferred over all other Alternatives for the following reasons:

- The proposed Project provides the most diverse mix of housing, including multi-family and single-family residences (with a variation of lot sizes).
- The proposed Project assists the City of Kingsburg and County of Tulare meet its regional housing needs allocation goals.
- Continued farming on only a portion of the site would be physically and economically infeasible due to economies of scale and reduced economic viability.
- The proposed Project is most consistent with the size and type of adjacent single-family neighborhoods.

ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA Guidelines Section 15126.6 (e)(2) requires that the environmentally superior alternative be identified. If the environmentally superior alternative is the No Project Alternative, the EIR shall identify an environmentally superior alternative among the other alternatives.

The following analyses evaluates Alternatives 1, 2, and 3 against the proposed Project in order to identify the environmentally superior alternative. The relative environmental impacts associated with each of the Alternatives, as compared to the proposed Project, are summarized in **Table 6-1**. A matrix comparing the Evaluation Criteria and Project objectives as they pertain to each Alternative is provided in **Table 6-2**.

Alternative 1 – Reduced Density (Same Footprint) The environmental impacts associated with this alternative would be less than the proposed Project because it would result in fewer overall housing units and a smaller population. Therefore, impacts associated with air quality, greenhouse gas emissions, water use, traffic, noise, and infrastructure would be slightly reduced. More open space would occur with this Alternative. However, this Alternative would not meet all of the project objectives as it would reduce the mix of housing choices, eliminate some of the lower cost housing associated with multi-family units and smaller single-family lots, and would

reduce the ability of the City and County to meet their respective regional housing needs allocations. As such, Alternative 1 is not superior to the proposed Project and is not considered a viable alternative.

Alternative 2: – Increased Density (Smaller Footprint). The environmental impacts associated with this Alternative would be less than the proposed Project because it would result in fewer overall housing units and a smaller population. Therefore, impacts associated with air quality, greenhouse gas emissions, water use, traffic, noise, and infrastructure would be slightly reduced than the proposed Project. It would also reduce the project footprint, thereby reducing impacts associated with agriculture, biological resources, cultural resources, and aesthetics (potentially). This Alternative could potentially meet most of the Project objectives, except for providing a comprehensive plan for the Hash Farms Specific Plan area, and continuity of community form (as it would introduce more multi-family housing adjacent to existing residential neighborhoods). As such, Alternative 2 is not superior to the proposed Project and is not considered a viable alternative.

Alternative 3 – No Build / No Project Alternative. The No Project Alternative would avoid all potential construction- and operations-related impacts related to air quality, biological resources, cultural resources, greenhouse gas emissions, noise, traffic, water use and infrastructure resulting from the proposed Project and each of the other Alternatives identified earlier. However, the No Project Alternative would not meet any of the Project objectives or project-specific elements. Therefore, the consideration of the No Project alternative being the environmentally superior alternative would require the judgment of whether in balance, eliminating or avoiding certain impacts is of greater benefit environmentally than avoiding certain other impacts. Therefore, this Alternative would not meet the criteria as the Environmentally Superior Alternative.

Environmental impacts associated with each of the alternatives presented compared to the proposed Project are shown in **Table 6-1**.

Table 6-1: Impacts of Alternatives Compared to the Proposed Project

Impact Topic	Alternative 1 Reduced Density	Alternative 2 Increased Density	Alternative 3 No Project
Aesthetics	similar	less	less
Agriculture	similar	less	less
Air Quality	less	less	less
Biology	similar	less	less
Cultural	similar	less	less
Geology/Soils	similar	less	less
Greenhouse Gases	less	less	less
Hazards & Hazardous Materials	similar	less	less
Hydrology/Water Quality	less	less	similar
Land Use	similar	less	less
Mineral Resources	similar	less	less
Noise	less	less	less

Table 6-1: Impacts of Alternatives Compared to the Proposed Project			
Population/Housing	less	less	less
Public Services	similar	less	less
Recreation	similar	similar	greater
Transportation and Traffic	less	less	less
Utilities	similar	less	less
Mandatory Findings	less	less	less

Table 6-2 is a matrix comparing each Alternative's and the proposed Project's abilities to achieve the Project objectives and reduce environmental impacts.

Table 6-2: Comparison of Alternatives Attaining Project Objectives and Reducing Environmental Impacts				
Evaluation Criteria	Proposed Project	Alternative 1 Reduced Density	Alternative 2 Increased Density	Alternative 3 No Project
Project-Specific Element	Yes	Yes & No	Yes & No	No
Comprehensive Planning	Yes	Yes	No	No
Existing Policies	Yes	Yes	Yes & No	No
Common Development Standards	Yes	Yes & No	Yes & No	No
Housing Opportunities	Yes	No	No	No
Regional Housing Needs Allocation	Yes	Yes & No	Yes & No	No
Community Form	Yes	No	No	No
Regional Preserve Planning	Yes	Yes	Yes & No	No
Reduce Significant Impacts	Yes	Yes	Yes	Yes
Physical Feasibility	Yes	Yes	Yes & No	Yes

In summary, based upon the above analyses, the proposed Project is the Environmentally Superior Alternative as it would not result in any significant impacts and it meets all of the evaluation criteria.

REFERENCES

See References cited in Chapter 3-2 Air Quality

See References cited in Chapter 3-4 Biology

See References cited in Chapter 3-5 Cultural

See References cited in Chapter 3-7 Greenhouse Gases

See References cited in Chapter 3-12 Noise

See References cited in Chapter 3-13 Population & Housing

See Reference cited in Chapter 3-16 Transportation

Chapter 7
Economic, Social, and Growth-Inducing Effects

INTRODUCTION

This chapter discusses economic, social, and growth-inducing effects of the Project. **Table 7-1** provides the CEQA requirements and a summary of the impact analysis.

Table 7-1
Summary of Economic, Social and Growth Inducing Impacts

Topic	Summary of Impact	CEQA Requirement
Economic Impact	The proposed Project will not result in negative impacts to the region. It will result in increases in economic benefits to the region in the short term and long term. The Project will result in temporary construction-related jobs. Long term economic benefits include payment of property taxes as well as on-going income expenditures of the residents of the new housing in and around Kingsburg (such as groceries, gasoline, household items, etc.).	CEQA does not have specific requirements for evaluating the economic impacts of a Project. Section 15131 of CEQA Guidelines states that "Economic or social information may be included in an EIR or may be presented in whatever form the agency desires."
Social Impact	The proposed Project would not result in disproportionate environmental effects on minority populations, low income populations, or Native Americans. The proposed Project does not pose any adverse environmental justice issues that would require mitigation. The project would improve the availability of quality residential housing in the area.	The social impacts of a project include environmental justice considerations. California Government Code Section 65040.12 defines Environmental Justice as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations and policies."
Growth Inducing Effect	The proposed Project would not result in significant growth inducing impacts. The Project site is already in the Kingsburg Sphere of Influence and is planned for residential development. The growth and associated population increase is in accordance with the housing parameters set forth in the City of Kingsburg General Plan and the Tulare County General Plan in reaching their RHNA goals.	CEQA Guidelines Section 15126 (d) makes recommendations for analyzing impacts due to growth inducement, including discussing ways in which the project could foster economic or population growth, the construction of additional housing, or other factors which could remove obstacles to population growth or encourage and facilitate other activities which could impact the environment individually or cumulatively.

Based on the information provided in **Table 7-1**, implementation of the proposed Project would result in ***Less Than Significant*** environmental impacts, either individually or cumulatively, caused by either economic, social, or growth-inducing effects. No mitigation measures are required.

DEMOGRAPHICS

"Tulare County has one of the highest rates of unemployment in California and the nation, due in large part to the seasonal nature of agricultural employment. "The unemployment rate in the Tulare County was 13.4 percent in February 2015, down from a revised 13.8 percent in January 2015, and below the year-ago estimate of 15.5 percent. This compares with an unadjusted unemployment rate of 6.8 percent for California and 5.8 percent for the nation during the same period."[1] The general demographic information can be found in **Table 7-2**.

Table 7-2
Profile of General Population and Housing Characteristics - 2010[2]

Demographic Profile Data	Tulare County
Population	
Total	442,179
% Hispanic or Latino	60.6%
% not Hispanic or Latino	39.4%
White alone	27.5%
Black or African American alone	0.4%
Asian alone	0.2%
Some other race alone	0.1%
Two or more races	1.4%
Housing	
Total housing units	141,696
Occupied Housing Units	130,352
Vacant housing units	11,344
Owner-occupied housing units	76,586 (58.8%)
Renter-occupied housing units	53,766 (41.2%)
Homeowner vacancy rate (%)	2.4%
Renter vacancy rate (%)	5.8%

[1] State of California Employment Development Department, Labor Market Information. http://www.labormarketinfo.edd.ca.gov/. Accessed September 2017.
[2] U.S. Census Bureau, 2010 Demographic Profile Data http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed September 2017.

ECONOMIC EFFECTS

Section 15131 of the CEQA Guidelines states:

"Economic or social information may be included in an EIR or may be presented in whatever form the agency desires.

(a) Economic or social effects of a project shall not be treated as significant effects on the environment. But rather, an EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

(b) Economic or social effects of a project may be used to determine the significance of physical changes caused by the project. For example, if the construction of a new freeway or rail line divides an existing community, the construction would be the physical change, but the social effect on the community would be the basis for determining that the effect would be significant. As an additional example, if the construction of a road and the resulting increase in noise in an area disturbed existing religious practices in the area, the disturbance of the religious practices could be used to determine that the construction and use of the road and the resulting noise would be significant effects on the environment. The religious practices would need to be analyzed only to the extent to show that the increase in traffic and noise would conflict with the religious practices. Where an EIR uses economic or social effects to determine that a physical change is significant, the EIR shall explain the reason for determining that the effect is significant.

(c) Economic, social, and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce or avoid the significant effects on the environment identified in the EIR. If information on these factors is not contained in the EIR, the information must be added to the record in some other manner to allow the agency to consider the factors in reaching a decision on the project."[3]

Some benefits would accrue directly to the general Tulare County economy from this Project related to initial expenditures for local labor force, potential purchase of construction and infrastructure materials from local vendors, and other construction-related expenditures. Also, these economic benefits can have beneficial secondary or "multiplier effects" which refers to the extent to which a Project could indirectly cause increased activity elsewhere in the local or regional economy from the initial local expenditures. Long term economic benefits include payment of

[3] CEQA Guidelines Section 15131.

property taxes as well as on-going income expenditures of the residents of the new housing in and around Kingsburg (such as groceries, gasoline, household items, etc.).

SOCIAL EFFECTS

Environmental Justice

"The basis for environmental justice lies in the Equal Protection Clause of the U.S. Constitution. The Fourteenth Amendment expressly provides that the states may not "deny to any person within [their] jurisdiction the equal protection of the laws" (U.S. Constitution, amend. XIV, Section1).

On February 11, 1994, President Clinton signed Executive Order (E.O.) 12898, titled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." The executive order followed a 1992 report by the U.S. Environmental Protection Agency (U.S. EPA) indicating that "[r]acial minority and low-income populations experience higher than average exposures to selected air pollutants, hazardous waste facilities, and other forms of environmental pollution." Among other things, E.O. 12898 directed federal agencies to incorporate environmental justice into their missions."[4]

Although the EIR identifies some potentially significant impacts that could result from the proposed Project, the EIR also indicates they can all be reduced or avoided through the adoption and implementation of project design features and feasible and reasonable Mitigation Measures. The Project is intended to provide single-family and multi-family housing that will be available for purchase and/or rent. Therefore, the residential development will not adversely impact low-income and/or minority populations.

GROWTH-INDUCING EFFECTS

As outlined in the CEQA Guidelines Section 15126 (d), growth-inducing impact of the proposed Project should be addressed.

The Project is growth inducing, as it provides additional housing opportunities in the area. However, the Project is being developed on land that is adjacent to existing housing, is within the City of Kingsburg's Sphere of Influence, and has been planned for urban development. The Project is being developed in a manner compatible with existing uses and is consistent with growth projections and guidelines contained in the City of Kingsburg General Plan and the Tulare County General Plan (See Table 3.10-1: General Plan Consistency Analysis). The Project will not cause an increase in population that is more than what is already planned for in the aforementioned general plans. The infrastructure being brought to the development (water, sewer, storm drain) will be appropriately sized for the development and will not be "over-sized" so as to potentially accommodate future growth in the area. As identified in Chapter Three, the Project will not result in significant impacts (including impacts to police/fire, utilities, transportation, air quality, etc.).

[4] State of California, General Plan Guidelines 2003. Page 22, http://opr.ca.gov/docs/General_Plan_Guidelines_2003.pdf. Accessed September 2017.

Therefore, based on the analysis in the EIR and the information provided in this Chapter, the proposed Project is not considered to have significant growth-inducing impacts. Consequently, there would be ***Less Than Significant Growth-Inducing Impacts*** as a result of the Project.

REFERENCES

2015 Tulare County Housing Element Update, Adopted November 17, 2015; Certified by State of California Department of Housing and Community Development on December 9, 2015.

CEQA Guidelines

State of California, General Plan Guidelines 2003, which can be accessed at http://opr.ca.gov/docs/General_Plan_Guidelines_2003.pdf

Tulare County General Plan 2030 Update and Final EIR adopted by the Board of Supervisors, August 28, 2012, Resolution No. 2012-0699.

2010 United States Census.

Chapter 8

Immitigable Impacts

NO ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Under CEQA Guidelines §15126.2 (b), "[w]here there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, should be described."[1] This analysis should include a description of any significant impacts, including those which can be mitigated but not reduced to a level of insignificance.

The proposed Project will not result in any significant and unavoidable impacts. All impacts have been found to be Less Than Significant, or have been mitigated to a level considered Less Than Significant.

NO IRREVERSIBLE IMPACTS

Under CEQA Guidelines §15126.2 (c), "[u]ses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified. (See Public Resources Code section 21100.1 and Title 14, California Code of Regulations, section 15127 for limitations to applicability of this requirement.)"[2]

The resources committed to the proposed Project are standard resources necessary for the construction and operation of a residential development. Potential minimal impacts would occur during the construction-related phase and once the site is developed. As noted in applicable resource sections, the proposed Project would be required to comply with local, state, and federal permitting requirements and operational practices, including air quality and greenhouse gas emission reductions (for example, through conservation of electricity and water), the proposed Project would not result in any irreversible life-cycle costs. The proposed Project will be in compliance with the goals of AB32 and the Climate Change Scoping Plan that outlines GHG reductions to 1990 levels.

[1] CEQA Guidelines, Section 15126.2 (b)
[2] Ibid. 15126.2 (c)

As contained in CEQA Guidelines §15043, "[a] public agency may approve a project even though the project would cause a significant effect on the environment, if the agency makes a fully informed and publicly disclosed decision that:

(a) There is no feasible way to lessen or avoid the significant effect (see Section 15091); and

(b) Specifically identified expected benefits from the project outweigh the policy of reducing or avoiding significant environmental impacts of the project. (see Section 15093)"[3]

When approving a project pursuant to § 15043, an agency must prepare a statement of overriding considerations. As noted in CEQA Guidelines § 15093, "CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits, including region-wide or statewide environmental benefits, of a proposed project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered acceptable."[4]

"When the lead agency approves a project which will result in the occurrence of significant effects which are identified in the final EIR but are not avoided or substantially lessened, the agency shall state in writing the specific reasons to support its action based on the final EIR and/or other information in the record. The statement of overriding considerations shall be supported by substantial evidence in the record."[5]

"If an agency makes a statement of overriding considerations, the statement should be included in the record of the project approval and should be mentioned in the notice of determination. This statement does not substitute for, and shall be in addition to, findings required pursuant to Section 15091."[6]

NO STATEMENT OF OVERRIDING CONSIDERATIONS

Based on the analysis contained in this Draft EIR, there are no environmental impacts that cannot be avoided and there are no irreversible impacts; therefore, a Statement of Overriding Considerations is not necessary. Furthermore, the Project's merits and objectives are discussed in the Project Description (Chapter 2) and are found to be consistent with the intent of Tulare County General Plan 2030 Update.

PROJECT OBJECTIVES AND BENEFIT STATEMENTS

The Project Objectives are presented in full in Chapter Two of this EIR. The purpose of the proposed Project is to implement a mixed-density master planned community in Tulare County (County) and the City of Kingsburg (City), consistent with the City's and County's Guiding

[3] CEQA Guidelines, Section 15043
[4] Ibid. 15093 (a)
[5] Ibid. 15093 (b)
[6] Ibid. 15093 (c)

Principles related to new development. The proposed Project is intended to provide for the orderly and systematic development of a residential community with the ultimate development pattern guided by the project objectives. The project benefits are described below:

Project Benefit #1 Complete Comprehensive Planning for the Hash Farm Specific Plan Area: The Comprehensive Specific Plan is a means of developing the Project area in an orderly manner, accommodating the areas share of future regional population growth, being compatible with surrounding land uses, complementing the pattern and intensity of existing development in the City, and providing new benefits to the City and County. The Project Specific Plan includes a mix of single-family and multi-family housing, a park, and related site improvements. The Project provides well-planned new growth in the area and is intended to be a desirable residential neighborhood. The Project will support existing residents and potential future residents.

Project Benefit #2 Existing Policies: The Project is being developed in a manner compatible with existing policies and is consistent with growth projections and guidelines contained in the City of Kingsburg General Plan and the Tulare County General Plan (See Table 3.10-1: General Plan Consistency Analysis).

Project Benefit #3 Common Development Standards: The Project has established development standards and urban improvement standards that are similar to those the City of Kingsburg. To this end, the Specific Plan will establish the City of Kingsburg's improvement standards as the appropriate standards for the project, and contain residential neighborhood standards that are similar to those established contained in the North Kingsburg Specific Plan. is being developed in a manner compatible with existing policies and is consistent with growth projections and guidelines contained in the City of Kingsburg General Plan and the Tulare County General Plan (See Table 3.10-1: General Plan Consistency Analysis).

Project Benefit #4 Housing Opportunities: The Project is providing a variety of housing choices in varying densities to respond to a range of market segments.

Project Benefit #5 Regional Housing Needs Allocation: The Project will assist the County of Tulare and City of Kingsburg in meeting its obligation to accommodate a percentage of future population growth in the region (as embodied in the respective Regional Housing Needs Allocation) identified by the Tulare County Association of Governments, Council of Fresno County Governments, and the California Department of Housing and Community Development by increasing the residential holding capacity in an area identified as appropriate for such development.

Project Benefit #6 Community Form: The Project provides the physical form and character of development that is functional and creates a sense of place in order to:

- Create a land use transition and connection between the City of Kingsburg and Tulare County.
- Organize neighborhoods to be identifiable and walkable, and to incorporate gathering places such as parks and walking pathways.
- Provide housing that is close to Downtown Kingsburg to support the economic viability of the downtown businesses.

Project Benefit #7 Contribute to Regional Preserve Planning: The Project creates open space preserves which provide regional benefit for habitat, resources, and open space amenities.

Following are the two hundred and sixty-nine (269) General Plan Policies as they apply to each specific resource contained in the CEQA Checklist and discussed in Chapter 3 of this document.

I. AESTHETICS – 13 Policies

LU-5.3	Storage Screening
LU-7.6	Screening
LU-7.14	Contextual and Compatible Design
LU-7.19	Minimize Lighting Impacts
SL-1.1	Natural Landscapes
SL-1.2	Working Landscapes
SL-2.1	Designated Scenic Routes and Highways
ERM-1.4	Protect Riparian Areas
ERM-1.5	Riparian Management Plans and Mining Reclamation Plans
ERM-1.6	Management of Wetlands
ERM-1.8	Open Space Buffers
ERM-1.15	Minimize Lighting Impacts
ERM-5.19	Night Sky Protection

II. AGRICULTURAL LANDS & FORESTRY RESOURCES – 11 Policies

AG-1.1	Primary Land Use
AG-1.3	Williamson Act
AG-1.4	Williamson Act in UDBs and HDBs
AG-1.6	Conservation Easements
AG-1.7	Preservation of Agricultural Lands
AG-1.8	Agriculture within Urban Boundaries
AG-1.9	Agricultural Preserves Outside Urban Boundaries
AG-1.10	Extension of Infrastructure into Agricultural Areas
AG-1.11	Agricultural Buffers
AG-1.17	Agricultural Water Resources
LU-2.3	Open Space Character

III. AIR QUALITY – 29 Policies

AQ-1.1	Cooperation with Other Agencies
AQ-1.2	Cooperation with Local Jurisdictions
AQ-1.3	Cumulative Air Quality Impacts
AQ-1.4	Air Quality Land Use Compatibility
AQ-1.5	California Environmental Quality Act (CEQA) Compliance
AQ-2.1	Transportation Demand Management Programs
AQ-2.2	Indirect Source Review
AQ-2.3	Transportation and Air Quality
AQ-2.4	Transportation Management Associations
AQ-2.5	Ridesharing
AQ-3.1	Location of Support
AQ-3.2	Infill near Employment
AQ-3.3	Street Design
AQ-3.4	Landscape
AQ-3.5	Alternative Energy Design
AQ-3.6	Mixed Land Uses
AQ-4.1	Air Pollution Control Technology
AQ-4.2	Dust Suppression Measures
AQ-4.3	Paving or Treatment of Roadways for Reduced Air Emissions
AQ-4.4	Wood Burning Devices
AQ-4.5	Public Awareness
AQ-4.6	Asbestos Airborne Toxic Control and Dust Protection
LU-1.1	Smart Growth and Healthy Communities
LU-1.4	Compact Development
LU-1.8	Encourage Infill Development
LU-3.2	Cluster Development
LU-3.3	High-Density Residential Locations
TC-5.1	Bicycle/Pedestrian Trail System
TC-5.2	Consider Non-Motorized Modes in Planning and Development

IV. BIOLOGICAL RESOURCES – 14 Policies

ERM-1.1	Protection of Rare and Endangered Species
ERM-1.2	Development in Environmentally Sensitive Areas
ERM-1.4	Protect Riparian Areas
ERM-1.5	Riparian Management Plans and Mining Reclamation Plans
ERM-1.6	Management of Wetlands
ERM-1.7	Planting of Native Vegetation
ERM-1.8	Open Space Buffers
ERM-1.12	Management of Oak Woodland Communities
ERM-1.14	Mitigation and Conservation Banking Program
ERM-1.15	Minimize Lighting Impacts
ERM-1.16	Cooperate with Wildlife Agencies

ERM-1.17 Conservation Plan Coordination
ERM-2.7 Minimize Adverse Impacts
ERM-5.8 Watercourse Development

V. CULTURAL RESOURCES – 6 Policies

ERM-6.1 Evaluation of Cultural and Archaeological Resources
ERM-6.2 Protection of Resources with Potential State or Federal Designations
ERM-6.3 Alteration of Sites with Identified Cultural Resources
ERM-6.4 Mitigation
ERM-6.9 Confidentiality of Archaeological Sites
ERM-6.10 Grading Cultural Resources Sites

VI. GEOLOGY AND SOILS –5 Policies

ERM-7.2 Soil Productivity
ERM-7.3 Protection of Soils on Slopes
HS-2.4 Structure Siting
HS-2.7 Subsidence
HS-2.8 Alquist-Priolo Act Compliance

VII. GREENHOUSE GAS EMISSIONS – 15 Policies

AQ-1.7 Support Statewide Climate Change Solutions
AQ-1.8 Greenhouse Gas Emissions Reduction Plan/Climate Action Plan
AQ-1.10 Alternative Fuel Vehicle Infrastructure
AQ-3.2 Infill Near Employment
AQ-3.3 Street Design
AQ-3.5 Alternative Energy Design
AQ-3.4 Landscape
AQ-4.4 Wood Burning Devices
LU-1.1 Smart Growth and Healthy Communities
LU-1.4 Compact Development
LU-1.8 Encourage Infill Development
LU-3.2 Cluster Development
LU-3.3 High-Density Residential Locations
TC-5.2 Consider Non-Motorized Modes in Planning and Development

VIII. HAZARDS AND HAZARDOUS MATERIALS – 5 Policies

HS-4.1 Hazardous Materials
HS-4.3 Incompatible Land Uses
HS-4.4 Contamination Prevention
HS-4.6 Pesticide Control
ERM-3.1 Environmental Contamination

IX HYDROLOGY AND WATER QUALITY - 43 Policies

AG-1.17	Agricultural Water Resources
HS-4.4	Contamination Prevention
HS-5.1	Development Compliance with Federal, State, and Local Regulations
HS-5.2	Development in Floodplain Zones
HS-5.4	Multi-Purpose Flood Control Measures
HS-5.6	Impacts to Downstream Properties
HS-5.9	Floodplain Development Restrictions
HS-5.10	Flood Control Design
HS-5.11	Natural Design
LU-7.16	Water Conservation
PF-1.4	Available Infrastructure
PF-2.7	Improvement Standards in Communities
PF-4.14	Compatible Project Design
PFS-1.4	Standards of Approval
PFS-1.5	Funding for Public Facilities
PFS-2.1	Water Supply
PFS-2.2	Adequate Systems
PFS-2.2	Adequate Systems
PFS-2.4	Water Connections
PFS-2.5	New Systems or Individual Wells
PFS-3.1	Private Sewage Disposal Standards
PFS-3.2	Adequate Capacity
PFS-3.3	New Development Requirements
PFS-4.2	Site Improvements
PFS-4.3	Development Requirements
PFS-4.4	Stormwater Retention Facilities
PFS-4.5	Detention/Retention Basins Design
WR-1.1	Groundwater Withdrawal
WR-1.5	Expand Use of Reclaimed Wastewater
WR-1.6	Expand Use of Reclaimed Water
WR-2.1	Protect Water Quality
WR-2.2	National Pollutant Discharge Elimination System (NPDES) Enforcement
WR-2.3	Best Management Practices (BMPs)
WR-2.4	Construction Site Sediment Control
WR-2.5	Major Drainage Management
WR-2.6	Degraded Water Resources
WR-2.8	Point Source Control
WR-3.3	Adequate Water Availability
WR-3.5	Use of Native and Drought Tolerant Landscaping
WR-3.6	Water Use Efficiency
WR-3.9	Establish Critical Water Supply
WR-3.10	Diversion of Surface Water

X. LAND USE AND PLANNING - 23 Policies

ED-2.2	Land Requirements
ED-2.11	Industrial Parks
ED-3.1	Diverse Economic Base
ERM-2.9	Compatibility
PF-1.1	Maintain Urban Edges
PF-1.2	Location of Urban Development
PF-1.3	Land Uses in UDBs/HDBs
PF-1.4	Available Infrastructure
PF-2.1	Urban Development Boundaries – Communities
PF-2.4	Community Plans
PF-2.7	Improvement Standards in Communities
PF-2.8	Inappropriate Land Use
LU-1.2	Innovative Development
LU-2.3	Open Space Character
LU-3.1	Residential Developments
LU-3.2	Cluster Development
LU-3.3	High-Density Residential Locations
LU-5.1	Industrial Developments
LU-5.4	Compatibility with Surrounding Land Use
LU-5.7	Industrial Uses Allowed on Resource Land
LU-6.2	Buffers
LU-7.2	Integrate Natural Features
ED-2.3	New Industries

XI MINERAL RESOURCES – 12 Policies

ERM-2.1	Conserve Mineral Deposits
ERM-2.2	Recognize Mineral Deposits
ERM-2.3	Future Resource Development
ERM-2.5	Resources Development
ERM-2.7	Minimize Adverse Impacts
ERM-2.8	Minimize Hazards and Nuisances
ERM-2.9	Compatibility
ERM-2.10	Incompatible Development
ERM-2.11	Conditions of Approval
ERM-2.12	Approved Limits
ERM-2.13	SMARA Requirements
ERM-3.1	Environmental Contamination

XII NOISE – 13 Policies

HS-8.1 Economic Base Protection
HS-8.2 Noise Impacted Areas
HS-8.3 Noise Sensitive Land Uses
HS-8.6 Noise Level Criteria
HS-8.8 Adjacent Uses
HS-8.10 Automobile Noise Enforcement
HS-8.11 Peak Noise Generators
HS-8.13 Noise Analysis
HS-8.14 Sound Attenuation Features
HS-8.15 Noise Buffering
HS-8.16 State Noise Insulation
HS-8.18 Construction Noise
HS-8.19 Construction Noise Control

XIII. POPULATION AND HOUSING – 32 Policies

Housing Guiding Principle 4.1
Housing Policy 1.11
Housing Policy 1.13
Housing Policy 1.14
Housing Policy 1.15
Housing Policy 1.16
Housing Policy 1.2
Housing Policy 1.3
Housing Policy 1.31
Housing Policy 1.33
Housing Policy 1.51
Housing Policy 1.52
Housing Policy 1.53
Housing Policy 1.6
Housing Policy 2.14
Housing Policy 2.2
Housing Policy 2.21
Housing Policy 3.1
Housing Policy 3.11
Housing Policy 3.12
Housing Policy 3.16
Housing Policy 3.23
Housing Policy 4.1
Housing Policy 4.11
Housing Policy 4.12
Housing Policy 4.13
Housing Policy 4.14

Housing Policy 4.15
Housing Policy 4.21
Housing Policy 4.22
Housing Policy 5.21
Housing Policy 5.26

XIV PUBLIC SERVICES – 14 Policies

ERM-5.2	Park Amenities
ERM-5.3	Park Dedication Requirements
ERM-5.5	Facilities
ERM-5.12	Meet Changing Recreational Needs
PFS-7.1	Fire Protection
PFS-7.2	Fire Protection Standards
PFS-7.3	Visible Signage for Roads and Buildings
PFS-7.5	Fire Staffing and Response Time Standards
PFS-7.6	Provision of Station Facilities and Equipment
PFS-7.8	Law Enforcement Staffing Ratios
PFS-7.9	Sheriff Response Time
PFS-7.12	Design Features for Crime Prevention and Reduction
PFS-8.1	Work with Local School Districts
PFS-8.4	Library Facilities and Services

XV RECREATION – 7 Policies

ERM-5.2	Park Amenities
ERM-5.3	Park Dedication Requirements
ERM-5.5	Collocated Facilities
ERM-5.7	Public Water Access
ERM-5.11	Cooperation with Federal and State Agencies
ERM-5.12	Meet Changing Recreational Needs
ERM-5.15	Open Space Preservation

XVI TRANSPORTATION/TRAFFIC – 9 Policies

LU-7.3	Friendly Streets
LU-7.4	Streetscape Continuity
LU-7.6	Screening
TC-1.14	Roadway Facilities
TC-1.15	Traffic Impact Study
TC-1.16	County Level of Service (LOS) Standards
TC-5.3	Provisions for Bicycle Use
TC-5.4	Design Standards for Bicycle Routes
HS-1.9	Emergency Access

XVII. UTILITIES AND SERVICE SYSTEMS - 18 Policies

PFS-2.1	Water Supply
PFS-2.3	Well Testing
PFS-2.4	Water Connections
PFS-2.5	New Systems or Individual Wells
PFS-3.1	Private Sewage Disposal Standards
PFS-3.2	Adequate Capacity
PFS-3.4	Alternative Rural Wastewater Systems
PFS-4.1	Stormwater Management Plans
PFS-4.2	Site Improvements
PFS-4.3	Development
PFS-4.4	Stormwater Retention Facilities
PFS-4.5	Detention/Retention Basins Design
PFS-4.7	NPDES Enforcement
PFS-5.1	Land Use Compatibility with Solid Waste Facilities
PFS-5.3	Solid Waste Reduction
PFS-5.4	County Usage of Recycled Materials and Products
PFS-5.8	Hazardous Waste Disposal Capabilities
PFS-5.9	Agricultural Waste

REFERENCES

Chapter 3.1 thru 3.18 of this DEIR

Public Resources Code, Sections 2710-2796

CEQA Guidelines, Sections 15043, 15093 (a) (b) (c), and 15126.2 (b) (c)

Tulare County General Plan 2030 Update

CHAPTER 9

MITIGATION MONITORING AND REPORTING PROGRAM

This Draft Mitigation Monitoring and Reporting Program (MMRP) has been prepared in compliance with State law and based upon the findings of the Draft Environmental Impact Report (EIR) for the proposed Project. The MMRP lists mitigation measures recommended in the draft EIR for the proposed Project and identifies monitoring and reporting requirements.

The CEQA Public Resources Code Section 21081.6 requires the Lead Agency decision making body is going to approve a project and certify the EIR that it also adopt a reporting or monitoring program for those measures recommended to mitigate or avoid significant/adverse effects of the environment identified in the EIR. The law states that the reporting or monitoring program shall be designed to ensure compliance during project implementation. The MMRP is to contain the following elements:

- **Action and Procedure.** The mitigation measures are recorded with the action and procedure necessary to ensure compliance. In some instances, one action may be used to verify implementation of several mitigation measures.

- **Compliance and Verification.** A procedure for compliance and verification has been outlined for each action necessary. This procedure designates who will take action, what action will be taken and when and by whom and compliance will be monitored and reported and to whom it will be report. As necessary the reporting should indicate any follow-up actions that might be necessary if the reporting notes the impact has not been mitigated.

- **Flexibility.** The program has been designed to be flexible. As monitoring progresses, changes to compliance procedures may be necessary based upon the recommendations by those responsible for the MMRP. As changes are made, new monitoring compliance procedures and records will be developed and incorporated into the program

Table 9-1 presents the Mitigation Measures identified for the proposed Project in this EIR. Each Mitigation Measure is identified by the impact number. For example, 4-1 would be the first Mitigation Measure identified in the Biological analysis of the draft EIR.

The first column of **Table 9-1** identifies the Mitigation Measure. The second column, entitled "When Monitoring is to Occur," identifies the time the Mitigation Measure should be initiated.

The third column, "Frequency of Monitoring," identifies the frequency of the monitoring that should take place to assure the mitigation is being or has been implemented to achieve the desired outcome or performance standard... The fourth column, "Agency Responsible for Monitoring," names the party ultimately responsible for ensuring that the Mitigation Measure is implemented. The last columns will be used by the Wastewater System Governing Entity once formed to ensure that individual Mitigation Measures have been complied with and monitored.

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
BIOLOGICAL RESOURCES							
Swainson's hawks and other raptors and migratory birds (including Loggerhead Shrike)							
4-1. Pre-construction surveys shall be conducted to determine the presence of nesting birds if ground clearing or construction activities will be initiated during the breeding season (February 15 through September 15). Potential nesting areas on the proposed Project site and potential nesting areas within 500 feet of the site should be surveyed prior to June 5th. Surveys shall be performed by a qualified biologist to verify the presence or absence of nesting birds. Construction shall not occur within a 500 foot buffer surrounding active nests of raptors or a 250 foot buffer surrounding active nests of migratory birds. If construction within these buffer areas is required or if nests must be removed to allow continuation of construction, then approval and specific removal methodologies should be obtained from California Department of Fish and Wildlife.	Prior to start of construction.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Field survey by a qualified Biologist.			
4-2. All trees which are suitable for Swainson's hawk nesting that are within 2,640 feet of construction activities shall be inspected by a qualified biologist.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			

Table 9-1
Mitigation Monitoring and Reporting Program

<table>
<tr><th rowspan="2">Mitigation Measure</th><th rowspan="2">Monitoring Timing / Frequency</th><th rowspan="2">Action Indicating Compliance</th><th rowspan="2">Monitoring Agency</th><th rowspan="2">Person conducting Monitoring / Reporting</th><th colspan="3">Verification of Compliance</th></tr>
<tr><th>Initials</th><th>Date</th><th>Remarks</th></tr>
<tr><td>4-3. If potential Swainson’s hawk nests are found during the inspection, then surveys shall be conducted at the following intensities, depending upon dates of initiation of construction:
<table>
<tr><th>Construction start</th><th>Survey period</th><th>Number of surveys</th><th>Timing</th></tr>
<tr><td>1 January to 20 March</td><td>1 January to 20 March</td><td>1</td><td>All day</td></tr>
<tr><td>21 March to 24 March</td><td>1 January to 20 March</td><td>1</td><td>All day</td></tr>
<tr><td></td><td>21 March to 24 March</td><td>Up to 3</td><td>Sunrise to 10 am and 4 pm to sunset</td></tr>
<tr><td>24 March to 5 April</td><td>1 January to 20 March</td><td>1</td><td>All day</td></tr>
<tr><td></td><td>21 March to 5 April</td><td>3</td><td>Sunrise to 10 am and 4 pm to sunset</td></tr>
<tr><td>6 April to 9 April</td><td>21 March to 5 April</td><td>3</td><td>Sunrise to 10 am and 4 pm to sunset</td></tr>
<tr><td></td><td>6 April to 9 April</td><td>Up to 3</td><td>Sunrise to 10 am and 4 pm to sunset</td></tr>
<tr><td></td><td>1 January to 20 March</td><td>1 (if all 3 surveys are performed between 6</td><td>All day</td></tr>
</table></td><td>Prior to construction-related activities.</td><td>Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable</td><td>County of Tulare Planning Department</td><td>Qualified biologist.</td><td></td><td></td><td></td></tr>
</table>

Table 9-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
<table><tr><td></td><td></td><td>and 9 April, then this survey need not be conducted)</td><td></td></tr><tr><td>10 April to 30 July</td><td>21 March to 5 April</td><td>3</td><td>Sunrise to 10 am and 4 pm to sunset</td></tr><tr><td></td><td>6 April to 20 April</td><td>3</td><td>Sunrise to 12 pm and 4:30 pm to sunset</td></tr><tr><td>31 July to 15 September</td><td>6 to 20 April</td><td>3</td><td>Sunrise to 12 pm and 4:30 pm to sunset</td></tr><tr><td></td><td>10 to 30 July</td><td>3</td><td>Sunrise to 12 pm and 4 pm to sunset</td></tr></table>							
4-4. If Swainson's hawks are detected to be actively nesting in trees within 2,640 feet of the construction area, construction shall not occur within this zone until after young Swainson's hawks have fledged (this usually occurs by early June). The nest shall be monitored by a qualified biologist to determine fledging date.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-5. If Swainson's hawks (foraging) or other raptors are found actively nesting within 250 feet of the construction area, construction should be postponed	Prior to construction-related	Retention of professional biologist/ongoing	County of Tulare Planning Department	Qualified biologist.			

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
until after young have fledged. The date of fledging should be determined by a qualified biologist. If construction cannot be delayed, the CDFW shall be consulted and alternative protection measures required by the CDFW shall be followed.	activities.	monitoring/ submittal of Report of Findings, if applicable					
4-6. If other nesting birds (particularly non-raptor species listed on the MBTA) are found actively nesting within 250 feet of the construction area, construction should be postponed until after young have fledged. The date of fledging should be determined by a qualified biologist. If construction cannot be delayed within this zone, the CDFW and/or the USFWS shall be consulted and alternative protection measures required by the CDFW and/or the USFWS shall be followed."[1]	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
Protection of San Joaquin kit fox							
4.7 A standardized pre-construction/ pre-activity shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any Project activity likely to impact the San Joaquin kit fox. Surveys shall identify kit fox habitat features on the Project site and evaluate use by kit fox and, if possible, assess the potential impacts to the kit fox by the proposed activity. The status of all dens shall be determined and mapped. Written results of pre-construction/pre-activity surveys	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			

[1] Op. Cit. Pages 27-30.

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities.							
4-8. Disturbance to all San Joaquin kit fox dens shall be avoided to the maximum extent possible.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-9. If a natal/pupping den is discovered within the Project area or within 200-feet of the site boundary, USFWS shall be immediately notified and under no circumstances should the den be disturbed or destroyed without prior authorization. If the pre-construction/pre-activity survey reveals an active natal pupping or new information, the Project applicant shall contact USFWS immediately to obtain the necessary take authorization/permit.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-10. Destruction of any den shall be accomplished by careful excavation until it is certain that no kit foxes are inside. The den shall be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if	County of Tulare Planning Department	Qualified biologist.			

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
		applicable					
4-11. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above shall be resumed. Destruction of the den may be completed when, in the judgment of the qualified biologist, the animal has escaped without further disturbance from the partially destroyed den.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-12. Project-related vehicles shall observe a daytime speed limit not to exceed 20-mph throughout the site in all proposed Project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. Night-time construction shall be minimized to the extent possible. However if it does occur, then the speed limit shall be reduced to 10-mph. Off-road traffic outside of designated project areas shall be prohibited.	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-13. To prevent inadvertent entrapment of kit fox or other animals during the construction phase of the proposed Project, all excavated, steep-walled holes or trenches more than 2-feet deep shall be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks shall be installed. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			

Table 9-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
animals. If at any time a trapped or injured kit fox is discovered, the USFWS and the California Department of Fish and Wildlife shall be contacted as noted under Mitigation Measure 4-20 referenced below.							
4-14. Kit fox are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit fox before the pipe is used or moved, buried, or capped in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the CFW has been consulted. If necessary, and under the direct supervision of a qualified biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-15. All food-related trash outside of the enclosed facility such as wrappers, cans, bottles, and food scraps shall be disposed of daily in securely closed containers and removed at least once a week during both construction and operational phases.	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-16. No pets, such as dogs or cats, shall be allowed on the Project site in order to prevent harassment, mortality	Prior to and during	Retention of professional	County of Tulare Planning	Qualified biologist.			

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
of kit fox, or destruction of dens.	construction-related activities.	biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	Department				
4-17. Use of rodenticides and herbicides in Project areas shall be restricted. If rodent control must be used it shall be limited to the use of zinc phosphide because of its demonstrated lower risk to kit fox.	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-18. A representative shall be appointed by the Project Applicant to serve as the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative will be identified during the employee education program and their name, telephone number, or other pertinent contact information shall be provided to the Service.	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
4-19. An employee education program shall be conducted to alert employees of potential impacts to kit fox or other species of concern. The program shall consist of a brief presentation by persons knowledgeable in kit fox biology and legislative protection to explain	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of	County of Tulare Planning Department	Qualified biologist.			

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
endangered species concerns to contractors, their employees, and military and/or agency personnel involved in the project. The program shall include the following: A description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of kit fox in the Project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during Project construction and implementation. A fact sheet conveying this information shall be prepared for distribution to the previously referenced people and anyone else who may enter the Project site.		Report of Findings, if applicable					
4-20. Any contractor, employee, or military or agency personnel who are responsible for inadvertently killing or injuring a San Joaquin kit fox shall immediately report the incident to their representative. The Sacramento Fish and Wildlife Office and CFW shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The Sacramento Fish and Wildlife Office contact is: Mr. Paul Hoffman 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670 (530) 934-9309	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
4-21. New sightings of kit fox shall be reported to the California Natural Diversity Database (CNDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed shall also be provided to Fish and Wildlife at the address below. Endangered Species Division 2800 Cottage Way, Suite W2605 Sacramento, California 95825-1846 (916) 414-6620 or (916) 414-6600	Prior to and during construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
Protection of Burrowing Owl							
4-22. In accordance with CDFG's 2012 *Staff Report on Burrowing Owl Mitigation*, a qualified biologist shall conduct three surveys for burrowing owls where potential burrowing owl habitat occurs within 500 feet of Project activities. Surveys shall occur during the peak breeding season for this species (15 April through 15 July), and spaced three weeks apart. If active burrowing owl burrows are identified within 500 feet of the Project site, then avoidance, take avoidance surveys, site surveillance, minimization, and buffer mitigation measures shall be implemented, in accordance with the 2012 CDFG *Staff Report* and direct consultation with CFW.	Prior to construction-related activities.	Retention of professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	County of Tulare Planning Department	Qualified biologist.			
Protection of Sensitive Amphibians and Reptiles							
4-23. Preconstruction surveys shall be conducted during	Prior to	Retention of	County of	Qualified			

Table 9-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
a period of high hydrological activity for the Slough. This may coincide with irrigation deliveries to downstream agriculture, typically an initial release from dams occurs in February-March and May-July. These surveys will detect tiger salamanders (early survey) and western pond turtles (late survey, if present. For spadefoots, survey shall be conducted after they emerge subsequent to 1-2 inches of precipitation at the start of the rainy season (usually around the beginning of December). If surveys detect these species, they shall be allowed to passively relocate off of the site before construction on the Slough begins.	construction-related activities.	professional biologist/ongoing monitoring/ submittal of Report of Findings, if applicable	Tulare Planning Department	biologist.			
CULTURAL RESOURCES							
5-1. In the event that archaeological or paleontological resources are discovered during site excavation, the County shall require that grading and construction work on the project site be immediately suspended until the significance of the features can be determined by a qualified archaeologist or paleontologist. In this event, the property owner shall retain a qualified archaeologist/paleontologist to make recommendations for measures necessary to protect any site determined to contain or constitute an historical resource, a unique archaeological resource, or a unique paleontological resource or to undertake data recover, excavation analysis, and curation of archaeological or paleontological materials. County staff shall consider such recommendations and implement them where they are feasible in light of Project design as previously	During Construction	Daily or as needed throughout the construction period if suspicious resources are discovered	County of Tulare Planning Department via field evaluation of the resource finds by a qualified archaeologist	A qualified archaeologist shall document the results of field evaluation and shall recommend further actions that shall be taken to mitigate for unique resource or human remains found, consistent with all applicable laws			

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
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approved by the County.				including CEQA.			
5-2. The property owner shall avoid and minimize impacts to paleontological resources. If a potentially significant paleontological resource is encountered during ground disturbing activities, all construction within a 100-foot radius of the find shall immediately cease until a qualified paleontologist determines whether the resources requires further study. The owner shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. The paleontologist shall notify the Tulare County Resource Management Agency and the project proponent of the procedures that must be followed before construction is allowed to resume at the location of the find. If the find is determined to be significant and the Tulare County Resource Management Agency determines avoidance is not feasible, the paleontologist shall design and implement a data recovery plan consistent with applicable standards. The plan shall be submitted to the Tulare County Resource Management Agency for review and approval. Upon approval, the plan shall be incorporated into the project.	During Construction	Daily or as needed throughout the construction period if suspicious resources are discovered	County of Tulare Planning Department via field evaluation of the resource finds by a qualified archaeologist	A qualified archaeologist shall document the results of field evaluation and shall recommend further actions that shall be taken to mitigate for unique resource or human remains found, consistent with all applicable laws including CEQA.			
5-3. Consistent with Section 7050.5 of the California Health and Safety Code and (CEQA Guidelines) Section 15064.5, if human remains of Native American origin are discovered during project construction, it is necessary to comply with State laws relating to the disposition of Native American burials, which fall	During Construction	Daily or as needed throughout the construction period if suspicious resources are	County of Tulare Planning Department via field evaluation of the resource finds by a	A qualified archaeologist shall document the results of field evaluation and shall			

Table 9-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
within the jurisdiction of the Native American Heritage Commission (Public Resources Code Sec. 5097). In the event of the accidental [that is, unanticipated] discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken: 1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: a. The Tulare County Coroner/Sheriff must be contacted to determine that no investigation of the cause of death is required; and b. If the coroner determines the remains to be Native American: i. The coroner shall contact the Native American Heritage Commission within 24 hours. ii. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. iii. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code		discovered	qualified archaeologist	recommend further actions that shall be taken to mitigate for unique resource or human remains found, consistent with all applicable laws including CEQA.			

Table 9-1
Mitigation Monitoring and Reporting Program

Mitigation Measure	Monitoring Timing / Frequency	Action Indicating Compliance	Monitoring Agency	Person conducting Monitoring / Reporting	Verification of Compliance		
					Initials	Date	Remarks
section 5097.98, or 2. Where the following conditions occur, the landowner or his/her authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance. a. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission. b. The descendant fails to make a recommendation; or c. The landowner or his authorized representative rejects the recommendation of the descendent.							
HYDROLOGY AND WATER QUALITY							
9-1. The Project applicant shall prepare a Storm Water Pollution Prevention Plan (SWPPP) according to the latest regulations to be retained onsite. The SWPPP must include best management practices that, when implemented, prevent storm water quality degradation to the extent practical by preventing sediments and other pollutants from leaving the Project site.	Prior to Construction	SWPPP submittal and acceptance.	County of Tulare Planning Department	Construction Contractor			
9-2. New sewage disposal systems shall be designed by an Engineer, Registered Environmental Health Specialist, Geologist, or other competent persons, all of	Prior to Issuance of Building	Submittal of disposal system design.	TCEHSD	TCEHSD			

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
whom must be registered and/or licensed professionals knowledgeable and experienced in the field of sewage disposal system and design. The specifications and engineering data for the system shall be submitted to the TCEHSD for review and approval prior to the issuance of a building permit.	Permit.						
9-3. All new construction shall have water conserving fixtures (water closets, low flow showerheads, low flow sinks, etc.) New urinals shall also conserve water through waterless, zero flush, or other water conservation technique and/or technology.	Prior to Issuance of Building Permit.	Verified on submitted site plans.	Tulare County Building Inspector	Tulare County Building Inspector			
9-4. The proposed Project shall conform to the Tulare County Water Efficient Landscaping Ordinance.	Prior to Issuance of Building Permit.	Verified on submitted site plans.	Tulare County Building Inspector	Tulare County Building Inspector			
9-5. No ground water shall be transported off-site for any use.	Prior to Issuance of Building Permit.	Verified on submitted site plans.	Tulare County Building Inspector	Tulare County Building Inspector			
TRANSPORTATION/TRAFFIC							
16-1. The Project Applicant will be responsible for paying fair share fees as identified in Table 3.16-11 through payment of standard City traffic impact fees and an additional ad hoc mitigation fee of $175 per dwelling unit. The Applicant will pay the fee amounts at building permit. This shall be made a condition of Project	Prior to Issuance of Building Permit.	Payment of Fees	Tulare County Planning Department	Tulare County Planning Department			

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
approval.							
TRIBAL CULTURAL RESOURCES							
17-1. In the event that historical, archaeological or paleontological resources are discovered during site excavation, the County shall require that grading and construction work on the Project site be immediately suspended until the significance of the features can be determined by a qualified archaeologist or paleontologist. In this event, the property owner shall retain a qualified archaeologist/paleontologist to provide recommendations for measures necessary to protect any site determined to contain or constitute an historical resource, a unique archaeological resource, or a unique paleontological resource or to undertake data recover, excavation analysis, and curation of archaeological or paleontological materials. County staff shall consider such recommendations and implement them where they are feasible in light of Project design as previously approved by the County.	During Construction	Daily or as needed throughout the construction period if suspicious resources are discovered	Tulare County Planning Department	A qualified archaeologist shall document the results of field evaluation and shall recommend further actions that shall be taken to mitigate for unique resource or human remains found, consistent with all applicable laws including CEQA.			
17-2. Consistent with Section 7050.5 of the California Health and Safety Code and (CEQA Guidelines) Section 15064.5, if human remains of Native American origin are discovered during Project construction, it is necessary to comply with State laws relating to the disposition of Native American burials, which fall within the jurisdiction of the Native American Heritage Commission (Public Resources Code Sec. 5097). In the event of the accidental discovery or recognition of any	During Construction	Daily or as needed throughout the construction period if suspicious resources are discovered	Tulare County Planning Department	A qualified archaeologist shall document the results of field evaluation and shall recommend further actions that shall be			

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
human remains in any location other than a dedicated cemetery, the following steps should be taken: 1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: a. The Tulare County Coroner/Sheriff must be contacted to determine that no investigation of the cause of death is required; and b. If the coroner determines the remains to be Native American: i. The coroner shall contact the Native American Heritage Commission within 24 hours. ii. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely d iii. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code section 5097.98, or 2. Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further				taken to mitigate for unique resource or human remains found, consistent with all applicable laws including CEQA.			

Table 9-1 Mitigation Monitoring and Reporting Program							
Mitigation Measure	**Monitoring Timing / Frequency**	**Action Indicating Compliance**	**Monitoring Agency**	**Person conducting Monitoring / Reporting**	**Verification of Compliance**		
					Initials	**Date**	**Remarks**
subsurface disturbance. a. The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission. b. The descendant fails to make a recommendation; or c. The landowner or his authorized representative rejects the recommendation of the descendent.							

Chapter 10

Report Preparation

PERSONS WHO PREPARED THIS REPORT

Key persons from the County of Tulare and the consulting firms that contributed to preparation of the Draft Environmental Impact Report (Draft EIR) are identified below:

LEAD AGENCY: COUNTY OF TULARE RESOURCE MANAGEMENT AGENCY

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Michael Washam,	Associate Director/ Economic Development and Planning Branch
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- Emily Bowen, LEED AP, Principal Planner

Crawford & Bowen Planning, Inc. – Air Quality Impact Analysis and Greenhouse Gas Study

- Emily Bowen, LEED AP, Principal Planner

Crawford & Bowen Planning, Inc. – Water Supply Assessment Memorandum

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APPENDIX A

AIR QUALITY & GREENHOUSE GASES

HASH FARMS DEVELOPMENT

Air Quality Impact Analysis and Greenhouse Gas Study

November 2017

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CHAPTER ONE – Executive Summary

Purpose and Analysis

The following air quality and greenhouse gas analysis was prepared to evaluate the impacts resulting from the construction and operation of the Hash Farms Development Project (project). The criteria pollutant emissions generated from the project are compared with the thresholds of significance impact, within the context of the California Environmental Quality Act (CEQA) and is intended to provide sufficient detail regarding potential impacts of development of the project to the regional air quality and to global climate change.

The methodology follows the San Joaquin Valley Air Pollution Control District (SJVAPCD) recommendations for both quantification of emissions and evaluation of potential impacts to air resources and the quantification of GHG emissions and evaluation of potential impacts on global climate change. The District prepared its Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) in 2002 and updated its GAMAQI in 2015.

Project Summary

The Hash Farms Development Specific Plan is a proposed plan for development of a 200-unit residential subdivision (160 single-family units and 40 multi-family units) on a total of 54 acres. The proposed Project will provide 2.54 acres of park space which will include a large play structure, "splash pad", basketball court, shade and picnic structures, and a half-sized soccer practice field. The park is located to provide access to and from the existing neighborhood which does not have a neighborhood park. The park is also located to preserve open easterly and southerly views. These facilities will be maintained through an assessment district mechanism and/or Community Facilities District.

Summary of Analysis Results

Impact – 1: The project would not conflict with or obstruct implementation of the applicable air quality plan. **Less Than Significant Impact.**

Impact – 2: The project would not violate air quality standards or contribute substantially to an existing or projected air quality violation. **Less Than Significant Impact.**

Impact – 3: The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceeds quantitative thresholds for ozone precursors). **Less Than Significant Impact.**

Impact – 4: The project would not expose sensitive receptors to substantial pollutant concentrations. **Less Than Significant Impact.**

Impact – 5: The project would not create objectionable odors affecting a substantial number of people. **Less Than Significant Impact.**

Impact – 6: The project would generate direct and indirect greenhouse gas emissions; however, these emissions would not result in a significant impact on the environment. **Less Than Significant Impact**.

Impact – 7: The project would not conflict with any applicable plan, policy or regulation of an agency adopted to reduce the emissions of greenhouse gases. **Less Than Significant Impact.**

Mitigation Measures Applied to the Project

No mitigation measures were required.

CHAPTER TWO – Environmental Setting

Air Quality Setting

San Joaquin Valley Air Basin

The following discussions on topography, climate, wind patterns, temperature, precipitation, humidity and fog in the San Joaquin Valley Air Basin (SJVAB) are taken from the SJVAPCD's Guidance for Assessing and Mitigating Air Quality (GAMAQI).[1]

"[The SJVAB] consists of eight counties: Fresno, Kern (western and central), Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare... Cumulatively, these counties represent approximately 16 percent of California's geographic area, making the SJVAB the second largest air quality basin (based on area) as delineated by the California Air Resources Board (ARB). Air pollution in the SJVAB can be attributed to both human-related (anthropogenic) and natural (non-anthropogenic) activities that produce emissions. Air pollution from significant anthropogenic activities in the SJVAB includes a variety of industrial-based sources as well as on- and off-road mobile sources. Activities that tend to increase mobile activity include increases in population, increases in general traffic activity (including automobiles, trucks, aircraft, and rail), urban sprawl (which will increase commuter driving distances), and general local land management practices as they pertain to modes of commuter transportation. These sources, coupled with geographical and meteorological conditions unique to the area, stimulate the formation of unhealthy air.

The San Joaquin Valley's (SJV) topography and meteorology provide ideal conditions for trapping air pollution for long periods of time and producing harmful levels of air pollutants, including ozone and particulate matter. Low precipitation levels, cloudless days, high temperatures, and light winds during the summer in the SJV are conducive to high ozone levels resulting from the photochemical reaction of nitrogen oxides (NOx) and volatile organic compounds (VOC). Inversion layers in the atmosphere during the winter can trap emissions of directly emitted PM2.5 (particulate matter that is 2.5 microns or less in diameter) and PM2.5 precursors (such as NOx and sulfur dioxide (SO2)) within the SJV for several days, accumulating to unhealthy levels. The region also houses the State's major arteries for goods and people movement, I-5 to the west and CA Highway 99 through the Central Valley (Valley), thereby attracting a large volume of vehicular traffic. Another compounding factor is the region's historically high rate of population growth compared to other regions of California. Increased population typically results in an even greater increase in vehicle activity and more consumer product use, leading to increased emissions of air pollution, including NOx. In fact, mobile

[1] San Joaquin Valley Air Pollution Control District. *Guidance for Assessing and Mitigating Air Quality Impacts.* Website: http://www.valleyair.ort/transportation/GAMAQI_3-19-15.pdf. Accessed December 2016.

sources account for about 80% of the Valley's total NOx emissions inventory. Since NOx is a significant precursor for both ozone and PM2.5, reducing NOx from mobile sources is critical for progressing the Valley towards attainment of ozone and PM2.5 standards.

The geography of mountainous areas to the east, west and south, in combination with long summers and relatively short winters, contributes to local climate episodes that prevent the dispersion of pollutants. Transport, as affected by wind flows and inversions, also plays a role in the creation of air pollution."[2]

Topography

"The climate of the SJV is modified by topography. This creates climatic conditions that are particularly conducive to air pollution formation… [The] SJV is surrounded by mountains on three sides and open to the Sacramento Valley and the San Francisco Bay Area to the north.

The SJVAB is the southern half of California's Central Valley and is approximately 250 miles long and averages 35 miles wide. The SJV is bordered by the Sierra Nevada Mountains in the east (8,000 to 14,491 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 7,981 feet in elevation). There is a slight downward elevation gradient from Bakersfield in the southeast end (elevation 408 feet) to sea level at the northwest end where the valley opens to the San Francisco Bay at the Carquinez Straits. At its northern end is the Sacramento Valley, which comprises the northern half of California's Central Valley. The bowl shaped topography inhibits movement of pollutants out of the valley."[3]

Climate

"The SJV is in a Mediterranean Climate Zone. Mediterranean Climates Zones occur on the west coast of continents at 30 to 40 degrees latitude and are influenced by a subtropical high-pressure cell most of the year. Mediterranean Climates are characterized by sparse rainfall, which occurs mainly in winter. Summers are hot and dry. Summertime maximum temperatures often exceed 100 degrees F in the Valley.

The subtropical high-pressure cell is strongest during spring, summer and fall and produces subsiding air, which can result in temperature inversions in the Valley. A temperature inversion can act like a lid, inhibiting vertical mixing of the air mass at the surface. Any emissions of pollutants can be trapped below the inversion. Most of the surrounding mountains are above the normal height of summer inversions (1,500-3,000 feet).

[2] Ibid. Pages 15-16.
[3] Op. Cit. 16.

Winter-time high pressure events can often last many weeks with surface temperatures often lowering into the thirties degree Fahrenheit. During these events, fog can be present and inversions are extremely strong. These wintertime inversions can inhibit vertical mixing of pollutants to a few hundred feet."[4]

Wind Patterns

"Wind speed and direction play an important role in dispersion and transport of air pollutants. Wind at the surface and aloft can disperse pollution by mixing and by transporting the pollution to other locations.

Especially in summer, winds in the Valley most frequently blow from the northwesterly direction. The region's topographic features restrict air movement and channel the air mass towards the southeastern end of the Valley. Marine air can flow into the basin from the San Joaquin River Delta and over Altamont Pass and Pacheco Pass, where it can flow along the axis of the valley, over the Tehachapi pass, into the Southeast Desert Air Basin. The Coastal Range is a barrier to air movement to the west and the high Sierra Nevada range is a significant barrier to the east (the highest peaks in the southern Sierra Nevada reach almost halfway through the Earth's atmosphere). Many days in the winter are marked by stagnation events where winds are very weak. Transport of pollutants during winter can be very limited. A secondary but significant summer wind pattern is from the southeasterly direction and can be associated with nighttime drainage winds, prefrontal conditions and summer monsoons.

Two significant diurnal wind cycles that occur frequently in the Valley are the sea breeze and mountain-valley upslope and drainage flows. The sea breeze can accentuate the northwest wind flow, especially on summer afternoons. Nighttime drainage flows can accentuate the southeast movement of air down the valley. In the mountains during periods of weak synoptic scale winds, winds tend to be upslope during the day and downslope at night. Nighttime and drainage flows are especially pronounced during the winter when flow from the easterly direction is enhanced by nighttime cooling in the Sierra Nevada. Eddies can form in the valley wind flow and can re-circulate a polluted air mass for an extended period. Such an eddy occurs in the Fresno area during both winter and summer."[5]

Temperature, Sunlight and Ozone Production

"Solar radiation and temperature are particularly important in the chemistry of ozone formation. The SJVAB averages over 260 sunny days per year. Photochemical air pollution (primarily ozone) is produced by the atmospheric reaction of organic substances (such as volatile organic compounds) and nitrogen dioxide under the influence of sunlight. Ozone concentrations are very dependent on the amount of solar radiation, especially during late spring, summer and early fall.

[4] Op. Cit. 17.

[5] Op. Cit. 17-18.

Ozone levels typically peak in the afternoon. After the sun goes down, the chemical reaction between nitrous oxide and ozone begins to dominate. This reaction tends to scavenge the ozone in the metropolitan areas through the early morning hours, resulting in the lowest ozone levels, possibly reaching zero at sunrise in areas with high nitrogen oxides emissions. At sunrise, nitrogen oxides tend to peak, partly due to low levels of ozone at this time and also due to the morning commuter vehicle emissions of nitrogen oxides.

Generally, the higher the temperature, the more ozone formed, since reaction rates increase with temperature. However, extremely hot temperatures can "lift" or "break" the inversion layer. Typically, if the inversion layer doesn't lift to allow the buildup of contaminants to be dispersed, the ozone levels will peak in the late afternoon. If the inversion layer breaks and the resultant afternoon winds occur, the ozone will peak in the early afternoon and decrease in the late afternoon as the contaminants are dispersed or transported out of the SJVAB.

Ozone levels are low during winter periods when there is much less sunlight to drive the photochemical reaction."[6]

Temperature Inversions

"The vertical dispersion of air pollutants in the SJV can be limited by persistent temperature inversions. Air temperature in the lowest layer of the atmosphere typically decreases with altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. The height of the base of the inversion is known as the "mixing height". This is the level to which pollutants can mix vertically. Mixing of air is minimized above and below the inversion base. The inversion base represents an abrupt density change where little air movement occurs.

Inversion layers are significant in determining pollutant concentrations. Concentration levels can be related to the amount of mixing space below the inversion. Temperature inversions that occur on the summer days are usually encountered 2,000 to 2,500 feet above the valley floor. In winter months, overnight inversions occur 500 to 1,500 feet above the valley floor."[7]

Precipitation, Humidity and Fog

"Precipitation and fog may reduce or limit some pollutant concentrations. Ozone needs sunlight for its formation, and clouds and fog can block the required solar radiation. Wet fogs can cleanse the air during winter as moisture collects on particles and deposits them on the ground. Atmospheric moisture can also increase pollution levels. In fogs with less water content, the moisture acts to form secondary ammonium nitrate particulate matter. This ammonium nitrate is part of the Valleys PM2.5 and PM10 problem.

[6] Op. Cit. 18.

[7] Op. Cit. 19.

The winds and unstable air conditions experienced during the passage of winter storms result in periods of low pollutant concentrations and excellent visibility. Between winter storms, high pressure and light winds allow cold moist air to pool on the SJV floor. This creates strong low-level temperature inversions and very stable air conditions, which can lead to Tule fog. Wintertime conditions favorable to fog formation are also conditions favorable to high concentrations of PM2.5 and PM10."[8]

Tulare County

Tulare County is located within the southern portion of the SJVAB. Due to the SJVAB's light wind patterns, long periods of warm and sunny days, and surrounding mountains, air quality problems in the County can occur at any time of the year. The following discussion on topography and climate in the County of Tulare are taken from the *Tulare County 2030 General Plan Recirculated Draft Environmental Impact Report* (RDEIR).

"The topography of Tulare County significantly varies in elevation from its eastern to western borders, which results in large climatic variations that ultimately affect air quality. The western portion of the County is within the low-lying areas of the SJVAB. This portion of the County is much dryer in comparison to the eastern portion that is located on the slopes of the Sierra Nevada Mountains. The higher elevation contributes to both increased precipitation and a cooler climate.

Wind direction and velocity in the eastern section varies significantly from the western portion of the County. The western side receives northwesterly winds. The eastern side of the County exhibits more variable wind patterns, but the wind direction is typically up-slope during the day and down-slope in the evening. Generally, the wind direction in the eastern portion of the County is westerly; however terrain differences can create moderate directional changes."[9]

Climate Change Setting

The United States Environmental Protection Agency (EPA) refers to climate change as, "…any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer." [10] The United Nations, Intergovernmental Panel on Climate Change (IPCC) refers to climate change as, "a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the United Nations Framework

[8] Op. Cit.
[9] Tulare County. 2010. *Tulare County 2030 General Plan, Recirculated Draft Environmental Impact Report* (RDEIR). Page 3.3-9.
[10] U.S. Environmental Protection Agency. Climate Change: Basic Information. https://www.epa.gov/climatechange/climate-change-basic-information#Change. Accessed December 2016.

Convention on Climate Change (UNFCCC), where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods."[11]

The United Nations Intergovernmental Panel on Climate Change (IPCC) predicted that the global mean temperature change from 1990 to 2100 could range from 1.1 degrees Celsius (°C) to 6.4°C. Regardless of analytical methodology, global average temperatures and sea levels are expected to rise under all scenarios.[12] The report also concluded that "[w]arming of the climate system is unequivocal," and that "[m]ost of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."

Greenhouse Gasses

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs). The effect is analogous to the way a greenhouse retains heat. The six GHGs defined by Assembly Bill (AB) 32 (discussed further in the Regulatory Environment section) include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).[13] The physical properties and common sources of these GHGs are described in Table 1. A seventh greenhouse gas, nitrogen trifluoride (NF_3) was added to Health and Safety Code section 38505(g)(7) as a greenhouse gas of concern.[14] Other greenhouse gases include water vapor, ozone, and aerosols.

Individual GHG compounds have varying global warming potential and atmospheric lifetimes. Carbon dioxide, the reference gas for global warming potential, has a global warming potential (GWP) of one. The GWP of a GHG is a measure of how much a given mass of a greenhouse gas is estimated to contribute to global warming. To describe how much global warming a given type and amount of greenhouse gas may cause, the carbon dioxide equivalent (CO_2e) is used. The calculation of the carbon dioxide equivalent is a consistent methodology for comparing greenhouse gas emissions since it normalizes various greenhouse gas emissions to a consistent reference gas, CO_2. For example, CH_4 has a GWP of 21 which indicates that CH_4 has 21 times greater warming effect than CO_2 on a molecule-per-molecule basis. A CO_2e is the mass emissions of an individual GHG multiplied by its GWP.

[11] United Nations, Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Page 30. http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf. Accessed December 2016.
[12] United Nations, Intergovernmental Panel on Climate Change. 2001. *Climate Change 2001: The Scientific Basis*. Summary for Policymakers. http://www.grida.no/publications/other/ipcc_tar/?src=/climate/ipcc_tar/wg1/005.htm. Accessed December 2016.
[13] Tulare County 2030 General Plan Recirculated Draft EIR, page 3.4-14
[14] California Environmental Protection Agency. Air Resources Board. Assembly Bill 32 Overview. http://www.arb.ca.gov/cc/ab32/ab32.htm Accessed December 2016.

Table 1: Description of Greenhouse Gases[15]		
Greenhouse Gas	**Description and Physical Properties**	**Sources**
Nitrous oxide	Nitrous oxide (laughing gas) is a colorless greenhouse gas. It has a lifetime of 114 years. Its global warming potential is 310.	Microbial processes in soil and water, fuel combustion, and industrial processes.
Methane	Methane is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years. Its global warming potential is 21.	Methane is extracted from geological deposits (natural gas fields). Other sources are landfills, fermentation of manure, and decay of organic matter.
Carbon dioxide	Carbon dioxide (CO_2) is an odorless, colorless, natural greenhouse gas. Carbon dioxide's global warming potential is 1. The concentration in 2005 was 379 parts per million (ppm), which is an increase of about 1.4 ppm per year since 1960.	Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.
Chlorofluorocarbons	These are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. They are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). Global warming potentials range from 3,800 to 8,100.	Chlorofluorocarbons were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone. The Montreal Protocol on Substances that Deplete the Ozone Layer prohibited their production in 1987.
Hydrofluorocarbons	Hydrofluorocarbons are a group of greenhouse gases containing carbon, chlorine, and at least one hydrogen atom. Global warming potentials range from 140 to 11,700.	Hydrofluorocarbons are synthetic manmade chemicals used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants.
Perfluorocarbons	Perfluorocarbons have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, they have long lifetimes, between 10,000 and 50,000 years. Global warming potentials range from 6,500 to 9,200.	Two main sources of perfluorocarbons are primary aluminum production and semiconductor manufacturing.
Sulfur hexafluoride	Sulfur hexafluoride (SF_6) is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. It has a high global warming potential, 23,900.	This gas is manmade and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas.
Nitrogen trifluoride	Nitrogen trifluoride (NF3) was added to Health and Safety Code section 38505(f)(7) as a greenhouse gas of concern. It has a high global warming potential of 17,200	This gas is used in electronics manufacture for semiconductors and liquid crystal displays.

[15] Compiled from a variety of sources, primarily from: United Nations, Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Page 30. http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf. Accessed December 2016.

Emissions Inventories

Emissions in the United States were approximately 6,575.5 million metric tons[16] of carbon dioxide equivalents ($MMTCO_2e$) and total California greenhouse gas emissions were 457 $MMTCO_2e$ in 2009.[17] The main contribution of greenhouse gas emissions in California between years 2000 and 2009 was transportation. The second highest sector was industrial, which includes sources from refineries, general fuel use, oil and gas extraction, cement plants, and cogeneration heat output.[18]

"In 2007, Tulare County generated approximately 5.2 million tonnes of CO_2e [carbon dioxide equivalent]. The largest portion of these emissions (63 percent) is attributed to dairies/feedlots, while the second largest portion (16 percent) is from mobile sources."[19] See Table 2 for 2007 Emissions by sector.

Table 2: Emissions by Sector in 2007[20]

Sector	CO_2e (tonnes/year)	% of Total
Electricity	542,690	11%
Natural Gas	321,020	6%
Mobile Sources	822,230	16%
Dairy/Feedlots	3,294,870	63%
Solid Waste	227,250	4%
Total	**5,208,060**	**100%**
Per Capita	**36.1**	

"Enhancement of the greenhouse effect can occur when concentrations of GHGs exceed the natural concentrations in the atmosphere. Of these gases, CO_2 and methane are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas methane primarily results from off-gassing associated with agricultural

[16] U.S. Energy Information Administration. Independent Statistics & Analysis. Emissions of Greenhouse Gases in the U.S. Greenhouse Gas Emissions Overview. https://www.eia.gov/environment/emissions/ghg_report/ghg_overview.cfm. Accessed January 2017.
[17] California Environmental Protection Agency. Air Resources Board. California Greenhouse Gas Emissions Inventory: 2000-2009. https://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-09_report.pdf. Accessed January 2017.
[18] Ibid.
[19] Tulare County 2030 General Plan Recirculated Draft EIR, page 3.4-32
[20] Ibid. Page 34-2, Table 3.4-2.

practices and landfills. Sulfur hexafluoride is a GHG commonly used in the utility industry as an insulating gas in transformers and other electronic equipment. Sulfur hexafluoride, while comprising a small fraction of the total GHGs emitted annually world-wide, is a much more potent GHG with 23,900 times the global warming potential as CO_2. There is widespread international scientific agreement that human-caused increases in GHGs has and will continue to contribute to global warming, although there is much uncertainty concerning the magnitude and rate of the warming.

Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. The projected effects of global warming on weather and climate are likely to vary regionally, but are expected to include the following direct effects[21]:

- Higher maximum temperatures and more hot days over nearly all land areas;
- Higher minimum temperatures, fewer cold days and frost days over nearly all land areas;
- Reduced diurnal temperature range over most land areas;
- Increase of heat index over land areas; and
- More intense precipitation events.

Also, there are many secondary effects that are projected to result from global warming, including global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity. While the possible outcomes and the feedback mechanisms involved are not fully understood, and much research remains to be done, the potential for substantial environmental, social, and economic consequences over the long term may be great."[22]

[21] United Nations, Intergovernmental Panel on Climate Change. 2001. *Climate Change 2001: The Scientific Basis*. Website: http://www.grida.no/climate/ipcc_tar/wg1/pdf/WG1_TAR-FRONT.pdf. Page 15. Accessed January 2017.

[22] Op. Cit., 3.4-14 to 3.4-15

CHAPTER THREE – Regulatory Setting

Air Quality Regulatory Setting

Regulatory Overview

Federal Clean Air Act

Congress established much of the basic structure of the CAA in 1970, and made major revisions in 1977 and 1990. Six common air pollutants (also known as criteria pollutants) are addressed in the federal CAA. These are particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. EPA calls these pollutants criteria air pollutants because it regulates them by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health is called primary standards. Another set of limits intended to prevent environmental and property damage is called secondary standards.14

The federal standards are called National Ambient Air Quality Standards (NAAQS). The air quality standards provide benchmarks for determining whether air quality is healthy at specific locations and whether development activities will cause or contribute to a violation of the standards. The criteria pollutants are:

- Ozone (O_3)
- Nitrogen dioxide (NO_2)
- Particulate matter (PM10 and $PM_{2.5}$)
- Carbon monoxide (CO)
- Sulfur dioxide (SO_2)
- Lead (Pb)

The NAAQS were set to protect public health, including that of sensitive individuals; thus, EPA is tasked with updating the standards as more medical research is available regarding the health effects of the criteria pollutants. Primary federal standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

The federal CAA requires states to adopt enforceable air quality plans to achieve the NAAQS. These attainment plans must also control emissions that drift across state lines and harm air quality in downwind states. Congress designed the law to minimize pollution increases from growing numbers of motor vehicles, and from new or expanded stationary sources. The Act requires new stationary sources to be built with best technology. The Act also contains specific provisions to address hazardous or toxic air pollutants; acid rain, ozone layer depleting chemical emissions, and regional haze. Congress also drafted the Act so that it could be used to address

pollutions project that emerge over time, such as the effects of greenhouse gases on global climate change.[23]

State Regulations

California Clean Air Act

"The California CAA of 1988 establishes an air quality management process that generally parallels the federal process. The California CAA, however, focuses on attainment of the State ambient air quality standards.., which, for certain pollutants and averaging periods are more stringent than the comparable federal standards. Responsibility for meeting California's standards is addressed by the CARB and local air pollution control districts (such as the eight county air district, which administers air quality regulations for Tulare County). Compliance strategies are presented in district-level air quality attainment plans.

The California CAA requires that Air Districts prepare an air quality attainment plan if the district violates State air quality standards for criteria pollutants including carbon monoxide, sulfur dioxide, nitrogen dioxide, $PM_{2.5}$, or ozone. Locally prepared attainment plans are not required for areas that violate the State PM_{10} standards. The California CAA requires that the State air quality standards be met as expeditiously as practicable but does not set precise attainment deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards."[24]

"The air quality attainment plan requirements established by the California CAA are based on the severity of air pollution caused by locally generated emissions. Upwind air pollution control districts are required to establish and implement emission control programs commensurate with the extent of pollutant transport to downwind districts."[25]

The state standards are called the California Ambient Air Quality Standards (CAAQS). The CAAQS include all the criteria pollutants established by the NAAQS plus additional pollutants that the State found to be of importance to human health. The CAAQS area:

- Ozone (O_3)
- Nitrogen dioxide (NO_2)
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Hydrogen sulfide (H_2S)
- Vinyl chloride
- Carbon monoxide (CO)
- Sulfur dioxide (SO_2)
- Lead (Pb)
- Sulfates
- Visibility reducing particles

[23] United States Environmental Protection Agency. 2013. *The Clean Air Act in a Nutshell: How it Works.* Website: http://www.epa.gov/air/caa/pdfs/CAA_Nutshell.pdf. Accessed January 2017.

[24] Tulare County 2030 General Plan, Recirculated Draft Environmental Impact Report. Page 3.3-2.

[25] Ibid. Page 3.3-5.

California Air Resources Board

"The CARB is responsible for establishing and reviewing the State ambient air quality standards, compiling the California State Implementation Plan (SIP) and securing approval of that plan from the U.S. EPA. As noted previously, federal clean air laws require areas with unhealthy levels of ozone, inhalable particulate matter, carbon monoxide, nitrogen dioxide, and sulfur dioxide to develop SIPs. SIPs are comprehensive plans that describe how an area will attain NAAQS. The 1990 amendments to the Federal CAA set deadlines for attainment based on the severity of an area's air pollution problem. State law makes CARB the lead agency for all purposes related to the SIP. The California SIP is periodically modified by the CARB to reflect the latest emission inventories, planning documents, and rules and regulations of various air basins. The CARB produces a major part of the SIP for pollution sources that are statewide in scope; however, it relies on the local Air Districts to provide emissions inventory data and additional strategies for sources under their jurisdiction. The SIP consists of the emission standards for vehicular sources and consumer products set by the CARB, and attainment plans adopted by the local air agencies as approved by CARB. The EPA reviews the air quality SIPs to verify conformity with CAA mandates and to ensure that they will achieve air quality goals when implemented. If EPA determines that a SIP is inadequate, it may prepare a Federal Implementation Plan for the nonattainment area, and may impose additional control measures.

In addition to preparation of the SIP, the CARB also regulates mobile emission sources in California, such as construction equipment, trucks, automobiles, and oversees the activities of air quality management districts and air pollution control districts, which are organized at the county or regional level. The local or regional Air Districts are primarily responsible for regulating stationary emission sources at industrial and commercial facilities within their jurisdiction and for preparing the air quality plans that are required under the Federal CAA and California CAA."[26]

Local Regulations

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air District is a public health agency whose mission is to improve the health and quality of life for all Valley residents through efficient, effective and entrepreneurial air quality-management strategies. The Air District's 10 core values include: protection of public health; active and effective air pollution control efforts with minimal disruption to the Valley's economic prosperity; outstanding customer service; ingenuity and innovation; accountability to the public; open and transparent public process; recognition of the uniqueness of the Valley; continuous improvement; effective and efficient use of public funds; and respect for the

[26] Tulare County 2030 General Plan, Recirculated Draft Environmental Impact Report, pages 3.3-6 to 3.3-7.

opinions and interests of all Valley residents.[27] To achieve these core values the Air District has adopted air quality plans pursuant to the California CAA and a comprehensive list of rules to limit air quality impacts. The air plans currently in effect in the SJVAB and specific rules that apply to the proposed Project are listed and described further below.

The Air District is responsible for controlling emissions primarily from stationary sources. The Air District, in coordination with the eight countywide transportation agencies, is also responsible for developing, updating, and implementing air quality attainment plans for the SJVAB.

8-Hour Ozone Attainment Plan

The Air Basin is designated nonattainment of state and federal health-based air quality standards for ozone. "The deadline for the San Joaquin Valley to attain the 2008 8-hour ozone standard is December 31, 2031. This requires another 207.7 tons per day in NO_x reductions from stationary and mobile sources throughout the Valley.

Since 1992, the District has adopted numerous attainment plans to reduce ozone and particulate precursor emissions. Leaving no stone unturned, the District has implemented these plans and adopted over 600 rules and rule amendments that have resulted in significant emissions reductions. Many of the District's innovative rules and strategies, such as Indirect Source Review, Glass Melting Furnaces, and Conservation Management Practices, now serve as models for the rest of the nation. In addition to having the toughest air regulations in the nation, the District also has the most effective and efficient incentive grants program. Through implementation of District regulations and incentives, Valley businesses and residents have invested billions of dollars to reduce emissions. To date, the District's incentive programs have invested a total of $1.4 billion in public/private funding towards clean air projects, resulting in over 120,000 tons of emissions reduced."[28]

"Despite strings of triple digit temperature and multiple wildfires, in 2015, the Valley experienced a record setting clean ozone season, achieving:

- Lowest 8-hour ozone design value on record for the Valley, the official metric used to measure progress towards meeting federal ozone standards
- Lowest number of days exceeding the federal 75 ppb 8-hour ozone standard
- Zero unhealthy days in the month of July
- Third consecutive year without violating the federal 1-hour ozone standard

[27] San Joaquin Valley Air Pollution Control District. About the District. Website: http://www.valleyair.org/General_info/aboutdist.htm#Mission. Accessed January 2017.
[28] San Joaquin Valley Air Pollution Control District. 2016 Plan for the 2008 8-Hour Ozone Standard. June 16, 2016. Page ES-1. http://www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016/ES.pdf. Accessed January 2017.

- 91% reduction in Valley residents exposure to high ozone concentrations above the 84 ppb standard since 2002 (73% reduction in population exposure for the 75 ppb standard)

As a part of the positive trend in ozone air quality, the Valley is also on track to meet the federal 8-hour ozone standard of 84 ppb ahead of the projected 2023 attainment date included in the 2007 Ozone Plan. With the ongoing improving trend in ozone air quality, EPA also recently approved the District's request for the 1-hour ozone clean data finding and has officially proposed to grant the San Joaquin Valley as attainment for the 1-hour ozone standard."[29]

2.5 Particulate Matter Attainment Plan

"The 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard (2016 $PM_{2.5}$ Plan) addresses the federal mandates for areas classified as "Moderate" nonattainment for the 2012 $PM_{2.5}$ federal annual air quality standard of 12 $\mu g/m^3$. This is the latest $PM_{2.5}$ standard for which the Valley is classified as a Moderate nonattainment. On July 29, 2016, two months before the plan for the 2012 $PM_{2.5}$ standard is due and decades after promulgation of the 1997 and 2006 $PM_{2.5}$ Standards, EPA released the $PM_{2.5}$ Implementation Rule that outlines the applicable requirements for preparation and submittal of the required $PM_{2.5}$ attainment plans.

Consistent with the Guiding Principles adopted by the District Governing Board on August 18, 2016 and the provisions of the $PM_{2.5}$ Implementation Rule, the 2016 $PM_{2.5}$ Plan:

- Satisfies the mandate to submit a Moderate attainment plan due to EPA by October 2016
- Demonstrates impracticability of attaining the 2012 $PM_{2.5}$ standard by the Moderate nonattainment area deadline of 2021
- Includes a request to reclassify the Valley to a Serious nonattainment area for the 2012 $PM_{2.5}$ standard
- Satisfies all applicable federal Clean Air Act requirements for Moderate nonattainment areas
- Demonstrates that emissions are continuing to be reduced in the Valley.

In addition to the many attainment plans that the District has already developed and implemented, the District is mandated under the Clean Air Act to develop and adopt a number of new ozone and particulate matter plans in the coming years. With respect to $PM_{2.5}$, the Valley has now reached a point where it is subject to three federal $PM_{2.5}$ standards with multiple attainment plans required for each standard, leading to multiple overlapping requirements and deadlines as summarized below.

[29] San Joaquin Valley Air Pollution Control District. 2016 Plan for the 2008 8-Hour Ozone Standard. June 16, 2016. Page ES-3. http://www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016/ES.pdf. Accessed January 2017.

1997 $PM_{2.5}$ Standard (24-hour 65 μg/m^3 and annual 15 μg/m^3)

- Serious Attainment Deadline: December 31, 2015
- 5% Plan due December 31, 2016

2006 24-hour $PM_{2.5}$ Standard (35μg/m^3)

- Serious Attainment Deadline: December 31, 2019
- Serious attainment plan due August 2017: Attainment demonstration requires a clean data finding for the consecutive three-year period of 2017 through 2019. This means that the 35 μg/m^3 standard needs to be reached by 2017 or much lower concentrations must be achieved in 2018 or 2019. Given that the State's truck and bus regulation will not be fully implemented until after 2023 and that EPA imposition of a national standard for trucks and locomotives, even if contemplated by EPA, cannot be implemented in that timeframe, it is impossible to craft an approvable attainment plan. The Clean Air Act provides a mechanism for seeking an extension of up to five years. However, EPA's recent inaction on the extension request for the 1997 $PM_{2.5}$ standard sets a hurdle that is not achievable for seeking an extension. Furthermore, attaining the standard by 2024 is highly unlikely even if EPA grants a five-year extension.

2012 Annual $PM_{2.5}$ Standard (1235μg/m^3)

- Moderate Attainment Deadline: December 31, 2021
- Moderate attainment plan due October 2016
- The District can bump up to a Serious nonattainment classification with an attainment deadline of 2025 if a request is submitted by October 2016 and approved by EPA demonstrating that attainment by the Moderate deadline of 2021 is impracticable and that the District meets all other applicable requirements for Moderate areas. The attainment plan under a Serious classification will then be due four years after EPA approves reclassification to Serious. The Clean Air Act also provides a mechanism for seeking an extension of up to five years beyond the 2025 Serious attainment deadline. However, EPA's recent inaction on the extension request for the 1997 $PM_{2.5}$ standard sets a hurdle that is not achievable for seeking an extension. Furthermore, attaining the standard by 2030 is highly unlikely even if EPA granted a five-year extension.

Under the antiquated provisions of the Clean Air Act, even though the District is already classified as Serious for the less stringent 1997 and 2006 $PM_{2.5}$ standards, the District must still submit another attainment plan including a request to EPA to be classified as Serious for the more stringent 2012 $PM_{2.5}$ Standard. Furthermore, even though attainment is not possible under

a Moderate area classification, the Clean Air Act requires two plans to be submitted, one for a Moderate classification and another for a Serious classification for the same standard."[30]

Rules and Regulations

The following SJVAPCD rules and regulations that may apply to projects that will occur during buildout of the planning area include but are not limited to the following:[31]

Rule 4002 – National Emissions Standards for Hazardous Air Pollutants. The purpose of the rule is to incorporate the National Emission Standards for Hazardous Air Pollutants from Part 61, Chapter I, Subchapter C, Title 40, Code of Federal Regulations and the National Emission Standards for Hazardous Air Pollutants for Source Categories from Part 63, Chapter I, Subchapter C, Title 40, Code of Federal Regulations to protect the health and safety of the public from HAPs, such as asbestos.

Rule 4102 – Nuisance. The purpose of this rule is to protect the health and safety of the public, and applies to any source operation that emits or may emit air contaminants or other materials.

Rule 4601 – Architectural Coatings. The purpose of this rule is to limit Volatile Organic Compounds (VOC) emissions from architectural coatings. Emissions are reduced by limits on VOC content of the various coatings and by requirements on coatings storage, cleanup, and labeling.

Rule 4641 – Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations. The purpose of this rule is to limit VOC emissions from asphalt paving and maintenance operations. If asphalt paving will be used, then the paving operations will be subject to Rule 4641.

Rule 4901 – Wood Burning Fireplaces and Wood Burning Heaters. The purpose of this rule is to limit emissions of carbon monoxide and particulate matter from wood burning fireplaces, wood burning heaters, and outdoor wood burning devices, and to establish a public education program to reduce wood burning emissions. All development that includes woodburning devices are subject to this rule.

Regulation VIII – Fugitive PM10 Prohibitions. Rules 8011-8081 are designed to reduce PM10 emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and trackout, etc. All development projects that involve soil disturbance are subject to at least one provision of the Regulation VIII series of rules.

[30] San Joaquin Valley Air Pollution Control District. 2016 Moderate Area Plan for the 2012 PM2.5 Standard. September 15, 2016. Page ES-1-2. http://www.valleyair.org/Air_Quality_Plans/docs/PM25-2016/es.pdf. Accessed January 2017.
[31] San Joaquin Valley Air Pollution Control District. 2015d. Current District Rules and Regulations. Website: http://www.valleyair.org/rules/1ruleslist.htm. Accessed January 2017.

Rule 9510 – Indirect Source Review. This rule reduces the impact of NO_x and PM_{10} emissions from growth on the Air Basin. The rule places application and emission reduction requirements on development projects meeting applicability criteria in order to reduce emissions through on-site mitigation, off-site Air District-administered projects, or a combination of the two. The project is subject to Rule 9510 as it proposes the construction of more than 50 dwelling units.

Role in CEQA

As a public agency, the Air District takes an active part in the intergovernmental review process under CEQA. In carrying out its duties under CEQA, the Air District may act as a Lead Agency, a Responsible Agency, or a Trustee/Commenting Agency depending on the approvals required by the District and other land use agencies.

"The District is always the Lead Agency for projects such as the development of District rules and regulations. The District may be Lead Agency for projects subject to District permit requirements. As discussed above, for projects triggering BACT, the District has discretionary approval in deciding how to permit the project. For projects subject to BACT, the District serves as Lead Agency when no other agency has principal responsibility for approving the project."[32]

"As a Responsible Agency, the District assists Lead Agencies by providing technical expertise in characterizing project-related impacts on air quality and is available to provide technical assistance in addressing air quality issues in environmental documents. When commenting on a Lead Agency's environmental analysis, the District reviews the air quality section of the analysis and other sections relevant to assessing potential impacts on air quality, i.e. sections assessing public health impacts. At the conclusion of its review the District may submit to the Lead Agency comments regarding the project air quality analysis. Where appropriate, the District will recommend feasible mitigation measures."[33]

"As a Trustee Agency, the District assists Lead Agencies by providing technical expertise or tools in characterizing project-related impacts on air quality and identifying potential mitigation measures, and is available to provide technical assistance in addressing air quality issues in environmental documents. At the conclusion of its review the District may submit to the Lead Agency comments regarding the project air quality analysis. Where appropriate, the District will recommend feasible mitigation measures. The process is subject to change due to the District's continuous improvements efforts."[34]

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[32] San Joaquin Valley Air Pollution Control District. *Guidance for Assessing and Mitigating Air Quality Impacts.* Page 50. Website: http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Accessed January 2017.

[33] Ibid. Page 51.

[34] San Joaquin Valley Air Pollution Control District. *Guidance for Assessing and Mitigating Air Quality Impacts.* Page52. Website: http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf. Accessed January 2017.

As mentioned above, the Air District provides technical expertise and tools in characterizing project-related impacts. As this Project is a development plan to guide the growth of the community, it has no specific development project associated with it. As such, as new developments are identified, the County will work with the SJVAPCD through the CEQA process to identify and mitigate, if necessary, any potential adverse impacts to air quality.

Tulare County

The County of Tulare General Plan was updated in 2012 and contains general provisions for air quality under various General Plan Elements, including the following policies and implementation measures listed below:[35]

AQ-1.1 – Cooperation with Other Agencies. The County shall cooperate with other local, regional, Federal, and State agencies in developing and implementing air quality plans to achieve State and Federal Ambient Air Quality Standards. The County shall partner with the SJVAPCD, Tulare County Association of Governments (TCAG), and the California Air Resources Board to achieve better air quality conditions locally and regionally.

AQ-1.2 – Cooperation with Local Jurisdictions. The County shall participate with cities, surrounding counties, and regional agencies to address cross-jurisdictional transportation and air quality issues.

AQ-1.3 – Cumulative Air Quality Impacts. The County shall require development to be located, designed, and constructed in a manner that would minimize cumulative air quality impacts. Applicants shall be required to proposed alternatives as part of the State CEQA process that reduce air emissions and enhance, rather than harm, the environment.

AQ-1.4 – Air Quality Land Use Compatibility. The County shall evaluate the compatibility of the industrial or other developments which are likely to cause undesirable air pollution with regard to proximity to sensitive land uses, and wind direction and circulation in an effort to alleviate effects upon sensitive receptors.

AQ-1.5 – California Environmental Quality Act (CEQA) Compliance. The County shall ensure that air quality impacts identified during the CEQA review process are consistently and reasonably mitigated when feasible.

AQ-2.1 – Transportation Demand Management Programs. The County shall coordinate and provide support for County Transportation Demand Management programs with other public and private agencies, including programs developed by the TCAG and the SJVAPCD.

[35] Tulare County. 2012. *Tulare County 2030 General Plan Update.*

AQ-2.2 – Indirect Source Review. The County shall require major development projects, as defined by the SJVAPCD, to reasonably mitigate air quality impacts associated with the project. The County shall notify developers of SJVAPCD Rule 9510 – Indirect Source Review requirements and work with SJVAPCD to determine mitigations, as feasible, that may include, but are not limited to the following:

1. Providing bicycle access and parking facilities,
2. Increasing density,
3. Encouraging mixed use developments,
4. Providing walkable and pedestrian-oriented neighborhoods,
5. Providing increased access to public transportation,
6. Providing preferential parking for high-occupancy vehicles, car pools, or alternative fuels vehicles, and
7. Establishing telecommuting programs or satellite work centers.

AQ-2.3 – Transportation and Air Quality. When developing the regional transportation system, the County shall work with TCAG to comprehensively study methods of transportation which may contribute to a reduction in air pollution in Tulare County. Some possible alternatives that should be studied are:

1. Commuter trains (Light Rail, Amtrak, or High Speed Rail) connecting with Sacramento, Los Angeles, and San Francisco, with attractive services scheduled up and down the Valley,
2. Public transportation such as buses and light rail, to serve between communities of the Valley, publicly subsidized if feasible,
3. Intermodal public transit such as buses provided with bicycle racks, bicycle parking at bus stations, bus service to train stations and airports, and park and ride facilities, and
4. Community transportation systems supportive of alternative transportation modes, such as cycling or walking trails, with particular attention to high-density areas.

AQ-2.4 – Transportation Management Associations. The County shall encourage commercial, retail, and residential developments to participate in or create Transportation Management Associations (TMAs) that may assist in the reduction of pollutants through strategies that support carpooling or other alternative transportation modes.

AQ-2.5 – Ridesharing. The County shall continue to encourage ridesharing programs such as employer-based rideshare programs.

AQ-3.1 – Location of Support Services. The County shall encourage the location of ancillary employee services (including, but not limited to, child care, restaurants, banking facilities,

convenience markets) near major employment centers for the purpose of reducing midday vehicle trips.

AQ-3.2 – Infill Near Employment. The County shall identify opportunities for infill development projects near employment areas within all unincorporated communities and hamlets to reduce vehicle trips.

AQ-3.3 – Street Design. The County shall promote street design that provides an environment which encourages transit use, biking, and pedestrian movements.

AQ-3.4 – Landscape. The County shall encourage the use of ecologically based landscape design principles that can improve local air quality by absorbing CO_2, producing oxygen, providing shade that reduces energy required for cooling, and filtering particulates. These principles include, but are not limited to, the incorporation of parks, landscaped medians, and landscaping within development.

AQ-3.5 – Alternative Energy Design. The County shall encourage all new development, including rehabilitation, renovation, and redevelopment, to incorporate energy conservation and green building practices to maximum extent feasible. Such practices include, but are not limited to: building orientation and shading, landscaping, and the use of active and passive solar heating and water systems.

AQ-4.1 – Air Pollution Control Technology. The County shall utilize the BACM and RACM as adopted by the County to support SJVAPCD air quality attainment plans to achieve and maintain healthful air quality and high visibility standards. These measures shall be applied to new development approvals and permit modifications as appropriate.

AQ-4.2 – Dust Suppression Measures. The County shall require developers to implement dust suppression measures during excavation, grading, and site preparation activities consistent with SJVAPCD Regulation VIII – Fugitive Dust Prohibitions. Techniques may include, but are not limited to, the following:

1. Site watering or application of dust suppressants,
2. Phasing or extension of grading operations,
3. Covering of stockpiles,
4. Suspension of grading activities during high wind periods (typically winds greater than 25 miles per hour), and
5. Re-vegetation of graded areas.

AQ-4.3 – Paving or Treatment of Roadways for Reduced Air Emissions. The County shall require that all new roads be paved or treated to reduce dust generation where feasible as required by SJVAPCD Regulation VIII, Rule 8061- Paved and Unpaved Roads. For new projects

with unpaved roads, funding for roadway maintenance shall be adequately addressed and secured.

AQ-4.4 – Wood Burning Devices. The County shall require the use of natural gas where service is available or the installation of low-emission, EPA-certified fireplace inserts in all open hearth fireplaces in new homes as required under the SJVAPCD Rule 4901 – Woodburning Fireplaces and Woodburning Heaters. The County shall promote the use of natural gas over wood products in space heating devices and fireplaces in all existing and new homes.

AQ-4.5 – Public Awareness. The County shall promote public awareness of the seriousness and extent of the existing air quality problems.

AQ-4.6 – Asbestos Airborne Toxic Control and Dust Protection. Asbestos is of concern to Tulare County because it occurs naturally in surface deposits of several types of ultramafic materials (materials that contain magnesium and iron and a very small amount of silica). Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining.

LU-1.1 – Smart Growth and Healthy Communities. The County shall promote the principles of smart growth and healthy communities in UDBs and HDBs, including: 1) creating walkable neighborhoods; 2) providing a mix of residential densities; 3) creating a strong sense of place; 4)mixing land uses; 5) directing growth toward existing communities; 6) building compactly; 7) discouraging sprawl; 8) encouraging infill; 9) preserving open space; 10) creating a range of housing opportunities and choices; 11) utilizing planned community zoning to provide for the orderly pre-planning and long term development of large tracks of land which may contain a variety of land uses, but are under unified ownership or development control; and 12) encouraging connectivity between new and existing development.

LU-1.4 – Compact Development. The County shall actively support the development of compact mixed use projects that reduce travel distances.

LU-1.8 – Encourage Infill Development. The County shall encourage and provide incentives for infill development in order to maximize the use of land within existing urban areas, minimize the conversion of existing agricultural land, and minimize environmental concerns associated with new development.

LU-3.2 – Cluster Development. The County shall encourage proposed residential development to be clustered onto portions of the site that are more suitable to accommodating the development, and shall require access either directly onto a public road or via a privately- maintained road designed to meet County road standards.

LU-3.3 – High-Density Residential Locations. The County shall encourage high-density residential development (greater than 14 dwelling units per gross acre) to locate along

collector roadways and transit routes, and near public facilities (e.g., schools, parks), shopping, recreation, and entertainment.

TC-5.1 – Bicycle/Pedestrian Trail System. The County shall coordinate with TCAG and other agencies to develop a Countywide integrated multi-purpose trail system that provides a linked network with access to recreational, cultural, and employment facilities, as well as offering a recreational experience apart from that available at neighborhood and community parks.

TC-5.2 – Consider Non-Motorized Modes in Planning and Development. The County shall consider incorporating facilities for non-motorized users, such as bike routes, sidewalks, and trails when constructing or improving transportation facilities and when reviewing new development proposals. For developments with 50 or more dwelling units or non-residential projects with an equivalent travel demand, the feasibility of such facilities shall be evaluated

Existing Air Quality Conditions

Ambient Air Quality Standards and Attainment Status

Air quality within the county is regulated by the SJVAPCD under both federal and state Clean Air Acts. CARB is required to designate areas of the state as attainment, nonattainment, or unclassified for any state standard. An "attainment" designation for an area signifies that pollutant concentrations do not violate the standard for the pollutant in that area. A "nonattainment" designation indicates that a pollutant concentration violated the standard at least once.

The EPA designates areas for ozone (O_3), carbon monoxide (CO), and nitrogen dioxide (NO_2) as either 'Does not meet the primary standards,' 'Cannot be classified,' or 'Better than national standards.

The current attainment designations for the Air Basin are shown in Table 3.

Table 3: San Joaquin Valley Air Basin Attainment Status[36]

Pollutant	*Designation*	
	National	**State**
Ozone—1-hour	No Federal Standard	*Nonattainment/Severe*
Ozone—8-hour	Nonattainment/Extreme	*Nonattainment*

[36] San Joaquin Valley Unified Air Pollution Control District, Ambient Air Quality Standards & Valley Attainment Status. http://www.valleyair.org/aqinfo/attainment.htm. Accessed July 2017.

Table 3: San Joaquin Valley Air Basin Attainment Status[36]		
PM_{10}	Attainment	*Nonattainment*
$PM_{2.5}$	Nonattainment	*Nonattainment*
Carbon monoxide	Attainment/Unclassified	*Attainment/Unclassified*
Nitrogen dioxide	Attainment/Unclassified	*Attainment*
Sulfur dioxide	Attainment/Unclassified	*Attainment*
Lead	No Designation/Classification	*Attainment*
Hydrogen sulfide	No Federal Standard	*Unclassified*
Sulfates	No Federal Standard	*Attainment*
Visibility-reducing particles	No Federal Standard	*Unclassified*
Vinyl chloride	No Federal Standard	*Attainment*

Criteria Pollutant Health Effects

Federal and state AAQS are established to protect the public from adverse impacts resulting from exposure to criteria pollutant emissions. Table 4 provides the health and atmospheric effects of each criteria pollutant, as well as the most common sources of each.

Table 4: Air Pollutant Effects and Sources[37,38,39,40,41]		
Pollutant	**Health and Atmospheric Effects**	**Major Pollutant Sources**
Ozone (O_3)	(a) Decrease of pulmonary function and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage	Formed when reactive organic gases (ROG) and nitrogen oxides (NO_x) react in the presence of sunlight. Major sources include on-road motor vehicles and any sources that burn fuels, (e.g., gasoline, natural gas, wood, oil), solvent evaporation, petroleum processing and storage, pesticides, and commercial/industrial mobile equipment.

[37] California Air Resources Board. 2009. ARB Fact Sheet: Air Pollution Sources, Effects and Control. http://www.arb.ca.gov/research/health/fs/fs2/fs2.htm. Accessed November 2017.

[38] California Air Resources Board. 2009. Vinyl Chloride. www.arb.ca.gov/research/aaqs/caaqs/vc/vc.htm. Accessed November 2017.

[39] United States Environmental Protection Agency. 2009. *Ozone and Your Health*. EPA- 456/F-09-001. http://www.epa.gov/airnow/ozone-c.pdf. Accessed November 2017.

[40] United States Environmental Protection Agency. 2011. Indoor Air Quality, An Introduction to Indoor Air Quality (IAQ), Volatile Organic Compounds (VOCs). www.epa.gov/iaq/voc.html. Accessed November 2017.

[41] United States Department of Health and Human Services, National Toxicology Program. 2014. Public Health Service. 13th Report on Carcinogens (RoC). http://ntp.niehs.nih.gov/ntp/roc/content/listed_substances_508.pdf. Accessed November 2017.

Table 4: Air Pollutant Effects and Sources[37,38,39,40,41]		
Respirable Particulate Matter (PM_{10})	a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in the elderly. Daily fluctuations in $PM_{2.5}$ levels have been related to hospital admissions for acute respiratory conditions, school absences, and increased medication use in children and adults with asthma.	Dust and fume-producing industrial and agricultural operations, combustion of any fuel (including fireplaces), atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
Fine Particulate Matter ($PM_{2.5}$)		Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_x, sulfur oxides, and organics.
Carbon Monoxide (CO)	a) Aggravation of angina pectoris (chest pain) and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses.	Internal combustion engines, primarily gasoline-powered motor vehicles, and any source that burns fuel such as heavy construction equipment, farming equipment and residential heating.
Nitrogen Dioxide (NO_2)	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration - Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads. See also Carbon Monoxide
Sulfur Dioxide (SO_2)	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient sulfur dioxide levels. It is not clear whether the two pollutants act synergistically, or one pollutant alone is the predominant factor.	Fuel combustion, coal or oil burning power plants and industries, oil refineries, chemical plants, sulfur recovery plants, and metal processing.
Lead	Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction. The more serious effects of lead poisoning include behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQs. Lead may also contribute to high blood pressure and heart disease.	Present source: metal smelters, battery manufacturing & recycling facilities; deterioration of lead paint. Past source: combustion of leaded gasoline.
Hydrogen Sulfide (H_2S)	High levels of hydrogen sulfide can cause immediate respiratory arrest. It can irritate the eyes and respiratory tract and cause headache, nausea, vomiting, and cough. Long exposure can cause pulmonary edema.	Geothermal Power Plants, Petroleum Production and refining

Table 4: Air Pollutant Effects and Sources[37,38,39,40,41]		
Sulfates	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage.	Produced by the reaction in the air of SO_2.
Visibility Reducing Particles	Reduces visibility, reduced airport safety, lower real estate value, and discourages tourism.	See $PM_{2.5}$.
Vinyl Chloride	Short-term exposure to high levels of vinyl chloride in the air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Long-term exposure through inhalation and oral exposure has resulted in liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation, as vinyl chloride exposure has been shown to increase the risk of a rare form of liver cancer in humans.	Vinyl Chloride

Toxic Air Contaminant Health Effects

A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

The California Almanac of Emissions and Air Quality presents the relevant concentration and cancer risk data for the ten TACs that pose the most substantial health risk in California based on available data. The ten TACs are acetaldehyde, benzene, 1.3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloro-ethylene, and diesel particulate matter (DPM).[42]

Some studies indicate that DPM poses the greatest health risk among the TACs listed above. A 10-year research program demonstrated that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic health risk.[43] DPM emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk.[44] In addition to increasing the risk of lung cancer, exposure to diesel exhaust can have other health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. Diesel exhaust is a major source of fine

[42] California Air Resources Board. 2009. ARB Fact Sheet: Air Pollution Sources, Effects and Control. http://www.arb.ca.gov/research/health/fs/fs2/fs2.htm. Accessed November 2017.
[43] California Air Resources Board. 1998. *The Toxic Air Contaminant Identification Process: Toxic Air Contaminant Emissions from Diesel-fueled Engines*. www.arb.ca.gov/toxics/dieseltac/factsht1.pdf. Accessed November 2017.
[44] California Air Resources Board. 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles*. http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf. Accessed November 2017.

particulate pollution as well, and studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems.

Limited data on levels and health risks attributable to the top 10 TACs listed above are available from the ARB as part of their California Almanac of Emissions and Air Quality - 2009 Edition. As shown therein for data collected at the California Avenue air monitoring station in Bakersfield, cancer risks attributable to all of the listed TACs above with the exception of DPM have declined about 70 percent from the mid-1990s to 2007. Unfortunately, risks associated with DPM emissions are only provided for the year 2000 and have not been updated in the Almanac. The cancer risk from DPM alone was reported at 390 in a million in 2000 with a total risk from all TACs of 586 in a million.[45] According to the California Almanac of Emissions and Air Quality - 2013 Edition, overall statewide DPM emissions are forecasted to decline by 71 percent between 2000 and 2035 and in the SJVAB DPM is forecasted to decline by approximately 72 percent between 2010 and 2035.[46]

Climate Change Regulatory Setting

United States Environmental Protection Agency Greenhouse Gas Endangerment Findings

"On December 7, 2009, Administrator Lisa Jackson signed a final action, under Section 202(a) of the Clean Air Act, finding that six key well-mixed greenhouse gases constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to the climate change problem."[47]

"The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases — carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) — in the atmosphere threaten the public health and welfare of current and future generations."[48]

[45] Ibid. Appendix C.
[46] California Air Resourced Board. 2013b. *The California Almanac of Emissions and Air Quality – 2013 Edition.* http://www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm. Accessed November 2017.
[47] United States Environmental Protection Agency. Climate Change. Climate Change Regulatory Initiatives. https://www.epa.gov/climatechange/climate-change-regulatory-initiatives. Accessed December 2016.
[48] United States Environmental Protection Agency. Climate Change. Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Section 202(a) of the Clean Air Act. https://www.epa.gov/climatechange/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a. Accessed January 2017.

State Agencies

California Clean Air Act

"The California CAA of 1988 establishes an air quality management process that generally parallels the federal process. The California CAA, however, focuses on attainment of the State ambient air quality standards,… which, for certain pollutants and averaging periods, are more stringent than the comparable federal standards. Responsibility for meeting California's standards is addressed by the CARB and local air pollution control districts (such as the eight county SJVAPCD, which administers air quality regulations for Tulare County). Compliance strategies are presented in district-level air quality attainment plans."[49]

California Air Resources Board

"The Air Resources Board (ARB or Board) has established State ambient air quality standards (State standards) to identify outdoor pollutant levels considered safe for the public. After State standards are established, State law requires ARB to designate each area as attainment, nonattainment, or unclassified for each State standard. The area designations, which are based on the most recent available data, indicate the healthfulness of air quality throughout the State."[50]

"On April 26, 1996, the Board approved the "Carbon Monoxide Redesignation Request and Maintenance Plan for Ten Federal Planning Areas" as part of the State Implementation Plan (SIP) for Carbon Monoxide. U.S. EPA approved this revision on June 1, 1998 and redesignated the ten areas to attainment. On October 22, 1998, ARB revised the SIP to incorporate the effects of the recent Board action to remove the wintertime oxygen requirement for gasoline in certain areas. On July 22, 2004, ARB approved an update to the SIP that shows how the ten areas will maintain the standard through 2018, revises emission estimates, and establishes new on-road motor vehicle emission budgets for transportation conformity purposes."[51]

Executive Order S-3-05

"Executive Order S-3-05 was signed by Governor Schwarzenegger on June 1, 2005. This executive order established [GHG] emission reduction targets for California. Specifically, the executive order established the following targets:

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.

[49] Tulare County 2030 General Plan RDEIR, pages 3.3-2 to 3.3-3

[50] California Environmental Protection Agency. Air Resources Board. Air Quality Standards and Area Designations. https://www.arb.ca.gov/desig/desig.htm. Accessed December 2016.

[51] California Environmental Protection Agency. Air Resources Board. California State Implementation Plan (SIP) for Carbon Monoxide. https://www.arb.ca.gov/planning/sip/co/co.htm. Accessed December 2016.

- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The executive order additionally ordered that the Secretary of the California Environmental Protection Agency (Cal EPA) would coordinate oversight of the efforts among state agencies made to meet the targets and report to the Governor and the State Legislature biannually on progress made toward meeting the GHG emission targets. Cal EPA was also directed to report biannually on the impacts to California of global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry, and prepare and report on mitigation and adaptation plans to combat these impacts.

In response to the EO [executive order], the Secretary of Cal EPA created the Climate Action Team (CAT), composed of representatives from the Air Resources Board; Business, Transportation, & Housing; Department of Food and Agriculture; Energy Commission; California Integrated Waste Management Board (CIWMB); Resources Agency; and the Public Utilities Commission (PUC). The CAT prepared a recommended list of strategies for the state to pursue to reduce climate change emission in the state…"[52]

Assembly Bill 32: California Global Warming Solutions Act of 2006

"In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.), which requires the CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020.

In December 2007, CARB approved the 2020 emission limit of 427 million metric tons of CO2 equivalents (CO_2e) of greenhouse gases.[53] The 2020 target of 427 million metric tons of CO_2e requires the reduction of 169 million metric tons of CO_2e, or approximately 30 percent, from the State's projected 2020 emissions of 596 million metric tons of CO_2e (business-as-usual).

Also in December 2007, CARB adopted mandatory reporting and verification regulations pursuant to AB 32. The regulations became effective on January 1, 2009, with the first reports covering 2008 emissions. The mandatory reporting regulations require reporting for certain types of facilities that make up the bulk of the stationary source emissions in California. Currently, the draft regulation language identifies major facilities as those that generate more than 25,000 metric tons/year of CO_2e. Cement plants, oil refineries, electric-generating facilities/providers, cogeneration facilities, and hydrogen plants and other stationary combustion sources that emit more than 25,000 metric tons/year CO_2e, make up 94 percent of the point source CO_2e emissions in California.[54]

[52] Tulare County 2030 General Plan RDEIR, pages 3.4-4 to 3.4-5
[53] California Air Resources Board. 2007. Staff Report. California 1990 Greenhouse Gas Level and 2020 Emissions Limit. November 16, 2007. http://www.arb.ca.gov/cc/inventory/pubs/reports/staff_report_1990_level.pdf. Accessed December 2017. Page 2.
[54] Ibid. Page 12.

In June, 2008, CARB published its *Climate Change Draft Scoping Plan*.[55] The *Climate Change Draft Scoping Plan* reported that CARB met the first milestones set by AB 32 in 2007: developing a list of early actions to begin sharply reducing greenhouse gas emissions; assembling an inventory of historic emissions; and establishing the 2020 emissions limit. After consideration of public comment and further analysis, CARB adopted the *Climate Change Scoping Plan* (Scoping Plan) in December, 2008.[56] The Scoping Plan proposes a set of actions designed to reduce overall carbon emissions in California. Key elements of the Scoping Plan include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a Statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long- term commitment to AB 32 implementation.[57]

The *Scoping Plan* notes that "[a]fter Board approval of this plan, the measures in it will be developed and adopted through the normal rulemaking process, with public input".[58]

The *Scoping Plan* states that local governments are "essential partners" in the effort to reduce greenhouse gas emissions, and that they have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to greenhouse gas emissions. Local governments may contribute to significant direct and indirect greenhouse gas emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce greenhouse gas emissions rely on local government actions. The plan encourages local governments to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020.[59]

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[55] California Air Resources Board. 2008. (includes edits made in 2009) Climate Change Scoping Plan, a framework for change. http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm. Accessed December 2017. Page ES-1.
[56] Ibid.
[57] Ibid. Page ES-3, ES-4
[58] Ibid. Page ES-4
[59] Ibid. Pages 26-27

The *Scoping Plan* also included recommended measures that were developed to reduce greenhouse gas emissions from key sources and activities while improving public health, promoting a cleaner environment, preserving our natural resources, and ensuring that the impacts of the reductions are equitable and do not disproportionately impact low-income and minority communities. These measures,… also put the State on a path to meet the long-term 2050 goal of reducing California's greenhouse gas emissions to 80 percent below 1990 levels. These measures were presented to and approved by the CARB on December 11, 2008.

The total reduction for the recommended measures is 174 million metric tons/year of CO_2e, slightly exceeding the 169 million metric tons/year of CO_2e of reductions estimated to be needed in the *Scoping Plan*. The measures in the Scoping Plan approved by the Board will be developed over the next two years and be in place by 2012.

The First Update to the Scoping Plan was approved by the Board on May 22, 2014, and builds upon the initial Scoping Plan with new strategies and recommendations. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defines ARB's climate change priorities for the next five years, and also sets the groundwork to reach long-term goals set forth in Executive Orders S-3-05 and B-16-2012. The Update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the initial Scoping Plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use." [60]

"In 2016, the Legislature passed SB 32, which codifies a 2030 GHG emissions reduction target of 40 percent below 1990 levels. With SB 32, the Legislature passed companion legislation AB 197, which provides additional direction for developing the Scoping Plan. ARB is moving forward with a second update to the Scoping Plan to reflect the 2030 target set by Executive Order B-30-15 and codified by SB 32."[61]

Senate Bill 97

Governor Schwarzenegger signed Senate Bill (SB) 97, a CEQA and greenhouse gas emission bill, into law on August 24, 2007. SB 97 requires the Governor's Office of Planning and Research (OPR) to prepare CEQA guidelines for the mitigation of GHG emissions, including, but not limited to, effects associated with transportation or energy consumption. The Resources Agency certified and adopted the guidelines on December 31, 2009 and submitted them for review by the Office of Administrative Law.

[60] California Air Resources Board. First Update to the AB 32 Scoping Plan. https://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed December 2017.
[61] California Air Resources Board. AB 32 Scoping Plan. https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm. Accessed December 2017.

Governor's Office of Planning and Research (OPR)

The OPR published a Technical Advisory in June of 2008 that is an informal guidance regarding the steps lead agencies should take to address climate change in their CEQA documents to serve in the interim until guidelines are established pursuant to SB 97. This Advisory recommends that CEQA documents include quantification of estimated GHG emissions associated with a proposed project and that a determination of significance be made. "The technical advisory points out that neither CEQA nor the CEQA Guidelines prescribe thresholds of significance or particular methodologies for performing an impact analysis. "This is left to lead agency judgment and discretion, based upon factual data and guidance from regulatory agencies and other sources where available and applicable" (OPR, page 4, 2008). OPR recommends that "the global nature of climate change warrants investigation of a Statewide threshold of significance for GHG emissions" (OPR, page 4, 2008). Until such a standard is established, OPR advises that each lead agency should develop its own approach to performing an analysis for projects that generate greenhouse gas emissions (OPR, page 5, 2008)."[62]

California Attorney General

The Attorney General prepared a variety of mitigation measures to address climate change, one of the most serious environmental effects affecting the State of California.[63] This list that was provided was not intended to be an exhaustive list and not all mitigation measures would apply to all projects. The following mitigation measures would apply to the proposed Project.

- Incorporate green building practice and design elements.
- Meet recognized green building and energy efficiency benchmarks
- Install energy efficient lighting (e.g. light emitting diodes, (LEDs)), heating and cooling systems, appliances, equipment, and control systems.
- Use passive solar design, e.g., orient buildings and incorporate landscaping to maximize passive solar heating during cool seasons, minimize solar heat gain during hot seasons, and enhance natural ventilation. Design buildings to take advantage of sunlight.
- Install light colored "cool" roofs and cool pavements.
- Install efficient lighting, (including LEDs) for traffic, street and other outdoor lighting.
- Meet "reach" goals for building energy efficiency and renewable energy use.
- Install solar, wind, and geothermal power systems and solar hot water heaters.

[62] Op. Cit. Pages 3.4-9 to 3.4-10

[63] California Governor's Office of Planning and Research. Technical Advisory. June 19, 2008. CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review. Pages 18-20. https://www.opr.ca.gov/docs/june08-ceqa.pdf. Accessed January 2017.

- Install solar panels on unused roof and ground space and over carports and parking areas.
- Include energy storage where appropriate to optimize renewable energy generation systems and avoid peak energy use.
- Incorporate water-reducing features into building and landscape design.
- Make effective use of graywater. (Graywater is untreated household waste water from bathtubs, showers, bathroom wash basins, and water from clothes washing machines. Graywater to be used for landscape irrigation.)
- Implement low-impact development practices that maintain the existing hydrology of the site to manage storm water and protect the environment.
- Devise a comprehensive water conservation strategy appropriate for the project and location.
- Design buildings to be water-efficient. Install water-efficient fixtures and appliances.
- Reuse and recycle construction and demolition waste (including, but not limited to, soil, vegetation, and concrete, lumber, metal, and cardboard). Integrate reuse and recycling into residential industrial, institutional and commercial projects.
- Provide easy and convenient recycling opportunities for residents, the public, and tenant businesses.
- Incorporate public transit into the project's design.
- Include pedestrian and bicycle facilities within projects and ensure that existing non- motorized routes are maintained and enhanced.
- Incorporate bicycle lanes, routes and facilities into street systems, new subdivisions, and large developments.
- Require amenities for non-motorized transportation, such as secure and convenient bicycle parking.
- Meet an identified transportation-related benchmark.
- Adopt a comprehensive parking policy that discourages private vehicle use and encourages the use of alternative transportation.
- Build or fund a major transit stop within or near the development.
- Ensure that the project enhances, and does not disrupt or create barriers to, non-motorized transportation.
- Create a ride sharing program. Promote existing ride sharing programs e.g., by designating a certain percentage of parking spaces for ride sharing vehicles, designating adequate passenger loading and unloading for ride sharing vehicles, and providing a web site or message board for coordinating rides.

- Create or accommodate car sharing programs, e.g., provide parking spaces for car share vehicles at convenient locations accessible by public transportation.
- Provide a vanpool for employees.
- Create local "light vehicle" networks, such as neighborhood electric vehicle systems.
- Enforce and follow limits idling time for commercial vehicles, including delivery and construction vehicles.
- Provide the necessary facilities and infrastructure to encourage the use of low or zero- emission vehicles.

Regional Agencies

San Joaquin Valley Air Pollution Control District

The San Joaquin Valley Air District has jurisdiction over eight counties in California's Central Valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare and the San Joaquin Valley Air Basin portion of Kern. The Air District "is a public health agency whose mission is to improve the health and quality of life for all Valley residents through efficient, effective and entrepreneurial air quality- management strategies."[64]

"On December 17, 2009, the San Joaquin Valley Air Pollution Control District (District) adopted the guidance: Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA and the policy: District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency. The guidance and policy rely on the use of performance based standards, otherwise known as Best Performance Standards (BPS), to assess significance of project specific greenhouse gas emissions on global climate change during the environmental review process, as required by CEQA.

Use of BPS is a method of streamlining the CEQA process of determining significance and is not a required emission reduction measure. Projects implementing BPS would be determined to have a less than cumulatively significant impact. Otherwise, demonstration of a 29 percent reduction in GHG emissions, from business-as-usual, is required to determine that a project would have a less than cumulatively significant impact. The guidance does not limit a lead agency's authority in establishing its own process and guidance for determining significance of project related impacts on global climate change."[65]

Local Agencies

[64] San Joaquin Valley Air Pollution Control District. About The District. http://www.valleyair.org/General_info/aboutdist.htm#Mission. Accessed January 2017.

[65] San Joaquin Valley Air Pollution Control District. Climate Change Action Plan. http://www.valleyair.org/Programs/CCAP/CCAP_menu.htm. Accessed January 2017.

Tulare County General Plan Policies

The Tulare County 2030 General Plan Update contains a number of policies that apply to projects within the County of Tulare. A summary of the General Plan policies that are most pertinent to the proposed Project are identified below. For a full list of General Plan policies that address GHG impacts, see Impact 7 of this report.

AQ-1.7 Support Statewide Climate Change Solutions - The County shall monitor and support the efforts of Cal/EPA, CARB, and the SJVAPCD, under AB 32 (Health and Safety Code §38501 et seq.), to develop a recommended list of emission reduction strategies. As appropriate, the County will evaluate each new project under the updated General Plan to determine its consistency with the emission reduction strategies.

AQ-1.8 Greenhouse Gas Emissions Reduction Plan/Climate Action Plan - The County will develop a Greenhouse Gas Emissions Reduction Plan (Plan) that identifies greenhouse gas emissions within the County as well as ways to reduce those emissions. The Plan will incorporate the requirements adopted by the California Air Resources Board specific to this issue. In addition, the County will work with the Tulare County Association of Governments and other applicable agencies to include the following key items in the regional planning efforts.

1. Inventory all known, or reasonably discoverable, sources of greenhouse gases in the County,
2. Inventory the greenhouse gas emissions in the most current year available, and those projected for year 2020, and
3. Set a target for the reduction of emissions attributable to the County's discretionary land use decisions and its own internal government operations.

AQ-1.9 Support Off-Site Measures to Reduce Greenhouse Gas Emissions - The County will support and encourage the use of off-site measures or the purchase of carbon offsets to reduce greenhouse gas emissions.

AQ-3.5 Alternative Energy Design - The County shall encourage all new development, including rehabilitation, renovation, and redevelopment, to incorporate energy conservation and green building practices to maximum extent feasible. Such practices include, but are not limited to: building orientation and shading, landscaping, and the use of active and passive solar heating and water systems.

LU-1.1 Smart Growth and Healthy Communities - The County shall promote the principles of smart growth and healthy communities in UDBs and HDBs, including:

1. Creating a strong sense of place,
2. Mixing land uses, and
3. Preserving open space.

Tulare County Climate Action Plan

"The Tulare County Climate Action Plan (CAP) serves as a guiding document for County of Tulare ("County") actions to reduce greenhouse gas emissions and adapt to the potential effects of climate change. The CAP is an implementation measure of the 2030 General Plan Update. The General Plan provides the supporting framework for development in the County to produce fewer greenhouse gas emissions during Plan buildout. The CAP builds on the General Plan's framework with more specific actions that will be applied to achieve emission reduction targets consistent with California legislation."[66]

The following provides a summary of CAP actions:

- "Identifies sources of greenhouse gas emissions caused by activities within the unincorporated areas of Tulare County and estimates how these emissions may change over time.
- Establishes a reduction target of reducing Tulare County's greenhouse gas emissions to demonstrate consistent with AB 32 (2006) and CARB Scoping Plan targets. This requires a reduction of 6 percent on average from new development in excess of those achieved from adopted regulations.
- Provides energy use, transportation, land use, water conservation, and solid waste strategies to bring Tulare County's greenhouse gas emissions levels to the reduction target.
- Mitigates the impacts of Tulare County activities on climate change (by reducing greenhouse gas emissions consistent with the direction of the State of California via AB 32, Governor's Order S-03-05, and the 2009 amendments to the CEQA Guidelines to comply with SB 97 (2008). The CEQA Guidelines encourage the adoption of policies or programs as a means of addressing comprehensively the cumulative impacts of projects. (See CEQA Guidelines, Sections 15064(h)(3), 15130(c).)
- Allows the greenhouse gas emissions inventory and CAP to be updated every five years and to respond to changes in science, effectiveness of emission reduction measures and federal, state, regional, or local policies to further strengthen the County's response to the challenges of climate change.
- Provides substantial evidence that the emission reductions estimated in the CAP are feasible.
- Serves as the threshold of significance within the County of Tulare for climate change impacts, by which all applicable developments within the County will be reviewed.
- Proposed development projects that are consistent with the emission reduction and adaptation measures included in the CAP and the programs that are developed as a

[66] Tulare County Climate Action Plan. Prepared by Michael Brandman Associates. February 25, 2010. Page 1. http://generalplan.co.tulare.ca.us/documents/GeneralPlan2010/ClimateActionPlan.pdf. Accessed January 2017.

result of the CAP, would be considered to have a less than significant cumulative impact on climate change and emissions consistent with CEQA Guidelines 15064(h)(3) as amended to comply with SB 97."[67]

City of Kingsburg

There are no adopted policies within the City of Kingsburg addressing Greenhouse Gas Emissions or Climate Change.

[67] Tulare County Climate Action Plan. Prepared by Michael Brandman Associates. February 25, 2010. Page 5. http://generalplan.co.tulare.ca.us/documents/GeneralPlan2010/ClimateActionPlan.pdf. Accessed January 2017.

CHAPTER FOUR – Methods and Thresholds

Air Quality and Greenhouse Gas Modeling Guidance

The emissions model applied in this assessment was the California Emissions Estimator Model (CalEEMod) version 2016.3.1. The South Coast Air Quality Management District (SCAQMD) in cooperation with other air districts throughout the state developed the CalEEMod model. CalEEMod is designed as a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas emissions associated with construction and operation from a variety of land uses. CalEEMod incorporates emission factors from ARB's EMFAC and OFFROAD emission models. Most importantly, the Air District uses CalEEMod when reviewing or preparing air impact assessments in compliance with provisions of District Rule 9510 (Indirect Source Review), California Environmental Quality Act (CEQA), and National Environmental Policy Act (NEPA), within the San Joaquin Valley air basins.[68] Therefore, CalEEMod was used to calculate both construction and operational related emissions in this analysis.

Construction Assumptions

CalEEMod includes default modeling assumptions for the type and quantity of equipment used during construction along with estimates of hours of operation and length of construction for each building phase; however, the applicant provided the anticipated construction schedule.

Operation Assumptions

Operational emissions are those emissions that occur once the project commences operation. Operational emissions are the result of direct and indirect emission related to the projects. The direct emissions include use of natural gas for cooking, water heating, and space heating, use of consumer products, use of architectural coatings for maintenance of structures, and operating gasoline powered landscape equipment. Indirect emissions are from motor vehicles that would travel to and from the project site and electricity usage. Motor vehicle emissions refer to exhaust and road dust emissions from automobiles, trucks, buses, motorcycles, etc. The emissions were estimated using CalEEMod and the modeling phases were broken down as follows:

- Phase I – 51 single family lots and 16 multifamily lots constructed between March 2018 – March 2019 and home occupancy beginning in September 2018.
- Phase II – 50 single family and 16 multifamily lots constructed between March 2019 –

[68] California Emissions Estimator Model, Version 2016.3.1. http://caleemod.com/. Accessed February 2017.

March 2020 and home occupancy beginning in September of 2019.

- Phase III – 49 single family lots constructed between March 2020 – March 2021 and home occupancy beginning in December of 2020.
- Phase IV – 10 single family and 8 multifamily lots constructed between March 2021 – September 2021 and home occupancy beginning in September 2021.

Default CalEEMod assumptions were used for most sources of emissions. A few changes to the default settings are described below.

Motor Vehicles - VMT

Vehicle Miles Traveled (VMT) were adjusted to be area-specific, per the California Statewide Travel Demand Model provided by Caltrans[69] while weekday trip rates were adjusted per the Traffic Study[70] prepared for this project.

Motor Vehicles - Fleet Mix

The vehicle fleet mix is defined as the mix of motor vehicle classes active during the operation of the project. Emission factors are assigned to the expected vehicle mix as a function of vehicle class, speed, and fuel use (gasoline and diesel-powered vehicles). The CalEEMod default vehicle fleet is not appropriate for the residential land uses because it overstates the number of heavy-duty truck trips. Therefore, the Air District recommended residential fleet percentages were used in the analysis, as shown below:

- Light duty automobile (LDA) – 51.5%
- Light duty truck (LTD1) – 22.5%
- Light duty truck (LTD2) – 16.4%
- Medium duty vehicle (MDV) – 6.4%
- Light heavy duty truck (LHDT1) – 0.2%
- Light heavy duty truck (LHDT2) – 0.1%
- Medium heavy duty truck (MHDT) – 0.7%
- Heavy heavy duty truck (HHDT) – 0.5%
- Other bus (OBUS) – 0.0%
- Urban bus (UBUS) – 0.1%
- Motorcycle (MCY) – 1.2%
- School bus (SBUS) – 0.1%
- Motor home (MH) – 0.7%

State Regulations

The following regulations are incorporated into the CalEEMod emission factors. While they are state-mandated, CalEEMod characterizes these reductions as 'mitigation':

[69] California Department of Transportation. SB 743 VMT Impact Assessment. http://www.dot.ca.gov/hq/tpp/offices/omsp/SB743.html. Accessed October 2017.

[70] Traffic Study for the Hash Farms Proposed Residential Development. Prepared by Ruettgers & Schuler Civil Engineers. January, 2017.

- Area Mitigation – Compliance with 2016 Title 24 including the following project design features:
    - Only Natural Gas Hearth
    - Use Electric Lawnmower, Leafblower and Chainsaw
    - Use LOW VOC Paint – Residential Interior, Residential Exterior, Non-Residential Interior, Non-Residential Exterior
- Energy Mitigation – Compliance with 2016 Title 24 including the following project design features:
    - Install High Efficiency Lighting
- Water Mitigation – Compliance with the California Green Building Standard including the following project design features:
    - Apply Water Conservation Strategy
    - Install Low Flow Bathroom Faucet
    - Install Low Flow Kitchen Faucet
    - Install Low Flow Toilet
    - Install Low Flow Shower
    - Reduction in planted Turf
    - Use Water Efficient Irrigation System
    - Use Water Efficient Landscaping
- Waste Mitigation – Compliance with CalRecycle minimum standards for solid waste handling and disposal[71]

The Criteria Pollutant and GHG analysis follows the guidance and threshold recommendations provided by the San Joaquin Valley Air Pollution Control District (District) where applicable. Protocols and procedures recommended by other agencies and organizations such as the Sacramento Metropolitan Air Quality Management District are used for impacts not specifically addressed by the District's Guide for Assessing Air Quality Impacts (GAMAQI).

Both Criteria Pollutant and Greenhouse gas emissions can be estimated by using emission factors and a level of activity. Emission factors are the emission rate of a pollutant given the activity over time, for example, grams of CO_2 per mile. The ARB has published emission factors for on-road mobile vehicles/trucks in the EMFAC mobile source emissions model and emission factors for off-road equipment and vehicles in the OFFROAD emissions model. An

[71] CalRecycle. Regulations: Title 14, Natural Resources – Division 7. Chapter 3. Minimum Standards for Solid Waste Handling and Disposal. http://www.calrecycle.ca.gov/laws/regulations/title14/ch3a4.htm. Accessed November 2017.

air emissions model (or calculator) combines the emission factors and the various levels of activity and outputs the emissions for the various pieces of equipment.

Greenhouse Gases Assessed

This analysis is restricted to greenhouse gases identified by AB 32, which include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_20), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The proposed Project would generate a variety of greenhouse gases, including several defined by AB 32 such as carbon dioxide, methane, and nitrous oxide.

The CalEEMod, version 2016.3.1 was used in this analysis. CalEEMod is designed as a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas emissions associated with construction and operation from a variety of land uses.

Greenhouse Gasses Thresholds of Significance

Section 15064.4 Determining the Significance of Impacts from Greenhouse Gas Emissions

"(a) The determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

(1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or

(2) Rely on a qualitative analysis or performance based standards.

(b) A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

(1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;

(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.

(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of

> greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.[72]"

"Projects complying with an approved GHG emission reduction plan or GHG mitigation program which avoids or substantially reduces GHG emissions within the geographic area in which the project is located would be determined to have a less than significant individual and cumulative impact for GHG emissions. Such plans or programs must be specified in law or approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the lead agency. Projects complying with an approved GHG emission reduction plan or GHG mitigation program would not be required to implement BPS."[73] Tulare County adopted a CAP (Climate Action Plan) as part of the Tulare County General Plan Update on August 28, 2012, and as such, compliance with the adopted CAP would result in less than significant greenhouse gas impacts.

Air Quality Thresholds of Significance

Consistent with Appendix G of the CEQA Guidelines, the proposed Project will have a significant impact on the environment associated with air quality if it will:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Cause a violation of any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Create objectionable odors affecting a substantial number of people.

The Air District recommends air pollution thresholds that can be used by Lead Agencies in determining whether a proposed project could result in a significant air quality and health risk impacts in responding to the Appendix G CEQA Guideline thresholds shown above. These thresholds are designed to ensure that an individual new source does not contribute to, cause a violation of an ambient air quality standard, or expose sensitive receptors to substantial levels of air pollution as an individual project or cumulatively with other current and projected projects. The values of the individual significance thresholds have been defined based on scientific research and studies by the ARB and EPA and are protective of public health. If a

[72] 2015 CEQA Guidelines, Section 15064.4

[73] San Joaquin Valley Air Pollution Control District. Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. December 17, 2009. https://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf. Accessed November 2017.

project has the potential to exceed any adopted significance threshold, then the project should be considered significant.

Criteria Pollutant Significance Thresholds

To assess potential air quality impacts, criteria pollutant significance thresholds follow two specifications: emission-based and air concentration-based. The Air District has established significance thresholds to assist Lead Agencies in determining whether a project may have a significant impact on air quality.[74] Table 5 provides the criteria pollutant significant thresholds as identified in the Air District's Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI).

The Air District has three sets of significance thresholds based on the source of the emissions. According to the GAMAQI, "The District identifies thresholds that separate a project's short-term emissions from its long-term emissions. The short-term emissions are mainly related to the construction phase of a project and are recognized to be short in duration. The long-term emissions are mainly related to the activities that will occur indefinitely as a result of project operations."[75]

Table 5: District Criteria Pollutant Significance Thresholds[76]

Pollutant/Precursor	Construction Emissions	Operational Emissions	
		Permitted Equipment and Activities	Non- Permitted Equipment and Activities
	Emissions (tpy)	Emissions (tpy)	Emissions (tpy)
CO	100	100	100
NO_x	10	10	10
ROG	10	10	10
SO_x	27	27	27
PM_{10}	15	15	15
$PM_{2.5}$	15	15	15

[74] San Joaquin Valley Air Pollution Control District. Guidance for Assessing and Mitigating Air Quality Impacts. March 19, 2015. Page 80, Table 2.
[75] Ibid. Page 75
[76] San Joaquin Valley Air Pollution Control District. Guidance for Assessing and Mitigating Air Quality Impacts. March 19, 2015. Page 80, Table 2.

Toxic Air Contaminants Thresholds[77]

The SJVAPCD's current thresholds of significance for toxic air contaminant (TAC) emissions from the operations of both permitted and non-permitted sources are combined and presented below:

- Carcinogens – Maximally exposed individual risk equals or exceeds 20 in one million
- Non-Carcinogens – Chronic: Hazard Index equals or exceeds 1 for the Maximally Exposed Individual

Odor Significance Thresholds

Odor impacts on residential areas and other sensitive receptors, such as hospitals, day-care centers, schools, etc., warrant the closest scrutiny, but consideration could also be given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas.

Two situations create a potential for odor impact. The first occurs when a new odor source is located near an existing sensitive receptor. The second occurs when a new sensitive receptor locates near an existing source of odor. The SJVAPCD has determined the common land use types that are known to produce odors in the Basin. These types are shown in Table 6.

Table 6: District Screening Levels for Potential Odor Sources[78]

Odor Generator	Distance
Wastewater Treatment Facilities	2 miles
Sanitary Landfill	1 mile
Transfer Station	1 mile
Composting Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	1 mile
Chemical Manufacturing	1 mile
Fiberglass Manufacturing	1 mile
Painting/Coating Operations (e.g., auto body shop)	1 mile

[77] San Joaquin Valley Air Pollution Control District. Air Quality Thresholds of Significance – Toxic Air Contaminants. http://www.valleyair.org/transportation/0714-GAMAQI-TACs-Thresholds-of-Significance.pdf. Accessed November 2017.
[78] San Joaquin Valley Air Pollution Control District. Guidance for Assessing and Mitigating Air Quality Impacts. March 19, 2015. Page 103.

Table 6: District Screening Levels for Potential Odor Sources[78]	
Food Processing Facility	1 mile
Feed Lot/Dairy	1 mile
Rendering Plant	1 mile

According to the District's GAMAQI, analysis of potential odor impacts should be conducted for the following two situations:[79]

- Generators - projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate, and
- Receivers - residential or other sensitive receptor projects or other projects built for the intent of attracting people locating near existing odor sources.

For a project locating near an existing source of odors, the project should be identified as having a potentially significant odor impact if it is proposed for a site that is closer to an existing odor source than any location where there have been:

- More than one confirmed complaint per year averaged over a three-year period, or
- Three unconfirmed complaints per year averaged over a three-year period.

Projects meeting these criteria would provide an odor assessment to determine if the odor issues from the facilities have been resolved or if mitigation measures are available to reduce odor impacts to future residents.

[79] Ibid. Page 102.

CHAPTER FIVE – Impact Analysis

Impact 1 – Consistency with Air Quality Plans

Would the project conflict with or obstruct implementation of the applicable air quality plan?

The CEQA Guidelines indicate that a significant impact would occur if the proposed project would conflict with or obstruct implementation of the applicable Air Quality Plan (AQP). AQPs are plans for reaching attainment of air quality standards. The assumptions, inputs, and control measures are analyzed to determine if the Air Basin can reach attainment for the ambient air quality standards. In order to show attainment of the standards, the District analyzes the growth projections in the valley, contributing factors in air pollutant emissions and formations, and existing and future emissions controls. The District then formulates a control strategy to reach attainment.

The District's GAMAQI provides the following guidance on analyzing conformity with the Air Quality Plan (AQP), "As presented in Chapter 8, the District has established threshold of significant for criteria pollutant emissions, which are based on District New Source Review (NSR) offset requirements for stationary sources. Stationary sources in the District are subject to some of the toughest regulatory requirements in the nation. Emission reductions achieved through implementation of District offset requirements are a major component of the District's air quality plans. Thus, projects with emission below the thresholds of significance for criteria pollutants would be determined to "Not conflict or obstruct implementation of the District's air quality plan."[80]

Contribution to Air Quality Violations

A measure of determining if the project is consistent with the AQPs is if the project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQPs. The SJVAB is in attainment for the federal PM_{10} standards. Because of the region's nonattainment status for ozone (state and federal standards), $PM_{2.5}$ (state and federal standards), and PM_{10} (state standards), if project-generated emissions of either of the ozone precursor pollutants (ROG and NOx), PM_{10}, or $PM_{2.5}$ would exceed the Air District's significance thresholds and were not included in the AQP's growth forecast, then the project may be considered to conflict with the AQP.

[80] San Joaquin Valley Air Pollution Control District. Guidance for Assessing and Mitigating Air Quality Impacts. March 19, 2015. Page 65.

As discussed in Impact 2 and Impact 3, criteria pollutant emissions associated with the construction and operation of the Project would neither result in CO hotspots nor exceed any of the Air District's thresholds of significance. Therefore, the Project would not result in a significant contribution to air quality violations.

Control Measures

The Air District's AQPs contains a number of control measures, which are enforceable requirements through the adoption of rules and regulations. A detailed description of rules and regulations that apply to this Project is provided in Chapter Three, Regulatory Setting above. The Project will comply with all applicable Air District rules and regulations. Therefore, the Project would not conflict with or obstruct implementation of the applicable AQPs.

Level of Significance: Less than significant impact.

Mitigation: None required.

Impact 2 – Potential for Air Quality Standard Violation

Would the project violate any air quality standards or contribute substantially to an existing or projected air quality violation?

Localized emissions from project construction and operation have been assessed using concentration-based thresholds that determine if the project would result in a localized exceedance of any ambient air quality standards or would make a cumulatively considerable contribution to an existing exceedance. The SJVAPCD's GAMAQI, adopted in 2015, contains significance thresholds for CO, NO_x, ROG, SOx, PM_{10} and $PM_{2.5}$, as seen in Table 5. The primary pollutants of concern during project construction and operation are ROG, NO_x, PM_{10}, and $PM_{2.5}$.

Construction-Related Emissions

Construction-related emissions, resulting from both on-site and off-site activities, can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. The proposed Project is estimated to start construction in March 2018, and end in September 2021. As demonstrated in Table 7, construction-related emissions are below the SJVAPCD significance thresholds and, therefore, would result in a less than significant impact. CalEEMod output files are shown in Attachment A.

Table 7: Estimated Construction Emissions								
		CO (tons/year)	**NO_x (tons/year)**	**ROG (tons/year)**	**SO_2 (tons/year)**	**PM_{10} (tons/year)**	**$PM_{2.5}$ (tons/year)**	**CO_2e (tons/year)**
Annual SJVAPCD Threshold		**100**	**10**	**10**	**27**	**15**	**15**	**--**
2018	**Phase I Construction**	2.2679	3.0958	0.3395	0.000	0.4268	0.2735	347.0288
2019	**Phase I Construction + Phase II Construction**	2.5925	3.3319	1.3787	0.000	0.4544	0.2893	406.0148
2020	**Phase II Construction + Phase III Construction**	2.5760	3.1298	1.3324	0.000	0.4170	0.2691	398.4107
2021	**Phase III + Phase IV Construction**	1.4809	1.6676	1.2510	0.000	0.2997	0.1829	246.8277
Total Construction Emissions		8.9173	11.2251	4.3001	0.0000	1.5979	1.0148	1,398.282
Additional ISR Reductions		0	2.2450	0	0	0.7191	0	0
Total after ISR		**8.9173**	**8.9801**	**4.3001**	**0.0000**	**0.8788**	**1.0148**	**1,398.282**
Exceeds Thresholds		**No**	**No**	**No**	**No**	**No**	**No**	**---**

Operational Emissions

Operational emissions occur over the lifetime of the project and are from two main sources: area sources and motor vehicle, or mobile sources. Project construction is expected to begin in March 2018, with full buildout completed in September 2021. First occupancy is expected as early as fall of 2018. As shown in Table 8, operations-related emissions at full buildout are below the SJVAPCD significance thresholds and, therefore, would result in a less than significant impact.

Table 8: Estimated Operational Emissions								
		CO (tons/year)	**NO_x (tons/year)**	**ROG (tons/year)**	**SO_2 (tons/year)**	**PM_{10} (tons/year)**	**$PM_{2.5}$ (tons/year)**	**CO_2e (tons/year)**
Annual SJVAPCD Threshold		**100**	**10**	**10**	**27**	**15**	**15**	**--**
2019	**Phase I Mitigated Operation**	4.2937	0.6943	0.8353	0.0000	0.8180	0.2308	900.5749
2020	**Phase II Mitigated Operation**	3.3127	0.5484	0.7832	0.0000	0.5656	0.1619	785.3269
2021	**Phase III Mitigated Operation + Phase IV Mitigated Operation**	3.0489	0.5676	0.8026	0.0000	0.5918	0.1685	785.8735
Total at Buildout		10.6553	1.2427	2.4211	0.0000	1.9754	0.5612	2,471.7753
Additional ISR Reductions		0	0.4101	0	0	0.9877	0	0
Total after ISR		**10.6553**	**0.8326**	**2.4211**	**0.0000**	**0.9877**	**0.5612**	**2,471.7753**
Exceeds Thresholds		**No**	**No**	**No**	**No**	**No**	**No**	**---**

Carbon Monoxide Hot Spot Analysis

Localized high levels are associated with traffic congestion and idling or slow-moving vehicles. The SJVAPCD provides screening criteria to determine when to quantify local CO concentrations based on impacts to the level of service of intersections in the project vicinity.

The project construction would result in minor increases in traffic for the surrounding road network during the construction duration. Motor vehicles accessing the site when it becomes operational would result in a minor increase in daily trips that would not substantially reduce the level of service.[81] Furthermore, local roadways are not identified as operating at unacceptable conditions under existing and future buildout conditions, according to the City of Kingsburg General Plan. Therefore, the project would not significantly contribute to an exceedance of state or federal CO standards.

Level of Significance: Less than significant impact.

Mitigation: None required.

[81] Traffic Study for the Hash Farms Proposed Residential Development. Prepared by Ruettgers & Schuler Civil Engineers. January, 2017. Page 19.

Impact 3 – Cumulative Impacts

Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

To result in a less than significant impact, the following criteria must be true:

1. *Regional analysis: emissions of nonattainment pollutants must be below the District's regional significance thresholds.*

   The Air Basin is in nonattainment for PM_{10}, $PM_{2.5}$ and ozone, therefore, if the project exceeds the regional thresholds for PM10 or PM2.5, then it contributes to a cumulatively considerable impact for those pollutants. If the project exceeds the regional threshold for NOx or ROG, then it follows that the project would contribute to a cumulatively considerable impact for ozone. As shown in Tables 7 and 8, criteria pollutant emissions would not exceed any threshold of significance during project construction or operation. As such, this project would not cumulatively contribute to a significant impact according to this criterion.

2. *Summary of projections: the project must be consistent with current air quality attainment plans including control measures and regulations.*

   As discussed in Impact 1 – Consistency with Air Quality Plans, the project is consistent with all applicable control measures in the air quality attainment plans. The project would comply with any SJVAPCD rules and regulations that may pertain to implementation of the Air Quality Plans. Therefore, impacts would be less than significant regarding compliance with applicable rules and regulations.

3. *Cumulative health impacts: the project must result in less than significant cumulative health effects from the nonattainment pollutants.*

   Since the San Joaquin Air Basin is in nonattainment for PM_{10}, $PM_{2.5}$ and ozone, it is considered to have an existing significant cumulative health impact without the project. When this occurs, the analysis considers whether the project's contribution to the existing violation of air quality standards is cumulatively considerable and the SJVAPCD regional thresholds for NO_x, VOC or ROG, PM_{10} or $PM_{2.5}$ are applied as cumulative contribution thresholds. As shown in Tables 7 and 8, criteria pollutant emissions would not exceed any threshold of significance during project construction or operation, which demonstrates the projects consistency with the applicable Air Quality Attainment Plan. The project would not result in significant cumulative health impacts.

Level of Significance: Less than significant impact.

Mitigation: None required.

Impact 4 – Sensitive Receptors

Would the project expose sensitive receptors to substantial pollutant concentrations?

Sensitive receptors are those who are sensitive to air pollution, including children, the elderly, and persons with preexisting respiratory or cardiovascular illness. The SJVAPCD considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants.

Construction – ROG

ROG is emitted during the application of architectural coatings (painting). The amount emitted is dependent on the amount of ROG (or VOC) in the paint. ROG emissions are typically an indoor air quality health hazard concern rather than an outdoor air quality health hazard concern. Therefore, exposures to ROG during architectural coatings is a less than significant health impact. There are three types of asphalt that are typically used in paving, asphalt cements, cutback asphalts and emulsified asphalts. However, SJVAPCD Rule 4641 prohibits the use of the following types of asphalt: rapid cure cutback asphalt, medium cure cutback asphalt, slow cure asphalt that contains more than one-half percent of organic compounds that evaporate at 500 degrees Fahrenheit or lower, and emulsified asphalt containing organic compounds in excess of three percent by volume, that evaporate at 500 degrees Fahrenheit or lower. An exception to this is medium cure asphalt when the National Weather Service forecast of the high temperature for the 24-hour period following application is below 50 degrees Fahrenheit.

The acute (short-term) health effects from worker direct exposure to asphalt fumes include irritation of the eyes, nose and throat. Other effects include respiratory tract symptoms and pulmonary function changes. Residents are not in the immediate vicinity of fumes; therefore they would not be subjected to concentrations high enough to evoke a negative response. In addition, the restrictions that are placed on asphalt in the San Joaquin Valley reduce ROG emissions from asphalt and exposure. The impact to nearby sensitive receptors from ROG during construction is less than significant.

Operation – ROG

During operation, ROG would be emitted primarily from motor vehicles. Direct exposure to ROG from project motor vehicles would not result in health effects, because the ROG would be distributed across miles and miles of roadway and in the air. The concentrations would not be great enough to result in direct health effects.

Construction – NO_x, PM_{10}, $PM_{2.5}$

As discussed in Impact 2, emissions during construction would not exceed the SJVAPCD thresholds, and would not be expected to result in concentrations that would exceed ambient standards or contribute substantially to an existing exceedance of an ambient air quality standard.

Operation – PM_{10}, $PM_{2.5}$, CO, NO_x

As discussed in Impact 2, localized concentrations of PM_{10}, $PM_{2.5}$, CO and NO_x would not exceed the ambient air quality standards. Residential development is an insignificant source of these pollutants, except for projects that allow wood burning devices that emit PM_{10}, $PM_{2.5}$ in wood smoke. The project will include only natural gas fueled fireplaces and inserts that are not significant sources of $PM_{2.5}$ and PM_{10}. Therefore, the project would not expose sensitive receptors to substantial criteria air pollutant concentrations during operation.

Health Risk Assessment

The Air District does not provide specific guidance on evaluation of a project's potential for adverse health risks during construction-related activities. However, the Air District's Ambient Air Quality Analysis Project Daily Emissions Assessment (2013) and draft policy Project Impact on Ambient Air Quality Status under CEQA (2015) documents do provide guidance on how to evaluate whether a project would require an Ambient Air Quality Analysis (AAQA). Projects requiring an AAQA would also need to prepare a health risk assessment if the AAQA indicates that project emissions exceed any ambient air quality standards at the project boundary.

Pursuant to the Air District's guidance, project-related average daily emissions were calculated and are provided in Table 9. As shown in Table 9, the average daily emissions are all below the Air District's 100 pound per day (lb/day) threshold for requiring an AAQA.

Table 9: Maximum Daily Air Pollutant Emissions During Construction

Maximum Daily Emissions	Emissions (lb/day)				
	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
2018 Construction	5.2480	59.6435	36.3573	20.8747	12.3639
2019 Construction	135.2153	54.6264	34.4957	20.6881	12.1922
2020 Construction	181.1723	50.2909	32.9557	20.4951	12.0147

Table 9: Maximum Daily Air Pollutant Emissions During Construction					
2021 Construction	127.6018	40.5718	21.9710	20.3421	11.8739
Maximum Daily Emissions	**127.6018**	**59.6435**	**36.3573**	**20.8747**	**12.3639**
Screening Threshold	--	100	100	100	100
Exceed screening threshold?	N/A	No	No	No	No

Since the Project's construction-related emissions do not require an AAQA, the project does not warrant a health risk assessment. As such, significant health risk impacts are not anticipated. Therefore, there would be Less Than Significant Project-specific Impacts

Level of Significance: Less than significant impact.

Mitigation: None required.

Impact 5 – Create Objectionable Odors

Would the project create objectionable odors affecting a substantial number of people?

Land uses that are typically identified as sources of objectionable odors include landfills, transfer stations, sewage treatment plants, wastewater pump stations, composting facilities, feed lots, coffee roasters, asphalt batch plants, and rendering plants. The project would not engage in any of these activities and as such, would not be considered to be a generator of objectionable odors during operations.

During construction, the various diesel-powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and would not likely be noticeable for extended periods of time beyond the project's site boundaries. The potential for diesel odor impacts would be less than significant.

As a residential development, the project has the potential to place sensitive receptors near existing odor sources; however, this project is not within any major odor generating sources screening distance of the site, as listed in Table 6. Therefore, the uses in the vicinity of the project would not cause substantial odor impacts to the project.

Level of Significance: Less than significant impact.

Mitigation: None required.

Impact 6 – Greenhouse Gas Generation

Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Construction

The Air District does not have a recommendation for assessing the significance of construction related GHG emissions. Emissions from construction would be temporary; however, to account for the construction emissions, the emissions were amortized based on the life of the development (residential – 50 years) and added to the operational emissions. Greenhouse gas emissions generated during construction are shown in Table 10.

Table 10: Construction Greenhouse Gas Emissions

Land Use	Total $MTCO_2e$ per year
2018	347.0288
2019	406.0148
2020	398.4107
2021	246.8277
Total	1,398.282
Amortized Emissions (Based on 50-year project life)	27.9656

Operation

Operational or long-term emissions occur over the project life. Sources of emissions may include motor vehicles and trucks, energy usage, water usage, waste generation, and area sources, such as landscaping activities and residential wood burning.

Business-As-Usual Operational Emissions

Operational emissions under the BAU scenario were modeled using CalEEMod Version 2016.3.1. The SJVAPCD guidance recommends using emissions in 2002-2004 in the baseline scenario to represent conditions[82]- as if regulations had not been adopted, to allow the effect of projected growth on achieving reduction targets to be clearly defined. CalEEMod defaults were used for project energy usage, water usage, waste generation, and area sources (architectural coating,

[82] San Joaquin Valley Air Pollution Control District. Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. December 17, 2009. https://www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf. Accessed November 2017. Page 9.

consumer projects, and landscaping). The vehicle fleet mix was revised to reflect the residential fleet mix approved by SJVAPCD for year 2020. The year 2020 was chosen because it is the AB 32 target year. CalEEMod model outputs are provided in Attachment A and results of this analysis are presented in Table 12.

2020 Operational Emissions

Operational emissions for the year 2020 were modeled using CalEEMod which assumes compliance with some, but not all, applicable rules and regulations regarding energy efficiency, vehicle fuel efficiency, renewable energy usage, and other GHG reduction policies, as described in the CalEEMod User's Guide. The reductions obtained from each regulation and the source of the reduction amount used in the analysis are described below.

Emissions Accounting for Applicable Regulations

The following regulations are incorporated into the CalEEMod emission factors:

- Pavely I motor vehicle emission standards
- Low Carbon Fuel Standard
- 2005 and 2008 Title 24 Energy Efficiency Standards

The following regulations have not been incorporated into the CalEEMod emission factors and require alternative methods to account for emission reductions provided by the regulations:

- 2013 and 2016 Title 24 Energy Efficiency Standards
- Renewable Portfolio Standards (RPS)
- Green Building Code Standards (indoor water use)
- California Model Water Efficient Landscape Ordinance (Outdoor Water)

Title 24 reductions for 2013 and 2016 updates are not accounted for in CalEEMod. The California Energy Commission (CEC) estimates that 2013 Title 24 standards would result in an increase in energy efficiency of 25 percent in residential buildings compared to 2008 Title 24. The benefits of 2013 Title 24 are applied in the CalEEMod mitigation component to correctly allocate the reductions only to building components subject to the regulation. No additional reductions have been claimed for compliance with 2016 Title 24; however, the CEC indicates that the new standards will increase energy efficiency in residential buildings by 28 percent compared to the 2013 Title 24 standards.

RPS is not accounted for in CalEEMod. Reductions from RPS are addressed by revising the electricity emission intensity factor in CalEEMod to account for the utility RPS rate forecast for 2020. PG&E provides emission factors for the electricity it provides to customers and projections for its energy portfolio for 2020 that is used to estimate project emissions.

Energy savings from water conservation resulting from the Green Building Code Standards for indoor water use and California Model Water Efficient Landscape Ordinance for outdoor water use are not included in CalEEMod. The Water Conservation Act of 2009 mandates a 20 percent reduction in urban water use that is implemented with these regulations. Benefits of the water conservation regulations are applied in the CalEEMod mitigation component.

Regulations applicable to project sources and the percent reduction anticipated from each source area shown in Table 11. The percentage reductions are only applied to the specific sources subject to the regulations. For example, the Paley Low Emission Vehicle Standards apply only to light duty cars and trucks.

Table 11: Reductions from Greenhouse Gas Regulations

Regulation	Project Applicability	Reduction Source	Percent Reduction in 2020
Title 24 Energy Efficiency Standards	Project building will be constructed to meet the latest version of Title 24 (currently 2016). Reduction applies only to energy consumption subject to the regulation.	CalEEMod defaults and CalEEMod mitigation component (2013)	25%[83]
Green Building Code Standards	The project will include water conservation features required by the standard	CalEEMod mitigation component	20%[84]
Water Efficient Land Use Ordinance	The project landscaping will comply with the regulation	CalEEMod mitigation component	20%[85]
Renewable Portfolio Standard (RPS)	Electricity purchased for use at the project site is subject to the 33 percent RPS mandate	CalEEMod adjusted energy intensity factors with PG&E emission factors that show the company will exceed the 33% mandate.	54.5%[86]
Solid waste	The solid waste service provider will need to provide programs to increase diversion and recycling to meet the 75 percent mandate	CalEEMod mitigation component	25%[87]

[83] California Energy Commission News Release: New Title 24 Standards Will Cut Residential Energy Use by 25 Percent, Save Water, and Reduce Greenhouse Gas Emissions.
[84] 2013 California Green Building Standards Code Section 5.303.2
[85] California Water Plan Update 2013.
[86] Based on CalEEMod default PG&E rate for 2005 and PG&E project emission factor for 2020
[87] CalRecycle 75 Percent Initiative: Defining the Future.

In addition to rules and regulations, the project would incorporate design features and would obtain benefits from its location and infrastructure that would reduce project vehicle miles travelled compared to default values. Note that CalEEMod nominally treats these design elements and conditions as "mitigation measures," despite their inclusion in the project description. Therefore reported operational emissions are considered to represent unmitigated project conditions. Full assumptions and model outputs are provided in Attachment A and results of this analysis are presented in Table 12.

Table 12: Project Operational Greenhouse Gases

	Emissions ($MTCO_2e$ per year)		
	Business as Usual	**2020 (with regulations and design features)**	**Percent Reduction**
2019	989.7650	900.5749	9.01
2020	956.4412	785.3269	17.89
2021	1,027.7781	785.8735	23.54
		Average	**16.81**

As shown in Table 12, the project would achieve an average reduction of 16.81 percent from BAU with regulations and design features, which surpasses the 6% reduction requirement by the Tulare County Action Plan. As such, impacts would be less than significant.

Level of Significance: Less than significant impact.

Mitigation: None required.

Impact 7 – Consistency with Greenhouse Gas Reduction Plans

Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reduction the emissions of greenhouse gases?

Consistency with the Climate Action Plan

Tulare County adopted a CAP as part of the Tulare County General Plan Update on August 28, 2012. The CAP requires projects to achieve an average reduction that is 6 percent in excess of the reductions stated in the ARB Scoping Plan and by regional regulations and programs. When combined with reductions anticipated from the ARB Scoping Plan measures and regional regulations and programs, Tulare County emissions would be 26.2 percent below 2020 business-as-usual levels for development related sources, which is the amount needed for the State to

reduce emissions to 1990 levels. As shown in Table 12, the project would exceed the required reduction and would therefore be consistent with the CAP 2020 target.

Since the adoption of the CAP, several additional regulations have been adopted by the State that provide additional reductions beyond those described in the CAP. The largest reductions are from LEVIII Light Duty Vehicle Standards and 2016 Title 24 Energy Efficiency Standards.

The CAP identifies General Plan policies that would help reduce greenhouse gas emissions; those policies can be seen in the following list. For a discussion of the benefits of the policies, refer to the CAP.

PF-1.1 Maintain Urban Edges
PF-1.2 Location of Urban Development
PF-1.4 Available Infrastructure
AG-1.7 Conservation Easements
AG-1.8 Agriculture Within Urban Boundaries
AG-1.11 Agricultural Buffers
AG-1.14 Right to Farm Noticing
AG-2.11 Energy Production
AG-2.11 Energy Production
AG-2.6 Biotechnology and Biofuels
AQ-1.6 Purchase of Low Emission/Alternative Fuel Vehicles
AQ-1.7 Support Statewide Global Warming Solutions
AQ-1.8 Greenhouse Gas Emissions Reduction Plan
AQ-1.9 Off-Site Measures to Reduce Greenhouse Gas Emissions
AQ-1.10 Alternative Fuel Vehicle Infrastructure
AQ-2.1 Transportation Demand Management Programs
AQ-2.3 Transportation and Air Quality
AQ-2.4 Transportation Management Associations
AQ-2.5 Ridesharing
AQ-3.1 Location of Support Services
AQ-3.2 Infill Near Employment
AQ-3.3 Street Design
AQ-3.5 Alternative Energy Design
AQ-3.6 Mixed Use Development
LU-1.1 Smart Growth and Healthy Communities
LU-1.2 Innovative Development
LU-1.3 Prevent Incompatible Uses
LU-1.4 Compact Development
LU-1.8 Encourage Infill Development
LU-2.1 Agricultural Lands
LU-3.2 Cluster Development
LU-3.3 High-Density Residential Locations

LU-4.1 Neighborhood Commercial Uses
LU-7.1 Distinctive Neighborhoods
LU-7.2 Integrate Natural Features
ERM-1.2 Development in Environmentally Sensitive Areas
ERM-1.3 Encourage Cluster Development
ERM-1.4 Protect Riparian Management Plans and Mining Reclamation Plans
ERM-1.6 Management of Wetlands
ERM-1.7 Planting of Native Vegetation
ERM-1.8 Open Space Buffers
ERM-1.14 Mitigation and Conservation Banking Program
ERM-4.1 Energy Conservation and Efficiency Measures
ERM-4.2 Streetscape and Parking Area Improvements for Energy Conservation
ERM-4.3 Local and State Programs
ERM-4.4 Promote Energy Conservation Awareness
ERM-4.6 Renewable Energy
ERM-4.7 Reduce Energy Use in County Facilities
ERM-4.8 Energy Efficiency Standards
ERM-5.1 Parks as Community Focal Points
ERM-5.6 Location and Size Criteria for Parks
ERM-5.15 Open Space Preservation
HS-1.4 Building and Codes
TC-2.1 Rail Service
TC-2.4 High Speed Rail (HSR)
TC-2.7 Rail Facilities and Existing Development
TC-4.4 Nodal Land Use Patterns that Support Public Transit
TC-5.1 Bicycle/Pedestrian Trail System
TC-5.2 Consider Non-Motorized Modes in Planning and Development
TC-5.3 Provisions for Bicycle Use
TC-5.4 Design Standards for Bicycle Routes
TC-5.5 Facilities
TC-5.6 Regional Bicycle Plan
TC-5.7 Designated Bike Paths
TC-5.8 Multi-Use Trails
PFS-1.3 Impact Mitigation
PFS-1.15 Efficient Expansion
PFS-2.1 Water Supply
PFS-2.2 Adequate Systems
LU-7.3 Friendly Streets
LU-7.15 Energy Conservation
ED-2.3 New Industries
ED-2.8 Jobs/Housing Ratio
ED-5.9 Bikeways
ED-6.1 Revitalization of Community Centers

ED-6.2 Comprehensive Redevelopment Plan
ED-6.3 Entertainment Venues
ED-6.4 Culturally Diverse Business
ED-6.5 Intermodal Hubs for Community and Hamlet Core Areas
ED-6.7 Existing Commercial Centers
SL-3.1 Community Centers and Neighborhoods
ERM-1.1 Protection of Rare and Endangered Species
PFS-3.3 New Development Requirements
PFS-5.3 Solid Waste Reduction
PFS-5.4 County Usage of Recycled Materials and Products
PFS-5.5 Private Use of Recycled Products
PFS-8.3 Location of School Sites
PFS-8.5 Government Facilities and Services
WR-1.5 Expand Use of Reclaimed Wastewater
WR-1.6 Expand Use of Reclaimed Water
WR-3.5 Use of Native and Drought Tolerant Landscaping

Consistency with San Joaquin Valley Air Pollution Control District Plans

The SJVAPCD adopted its own procedures for addressing climate change impacts of projects where the SJVAPCD issues a permit. For these projects, the SJVAPCD is either a Lead Agency or a Responsible Agency for CEQA purposes. The procedures do not apply directly to projects subject to County approval; however, development projects that include stationary source emissions requiring a District permit would need to comply with District procedures.

The SJVAPCD adopted the Climate Change Action Plan (CCAP) in 2008. The Carbon Exchange Program is not applicable to this project, and the project would not require Voluntary Greenhouse Gas Mitigation Agreements, as greenhouse gas emissions impacts are less than significant. The project would comply with all applicable greenhouse gas regulations contained in the CCAP. Per Guidance provided by the SJVAPCD, the proposed Project is consistent with the adopted Tulare County CAP, as the CAP requires a 6% reduction in GHG emissions and the proposed project is expected to reduce GHG emissions by 14%.

Consistency with AB 32

The California State Legislature adopted AB 32 in 2006. AB 32 focuses on reducing greenhouse gases (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) to 1990 levels by the year 2020. Pursuant to the requirements in AB 32, the ARB adopted the Climate Change Scoping Plan (Scoping Plan) in 2008, which outlines actions recommended to obtain that goal. The Scoping Plan calls for an "ambitious but achievable" reduction in California's greenhouse gas emissions, cutting approximately 29 percent from business-as-usual emission levels projected for 2020, or about 10 percent from 2008 levels. On a per-capita basis, that means reducing annual emissions of 14 tons of carbon dioxide for every

man, woman, and child in California down to about 10 tons per person by 2020.31[88] In addition, the total GHG per year divided by the total new population generated by the project (564) would be less than 10 tons per person, as 1,398.28 tons / 564 persons = 2.48 tons per person).

The Scoping Plan contains a variety of strategies to reduce the State's emissions. As shown in Table 13, the strategies are either consistent or not applicable to the project.

Table 13: Scoping Plan Reduction Measures

Scoping Plan Reduction Measure	Recommended Action
California Cap – and – Trade Program Linked to Western Climate Initiative Partner Jurisdictions – Implement a broad-based California cap-and-trade program to provide a firm limit on emissions, Link the California cap-and-trade program with other Western Climate Initiative Partner programs to create a regional market system to achieve greater environmental and economic benefits for California.	**Not applicable.** Under the cap-and-trade system, products or services (such as electricity) would be covered and the cost of the cap-and-trade system would be transferred to the consumers.
California Light-Duty Vehicle Greenhouse Gas Standards – Implement adopted Pavley standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs with long-term climate change goals.	**Consistent.** This is a statewide measure that cannot be implemented by a project applicant or lead agency. However, vehicles accessing projects in the Community would be subject to the standards.
Energy Efficiency – Maximize energy efficiency building and appliance standards, and pursue additional efficiency efforts including new technologies, and new policy and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California (including both investor-owned and publicly owned utilities).	**Consistent.** This is a measure for the state to increase its energy efficiency standards. However, the project would increase its energy efficiency through existing regulation.
Renewable Portfolio Standard – Renewables Portfolio Standard Achieve 33 percent renewable energy mix statewide.	**Consistent.** This is a statewide measure that cannot be implemented by a project applicant or lead agency. Southern California Edison obtains 19.9 percent of its power supply from renewable sources such as geothermal. However, residents and businesses in the community will purchase power with increasing amounts of renewable energy content.
Low Carbon Fuel Standard – Develop and adopt the Low Carbon Fuel Standard.	**Consistent.** This is a statewide measure that cannot be implemented by a project applicant or lead agency. However, the standard is applicable to the fuel used by vehicles that would access the project site.
Regional Transportation, Related Greenhouse Gas Targets – Develop regional greenhouse gas emissions reduction targets for passenger vehicles.	**Consistent.** The plan area will be constructed to densities consistent with the 2014 RTP/SCS.
Vehicle Efficiency Measures – Implement light-duty vehicle efficiency measures.	**Consistent.** The standards would be applicable to the light-duty vehicles that would access the project site.

[88] California Air Resources Board. Initial AB 32 Climate Change Scoping Plan Document. https://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm. Accessed November 2017.

Table 13: Scoping Plan Reduction Measures	
Goods Movement – Implement adopted regulations for the use of shore power for ships at berth. Improve efficiency in goods movement activities.	**Not applicable.** The project does not propose any changes to maritime, rail, or intermodal facilities or forms of transportation.
Million Solar Roofs Program – Install 3,000 MW of solar-electric capacity under California's existing solar programs.	**Consistent.** This measure is to increase solar throughout California, which is being done by various electricity providers and existing solar programs. Residences within the project area will be able to take advantage of incentives that are in place at the time of construction.
Medium/Heavy-Duty Vehicles – Adopt medium and heavy-duty vehicle efficiency measures.	**Consistent.** This is a statewide measure that cannot be implemented by a project applicant or lead agency. When this measure is initiated, the standards would be applicable to the vehicles that access the project site.
Industrial Emissions – Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce greenhouse gas emissions and provide other pollution reduction co-benefits. Reduce greenhouse gas emissions from fugitive emissions from oil and gas extraction and gas transmission.	**Not applicable.** Industrial sources are not proposed as a part of this project.
High Speed Rail – Support implementation of a high speed rail system.	**Not applicable.** This is a statewide measure that cannot be implemented by a project applicant or lead agency.
Green Building Strategy – Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.	**Consistent.** The State is to increase the use of green building practices. The project would implement some green building strategies through existing regulation.
High Global Warming Potential Gases – Adopt measures to reduce high global warming potential gases.	**Consistent.** This measure is applicable to the high global warming potential gases that would be used by the project (such as in air conditioning and refrigerators).
Recycling and Waste – Reduce methane emissions at landfills. Increase waste diversion, composting and other beneficial uses of organic materials, and mandate commercial recycling. Move toward zero-waste.	**Consistent.** The project would not contain a landfill. The State is to help increase waste diversion. The project would reduce waste with implementation of state mandated recycling and reuse mandates.
Sustainable Forests – Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation.	**Not applicable.** The project site is in an agricultural condition. No forested lands exist onsite.
Water – Continue efficiency programs and use cleaner energy sources to move and treat water.	**Consistent.** This is a measure for state and local agencies. However, project will comply with the California Green Building Standards Code, which requires a 20 percent reduction in indoor water use.
Agriculture – Encourage investment in manure digesters and at the five-year Scoping Plan update determine if the program should be made mandatory in 2020.	**Not applicable.** The project site is in an agricultural condition with orchards. No grazing, feedlot, or other agricultural activities that generate manure occur onsite or are proposed to be implemented by the project.

Level of Significance: Less than significant impact.

Mitigation: None required.

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	51.00	Dwelling Unit	16.56	91,800.00	144
Condo/Townhouse	16.00	Dwelling Unit	1.00	16,000.00	45

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2020
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

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Project Characteristics - Project includes single and multifamily units, and a neighborhood park.

Land Use - Population modified to reflect City of Kingsburgs Urban Water Management Plan Population Estimates

Construction Phase - Applicant provided anticipated construction schedule

Off-road Equipment -

Vehicle Trips - Trip length adjusted per Caltrans' SB 43 compliance database. Used an average of defalut, clovis, selma, kingsburg, visalia and reedley. Weekday trip rate adjusted per Traffic Study prepared by Ruettgers & Schuler Civil Engineers.

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix - fleet mix adjusted per SJVAPCD recommended residential mix

Mobile Land Use Mitigation - Project includes sidewalks connecting to existing neighborhood and intersections will have bulbouts and curb extensions.

Area Mitigation - Per state requirement

Energy Mitigation - In compliance with 2016 Title 24, and per project design elements

Water Mitigation - In compliance with state-required green building standard

Waste Mitigation - waste hauler is required to be in compliance with state mandates

Table Name	Column Name	Default Value	New Value
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tblConstructionPhase	NumDays	30.00	21.00
tblConstructionPhase	NumDays	20.00	25.00
tblConstructionPhase	NumDays	10.00	12.00
tblConstructionPhase	PhaseEndDate	2/28/2018	3/10/2019
tblConstructionPhase	PhaseEndDate	2/28/2018	2/15/2019
tblConstructionPhase	PhaseEndDate	2/28/2018	5/21/2018
tblConstructionPhase	PhaseEndDate	2/28/2018	4/20/2018
tblConstructionPhase	PhaseEndDate	2/28/2018	3/18/2018
tblConstructionPhase	PhaseStartDate	3/1/2018	2/16/2019
tblConstructionPhase	PhaseStartDate	3/1/2018	5/22/2018

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tblConstructionPhase	PhaseStartDate	3/1/2018	4/21/2018
tblConstructionPhase	PhaseStartDate	3/1/2018	3/19/2018
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tblFleetMix	HHD	0.11	5.0000e-003
tblFleetMix	LDA	0.50	0.52
tblFleetMix	LDA	0.50	0.52
tblFleetMix	LDT1	0.03	0.22
tblFleetMix	LDT1	0.03	0.22
tblFleetMix	LDT2	0.17	0.16
tblFleetMix	LDT2	0.17	0.16
tblFleetMix	LHD1	0.02	2.0000e-003
tblFleetMix	LHD1	0.02	2.0000e-003
tblFleetMix	LHD2	5.6900e-003	1.0000e-003
tblFleetMix	LHD2	5.6900e-003	1.0000e-003
tblFleetMix	MCY	5.3970e-003	0.01
tblFleetMix	MCY	5.3970e-003	0.01
tblFleetMix	MDV	0.13	0.06
tblFleetMix	MDV	0.13	0.06
tblFleetMix	MH	8.4800e-004	7.0000e-003
tblFleetMix	MH	8.4800e-004	7.0000e-003
tblFleetMix	MHD	0.02	7.0000e-003
tblFleetMix	MHD	0.02	7.0000e-003
tblFleetMix	OBUS	1.7990e-003	0.00
tblFleetMix	OBUS	1.7990e-003	0.00
tblFleetMix	SBUS	9.8700e-004	1.0000e-003
tblFleetMix	SBUS	9.8700e-004	1.0000e-003
tblFleetMix	UBUS	1.6900e-003	1.0000e-003

tblFleetMix	UBUS	1.6900e-003	1.0000e-003
tblGrading	AcresOfGrading	52.50	75.00
tblLandUse	Population	162.00	144.00
tblLandUse	Population	51.00	45.00
tblProjectCharacteristics	OperationalYear	2018	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	HO_TL	7.90	4.47
tblVehicleTrips	HS_TL	7.10	5.13
tblVehicleTrips	HW_TL	16.80	11.01
tblVehicleTrips	WD_TR	5.81	10.60
tblVehicleTrips	WD_TR	9.52	10.00
tblWoodstoves	NumberCatalytic	1.00	0.00
tblWoodstoves	NumberCatalytic	16.56	0.00
tblWoodstoves	NumberNoncatalytic	1.00	0.00
tblWoodstoves	NumberNoncatalytic	16.56	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.3395	3.0958	2.2679	3.8500e-003	0.2509	0.1759	0.4268	0.1092	0.1643	0.2735	0.0000	344.9744	344.9744	0.0822	0.0000	347.0288
2019	1.0581	0.3900	0.3350	5.8000e-004	7.6100e-003	0.0231	0.0307	2.0400e-003	0.0217	0.0238	0.0000	51.2180	51.2180	0.0104	0.0000	51.4770
Maximum	**1.0581**	**3.0958**	**2.2679**	**3.8500e-003**	**0.2509**	**0.1759**	**0.4268**	**0.1092**	**0.1643**	**0.2735**	**0.0000**	**344.9744**	**344.9744**	**0.0822**	**0.0000**	**347.0288**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.3395	3.0958	2.2679	3.8500e-003	0.2509	0.1759	0.4268	0.1092	0.1643	0.2735	0.0000	344.9741	344.9741	0.0822	0.0000	347.0284
2019	1.0581	0.3900	0.3350	5.8000e-004	7.6100e-003	0.0231	0.0307	2.0400e-003	0.0217	0.0238	0.0000	51.2180	51.2180	0.0104	0.0000	51.4770
Maximum	**1.0581**	**3.0958**	**2.2679**	**3.8500e-003**	**0.2509**	**0.1759**	**0.4268**	**0.1092**	**0.1643**	**0.2735**	**0.0000**	**344.9741**	**344.9741**	**0.0822**	**0.0000**	**347.0284**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	3-1-2018	5-31-2018	1.3852	1.3852
2	6-1-2018	8-31-2018	0.9010	0.9010
3	9-1-2018	11-30-2018	0.8921	0.8921
4	12-1-2018	2-28-2019	1.3469	1.3469
5	3-1-2019	5-31-2019	0.4896	0.4896
		Highest	1.3852	1.3852

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.5403	0.0308	0.5098	1.9000e-004		4.7700e-003	4.7700e-003		4.7700e-003	4.7700e-003	0.0000	29.8375	29.8375	1.3500e-003	5.3000e-004	30.0298
Energy	0.0107	0.0915	0.0389	5.8000e-004		7.4000e-003	7.4000e-003		7.4000e-003	7.4000e-003	0.0000	105.9490	105.9490	2.0300e-003	1.9400e-003	106.5786
Mobile	0.3265	0.6240	3.9311	8.9900e-003	0.8422	8.4200e-003	0.8507	0.2247	7.8500e-003	0.2326	0.0000	815.2346	815.2346	0.0413	0.0000	816.2661
Waste						0.0000	0.0000		0.0000	0.0000	12.4921	0.0000	12.4921	0.7383	0.0000	30.9486
Water						0.0000	0.0000		0.0000	0.0000	1.3849	0.0000	1.3849	0.1422	3.3600e-003	5.9419
Total	**0.8776**	**0.7464**	**4.4798**	**9.7600e-003**	**0.8422**	**0.0206**	**0.8628**	**0.2247**	**0.0200**	**0.2448**	**13.8770**	**951.0212**	**964.8981**	**0.9251**	**5.8300e-003**	**989.7650**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.5081	0.0307	0.4978	1.9000e-004		4.7000e-003	4.7000e-003		4.7000e-003	4.7000e-003	0.0000	29.8131	29.8131	1.3100e-003	5.3000e-004	30.0045
Energy	7.4300e-003	0.0635	0.0270	4.1000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	73.5258	73.5258	1.4100e-003	1.3500e-003	73.9627
Mobile	0.3197	0.6001	3.7689	8.5600e-003	0.8001	8.0400e-003	0.8082	0.2135	7.5000e-003	0.2210	0.0000	775.6896	775.6896	0.0395	0.0000	776.6770
Waste						0.0000	0.0000		0.0000	0.0000	6.2460	0.0000	6.2460	0.3691	0.0000	15.4743
Water						0.0000	0.0000		0.0000	0.0000	1.0387	0.0000	1.0387	0.1067	2.5200e-003	4.4564
Total	**0.8353**	**0.6943**	**4.2937**	**9.1600e-003**	**0.8001**	**0.0179**	**0.8180**	**0.2135**	**0.0173**	**0.2308**	**7.2847**	**879.0285**	**886.3132**	**0.5180**	**4.4000e-003**	**900.5749**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**4.82**	**6.98**	**4.15**	**6.15**	**5.00**	**13.21**	**5.20**	**5.00**	**13.44**	**5.69**	**47.50**	**7.57**	**8.14**	**44.01**	**24.53**	**9.01**

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2018	3/18/2018	5	12	
2	Paving	Paving	3/19/2018	4/20/2018	5	25	
3	Grading	Grading	4/21/2018	5/21/2018	5	21	
4	Building Construction	Building Construction	5/22/2018	2/15/2019	5	194	
5	Architectural Coating	Architectural Coating	2/16/2019	3/10/2019	5	15	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 218,295; Residential Outdoor: 72,765; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	6.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	30.00	7.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1084	0.0000	0.1084	0.0596	0.0000	0.0596	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0274	0.2892	0.1349	2.3000e-004		0.0155	0.0155		0.0142	0.0142	0.0000	20.8559	20.8559	6.4900e-003	0.0000	21.0183
Total	**0.0274**	**0.2892**	**0.1349**	**2.3000e-004**	**0.1084**	**0.0155**	**0.1239**	**0.0596**	**0.0142**	**0.0738**	**0.0000**	**20.8559**	**20.8559**	**6.4900e-003**	**0.0000**	**21.0183**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.8000e-004	6.0000e-004	5.8400e-003	1.0000e-005	1.3400e-003	1.0000e-005	1.3500e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.2694	1.2694	4.0000e-005	0.0000	1.2705
Total	**7.8000e-004**	**6.0000e-004**	**5.8400e-003**	**1.0000e-005**	**1.3400e-003**	**1.0000e-005**	**1.3500e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.2694**	**1.2694**	**4.0000e-005**	**0.0000**	**1.2705**

3.2 Site Preparation - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1084	0.0000	0.1084	0.0596	0.0000	0.0596	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0274	0.2892	0.1349	2.3000e-004		0.0155	0.0155		0.0142	0.0142	0.0000	20.8559	20.8559	6.4900e-003	0.0000	21.0182
Total	**0.0274**	**0.2892**	**0.1349**	**2.3000e-004**	**0.1084**	**0.0155**	**0.1239**	**0.0596**	**0.0142**	**0.0738**	**0.0000**	**20.8559**	**20.8559**	**6.4900e-003**	**0.0000**	**21.0182**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.8000e-004	6.0000e-004	5.8400e-003	1.0000e-005	1.3400e-003	1.0000e-005	1.3500e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.2694	1.2694	4.0000e-005	0.0000	1.2705
Total	**7.8000e-004**	**6.0000e-004**	**5.8400e-003**	**1.0000e-005**	**1.3400e-003**	**1.0000e-005**	**1.3500e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.2694**	**1.2694**	**4.0000e-005**	**0.0000**	**1.2705**

3.3 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0206	0.2190	0.1850	2.8000e-004		0.0120	0.0120		0.0110	0.0110	0.0000	26.0145	26.0145	8.1000e-003	0.0000	26.2170
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0206**	**0.2190**	**0.1850**	**2.8000e-004**		**0.0120**	**0.0120**		**0.0110**	**0.0110**	**0.0000**	**26.0145**	**26.0145**	**8.1000e-003**	**0.0000**	**26.2170**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3500e-003	1.0400e-003	0.0101	2.0000e-005	2.3300e-003	2.0000e-005	2.3500e-003	6.2000e-004	2.0000e-005	6.4000e-004	0.0000	2.2038	2.2038	8.0000e-005	0.0000	2.2057
Total	**1.3500e-003**	**1.0400e-003**	**0.0101**	**2.0000e-005**	**2.3300e-003**	**2.0000e-005**	**2.3500e-003**	**6.2000e-004**	**2.0000e-005**	**6.4000e-004**	**0.0000**	**2.2038**	**2.2038**	**8.0000e-005**	**0.0000**	**2.2057**

3.3 Paving - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0206	0.2190	0.1850	2.8000e-004		0.0120	0.0120		0.0110	0.0110	0.0000	26.0145	26.0145	8.1000e-003	0.0000	26.2170
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0206**	**0.2190**	**0.1850**	**2.8000e-004**		**0.0120**	**0.0120**		**0.0110**	**0.0110**	**0.0000**	**26.0145**	**26.0145**	**8.1000e-003**	**0.0000**	**26.2170**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3500e-003	1.0400e-003	0.0101	2.0000e-005	2.3300e-003	2.0000e-005	2.3500e-003	6.2000e-004	2.0000e-005	6.4000e-004	0.0000	2.2038	2.2038	8.0000e-005	0.0000	2.2057
Total	**1.3500e-003**	**1.0400e-003**	**0.0101**	**2.0000e-005**	**2.3300e-003**	**2.0000e-005**	**2.3500e-003**	**6.2000e-004**	**2.0000e-005**	**6.4000e-004**	**0.0000**	**2.2038**	**2.2038**	**8.0000e-005**	**0.0000**	**2.2057**

3.4 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1030	0.0000	0.1030	0.0391	0.0000	0.0391	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0535	0.6250	0.3684	6.5000e-004		0.0277	0.0277		0.0254	0.0254	0.0000	59.4809	59.4809	0.0185	0.0000	59.9439
Total	**0.0535**	**0.6250**	**0.3684**	**6.5000e-004**	**0.1030**	**0.0277**	**0.1307**	**0.0391**	**0.0254**	**0.0645**	**0.0000**	**59.4809**	**59.4809**	**0.0185**	**0.0000**	**59.9439**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5100e-003	1.1600e-003	0.0114	3.0000e-005	2.6100e-003	2.0000e-005	2.6300e-003	6.9000e-004	2.0000e-005	7.1000e-004	0.0000	2.4682	2.4682	8.0000e-005	0.0000	2.4703
Total	**1.5100e-003**	**1.1600e-003**	**0.0114**	**3.0000e-005**	**2.6100e-003**	**2.0000e-005**	**2.6300e-003**	**6.9000e-004**	**2.0000e-005**	**7.1000e-004**	**0.0000**	**2.4682**	**2.4682**	**8.0000e-005**	**0.0000**	**2.4703**

3.4 Grading - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1030	0.0000	0.1030	0.0391	0.0000	0.0391	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0535	0.6250	0.3684	6.5000e-004		0.0277	0.0277		0.0254	0.0254	0.0000	59.4809	59.4809	0.0185	0.0000	59.9438
Total	**0.0535**	**0.6250**	**0.3684**	**6.5000e-004**	**0.1030**	**0.0277**	**0.1307**	**0.0391**	**0.0254**	**0.0645**	**0.0000**	**59.4809**	**59.4809**	**0.0185**	**0.0000**	**59.9438**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5100e-003	1.1600e-003	0.0114	3.0000e-005	2.6100e-003	2.0000e-005	2.6300e-003	6.9000e-004	2.0000e-005	7.1000e-004	0.0000	2.4682	2.4682	8.0000e-005	0.0000	2.4703
Total	**1.5100e-003**	**1.1600e-003**	**0.0114**	**3.0000e-005**	**2.6100e-003**	**2.0000e-005**	**2.6300e-003**	**6.9000e-004**	**2.0000e-005**	**7.1000e-004**	**0.0000**	**2.4682**	**2.4682**	**8.0000e-005**	**0.0000**	**2.4703**

3.5 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2144	1.8712	1.4064	2.1500e-003		0.1200	0.1200		0.1128	0.1128	0.0000	190.2138	190.2138	0.0466	0.0000	191.3788
Total	**0.2144**	**1.8712**	**1.4064**	**2.1500e-003**		**0.1200**	**0.1200**		**0.1128**	**0.1128**	**0.0000**	**190.2138**	**190.2138**	**0.0466**	**0.0000**	**191.3788**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8800e-003	0.0753	0.0161	1.5000e-004	3.3600e-003	6.1000e-004	3.9600e-003	9.7000e-004	5.8000e-004	1.5500e-003	0.0000	14.2595	14.2595	1.3000e-003	0.0000	14.2921
Worker	0.0173	0.0133	0.1298	3.1000e-004	0.0298	2.2000e-004	0.0301	7.9300e-003	2.0000e-004	8.1300e-003	0.0000	28.2083	28.2083	9.6000e-004	0.0000	28.2323
Total	**0.0202**	**0.0886**	**0.1459**	**4.6000e-004**	**0.0332**	**8.3000e-004**	**0.0340**	**8.9000e-003**	**7.8000e-004**	**9.6800e-003**	**0.0000**	**42.4678**	**42.4678**	**2.2600e-003**	**0.0000**	**42.5244**

3.5 Building Construction - 2018

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2144	1.8712	1.4064	2.1500e-003		0.1200	0.1200		0.1128	0.1128	0.0000	190.2136	190.2136	0.0466	0.0000	191.3786
Total	**0.2144**	**1.8712**	**1.4064**	**2.1500e-003**		**0.1200**	**0.1200**		**0.1128**	**0.1128**	**0.0000**	**190.2136**	**190.2136**	**0.0466**	**0.0000**	**191.3786**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8800e-003	0.0753	0.0161	1.5000e-004	3.3600e-003	6.1000e-004	3.9600e-003	9.7000e-004	5.8000e-004	1.5500e-003	0.0000	14.2595	14.2595	1.3000e-003	0.0000	14.2921
Worker	0.0173	0.0133	0.1298	3.1000e-004	0.0298	2.2000e-004	0.0301	7.9300e-003	2.0000e-004	8.1300e-003	0.0000	28.2083	28.2083	9.6000e-004	0.0000	28.2323
Total	**0.0202**	**0.0886**	**0.1459**	**4.6000e-004**	**0.0332**	**8.3000e-004**	**0.0340**	**8.9000e-003**	**7.8000e-004**	**9.6800e-003**	**0.0000**	**42.4678**	**42.4678**	**2.2600e-003**	**0.0000**	**42.5244**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0401	0.3583	0.2918	4.6000e-004		0.0219	0.0219		0.0206	0.0206	0.0000	39.9677	39.9677	9.7400e-003	0.0000	40.2111
Total	**0.0401**	**0.3583**	**0.2918**	**4.6000e-004**		**0.0219**	**0.0219**		**0.0206**	**0.0206**	**0.0000**	**39.9677**	**39.9677**	**9.7400e-003**	**0.0000**	**40.2111**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5000e-004	0.0152	3.0400e-003	3.0000e-005	7.1000e-004	1.1000e-004	8.2000e-004	2.1000e-004	1.0000e-004	3.1000e-004	0.0000	3.0047	3.0047	2.7000e-004	0.0000	3.0114
Worker	3.3000e-003	2.4700e-003	0.0243	6.0000e-005	6.3400e-003	4.0000e-005	6.3800e-003	1.6800e-003	4.0000e-005	1.7300e-003	0.0000	5.8173	5.8173	1.8000e-004	0.0000	5.8218
Total	**3.8500e-003**	**0.0176**	**0.0273**	**9.0000e-005**	**7.0500e-003**	**1.5000e-004**	**7.2000e-003**	**1.8900e-003**	**1.4000e-004**	**2.0400e-003**	**0.0000**	**8.8221**	**8.8221**	**4.5000e-004**	**0.0000**	**8.8332**

3.5 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0401	0.3583	0.2918	4.6000e-004		0.0219	0.0219		0.0206	0.0206	0.0000	39.9677	39.9677	9.7400e-003	0.0000	40.2111
Total	**0.0401**	**0.3583**	**0.2918**	**4.6000e-004**		**0.0219**	**0.0219**		**0.0206**	**0.0206**	**0.0000**	**39.9677**	**39.9677**	**9.7400e-003**	**0.0000**	**40.2111**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5000e-004	0.0152	3.0400e-003	3.0000e-005	7.1000e-004	1.1000e-004	8.2000e-004	2.1000e-004	1.0000e-004	3.1000e-004	0.0000	3.0047	3.0047	2.7000e-004	0.0000	3.0114
Worker	3.3000e-003	2.4700e-003	0.0243	6.0000e-005	6.3400e-003	4.0000e-005	6.3800e-003	1.6800e-003	4.0000e-005	1.7300e-003	0.0000	5.8173	5.8173	1.8000e-004	0.0000	5.8218
Total	**3.8500e-003**	**0.0176**	**0.0273**	**9.0000e-005**	**7.0500e-003**	**1.5000e-004**	**7.2000e-003**	**1.8900e-003**	**1.4000e-004**	**2.0400e-003**	**0.0000**	**8.8221**	**8.8221**	**4.5000e-004**	**0.0000**	**8.8332**

3.6 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0118					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0000e-003	0.0138	0.0138	2.0000e-005		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	1.9149	1.9149	1.6000e-004	0.0000	1.9190
Total	**1.0138**	**0.0138**	**0.0138**	**2.0000e-005**		**9.7000e-004**	**9.7000e-004**		**9.7000e-004**	**9.7000e-004**	**0.0000**	**1.9149**	**1.9149**	**1.6000e-004**	**0.0000**	**1.9190**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	2.2000e-004	2.1400e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5133	0.5133	2.0000e-005	0.0000	0.5137
Total	**2.9000e-004**	**2.2000e-004**	**2.1400e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.5133**	**0.5133**	**2.0000e-005**	**0.0000**	**0.5137**

3.6 Architectural Coating - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.0118					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0000e-003	0.0138	0.0138	2.0000e-005		9.7000e-004	9.7000e-004		9.7000e-004	9.7000e-004	0.0000	1.9149	1.9149	1.6000e-004	0.0000	1.9190
Total	**1.0138**	**0.0138**	**0.0138**	**2.0000e-005**		**9.7000e-004**	**9.7000e-004**		**9.7000e-004**	**9.7000e-004**	**0.0000**	**1.9149**	**1.9149**	**1.6000e-004**	**0.0000**	**1.9190**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	2.2000e-004	2.1400e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.5133	0.5133	2.0000e-005	0.0000	0.5137
Total	**2.9000e-004**	**2.2000e-004**	**2.1400e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.5133**	**0.5133**	**2.0000e-005**	**0.0000**	**0.5137**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

Provide Traffic Calming Measures

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3197	0.6001	3.7689	8.5600e-003	0.8001	8.0400e-003	0.8082	0.2135	7.5000e-003	0.2210	0.0000	775.6896	775.6896	0.0395	0.0000	776.6770
Unmitigated	0.3265	0.6240	3.9311	8.9900e-003	0.8422	8.4200e-003	0.8507	0.2247	7.8500e-003	0.2326	0.0000	815.2346	815.2346	0.0413	0.0000	816.2661

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	169.60	90.72	77.44	355,518	337,742
Single Family Housing	510.00	505.41	439.62	1,904,866	1,809,623
Total	679.60	596.13	517.06	2,260,384	2,147,365

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	11.01	5.13	4.47	45.60	19.00	35.40	86	11	3
Single Family Housing	16.80	7.10	7.90	45.60	19.00	35.40	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.515000	0.221000	0.164000	0.064000	0.002000	0.001000	0.007000	0.005000	0.000000	0.001000	0.012000	0.001000	0.007000
Condo/Townhouse	0.515000	0.221000	0.164000	0.064000	0.002000	0.001000	0.007000	0.005000	0.000000	0.001000	0.012000	0.001000	0.007000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	7.4300e-003	0.0635	0.0270	4.1000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	73.5258	73.5258	1.4100e-003	1.3500e-003	73.9627
NaturalGas Unmitigated	0.0107	0.0915	0.0389	5.8000e-004		7.4000e-003	7.4000e-003		7.4000e-003	7.4000e-003	0.0000	105.9490	105.9490	2.0300e-003	1.9400e-003	106.5786

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Condo/Townhouse	348025	1.8800e-003	0.0160	6.8200e-003	1.0000e-004		1.3000e-003	1.3000e-003		1.3000e-003	1.3000e-003	0.0000	18.5720	18.5720	3.6000e-004	3.4000e-004	18.6823
Single Family Housing	1.63738e+006	8.8300e-003	0.0755	0.0321	4.8000e-004		6.1000e-003	6.1000e-003		6.1000e-003	6.1000e-003	0.0000	87.3771	87.3771	1.6700e-003	1.6000e-003	87.8963
Total		**0.0107**	**0.0915**	**0.0389**	**5.8000e-004**		**7.4000e-003**	**7.4000e-003**		**7.4000e-003**	**7.4000e-003**	**0.0000**	**105.9490**	**105.9490**	**2.0300e-003**	**1.9400e-003**	**106.5786**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Condo/Townhouse	247065	1.3300e-003	0.0114	4.8400e-003	7.0000e-005		9.2000e-004	9.2000e-004		9.2000e-004	9.2000e-004	0.0000	13.1843	13.1843	2.5000e-004	2.4000e-004	13.2627
Single Family Housing	1.13076e+006	6.1000e-003	0.0521	0.0222	3.3000e-004		4.2100e-003	4.2100e-003		4.2100e-003	4.2100e-003	0.0000	60.3414	60.3414	1.1600e-003	1.1100e-003	60.7000
Total		**7.4300e-003**	**0.0635**	**0.0270**	**4.0000e-004**		**5.1300e-003**	**5.1300e-003**		**5.1300e-003**	**5.1300e-003**	**0.0000**	**73.5258**	**73.5258**	**1.4100e-003**	**1.3500e-003**	**73.9627**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	94672.3	0.0000	0.0000	0.0000	0.0000
Single Family Housing	480275	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	84550.7	0.0000	0.0000	0.0000	0.0000
Single Family Housing	431424	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.5081	0.0307	0.4978	1.9000e-004		4.7000e-003	4.7000e-003		4.7000e-003	4.7000e-003	0.0000	29.8131	29.8131	1.3100e-003	5.3000e-004	30.0045
Unmitigated	0.5403	0.0308	0.5098	1.9000e-004		4.7700e-003	4.7700e-003		4.7700e-003	4.7700e-003	0.0000	29.8375	29.8375	1.3500e-003	5.3000e-004	30.0298

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1012					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4210					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.9300e-003	0.0251	0.0107	1.6000e-004		2.0300e-003	2.0300e-003		2.0300e-003	2.0300e-003	0.0000	29.0249	29.0249	5.6000e-004	5.3000e-004	29.1974
Landscaping	0.0152	5.7700e-003	0.4991	3.0000e-005		2.7400e-003	2.7400e-003		2.7400e-003	2.7400e-003	0.0000	0.8126	0.8126	7.9000e-004	0.0000	0.8324
Total	**0.5403**	**0.0308**	**0.5098**	**1.9000e-004**		**4.7700e-003**	**4.7700e-003**		**4.7700e-003**	**4.7700e-003**	**0.0000**	**29.8375**	**29.8375**	**1.3500e-003**	**5.3000e-004**	**30.0298**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1012					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3895					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.9300e-003	0.0251	0.0107	1.6000e-004		2.0300e-003	2.0300e-003		2.0300e-003	2.0300e-003	0.0000	29.0249	29.0249	5.6000e-004	5.3000e-004	29.1974
Landscaping	0.0145	5.6500e-003	0.4871	3.0000e-005		2.6700e-003	2.6700e-003		2.6700e-003	2.6700e-003	0.0000	0.7882	0.7882	7.5000e-004	0.0000	0.8071
Total	**0.5081**	**0.0307**	**0.4978**	**1.9000e-004**		**4.7000e-003**	**4.7000e-003**		**4.7000e-003**	**4.7000e-003**	**0.0000**	**29.8131**	**29.8131**	**1.3100e-003**	**5.3000e-004**	**30.0045**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Turf Reduction

Use Water Efficient Irrigation System

Use Water Efficient Landscaping

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.0387	0.1067	2.5200e-003	4.4564
Unmitigated	1.3849	0.1422	3.3600e-003	5.9419

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	1.04246 / 0.657206	0.3307	0.0340	8.0000e-004	1.4190
Single Family Housing	3.32286 / 2.09484	1.0542	0.1083	2.5600e-003	4.5229
Total		**1.3849**	**0.1423**	**3.3600e-003**	**5.9419**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	0.781848 / 0.295743	0.2480	0.0255	6.0000e-004	1.0642
Single Family Housing	2.49214 / 0.94268	0.7906	0.0812	1.9200e-003	3.3922
Total		**1.0387**	**0.1067**	**2.5200e-003**	**4.4564**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	6.2460	0.3691	0.0000	15.4743
Unmitigated	12.4921	0.7383	0.0000	30.9486

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	7.36	1.4940	0.0883	0.0000	3.7014
Single Family Housing	54.18	10.9981	0.6500	0.0000	27.2472
Total		**12.4921**	**0.7383**	**0.0000**	**30.9486**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	3.68	0.7470	0.0442	0.0000	1.8507
Single Family Housing	27.09	5.4990	0.3250	0.0000	13.6236
Total		**6.2460**	**0.3691**	**0.0000**	**15.4743**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Hash Farms Development Project Phase 1

San Joaquin Valley Unified APCD, Summary Report

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	51.00	Dwelling Unit	16.56	91,800.00	144
Condo/Townhouse	16.00	Dwelling Unit	1.00	16,000.00	45

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2020
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments

Only CalEEMod defaults were used.

Project Characteristics - Project includes single and multifamily units, and a neighborhood park.

Land Use - Population modified to reflect City of Kingsburgs Urban Water Management Plan Population Estimates

Construction Phase - Applicant provided anticipated construction schedule

Off-road Equipment -

Vehicle Trips - Trip length adjusted per Caltrans' SB 43 compliance database. Used an average of defalut, clovis, selma, kingsburg, visalia and reedley. Weekday trip rate adjusted per Traffic Study prepared by Ruettgers & Schuler Civil Engineers.

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix - fleet mix adjusted per SJVAPCD recommended residential mix

Mobile Land Use Mitigation - Project includes sidewalks connecting to existing neighborhood and intersections will have bulbouts and curb extensions.

Area Mitigation - Per state requirement

Energy Mitigation - In compliance with 2016 Title 24, and per project design elements

Water Mitigation - In compliance with state-required green building standard

Waste Mitigation - waste hauler is required to be in compliance with state mandates

2.0 Peak Daily Emissions

Peak Daily Construction Emissions

Peak Daily Construction Emissions

Hash Farms Development Project Phase 1 - San Joaquin Valley Unified APCD Air District, Summary Report

		Unmitigated						Mitigated					
		ROG	NOX	CO	SO2	PM10	PM2.5	ROG	NOX	CO	SO2	PM10	PM2.5
Year	Phase	lb/day											
2018	Site Preparation	4.7048 S	48.3083 W	23.6174 S	0.0406 S	20.8747 S	12.3639 S	4.7048 S	48.3083 W	23.6174 S	0.0406 S	20.8747 S	12.3639 S
2018	Paving	1.7621 S	17.6122 W	15.7473 S	0.0249 S	1.1491 S	0.9317 S	1.7621 S	17.6122 W	15.7473 S	0.0249 S	1.1491 S	0.9317 S
2018	Grading	5.2480 S	59.6435 W	36.3573 S	0.0649 S	12.7006 S	6.2117 S	5.2480 S	59.6435 W	36.3573 S	0.0649 S	12.7006 S	6.2117 S
2018	Building Construction	2.9518 S	24.5127 W	19.6705 S	0.0331 S	1.9363 W	1.5337 W	2.9518 S	24.5127 W	19.6705 S	0.0331 S	1.9363 W	1.5337 W
2019	Building Construction	2.6057 S	22.1281 W	19.0086 S	0.0330 S	1.7251 W	1.3353 W	2.6057 S	22.1281 W	19.0086 S	0.0330 S	1.7251 W	1.3353 W
2019	Architectural Coating	135.2153 S	1.8672 W	2.1770 S	3.8000e-003 S	0.2059 S	0.1496 S	135.2153 S	1.8672 W	2.1770 S	3.8000e-003 S	0.2059 S	0.1496 S
	Peak Daily Total	135.2153 S	59.6435 W	36.3573 S	0.0649 S	20.8747 S	12.3639 S	135.2153 S	59.6435 W	36.3573 S	0.0649 S	20.8747 S	12.3639 S
	Air District Threshold												
	Exceed Significance?												

Peak Daily Operational Emissions

Peak Daily Operational Emissions

		Unmitigated						Mitigated					
		ROG	NOX	CO	SO2	PM10	PM2.5	ROG	NOX	CO	SO2	PM10	PM2.5
	Operational Activity	lb/day											
On-Site	Area	3.1017 S	0.6754 S	5.8061 S	4.1900e-003 S	0.0799 S	0.0799 S	2.9213 S	0.6741 S	5.6727 S	4.1800e-003 S	0.0791 S	0.0791 S
On-Site	Energy	0.0587 S	0.5013 S	0.2133 S	3.2000e-003 S	0.0405 S	0.0405 S	0.0407 S	0.3479 S	0.1480 S	2.2200e-003 S	0.0281 S	0.0281 S
Off-Site	Mobile	1.9456 S	18.0566 W	20.4040 S	0.0871 S	5.1752 W	1.4531 W	1.9059 S	17.5645 W	19.5462 S	0.0833 S	4.9169 W	1.3809 W
	Peak Daily Total	5.1060 S	19.2333 W	26.4234 S	0.0945 S	5.2956 W	1.5736 W	4.8679 S	18.5865 W	25.3670 S	0.0897 S	5.0242 W	1.4882 W
	Air District Threshold												
	Exceed Significance?												

3.0 Annual GHG Emissions

Hash Farms Development Project Phase 1 - San Joaquin Valley Unified APCD Air District, Summary Report

Annual GHG

Annual GHG

		Unmitigated				Mitigated			
		CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
GHG Activity	Year	MT/yr							
Construction	2018	344.9744	0.0822	0.0000	347.0287	344.9741	0.0822	0.0000	347.0284
Construction	2019	51.2180	0.0104	0.0000	51.4770	51.2180	0.0104	0.0000	51.4770
Operational	2020	1,479.1048	0.9655	5.8332e-003	1,504.9801	1,382.0481	0.5586	4.4089e-003	1,397.3265
	Total								
	Significance Threshold								
	Exceed Significance?								

Hash Farms Development Project Phase 2

San Joaquin Valley Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	50.00	Dwelling Unit	16.23	90,000.00	140
Condo/Townhouse	16.00	Dwelling Unit	1.00	16,000.00	45

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	506.83	**CH4 Intensity (lb/MWhr)**	0.023	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Hash Farms Development Project Phase 2 - San Joaquin Valley Unified APCD Air District, Annual

Project Characteristics - Project includes single and multifamily units, and a neighborhood park. SCE intensity factors were adjusted to account for the utility Renewable Portfolio Standard rate forecast for 2020.

Land Use - Population modified to reflect City of Kingsburgs Urban Water Management Plan Population Estimates

Construction Phase - Applicant provided anticipated construction schedule

Off-road Equipment -

Vehicle Trips - Trip length adjusted per Caltrans' SB 43 compliance database. Used an average of defalut, clovis, selma, kingsburg, visalia and reedley. Weekday trip rate adjusted per Traffic Study prepared by Ruettgers & Schuler Civil Engineers.

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix - fleet mix adjusted per SJVAPCD recommended residential mix

Mobile Land Use Mitigation - Project includes sidewalks connecting to existing neighborhood and intersections will have bulbouts and curb extensions.

Area Mitigation - Per state requirement

Energy Mitigation - In compliance with 2016 Title 24, and per project design elements

Water Mitigation - In compliance with state-required green building standard

Waste Mitigation - waste hauler is required to be in compliance with state mandates

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	11.00
tblConstructionPhase	NumDays	300.00	220.00
tblConstructionPhase	NumDays	30.00	24.00
tblConstructionPhase	NumDays	20.00	9.00
tblConstructionPhase	NumDays	10.00	12.00
tblConstructionPhase	PhaseEndDate	6/11/2020	3/20/2020
tblConstructionPhase	PhaseEndDate	5/19/2020	2/21/2020
tblConstructionPhase	PhaseEndDate	4/17/2019	4/20/2019
tblConstructionPhase	PhaseEndDate	5/19/2020	3/5/2020
tblConstructionPhase	PhaseEndDate	3/14/2019	3/18/2019
tblConstructionPhase	PhaseStartDate	5/20/2020	3/6/2020

Hash Farms Development Project Phase 2 - San Joaquin Valley Unified APCD Air District, Annual

tblConstructionPhase	PhaseStartDate	4/18/2019	4/21/2019
tblConstructionPhase	PhaseStartDate	3/15/2019	3/19/2019
tblConstructionPhase	PhaseStartDate	5/20/2020	2/22/2020
tblFleetMix	HHD	0.11	5.0000e-003
tblFleetMix	HHD	0.11	5.0000e-003
tblFleetMix	LDA	0.50	0.52
tblFleetMix	LDA	0.50	0.52
tblFleetMix	LDT1	0.03	0.22
tblFleetMix	LDT1	0.03	0.22
tblFleetMix	LDT2	0.17	0.16
tblFleetMix	LDT2	0.17	0.16
tblFleetMix	LHD1	0.02	2.0000e-003
tblFleetMix	LHD1	0.02	2.0000e-003
tblFleetMix	LHD2	5.6900e-003	1.0000e-003
tblFleetMix	LHD2	5.6900e-003	1.0000e-003
tblFleetMix	MCY	5.3970e-003	0.01
tblFleetMix	MCY	5.3970e-003	0.01
tblFleetMix	MDV	0.13	0.06
tblFleetMix	MDV	0.13	0.06
tblFleetMix	MH	8.4800e-004	7.0000e-003
tblFleetMix	MH	8.4800e-004	7.0000e-003
tblFleetMix	MHD	0.02	7.0000e-003
tblFleetMix	MHD	0.02	7.0000e-003
tblFleetMix	OBUS	1.7990e-003	0.00
tblFleetMix	OBUS	1.7990e-003	0.00
tblFleetMix	SBUS	9.8700e-004	1.0000e-003
tblFleetMix	SBUS	9.8700e-004	1.0000e-003

tblFleetMix	UBUS	1.6900e-003	1.0000e-003
tblFleetMix	UBUS	1.6900e-003	1.0000e-003
tblGrading	AcresOfGrading	60.00	75.00
tblLandUse	Population	159.00	140.00
tblLandUse	Population	51.00	45.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.023
tblProjectCharacteristics	CO2IntensityFactor	702.44	506.83
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2018	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	HO_TL	7.90	4.47
tblVehicleTrips	HO_TL	7.90	4.47
tblVehicleTrips	HS_TL	7.10	5.13
tblVehicleTrips	HS_TL	7.10	5.13
tblVehicleTrips	HW_TL	16.80	11.01
tblVehicleTrips	HW_TL	16.80	11.01
tblVehicleTrips	WD_TR	5.81	10.60
tblVehicleTrips	WD_TR	9.52	10.00
tblWoodstoves	NumberCatalytic	16.23	16.56
tblWoodstoves	NumberNoncatalytic	16.23	16.56

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.3206	2.9419	2.2575	3.9800e-003	0.2625	0.1612	0.4237	0.1149	0.1507	0.2655	0.0000	352.4810	352.4810	0.0823	0.0000	354.5378
2020	1.0471	0.4555	0.4274	7.5000e-004	9.1300e-003	0.0254	0.0345	2.4500e-003	0.0238	0.0263	0.0000	65.1639	65.1639	0.0143	0.0000	65.5200
Maximum	**1.0471**	**2.9419**	**2.2575**	**3.9800e-003**	**0.2625**	**0.1612**	**0.4237**	**0.1149**	**0.1507**	**0.2655**	**0.0000**	**352.4810**	**352.4810**	**0.0823**	**0.0000**	**354.5378**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.3206	2.9419	2.2575	3.9800e-003	0.2625	0.1612	0.4237	0.1149	0.1507	0.2655	0.0000	352.4807	352.4807	0.0823	0.0000	354.5374
2020	1.0471	0.4555	0.4274	7.5000e-004	9.1300e-003	0.0254	0.0345	2.4500e-003	0.0238	0.0263	0.0000	65.1638	65.1638	0.0143	0.0000	65.5199
Maximum	**1.0471**	**2.9419**	**2.2575**	**3.9800e-003**	**0.2625**	**0.1612**	**0.4237**	**0.1149**	**0.1507**	**0.2655**	**0.0000**	**352.4807**	**352.4807**	**0.0823**	**0.0000**	**354.5374**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	3-1-2019	5-31-2019	1.3851	1.3851
2	6-1-2019	8-31-2019	0.8115	0.8115
3	9-1-2019	11-30-2019	0.8034	0.8034
4	12-1-2019	2-29-2020	0.7358	0.7358
5	3-1-2020	5-31-2020	1.0076	1.0076
		Highest	1.3851	1.3851

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8892	0.0834	3.7521	0.0108		0.5349	0.5349		0.5349	0.5349	70.9902	29.3922	100.3824	0.3332	5.2000e-004	108.8684
Energy	0.0105	0.0900	0.0383	5.7000e-004		7.2800e-003	7.2800e-003		7.2800e-003	7.2800e-003	0.0000	234.2478	234.2478	7.9000e-003	3.1900e-003	235.3969
Mobile	0.2811	0.4721	2.9073	6.2700e-003	0.5792	6.0200e-003	0.5852	0.1545	5.6100e-003	0.1602	0.0000	567.8181	567.8181	0.0302	0.0000	568.5722
Waste						0.0000	0.0000		0.0000	0.0000	12.1856	0.0000	12.1856	0.7202	0.0000	30.1892
Water						0.0000	0.0000		0.0000	0.0000	1.3642	7.5306	8.8948	0.1405	3.3800e-003	13.4145
Total	**1.1809**	**0.6455**	**6.6978**	**0.0176**	**0.5792**	**0.5482**	**1.1273**	**0.1545**	**0.5478**	**0.7023**	**84.5400**	**838.9886**	**923.5286**	**1.2319**	**7.0900e-003**	**956.4412**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4997	0.0303	0.4904	1.8000e-004		4.6300e-003	4.6300e-003		4.6300e-003	4.6300e-003	0.0000	29.3682	29.3682	1.2900e-003	5.2000e-004	29.5566
Energy	7.3100e-003	0.0625	0.0266	4.0000e-004		5.0500e-003	5.0500e-003		5.0500e-003	5.0500e-003	0.0000	189.0174	189.0174	6.6800e-003	2.4800e-003	189.9227
Mobile	0.2765	0.4556	2.7958	5.9700e-003	0.5502	5.7600e-003	0.5560	0.1468	5.3700e-003	0.1522	0.0000	540.6254	540.6254	0.0290	0.0000	541.3492
Waste						0.0000	0.0000		0.0000	0.0000	6.0928	0.0000	6.0928	0.3601	0.0000	15.0946
Water						0.0000	0.0000		0.0000	0.0000	1.0232	4.9935	6.0167	0.1053	2.5300e-003	9.4038
Total	**0.7834**	**0.5484**	**3.3127**	**6.5500e-003**	**0.5502**	**0.0154**	**0.5656**	**0.1468**	**0.0151**	**0.1619**	**7.1160**	**764.0045**	**771.1204**	**0.5023**	**5.5300e-003**	**785.3269**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**33.66**	**15.05**	**50.54**	**62.85**	**5.00**	**97.18**	**49.83**	**5.00**	**97.25**	**76.95**	**91.58**	**8.94**	**16.50**	**59.22**	**22.00**	**17.89**

3.0 Construction Detail

Construction Phase

Hash Farms Development Project Phase 2 - San Joaquin Valley Unified APCD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2019	3/18/2019	5	12	
2	Grading	Grading	3/19/2019	4/20/2019	5	24	
3	Building Construction	Building Construction	4/21/2019	2/21/2020	5	220	
4	Paving	Paving	2/22/2020	3/5/2020	5	9	
5	Architectural Coating	Architectural Coating	3/6/2020	3/20/2020	5	11	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 214,650; Residential Outdoor: 71,550; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	6.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	30.00	7.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1084	0.0000	0.1084	0.0596	0.0000	0.0596	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0260	0.2734	0.1324	2.3000e-004		0.0143	0.0143		0.0132	0.0132	0.0000	20.5012	20.5012	6.4900e-003	0.0000	20.6634
Total	**0.0260**	**0.2734**	**0.1324**	**2.3000e-004**	**0.1084**	**0.0143**	**0.1227**	**0.0596**	**0.0132**	**0.0728**	**0.0000**	**20.5012**	**20.5012**	**6.4900e-003**	**0.0000**	**20.6634**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-004	5.2000e-004	5.1400e-003	1.0000e-005	1.3400e-003	1.0000e-005	1.3500e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.2319	1.2319	4.0000e-005	0.0000	1.2329
Total	**7.0000e-004**	**5.2000e-004**	**5.1400e-003**	**1.0000e-005**	**1.3400e-003**	**1.0000e-005**	**1.3500e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.2319**	**1.2319**	**4.0000e-005**	**0.0000**	**1.2329**

3.2 Site Preparation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1084	0.0000	0.1084	0.0596	0.0000	0.0596	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0260	0.2734	0.1324	2.3000e-004		0.0143	0.0143		0.0132	0.0132	0.0000	20.5012	20.5012	6.4900e-003	0.0000	20.6634
Total	**0.0260**	**0.2734**	**0.1324**	**2.3000e-004**	**0.1084**	**0.0143**	**0.1227**	**0.0596**	**0.0132**	**0.0728**	**0.0000**	**20.5012**	**20.5012**	**6.4900e-003**	**0.0000**	**20.6634**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.0000e-004	5.2000e-004	5.1400e-003	1.0000e-005	1.3400e-003	1.0000e-005	1.3500e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.2319	1.2319	4.0000e-005	0.0000	1.2329
Total	**7.0000e-004**	**5.2000e-004**	**5.1400e-003**	**1.0000e-005**	**1.3400e-003**	**1.0000e-005**	**1.3500e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.2319**	**1.2319**	**4.0000e-005**	**0.0000**	**1.2329**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1120	0.0000	0.1120	0.0440	0.0000	0.0440	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0569	0.6542	0.4005	7.4000e-004		0.0286	0.0286		0.0263	0.0263	0.0000	66.8416	66.8416	0.0212	0.0000	67.3703
Total	**0.0569**	**0.6542**	**0.4005**	**7.4000e-004**	**0.1120**	**0.0286**	**0.1406**	**0.0440**	**0.0263**	**0.0703**	**0.0000**	**66.8416**	**66.8416**	**0.0212**	**0.0000**	**67.3703**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5500e-003	1.1600e-003	0.0114	3.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.7376	2.7376	8.0000e-005	0.0000	2.7397
Total	**1.5500e-003**	**1.1600e-003**	**0.0114**	**3.0000e-005**	**2.9800e-003**	**2.0000e-005**	**3.0000e-003**	**7.9000e-004**	**2.0000e-005**	**8.1000e-004**	**0.0000**	**2.7376**	**2.7376**	**8.0000e-005**	**0.0000**	**2.7397**

3.3 Grading - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1120	0.0000	0.1120	0.0440	0.0000	0.0440	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0569	0.6542	0.4005	7.4000e-004		0.0286	0.0286		0.0263	0.0263	0.0000	66.8415	66.8415	0.0212	0.0000	67.3702
Total	**0.0569**	**0.6542**	**0.4005**	**7.4000e-004**	**0.1120**	**0.0286**	**0.1406**	**0.0440**	**0.0263**	**0.0703**	**0.0000**	**66.8415**	**66.8415**	**0.0212**	**0.0000**	**67.3702**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5500e-003	1.1600e-003	0.0114	3.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.7376	2.7376	8.0000e-005	0.0000	2.7397
Total	**1.5500e-003**	**1.1600e-003**	**0.0114**	**3.0000e-005**	**2.9800e-003**	**2.0000e-005**	**3.0000e-003**	**7.9000e-004**	**2.0000e-005**	**8.1000e-004**	**0.0000**	**2.7376**	**2.7376**	**8.0000e-005**	**0.0000**	**2.7397**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2149	1.9182	1.5619	2.4500e-003		0.1174	0.1174		0.1104	0.1104	0.0000	213.9448	213.9448	0.0521	0.0000	215.2478
Total	**0.2149**	**1.9182**	**1.5619**	**2.4500e-003**		**0.1174**	**0.1174**		**0.1104**	**0.1104**	**0.0000**	**213.9448**	**213.9448**	**0.0521**	**0.0000**	**215.2478**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.9200e-003	0.0811	0.0163	1.7000e-004	3.8200e-003	5.8000e-004	4.4000e-003	1.1000e-003	5.6000e-004	1.6600e-003	0.0000	16.0841	16.0841	1.4300e-003	0.0000	16.1199
Worker	0.0177	0.0132	0.1298	3.4000e-004	0.0339	2.4000e-004	0.0342	9.0200e-003	2.2000e-004	9.2400e-003	0.0000	31.1399	31.1399	9.6000e-004	0.0000	31.1639
Total	**0.0206**	**0.0944**	**0.1461**	**5.1000e-004**	**0.0378**	**8.2000e-004**	**0.0386**	**0.0101**	**7.8000e-004**	**0.0109**	**0.0000**	**47.2239**	**47.2239**	**2.3900e-003**	**0.0000**	**47.2838**

3.4 Building Construction - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2149	1.9182	1.5619	2.4500e-003		0.1174	0.1174		0.1104	0.1104	0.0000	213.9446	213.9446	0.0521	0.0000	215.2475
Total	**0.2149**	**1.9182**	**1.5619**	**2.4500e-003**		**0.1174**	**0.1174**		**0.1104**	**0.1104**	**0.0000**	**213.9446**	**213.9446**	**0.0521**	**0.0000**	**215.2475**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.9200e-003	0.0811	0.0163	1.7000e-004	3.8200e-003	5.8000e-004	4.4000e-003	1.1000e-003	5.6000e-004	1.6600e-003	0.0000	16.0841	16.0841	1.4300e-003	0.0000	16.1199
Worker	0.0177	0.0132	0.1298	3.4000e-004	0.0339	2.4000e-004	0.0342	9.0200e-003	2.2000e-004	9.2400e-003	0.0000	31.1399	31.1399	9.6000e-004	0.0000	31.1639
Total	**0.0206**	**0.0944**	**0.1461**	**5.1000e-004**	**0.0378**	**8.2000e-004**	**0.0386**	**0.0101**	**7.8000e-004**	**0.0109**	**0.0000**	**47.2239**	**47.2239**	**2.3900e-003**	**0.0000**	**47.2838**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0403	0.3645	0.3201	5.1000e-004		0.0212	0.0212		0.0200	0.0200	0.0000	44.0059	44.0059	0.0107	0.0000	44.2743
Total	**0.0403**	**0.3645**	**0.3201**	**5.1000e-004**		**0.0212**	**0.0212**		**0.0200**	**0.0200**	**0.0000**	**44.0059**	**44.0059**	**0.0107**	**0.0000**	**44.2743**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-004	0.0155	2.9300e-003	4.0000e-005	8.0000e-004	8.0000e-005	8.8000e-004	2.3000e-004	8.0000e-005	3.1000e-004	0.0000	3.3298	3.3298	2.8000e-004	0.0000	3.3369
Worker	3.3600e-003	2.4200e-003	0.0241	7.0000e-005	7.0900e-003	5.0000e-005	7.1300e-003	1.8800e-003	4.0000e-005	1.9300e-003	0.0000	6.3003	6.3003	1.7000e-004	0.0000	6.3047
Total	**3.8600e-003**	**0.0179**	**0.0270**	**1.1000e-004**	**7.8900e-003**	**1.3000e-004**	**8.0100e-003**	**2.1100e-003**	**1.2000e-004**	**2.2400e-003**	**0.0000**	**9.6301**	**9.6301**	**4.5000e-004**	**0.0000**	**9.6415**

3.4 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0403	0.3645	0.3201	5.1000e-004		0.0212	0.0212		0.0200	0.0200	0.0000	44.0058	44.0058	0.0107	0.0000	44.2742
Total	**0.0403**	**0.3645**	**0.3201**	**5.1000e-004**		**0.0212**	**0.0212**		**0.0200**	**0.0200**	**0.0000**	**44.0058**	**44.0058**	**0.0107**	**0.0000**	**44.2742**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-004	0.0155	2.9300e-003	4.0000e-005	8.0000e-004	8.0000e-005	8.8000e-004	2.3000e-004	8.0000e-005	3.1000e-004	0.0000	3.3298	3.3298	2.8000e-004	0.0000	3.3369
Worker	3.3600e-003	2.4200e-003	0.0241	7.0000e-005	7.0900e-003	5.0000e-005	7.1300e-003	1.8800e-003	4.0000e-005	1.9300e-003	0.0000	6.3003	6.3003	1.7000e-004	0.0000	6.3047
Total	**3.8600e-003**	**0.0179**	**0.0270**	**1.1000e-004**	**7.8900e-003**	**1.3000e-004**	**8.0100e-003**	**2.1100e-003**	**1.2000e-004**	**2.2400e-003**	**0.0000**	**9.6301**	**9.6301**	**4.5000e-004**	**0.0000**	**9.6415**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.1000e-003	0.0633	0.0659	1.0000e-004		3.3900e-003	3.3900e-003		3.1200e-003	3.1200e-003	0.0000	9.0127	9.0127	2.9100e-003	0.0000	9.0856
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.1000e-003**	**0.0633**	**0.0659**	**1.0000e-004**		**3.3900e-003**	**3.3900e-003**		**3.1200e-003**	**3.1200e-003**	**0.0000**	**9.0127**	**9.0127**	**2.9100e-003**	**0.0000**	**9.0856**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-004	2.9000e-004	2.8500e-003	1.0000e-005	8.4000e-004	1.0000e-005	8.4000e-004	2.2000e-004	1.0000e-005	2.3000e-004	0.0000	0.7461	0.7461	2.0000e-005	0.0000	0.7466
Total	**4.0000e-004**	**2.9000e-004**	**2.8500e-003**	**1.0000e-005**	**8.4000e-004**	**1.0000e-005**	**8.4000e-004**	**2.2000e-004**	**1.0000e-005**	**2.3000e-004**	**0.0000**	**0.7461**	**0.7461**	**2.0000e-005**	**0.0000**	**0.7466**

3.5 Paving - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.1000e-003	0.0633	0.0659	1.0000e-004		3.3900e-003	3.3900e-003		3.1200e-003	3.1200e-003	0.0000	9.0127	9.0127	2.9100e-003	0.0000	9.0856
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.1000e-003**	**0.0633**	**0.0659**	**1.0000e-004**		**3.3900e-003**	**3.3900e-003**		**3.1200e-003**	**3.1200e-003**	**0.0000**	**9.0127**	**9.0127**	**2.9100e-003**	**0.0000**	**9.0856**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-004	2.9000e-004	2.8500e-003	1.0000e-005	8.4000e-004	1.0000e-005	8.4000e-004	2.2000e-004	1.0000e-005	2.3000e-004	0.0000	0.7461	0.7461	2.0000e-005	0.0000	0.7466
Total	**4.0000e-004**	**2.9000e-004**	**2.8500e-003**	**1.0000e-005**	**8.4000e-004**	**1.0000e-005**	**8.4000e-004**	**2.2000e-004**	**1.0000e-005**	**2.3000e-004**	**0.0000**	**0.7461**	**0.7461**	**2.0000e-005**	**0.0000**	**0.7466**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9949					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3300e-003	9.2600e-003	0.0101	2.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	1.4043	1.4043	1.1000e-004	0.0000	1.4070
Total	**0.9962**	**9.2600e-003**	**0.0101**	**2.0000e-005**		**6.1000e-004**	**6.1000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**1.4043**	**1.4043**	**1.1000e-004**	**0.0000**	**1.4070**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.4000e-004	1.4000e-003	0.0000	4.1000e-004	0.0000	4.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3648	0.3648	1.0000e-005	0.0000	0.3650
Total	**1.9000e-004**	**1.4000e-004**	**1.4000e-003**	**0.0000**	**4.1000e-004**	**0.0000**	**4.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3648**	**0.3648**	**1.0000e-005**	**0.0000**	**0.3650**

3.6 Architectural Coating - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9949					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3300e-003	9.2600e-003	0.0101	2.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	1.4043	1.4043	1.1000e-004	0.0000	1.4070
Total	**0.9962**	**9.2600e-003**	**0.0101**	**2.0000e-005**		**6.1000e-004**	**6.1000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**1.4043**	**1.4043**	**1.1000e-004**	**0.0000**	**1.4070**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.4000e-004	1.4000e-003	0.0000	4.1000e-004	0.0000	4.1000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3648	0.3648	1.0000e-005	0.0000	0.3650
Total	**1.9000e-004**	**1.4000e-004**	**1.4000e-003**	**0.0000**	**4.1000e-004**	**0.0000**	**4.1000e-004**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**0.3648**	**0.3648**	**1.0000e-005**	**0.0000**	**0.3650**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

Provide Traffic Calming Measures

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2765	0.4556	2.7958	5.9700e-003	0.5502	5.7600e-003	0.5560	0.1468	5.3700e-003	0.1522	0.0000	540.6254	540.6254	0.0290	0.0000	541.3492
Unmitigated	0.2811	0.4721	2.9073	6.2700e-003	0.5792	6.0200e-003	0.5852	0.1545	5.6100e-003	0.1602	0.0000	567.8181	567.8181	0.0302	0.0000	568.5722

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	169.60	90.72	77.44	355,518	337,742
Single Family Housing	500.00	495.50	431.00	1,198,809	1,138,869
Total	669.60	586.22	508.44	1,554,327	1,476,611

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	11.01	5.13	4.47	45.60	19.00	35.40	86	11	3
Single Family Housing	11.01	5.13	4.47	45.60	19.00	35.40	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.515000	0.221000	0.164000	0.064000	0.002000	0.001000	0.007000	0.005000	0.000000	0.001000	0.012000	0.001000	0.007000
Condo/Townhouse	0.515000	0.221000	0.164000	0.064000	0.002000	0.001000	0.007000	0.005000	0.000000	0.001000	0.012000	0.001000	0.007000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	116.6748	116.6748	5.2900e-003	1.1500e-003	117.1502
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	130.0120	130.0120	5.9000e-003	1.2800e-003	130.5418
NaturalGas Mitigated	7.3100e-003	0.0625	0.0266	4.0000e-004		5.0500e-003	5.0500e-003		5.0500e-003	5.0500e-003	0.0000	72.3426	72.3426	1.3900e-003	1.3300e-003	72.7725
NaturalGas Unmitigated	0.0105	0.0900	0.0383	5.7000e-004		7.2800e-003	7.2800e-003		7.2800e-003	7.2800e-003	0.0000	104.2358	104.2358	2.0000e-003	1.9100e-003	104.8552

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Condo/Townhouse	348025	1.8800e-003	0.0160	6.8200e-003	1.0000e-004		1.3000e-003	1.3000e-003		1.3000e-003	1.3000e-003	0.0000	18.5720	18.5720	3.6000e-004	3.4000e-004	18.6823
Single Family Housing	1.60528e+006	8.6600e-003	0.0740	0.0315	4.7000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	85.6638	85.6638	1.6400e-003	1.5700e-003	86.1729
Total		**0.0105**	**0.0900**	**0.0383**	**5.7000e-004**		**7.2800e-003**	**7.2800e-003**		**7.2800e-003**	**7.2800e-003**	**0.0000**	**104.2358**	**104.2358**	**2.0000e-003**	**1.9100e-003**	**104.8552**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Condo/Townhouse	247065	1.3300e-003	0.0114	4.8400e-003	7.0000e-005		9.2000e-004	9.2000e-004		9.2000e-004	9.2000e-004	0.0000	13.1843	13.1843	2.5000e-004	2.4000e-004	13.2627
Single Family Housing	1.10858e+006	5.9800e-003	0.0511	0.0217	3.3000e-004		4.1300e-003	4.1300e-003		4.1300e-003	4.1300e-003	0.0000	59.1583	59.1583	1.1300e-003	1.0800e-003	59.5098
Total		**7.3100e-003**	**0.0625**	**0.0266**	**4.0000e-004**		**5.0500e-003**	**5.0500e-003**		**5.0500e-003**	**5.0500e-003**	**0.0000**	**72.3426**	**72.3426**	**1.3800e-003**	**1.3200e-003**	**72.7725**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	94672.3	21.7646	9.9000e-004	2.1000e-004	21.8533
Single Family Housing	470858	108.2474	4.9100e-003	1.0700e-003	108.6885
Total		**130.0120**	**5.9000e-003**	**1.2800e-003**	**130.5418**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	84550.7	19.4377	8.8000e-004	1.9000e-004	19.5169
Single Family Housing	422965	97.2371	4.4100e-003	9.6000e-004	97.6333
Total		**116.6748**	**5.2900e-003**	**1.1500e-003**	**117.1502**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.4997	0.0303	0.4904	1.8000e-004		4.6300e-003	4.6300e-003		4.6300e-003	4.6300e-003	0.0000	29.3682	29.3682	1.2900e-003	5.2000e-004	29.5566
Unmitigated	0.8892	0.0834	3.7521	0.0108		0.5349	0.5349		0.5349	0.5349	70.9902	29.3922	100.3824	0.3332	5.2000e-004	108.8684

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0995					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.4140					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.3608	0.0777	3.2605	0.0108		0.5322	0.5322		0.5322	0.5322	70.9902	28.5917	99.5819	0.3324	5.2000e-004	108.0484
Landscaping	0.0150	5.6900e-003	0.4917	3.0000e-005		2.7000e-003	2.7000e-003		2.7000e-003	2.7000e-003	0.0000	0.8005	0.8005	7.8000e-004	0.0000	0.8200
Total	**0.8892**	**0.0834**	**3.7522**	**0.0108**		**0.5349**	**0.5349**		**0.5349**	**0.5349**	**70.9902**	**29.3922**	**100.3824**	**0.3332**	**5.2000e-004**	**108.8684**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0995					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3830					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.8900e-003	0.0247	0.0105	1.6000e-004		2.0000e-003	2.0000e-003		2.0000e-003	2.0000e-003	0.0000	28.5917	28.5917	5.5000e-004	5.2000e-004	28.7616
Landscaping	0.0143	5.5700e-003	0.4799	2.0000e-005		2.6300e-003	2.6300e-003		2.6300e-003	2.6300e-003	0.0000	0.7765	0.7765	7.4000e-004	0.0000	0.7951
Total	**0.4997**	**0.0303**	**0.4904**	**1.8000e-004**		**4.6300e-003**	**4.6300e-003**		**4.6300e-003**	**4.6300e-003**	**0.0000**	**29.3682**	**29.3682**	**1.2900e-003**	**5.2000e-004**	**29.5566**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Turf Reduction

Use Water Efficient Irrigation System

Use Water Efficient Landscaping

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	6.0167	0.1053	2.5300e-003	9.4038
Unmitigated	8.8948	0.1405	3.3800e-003	13.4145

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	1.04246 / 0.657206	2.1563	0.0341	8.2000e-004	3.2520
Single Family Housing	3.2577 / 2.05377	6.7385	0.1064	2.5600e-003	10.1625
Total		**8.8948**	**0.1405**	**3.3800e-003**	**13.4145**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	0.781848 / 0.295743	1.4586	0.0255	6.1000e-004	2.2797
Single Family Housing	2.44328 / 0.924196	4.5581	0.0798	1.9200e-003	7.1241
Total		**6.0167**	**0.1053**	**2.5300e-003**	**9.4038**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	6.0928	0.3601	0.0000	15.0946
Unmitigated	12.1856	0.7202	0.0000	30.1892

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	7.36	1.4940	0.0883	0.0000	3.7014
Single Family Housing	52.67	10.6915	0.6319	0.0000	26.4878
Total		**12.1855**	**0.7201**	**0.0000**	**30.1892**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	3.68	0.7470	0.0442	0.0000	1.8507
Single Family Housing	26.335	5.3458	0.3159	0.0000	13.2439
Total		**6.0928**	**0.3601**	**0.0000**	**15.0946**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Hash Farms Development Project Phase 2

San Joaquin Valley Unified APCD, Summary Report

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	50.00	Dwelling Unit	16.23	90,000.00	140
Condo/Townhouse	16.00	Dwelling Unit	1.00	16,000.00	45

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	506.83	**CH4 Intensity (lb/MWhr)**	0.023	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments

Only CalEEMod defaults were used.

Project Characteristics - Project includes single and multifamily units, and a neighborhood park. SCE intensity factors were adjusted to account for the utility Renewable Portfolio Standard rate forecast for 2020.

Land Use - Population modified to reflect City of Kingsburgs Urban Water Management Plan Population Estimates

Construction Phase - Applicant provided anticipated construction schedule

Off-road Equipment -

Vehicle Trips - Trip length adjusted per Caltrans' SB 43 compliance database. Used an average of defalut, clovis, selma, kingsburg, visalia and reedley. Weekday trip rate adjusted per Traffic Study prepared by Ruettgers & Schuler Civil Engineers.

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix - fleet mix adjusted per SJVAPCD recommended residential mix

Mobile Land Use Mitigation - Project includes sidewalks connecting to existing neighborhood and intersections will have bulbouts and curb extensions.

Area Mitigation - Per state requirement

Energy Mitigation - In compliance with 2016 Title 24, and per project design elements

Water Mitigation - In compliance with state-required green building standard

Waste Mitigation - waste hauler is required to be in compliance with state mandates

2.0 Peak Daily Emissions

Peak Daily Construction Emissions

Peak Daily Construction Emissions

Hash Farms Development Project Phase 2 - San Joaquin Valley Unified APCD Air District, Summary Report

		Unmitigated						Mitigated					
		ROG	NOX	CO	SO2	PM10	PM2.5	ROG	NOX	CO	SO2	PM10	PM2.5
Year	Phase	lb/day											
2019	Site Preparation	4.4628 S	45.6683 W	23.0701 S	0.0405 S	20.6881 S	12.1922 S	4.4628 S	45.6683 W	23.0701 S	0.0405 S	20.6881 S	12.1922 S
2019	Grading	4.8809 S	54.6264 W	34.4957 S	0.0648 S	11.9760 S	5.9295 S	4.8809 S	54.6264 W	34.4957 S	0.0648 S	11.9760 S	5.9295 S
2019	Building Construction	2.6057 S	22.1281 W	19.0086 S	0.0330 S	1.7251 W	1.3353 W	2.6057 S	22.1281 W	19.0086 S	0.0330 S	1.7251 W	1.3353 W
2020	Building Construction	2.3392 S	20.1404 W	18.4875 S	0.0328 S	1.5500 W	1.1708 W	2.3392 S	20.1404 W	18.4875 S	0.0328 S	1.5500 W	1.1708 W
2020	Paving	1.4534 S	14.1356 W	15.4001 S	0.0248 S	0.9457 S	0.7446 S	1.4534 S	14.1356 W	15.4001 S	0.0248 S	0.9457 S	0.7446 S
2020	Architectural Coating	181.1723 S	1.7119 W	2.1306 S	3.7800e-003 S	0.1881 S	0.1317 S	181.1723 S	1.7119 W	2.1306 S	3.7800e-003 S	0.1881 S	0.1317 S
	Peak Daily Total	181.1723 S	54.6264 W	34.4957 S	0.0648 S	20.6881 S	12.1922 S	181.1723 S	54.6264 W	34.4957 S	0.0648 S	20.6881 S	12.1922 S
	Air District Threshold												
	Exceed Significance?												

Peak Daily Operational Emissions

Peak Daily Operational Emissions

		Unmitigated						Mitigated					
		ROG	NOX	CO	SO2	PM10	PM2.5	ROG	NOX	CO	SO2	PM10	PM2.5
	Operational Activity	lb/day											
On-Site	Area	11.7788 S	1.9584 S	84.9865 S	0.2628 S	13.0097 S	13.0097 S	2.8729 S	0.6640 S	5.5880 S	4.1200e-003 S	0.0780 S	0.0780 S
On-Site	Energy	0.0577 S	0.4932 S	0.2099 S	3.1500e-003 S	0.0399 S	0.0399 S	0.0401 S	0.3423 S	0.1457 S	2.1800e-003 S	0.0277 S	0.0277 S
Off-Site	Mobile	2.0991 S	2.8881 W	18.4961 S	0.0395 S	3.4841 W	0.9510 W	2.0709 S	2.7859 W	17.7346 S	0.0376 S	3.3101 W	0.9036 W
	Peak Daily Total	13.9356 S	5.3397 W	103.6925 S	0.3054 S	16.5337 W	14.0006 W	4.9839 S	3.7922 W	23.4683 S	0.0439 S	3.4158 W	1.0093 W
	Air District Threshold												
	Exceed Significance?												

3.0 Annual GHG Emissions

Hash Farms Development Project Phase 2 - San Joaquin Valley Unified APCD Air District, Summary Report

Annual GHG

Annual GHG

		Unmitigated				Mitigated			
		CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
GHG Activity	Year	MT/yr							
Construction	2019	352.4810	0.0823	0.0000	354.5378	352.4807	0.0823	0.0000	354.5375
Construction	2020	65.1639	0.0142	0.0000	65.5199	65.1638	0.0142	0.0000	65.5199
Operational	2020	923.5286	1.2319	7.1033e-003	956.4418	771.1204	0.5023	5.5338e-003	785.3272
	Total								
	Significance Threshold								
	Exceed Significance?								

Hash Farms Development Project Phase 3

San Joaquin Valley Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	49.00	Dwelling Unit	15.91	88,200.00	138

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	506.83	**CH4 Intensity (lb/MWhr)**	0.023	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Hash Farms Development Project Phase 3 - San Joaquin Valley Unified APCD Air District, Annual

Project Characteristics - Project includes single and multifamily units, and a neighborhood park. SCE intensity factors were adjusted to account for the utility Renewable Portfolio Standard rate forecast for 2020.

Land Use - Population modified to reflect City of Kingsburgs Urban Water Management Plan Population Estimates

Construction Phase - Applicant provided anticipated construction schedule

Off-road Equipment -

Vehicle Trips - Trip length adjusted per Caltrans' SB 43 compliance database. Used an average of defalut, clovis, selma, kingsburg, visalia and reedley. Weekday trip rate adjusted per Traffic Study prepared by Ruettgers & Schuler Civil Engineers.

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix - fleet mix adjusted per SJVAPCD recommended residential mix

Mobile Land Use Mitigation - Project includes sidewalks connecting to existing neighborhood and intersections will have bulbouts and curb extensions.

Area Mitigation - Per state requirement

Energy Mitigation - In compliance with 2016 Title 24, and per project design elements

Water Mitigation - In compliance with state-required green building standard

Waste Mitigation - waste hauler is required to be in compliance with state mandates

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	13.00
tblConstructionPhase	NumDays	300.00	199.00
tblConstructionPhase	NumDays	20.00	23.00
tblConstructionPhase	PhaseEndDate	3/22/2021	3/15/2021
tblConstructionPhase	PhaseEndDate	2/22/2021	1/22/2021
tblConstructionPhase	PhaseEndDate	3/5/2021	2/24/2021
tblConstructionPhase	PhaseStartDate	3/6/2021	2/25/2021
tblConstructionPhase	PhaseStartDate	2/23/2021	1/23/2021
tblFleetMix	HHD	0.11	5.0000e-003
tblFleetMix	LDA	0.51	0.52
tblFleetMix	LDT1	0.03	0.22

tblFleetMix	LDT2	0.17	0.16
tblFleetMix	LHD1	0.02	1.0000e-003
tblFleetMix	LHD2	5.3740e-003	7.0000e-003
tblFleetMix	MCY	5.3070e-003	0.01
tblFleetMix	MDV	0.12	2.0000e-003
tblFleetMix	MH	7.9200e-004	7.0000e-003
tblFleetMix	MHD	0.02	5.0000e-003
tblFleetMix	OBUS	1.7970e-003	0.00
tblFleetMix	SBUS	9.6900e-004	1.0000e-003
tblFleetMix	UBUS	1.6230e-003	1.0000e-003
tblLandUse	Population	155.00	138.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.023
tblProjectCharacteristics	CO2IntensityFactor	702.44	506.83
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2018	2021
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	HO_TL	7.90	4.47
tblVehicleTrips	HS_TL	7.10	5.13
tblVehicleTrips	HW_TL	16.80	11.01
tblVehicleTrips	WD_TR	9.52	10.00
tblWoodstoves	NumberCatalytic	15.91	16.23
tblWoodstoves	NumberNoncatalytic	15.91	16.23

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.2853	2.6743	2.1486	3.8000e-003	0.2400	0.1419	0.3820	0.1101	0.1327	0.2428	0.0000	330.8679	330.8679	0.0809	0.0000	332.8907
2021	0.8609	0.3035	0.3269	5.5000e-004	4.5000e-003	0.0161	0.0206	1.2000e-003	0.0150	0.0162	0.0000	47.8636	47.8636	0.0122	0.0000	48.1688
Maximum	**0.8609**	**2.6743**	**2.1486**	**3.8000e-003**	**0.2400**	**0.1419**	**0.3820**	**0.1101**	**0.1327**	**0.2428**	**0.0000**	**330.8679**	**330.8679**	**0.0809**	**0.0000**	**332.8907**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.2853	2.6743	2.1486	3.8000e-003	0.2400	0.1419	0.3820	0.1101	0.1327	0.2428	0.0000	330.8675	330.8675	0.0809	0.0000	332.8903
2021	0.8609	0.3035	0.3269	5.5000e-004	4.5000e-003	0.0161	0.0206	1.2000e-003	0.0150	0.0162	0.0000	47.8636	47.8636	0.0122	0.0000	48.1688
Maximum	**0.8609**	**2.6743**	**2.1486**	**3.8000e-003**	**0.2400**	**0.1419**	**0.3820**	**0.1101**	**0.1327**	**0.2428**	**0.0000**	**330.8675**	**330.8675**	**0.0809**	**0.0000**	**332.8903**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	3-1-2020	5-31-2020	1.2731	1.2731
2	6-1-2020	8-31-2020	0.7257	0.7257
3	9-1-2020	11-30-2020	0.7182	0.7182
4	12-1-2020	2-28-2021	0.7557	0.7557
5	3-1-2021	5-31-2021	0.6918	0.6918
		Highest	1.2731	1.2731

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7712	0.0715	3.3762	9.9400e-003		0.4935	0.4935		0.4935	0.4935	65.6134	21.8215	87.4349	0.3077	3.9000e-004	95.2436
Energy	8.4800e-003	0.0725	0.0309	4.6000e-004		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	190.0330	190.0330	6.4200e-003	2.5900e-003	190.9641
Mobile	0.1846	0.3045	1.8480	4.1700e-003	0.4344	3.9400e-003	0.4384	0.1155	3.6600e-003	0.1192	0.0000	377.9214	377.9214	0.0201	0.0000	378.4245
Waste						0.0000	0.0000		0.0000	0.0000	10.5393	0.0000	10.5393	0.6229	0.0000	26.1107
Water						0.0000	0.0000		0.0000	0.0000	1.0129	5.5909	6.6037	0.1043	2.5100e-003	9.9592
Total	**0.9643**	**0.4485**	**5.2551**	**0.0146**	**0.4344**	**0.5033**	**0.9378**	**0.1155**	**0.5030**	**0.6185**	**77.1655**	**595.3667**	**672.5322**	**1.0614**	**5.4900e-003**	**700.7021**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4142	0.0225	0.3637	1.4000e-004		3.4400e-003	3.4400e-003		3.4400e-003	3.4400e-003	0.0000	21.8036	21.8036	9.6000e-004	3.9000e-004	21.9435
Energy	5.8600e-003	0.0501	0.0213	3.2000e-004		4.0500e-003	4.0500e-003		4.0500e-003	4.0500e-003	0.0000	153.2675	153.2675	5.4400e-003	2.0000e-003	154.0002
Mobile	0.1814	0.2939	1.7764	3.9700e-003	0.4127	3.7700e-003	0.4165	0.1097	3.5000e-003	0.1132	0.0000	359.8465	359.8465	0.0193	0.0000	360.3293
Waste						0.0000	0.0000		0.0000	0.0000	5.2697	0.0000	5.2697	0.3114	0.0000	13.0553
Water						0.0000	0.0000		0.0000	0.0000	0.7596	3.7073	4.4669	0.0782	1.8800e-003	6.9816
Total	**0.6015**	**0.3664**	**2.1613**	**4.4300e-003**	**0.4127**	**0.0113**	**0.4240**	**0.1097**	**0.0110**	**0.1207**	**6.0293**	**538.6249**	**544.6541**	**0.4153**	**4.2700e-003**	**556.3099**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**37.63**	**18.31**	**58.87**	**69.60**	**5.00**	**97.76**	**54.79**	**5.00**	**97.82**	**80.48**	**92.19**	**9.53**	**19.01**	**60.87**	**22.22**	**20.61**

3.0 Construction Detail

Construction Phase

Hash Farms Development Project Phase 3 - San Joaquin Valley Unified APCD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2020	3/17/2020	5	10	
2	Grading	Grading	3/18/2020	4/20/2020	5	30	
3	Building Construction	Building Construction	4/21/2020	1/22/2021	5	199	
4	Paving	Paving	1/23/2021	2/24/2021	5	23	
5	Architectural Coating	Architectural Coating	2/25/2021	3/15/2021	5	13	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 178,605; Residential Outdoor: 59,535; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	4.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	18.00	5.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1084	0.0000	0.1084	0.0596	0.0000	0.0596	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0245	0.2545	0.1291	2.3000e-004		0.0132	0.0132		0.0121	0.0121	0.0000	20.0584	20.0584	6.4900e-003	0.0000	20.2206
Total	**0.0245**	**0.2545**	**0.1291**	**2.3000e-004**	**0.1084**	**0.0132**	**0.1216**	**0.0596**	**0.0121**	**0.0717**	**0.0000**	**20.0584**	**20.0584**	**6.4900e-003**	**0.0000**	**20.2206**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.4000e-004	4.6000e-004	4.5700e-003	1.0000e-005	1.3400e-003	1.0000e-005	1.3500e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.1937	1.1937	3.0000e-005	0.0000	1.1946
Total	**6.4000e-004**	**4.6000e-004**	**4.5700e-003**	**1.0000e-005**	**1.3400e-003**	**1.0000e-005**	**1.3500e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.1937**	**1.1937**	**3.0000e-005**	**0.0000**	**1.1946**

3.2 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1084	0.0000	0.1084	0.0596	0.0000	0.0596	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0245	0.2545	0.1291	2.3000e-004		0.0132	0.0132		0.0121	0.0121	0.0000	20.0584	20.0584	6.4900e-003	0.0000	20.2206
Total	**0.0245**	**0.2545**	**0.1291**	**2.3000e-004**	**0.1084**	**0.0132**	**0.1216**	**0.0596**	**0.0121**	**0.0717**	**0.0000**	**20.0584**	**20.0584**	**6.4900e-003**	**0.0000**	**20.2206**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.4000e-004	4.6000e-004	4.5700e-003	1.0000e-005	1.3400e-003	1.0000e-005	1.3500e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.1937	1.1937	3.0000e-005	0.0000	1.1946
Total	**6.4000e-004**	**4.6000e-004**	**4.5700e-003**	**1.0000e-005**	**1.3400e-003**	**1.0000e-005**	**1.3500e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.1937**	**1.1937**	**3.0000e-005**	**0.0000**	**1.1946**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1041	0.0000	0.1041	0.0432	0.0000	0.0432	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0534	0.6024	0.3835	7.4000e-004		0.0261	0.0261		0.0240	0.0240	0.0000	65.3812	65.3812	0.0212	0.0000	65.9098
Total	**0.0534**	**0.6024**	**0.3835**	**7.4000e-004**	**0.1041**	**0.0261**	**0.1302**	**0.0432**	**0.0240**	**0.0672**	**0.0000**	**65.3812**	**65.3812**	**0.0212**	**0.0000**	**65.9098**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4100e-003	1.0200e-003	0.0102	3.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.6528	2.6528	7.0000e-005	0.0000	2.6546
Total	**1.4100e-003**	**1.0200e-003**	**0.0102**	**3.0000e-005**	**2.9800e-003**	**2.0000e-005**	**3.0000e-003**	**7.9000e-004**	**2.0000e-005**	**8.1000e-004**	**0.0000**	**2.6528**	**2.6528**	**7.0000e-005**	**0.0000**	**2.6546**

3.3 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1041	0.0000	0.1041	0.0432	0.0000	0.0432	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0534	0.6024	0.3835	7.4000e-004		0.0261	0.0261		0.0240	0.0240	0.0000	65.3811	65.3811	0.0212	0.0000	65.9097
Total	**0.0534**	**0.6024**	**0.3835**	**7.4000e-004**	**0.1041**	**0.0261**	**0.1302**	**0.0432**	**0.0240**	**0.0672**	**0.0000**	**65.3811**	**65.3811**	**0.0212**	**0.0000**	**65.9097**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4100e-003	1.0200e-003	0.0102	3.0000e-005	2.9800e-003	2.0000e-005	3.0000e-003	7.9000e-004	2.0000e-005	8.1000e-004	0.0000	2.6528	2.6528	7.0000e-005	0.0000	2.6546
Total	**1.4100e-003**	**1.0200e-003**	**0.0102**	**3.0000e-005**	**2.9800e-003**	**2.0000e-005**	**3.0000e-003**	**7.9000e-004**	**2.0000e-005**	**8.1000e-004**	**0.0000**	**2.6528**	**2.6528**	**7.0000e-005**	**0.0000**	**2.6546**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1940	1.7555	1.5416	2.4600e-003		0.1022	0.1022		0.0961	0.0961	0.0000	211.9231	211.9231	0.0517	0.0000	213.2157
Total	**0.1940**	**1.7555**	**1.5416**	**2.4600e-003**		**0.1022**	**0.1022**		**0.0961**	**0.0961**	**0.0000**	**211.9231**	**211.9231**	**0.0517**	**0.0000**	**213.2157**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.7100e-003	0.0534	0.0101	1.2000e-004	2.7400e-003	2.8000e-004	3.0200e-003	7.9000e-004	2.7000e-004	1.0600e-003	0.0000	11.4542	11.4542	9.7000e-004	0.0000	11.4784
Worker	9.7000e-003	7.0100e-003	0.0696	2.0000e-004	0.0205	1.4000e-004	0.0206	5.4400e-003	1.3000e-004	5.5700e-003	0.0000	18.2046	18.2046	5.0000e-004	0.0000	18.2171
Total	**0.0114**	**0.0604**	**0.0797**	**3.2000e-004**	**0.0232**	**4.2000e-004**	**0.0236**	**6.2300e-003**	**4.0000e-004**	**6.6300e-003**	**0.0000**	**29.6587**	**29.6587**	**1.4700e-003**	**0.0000**	**29.6955**

3.4 Building Construction - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1940	1.7555	1.5416	2.4600e-003		0.1022	0.1022		0.0961	0.0961	0.0000	211.9229	211.9229	0.0517	0.0000	213.2154
Total	**0.1940**	**1.7555**	**1.5416**	**2.4600e-003**		**0.1022**	**0.1022**		**0.0961**	**0.0961**	**0.0000**	**211.9229**	**211.9229**	**0.0517**	**0.0000**	**213.2154**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.7100e-003	0.0534	0.0101	1.2000e-004	2.7400e-003	2.8000e-004	3.0200e-003	7.9000e-004	2.7000e-004	1.0600e-003	0.0000	11.4542	11.4542	9.7000e-004	0.0000	11.4784
Worker	9.7000e-003	7.0100e-003	0.0696	2.0000e-004	0.0205	1.4000e-004	0.0206	5.4400e-003	1.3000e-004	5.5700e-003	0.0000	18.2046	18.2046	5.0000e-004	0.0000	18.2171
Total	**0.0114**	**0.0604**	**0.0797**	**3.2000e-004**	**0.0232**	**4.2000e-004**	**0.0236**	**6.2300e-003**	**4.0000e-004**	**6.6300e-003**	**0.0000**	**29.6587**	**29.6587**	**1.4700e-003**	**0.0000**	**29.6955**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0152	0.1395	0.1326	2.2000e-004		7.6700e-003	7.6700e-003		7.2100e-003	7.2100e-003	0.0000	18.5310	18.5310	4.4700e-003	0.0000	18.6428
Total	**0.0152**	**0.1395**	**0.1326**	**2.2000e-004**		**7.6700e-003**	**7.6700e-003**		**7.2100e-003**	**7.2100e-003**	**0.0000**	**18.5310**	**18.5310**	**4.4700e-003**	**0.0000**	**18.6428**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2000e-004	4.2400e-003	7.7000e-004	1.0000e-005	2.4000e-004	1.0000e-005	2.5000e-004	7.0000e-005	1.0000e-005	8.0000e-005	0.0000	0.9921	0.9921	8.0000e-005	0.0000	0.9941
Worker	7.8000e-004	5.4000e-004	5.5300e-003	2.0000e-005	1.7900e-003	1.0000e-005	1.8000e-003	4.8000e-004	1.0000e-005	4.9000e-004	0.0000	1.5363	1.5363	4.0000e-005	0.0000	1.5372
Total	**9.0000e-004**	**4.7800e-003**	**6.3000e-003**	**3.0000e-005**	**2.0300e-003**	**2.0000e-005**	**2.0500e-003**	**5.5000e-004**	**2.0000e-005**	**5.7000e-004**	**0.0000**	**2.5284**	**2.5284**	**1.2000e-004**	**0.0000**	**2.5314**

3.4 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0152	0.1395	0.1326	2.2000e-004		7.6700e-003	7.6700e-003		7.2100e-003	7.2100e-003	0.0000	18.5310	18.5310	4.4700e-003	0.0000	18.6427
Total	**0.0152**	**0.1395**	**0.1326**	**2.2000e-004**		**7.6700e-003**	**7.6700e-003**		**7.2100e-003**	**7.2100e-003**	**0.0000**	**18.5310**	**18.5310**	**4.4700e-003**	**0.0000**	**18.6427**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2000e-004	4.2400e-003	7.7000e-004	1.0000e-005	2.4000e-004	1.0000e-005	2.5000e-004	7.0000e-005	1.0000e-005	8.0000e-005	0.0000	0.9921	0.9921	8.0000e-005	0.0000	0.9941
Worker	7.8000e-004	5.4000e-004	5.5300e-003	2.0000e-005	1.7900e-003	1.0000e-005	1.8000e-003	4.8000e-004	1.0000e-005	4.9000e-004	0.0000	1.5363	1.5363	4.0000e-005	0.0000	1.5372
Total	**9.0000e-004**	**4.7800e-003**	**6.3000e-003**	**3.0000e-005**	**2.0300e-003**	**2.0000e-005**	**2.0500e-003**	**5.5000e-004**	**2.0000e-005**	**5.7000e-004**	**0.0000**	**2.5284**	**2.5284**	**1.2000e-004**	**0.0000**	**2.5314**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0144	0.1486	0.1685	2.6000e-004		7.7900e-003	7.7900e-003		7.1700e-003	7.1700e-003	0.0000	23.0270	23.0270	7.4500e-003	0.0000	23.2132
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0144**	**0.1486**	**0.1685**	**2.6000e-004**		**7.7900e-003**	**7.7900e-003**		**7.1700e-003**	**7.1700e-003**	**0.0000**	**23.0270**	**23.0270**	**7.4500e-003**	**0.0000**	**23.2132**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.4000e-004	6.5000e-004	6.6200e-003	2.0000e-005	2.1400e-003	1.0000e-005	2.1600e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.8403	1.8403	5.0000e-005	0.0000	1.8415
Total	**9.4000e-004**	**6.5000e-004**	**6.6200e-003**	**2.0000e-005**	**2.1400e-003**	**1.0000e-005**	**2.1600e-003**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**1.8403**	**1.8403**	**5.0000e-005**	**0.0000**	**1.8415**

3.5 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0144	0.1486	0.1685	2.6000e-004		7.7900e-003	7.7900e-003		7.1700e-003	7.1700e-003	0.0000	23.0270	23.0270	7.4500e-003	0.0000	23.2132
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0144**	**0.1486**	**0.1685**	**2.6000e-004**		**7.7900e-003**	**7.7900e-003**		**7.1700e-003**	**7.1700e-003**	**0.0000**	**23.0270**	**23.0270**	**7.4500e-003**	**0.0000**	**23.2132**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.4000e-004	6.5000e-004	6.6200e-003	2.0000e-005	2.1400e-003	1.0000e-005	2.1600e-003	5.7000e-004	1.0000e-005	5.8000e-004	0.0000	1.8403	1.8403	5.0000e-005	0.0000	1.8415
Total	**9.4000e-004**	**6.5000e-004**	**6.6200e-003**	**2.0000e-005**	**2.1400e-003**	**1.0000e-005**	**2.1600e-003**	**5.7000e-004**	**1.0000e-005**	**5.8000e-004**	**0.0000**	**1.8403**	**1.8403**	**5.0000e-005**	**0.0000**	**1.8415**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8278					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4200e-003	9.9200e-003	0.0118	2.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	1.6596	1.6596	1.1000e-004	0.0000	1.6625
Total	**0.8293**	**9.9200e-003**	**0.0118**	**2.0000e-005**		**6.1000e-004**	**6.1000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**1.6596**	**1.6596**	**1.1000e-004**	**0.0000**	**1.6625**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.0000e-004	1.0000e-003	0.0000	3.2000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2774	0.2774	1.0000e-005	0.0000	0.2776
Total	**1.4000e-004**	**1.0000e-004**	**1.0000e-003**	**0.0000**	**3.2000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2774**	**0.2774**	**1.0000e-005**	**0.0000**	**0.2776**

3.6 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.8278					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.4200e-003	9.9200e-003	0.0118	2.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004	0.0000	1.6596	1.6596	1.1000e-004	0.0000	1.6625
Total	**0.8293**	**9.9200e-003**	**0.0118**	**2.0000e-005**		**6.1000e-004**	**6.1000e-004**		**6.1000e-004**	**6.1000e-004**	**0.0000**	**1.6596**	**1.6596**	**1.1000e-004**	**0.0000**	**1.6625**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.0000e-004	1.0000e-003	0.0000	3.2000e-004	0.0000	3.3000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2774	0.2774	1.0000e-005	0.0000	0.2776
Total	**1.4000e-004**	**1.0000e-004**	**1.0000e-003**	**0.0000**	**3.2000e-004**	**0.0000**	**3.3000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2774**	**0.2774**	**1.0000e-005**	**0.0000**	**0.2776**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

Provide Traffic Calming Measures

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1814	0.2939	1.7764	3.9700e-003	0.4127	3.7700e-003	0.4165	0.1097	3.5000e-003	0.1132	0.0000	359.8465	359.8465	0.0193	0.0000	360.3293
Unmitigated	0.1846	0.3045	1.8480	4.1700e-003	0.4344	3.9400e-003	0.4384	0.1155	3.6600e-003	0.1192	0.0000	377.9214	377.9214	0.0201	0.0000	378.4245

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	490.00	485.59	422.38	1,174,833	1,116,091
Total	490.00	485.59	422.38	1,174,833	1,116,091

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	11.01	5.13	4.47	45.60	19.00	35.40	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.515000	0.221000	0.164000	0.002000	0.001000	0.007000	0.005000	0.005000	0.000000	0.001000	0.012000	0.001000	0.007000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	95.2924	95.2924	4.3200e-003	9.4000e-004	95.6806
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	106.0825	106.0825	4.8100e-003	1.0500e-003	106.5147
NaturalGas Mitigated	5.8600e-003	0.0501	0.0213	3.2000e-004		4.0500e-003	4.0500e-003		4.0500e-003	4.0500e-003	0.0000	57.9751	57.9751	1.1100e-003	1.0600e-003	58.3196
NaturalGas Unmitigated	8.4800e-003	0.0725	0.0309	4.6000e-004		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	83.9505	83.9505	1.6100e-003	1.5400e-003	84.4494

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	1.57317e+006	8.4800e-003	0.0725	0.0309	4.6000e-004		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	83.9505	83.9505	1.6100e-003	1.5400e-003	84.4494
Total		**8.4800e-003**	**0.0725**	**0.0309**	**4.6000e-004**		**5.8600e-003**	**5.8600e-003**		**5.8600e-003**	**5.8600e-003**	**0.0000**	**83.9505**	**83.9505**	**1.6100e-003**	**1.5400e-003**	**84.4494**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	1.08641e+006	5.8600e-003	0.0501	0.0213	3.2000e-004		4.0500e-003	4.0500e-003		4.0500e-003	4.0500e-003	0.0000	57.9751	57.9751	1.1100e-003	1.0600e-003	58.3196
Total		**5.8600e-003**	**0.0501**	**0.0213**	**3.2000e-004**		**4.0500e-003**	**4.0500e-003**		**4.0500e-003**	**4.0500e-003**	**0.0000**	**57.9751**	**57.9751**	**1.1100e-003**	**1.0600e-003**	**58.3196**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	461440	106.0825	4.8100e-003	1.0500e-003	106.5147
Total		**106.0825**	**4.8100e-003**	**1.0500e-003**	**106.5147**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	414505	95.2924	4.3200e-003	9.4000e-004	95.6806
Total		**95.2924**	**4.3200e-003**	**9.4000e-004**	**95.6806**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.4142	0.0225	0.3637	1.4000e-004		3.4400e-003	3.4400e-003		3.4400e-003	3.4400e-003	0.0000	21.8036	21.8036	9.6000e-004	3.9000e-004	21.9435
Unmitigated	0.7712	0.0715	3.3762	9.9400e-003		0.4935	0.4935		0.4935	0.4935	65.6134	21.8215	87.4349	0.3077	3.9000e-004	95.2436

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0828					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3445					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.3329	0.0673	3.0116	9.9200e-003		0.4915	0.4915		0.4915	0.4915	65.6134	21.2272	86.8406	0.3071	3.9000e-004	94.6349
Landscaping	0.0111	4.2100e-003	0.3646	2.0000e-005		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	0.5943	0.5943	5.8000e-004	0.0000	0.6087
Total	**0.7712**	**0.0715**	**3.3762**	**9.9400e-003**		**0.4935**	**0.4935**		**0.4935**	**0.4935**	**65.6134**	**21.8215**	**87.4349**	**0.3077**	**3.9000e-004**	**95.2436**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0828					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3187					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.1400e-003	0.0183	7.8000e-003	1.2000e-004		1.4800e-003	1.4800e-003		1.4800e-003	1.4800e-003	0.0000	21.2272	21.2272	4.1000e-004	3.9000e-004	21.3533
Landscaping	0.0105	4.1200e-003	0.3559	2.0000e-005		1.9600e-003	1.9600e-003		1.9600e-003	1.9600e-003	0.0000	0.5765	0.5765	5.5000e-004	0.0000	0.5902
Total	**0.4142**	**0.0225**	**0.3637**	**1.4000e-004**		**3.4400e-003**	**3.4400e-003**		**3.4400e-003**	**3.4400e-003**	**0.0000**	**21.8036**	**21.8036**	**9.6000e-004**	**3.9000e-004**	**21.9435**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Turf Reduction

Use Water Efficient Irrigation System

Use Water Efficient Landscaping

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	4.4669	0.0782	1.8800e-003	6.9816
Unmitigated	6.6037	0.1043	2.5100e-003	9.9592

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	3.19255 / 2.01269	6.6037	0.1043	2.5100e-003	9.9592
Total		**6.6037**	**0.1043**	**2.5100e-003**	**9.9592**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	2.39441 / 0.905712	4.4669	0.0782	1.8800e-003	6.9816
Total		**4.4669**	**0.0782**	**1.8800e-003**	**6.9816**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	5.2697	0.3114	0.0000	13.0553
Unmitigated	10.5393	0.6229	0.0000	26.1107

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	51.92	10.5393	0.6229	0.0000	26.1107
Total		**10.5393**	**0.6229**	**0.0000**	**26.1107**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	25.96	5.2697	0.3114	0.0000	13.0553
Total		**5.2697**	**0.3114**	**0.0000**	**13.0553**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Hash Farms Development Project Phase 3

San Joaquin Valley Unified APCD, Summary Report

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	49.00	Dwelling Unit	15.91	88,200.00	138

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	506.83	**CH4 Intensity (lb/MWhr)**	0.023	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments

Only CalEEMod defaults were used.

Project Characteristics - Project includes single and multifamily units, and a neighborhood park. SCE intensity factors were adjusted to account for the utility Renewable Portfolio Standard rate forecast for 2020.

Land Use - Population modified to reflect City of Kingsburgs Urban Water Management Plan Population Estimates

Construction Phase - Applicant provided anticipated construction schedule

Off-road Equipment -

Vehicle Trips - Trip length adjusted per Caltrans' SB 43 compliance database. Used an average of defalut, clovis, selma, kingsburg, visalia and reedley. Weekday trip rate adjusted per Traffic Study prepared by Ruettgers & Schuler Civil Engineers.

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix - fleet mix adjusted per SJVAPCD recommended residential mix

Mobile Land Use Mitigation - Project includes sidewalks connecting to existing neighborhood and intersections will have bulbouts and curb extensions.

Area Mitigation - Per state requirement

Energy Mitigation - In compliance with 2016 Title 24, and per project design elements

Water Mitigation - In compliance with state-required green building standard

Waste Mitigation - waste hauler is required to be in compliance with state mandates

2.0 Peak Daily Emissions

Peak Daily Construction Emissions

Peak Daily Construction Emissions

Hash Farms Development Project Phase 3 - San Joaquin Valley Unified APCD Air District, Summary Report

		Unmitigated						Mitigated					
		ROG	NOX	CO	SO2	PM10	PM2.5	ROG	NOX	CO	SO2	PM10	PM2.5
Year	Phase	lb/day											
2020	Site Preparation	4.1927 S	42.5014 W	22.4113 S	0.0404 S	20.4951 S	12.0147 S	4.1927 S	42.5014 W	22.4113 S	0.0404 S	20.4951 S	12.0147 S
2020	Grading	4.5792 S	50.2909 W	32.9557 S	0.0647 S	11.1044 S	5.6658 S	4.5792 S	50.2909 W	32.9557 S	0.0647 S	11.1044 S	5.6658 S
2020	Building Construction	2.2544 W	19.8517 W	17.8482 S	0.0307 S	1.3822 W	1.1245 W	2.2544 W	19.8517 W	17.8482 S	0.0307 S	1.3822 W	1.1245 W
2021	Building Construction	2.0232 W	18.0352 W	17.4806 S	0.0306 S	1.2221 W	0.9738 W	2.0232 W	18.0352 W	17.4806 S	0.0306 S	1.2221 W	0.9738 W
2021	Paving	1.3448 S	12.9814 W	15.3339 S	0.0247 S	0.8705 S	0.6755 S	1.3448 S	12.9814 W	15.3339 S	0.0247 S	0.8705 S	0.6755 S
2021	Architectural Coating	127.6018 S	1.5435 W	1.9991 S	3.4900e-003 S	0.1455 S	0.1080 S	127.6018 S	1.5435 W	1.9991 S	3.4900e-003 S	0.1455 S	0.1080 S
	Peak Daily Total	127.6018 S	50.2909 W	32.9557 S	0.0647 S	20.4951 S	12.0147 S	127.6018 S	50.2909 W	32.9557 S	0.0647 S	20.4951 S	12.0147 S
	Air District Threshold												
	Exceed Significance?												

Peak Daily Operational Emissions

Peak Daily Operational Emissions

		Unmitigated						Mitigated					
		ROG	NOX	CO	SO2	PM10	PM2.5	ROG	NOX	CO	SO2	PM10	PM2.5
	Operational Activity	lb/day											
On-Site	Area	10.5835 S	1.6890 S	77.5050 S	0.2421 S	12.0101 S	12.0101 S	2.3693 S	0.4928 S	4.1442 S	3.0600e-003 S	0.0579 S	0.0579 S
On-Site	Energy	0.0465 S	0.3972 S	0.1690 S	2.5400e-003 S	0.0321 S	0.0321 S	0.0321 S	0.2743 S	0.1167 S	1.7500e-003 S	0.0222 S	0.0222 S
Off-Site	Mobile	1.3396 S	1.7978 W	11.3720 S	0.0254 S	2.5276 W	0.6853 W	1.3211 S	1.7343 W	10.9002 S	0.0242 S	2.4014 W	0.6512 W
	Peak Daily Total	11.9696 S	3.8840 W	89.0460 S	0.2701 S	14.5698 W	12.7275 W	3.7225 S	2.5014 W	15.1611 S	0.0290 S	2.4814 W	0.7313 W
	Air District Threshold												
	Exceed Significance?												

3.0 Annual GHG Emissions

Hash Farms Development Project Phase 3 - San Joaquin Valley Unified APCD Air District, Summary Report

Annual GHG

Annual GHG

		Unmitigated				Mitigated			
		CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
GHG Activity	Year	MT/yr							
Construction	2020	330.8679	0.0809	0.0000	332.8907	330.8675	0.0809	0.0000	332.8903
Construction	2021	47.8636	0.0122	0.0000	48.1689	47.8636	0.0122	0.0000	48.1689
Operational	2021	672.5322	1.0614	5.4885e-003	700.7025	544.6541	0.4153	4.2728e-003	556.3104
	Total								
	Significance Threshold								
	Exceed Significance?								

Hash Farms Development Project Phase 4

San Joaquin Valley Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	10.00	Dwelling Unit	3.25	18,000.00	28
Condo/Townhouse	8.00	Dwelling Unit	0.50	8,000.00	23
City Park	2.54	Acre	2.54	110,642.40	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	506.83	**CH4 Intensity (lb/MWhr)**	0.023	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Hash Farms Development Project Phase 4 - San Joaquin Valley Unified APCD Air District, Annual

Project Characteristics - Project includes single and multifamily units, and a neighborhood park. SCE intensity factors were adjusted to account for the utility Renewable Portfolio Standard rate forecast for 2020.

Land Use - Population modified to reflect City of Kingsburgs Urban Water Management Plan Population Estimates

Construction Phase - Applicant provided anticipated construction schedule

Off-road Equipment -

Vehicle Trips - Trip length adjusted per Caltrans' SB 43 compliance database. Used an average of defalut, clovis, selma, kingsburg, visalia and reedley. Weekday trip rate adjusted per Traffic Study prepared by Ruettgers & Schuler Civil Engineers.

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix - fleet mix adjusted per SJVAPCD recommended residential mix

Mobile Land Use Mitigation - Project includes sidewalks connecting to existing neighborhood and intersections will have bulbouts and curb extensions.

Area Mitigation - Per state requirement

Energy Mitigation - In compliance with 2016 Title 24, and per project design elements

Water Mitigation - In compliance with state-required green building standard

Waste Mitigation - waste hauler is required to be in compliance with state mandates

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	NumDays	230.00	73.00
tblConstructionPhase	NumDays	20.00	27.00
tblConstructionPhase	NumDays	20.00	15.00
tblConstructionPhase	PhaseEndDate	3/18/2022	9/5/2021
tblConstructionPhase	PhaseEndDate	1/27/2022	8/1/2021
tblConstructionPhase	PhaseEndDate	4/23/2021	4/20/2021
tblConstructionPhase	PhaseEndDate	3/1/2022	8/20/2021
tblConstructionPhase	PhaseStartDate	3/2/2022	8/21/2021
tblConstructionPhase	PhaseStartDate	4/24/2021	4/21/2021
tblConstructionPhase	PhaseStartDate	1/28/2022	8/2/2021

tblFleetMix	HHD	0.11	5.0000e-003
tblFleetMix	HHD	0.11	5.0000e-003
tblFleetMix	LDA	0.51	0.52
tblFleetMix	LDA	0.51	0.52
tblFleetMix	LDT1	0.03	0.22
tblFleetMix	LDT1	0.03	0.22
tblFleetMix	LDT2	0.17	0.16
tblFleetMix	LDT2	0.17	0.16
tblFleetMix	LHD1	0.02	2.0000e-003
tblFleetMix	LHD1	0.02	2.0000e-003
tblFleetMix	LHD2	5.3740e-003	1.0000e-003
tblFleetMix	LHD2	5.3740e-003	1.0000e-003
tblFleetMix	MCY	5.3070e-003	0.01
tblFleetMix	MCY	5.3070e-003	0.01
tblFleetMix	MDV	0.12	0.06
tblFleetMix	MDV	0.12	0.06
tblFleetMix	MH	7.9200e-004	7.0000e-003
tblFleetMix	MH	7.9200e-004	7.0000e-003
tblFleetMix	MHD	0.02	7.0000e-003
tblFleetMix	MHD	0.02	7.0000e-003
tblFleetMix	OBUS	1.7970e-003	0.00
tblFleetMix	OBUS	1.7970e-003	0.00
tblFleetMix	SBUS	9.6900e-004	1.0000e-003
tblFleetMix	SBUS	9.6900e-004	1.0000e-003
tblFleetMix	UBUS	1.6230e-003	1.0000e-003
tblFleetMix	UBUS	1.6230e-003	1.0000e-003
tblGrading	AcresOfGrading	13.50	10.00

tblLandUse	Population	32.00	28.00
tblLandUse	Population	25.00	23.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.023
tblProjectCharacteristics	CO2IntensityFactor	702.44	506.83
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2018	2021
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	HO_TL	7.90	4.47
tblVehicleTrips	HO_TL	7.90	4.47
tblVehicleTrips	HS_TL	7.10	5.13
tblVehicleTrips	HS_TL	7.10	5.13
tblVehicleTrips	HW_TL	16.80	11.01
tblVehicleTrips	HW_TL	16.80	11.01
tblVehicleTrips	WD_TR	9.52	10.00
tblVehicleTrips	WD_TR	5.81	10.60
tblWoodstoves	NumberCatalytic	0.50	0.00
tblWoodstoves	NumberCatalytic	3.25	15.91
tblWoodstoves	NumberNoncatalytic	0.50	0.00
tblWoodstoves	NumberNoncatalytic	3.25	15.91

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.3901	1.3641	1.1540	2.2400e-003	0.2124	0.0668	0.2793	0.1045	0.0622	0.1667	0.0000	197.5517	197.5517	0.0443	0.0000	198.6589
Maximum	**0.3901**	**1.3641**	**1.1540**	**2.2400e-003**	**0.2124**	**0.0668**	**0.2793**	**0.1045**	**0.0622**	**0.1667**	**0.0000**	**197.5517**	**197.5517**	**0.0443**	**0.0000**	**198.6589**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.3901	1.3641	1.1540	2.2400e-003	0.2124	0.0668	0.2793	0.1045	0.0622	0.1667	0.0000	197.5515	197.5515	0.0443	0.0000	198.6587
Maximum	**0.3901**	**1.3641**	**1.1540**	**2.2400e-003**	**0.2124**	**0.0668**	**0.2793**	**0.1045**	**0.0622**	**0.1667**	**0.0000**	**197.5515**	**197.5515**	**0.0443**	**0.0000**	**198.6587**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Hash Farms Development Project Phase 4 - San Joaquin Valley Unified APCD Air District, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	3-1-2021	5-31-2021	0.8919	0.8919
2	6-1-2021	8-31-2021	0.7837	0.7837
3	9-1-2021	9-30-2021	0.0905	0.0905
		Highest	0.8919	0.8919

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4561	0.0563	3.0814	9.6600e-003		0.4816	0.4816		0.4816	0.4816	64.3197	8.0161	72.3358	0.3010	1.4000e-004	79.9045
Energy	2.6700e-003	0.0228	9.7100e-003	1.5000e-004		1.8400e-003	1.8400e-003		1.8400e-003	1.8400e-003	0.0000	58.9505	58.9505	1.9800e-003	8.1000e-004	59.2401
Mobile	0.0765	0.1824	0.7771	1.9200e-003	0.1723	1.6900e-003	0.1740	0.0460	1.5700e-003	0.0476	0.0000	174.3282	174.3282	9.5100e-003	0.0000	174.5660
Waste						0.0000	0.0000		0.0000	0.0000	2.9312	0.0000	2.9312	0.1732	0.0000	7.2619
Water						0.0000	0.0000		0.0000	0.0000	0.3721	4.4889	4.8610	0.0384	9.5000e-004	6.1035
Total	**0.5352**	**0.2616**	**3.8682**	**0.0117**	**0.1723**	**0.4852**	**0.6574**	**0.0460**	**0.4851**	**0.5311**	**67.6230**	**245.7837**	**313.4067**	**0.5242**	**1.9000e-003**	**327.0760**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1241	8.2500e-003	0.1336	5.0000e-005		1.2600e-003	1.2600e-003		1.2600e-003	1.2600e-003	0.0000	8.0095	8.0095	3.5000e-004	1.4000e-004	8.0609
Energy	1.8600e-003	0.0159	6.7700e-003	1.0000e-004		1.2900e-003	1.2900e-003		1.2900e-003	1.2900e-003	0.0000	47.5901	47.5901	1.6800e-003	6.3000e-004	47.8184
Mobile	0.0752	0.1771	0.7473	1.8300e-003	0.1637	1.6200e-003	0.1653	0.0437	1.5100e-003	0.0452	0.0000	166.1589	166.1589	9.1800e-003	0.0000	166.3884
Waste						0.0000	0.0000		0.0000	0.0000	1.4656	0.0000	1.4656	0.0866	0.0000	3.6310
Water						0.0000	0.0000		0.0000	0.0000	0.2791	2.4577	2.7367	0.0288	7.0000e-004	3.6649
Total	**0.2011**	**0.2012**	**0.8876**	**1.9800e-003**	**0.1637**	**4.1700e-003**	**0.1678**	**0.0437**	**4.0600e-003**	**0.0478**	**1.7446**	**224.2162**	**225.9608**	**0.1266**	**1.4700e-003**	**229.5636**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**62.43**	**23.07**	**77.05**	**83.12**	**5.00**	**99.14**	**74.47**	**5.00**	**99.16**	**91.01**	**97.42**	**8.78**	**27.90**	**75.85**	**22.63**	**29.81**

3.0 Construction Detail

Construction Phase

Hash Farms Development Project Phase 4 - San Joaquin Valley Unified APCD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2021	3/12/2021	5	10	
2	Grading	Grading	3/13/2021	4/20/2021	5	27	
3	Building Construction	Building Construction	4/21/2021	8/1/2021	5	73	
4	Paving	Paving	8/2/2021	8/20/2021	5	15	
5	Architectural Coating	Architectural Coating	8/21/2021	9/5/2021	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 52,650; Residential Outdoor: 17,550; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	1	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	11.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	56.00	20.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7179	16.7179	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0903**	**0.0102**	**0.1006**	**0.0497**	**9.4000e-003**	**0.0591**	**0.0000**	**16.7179**	**16.7179**	**5.4100e-003**	**0.0000**	**16.8530**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.4000e-004	3.4600e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.0000e-004	0.0000	0.9602	0.9602	2.0000e-005	0.0000	0.9608
Total	**4.9000e-004**	**3.4000e-004**	**3.4600e-003**	**1.0000e-005**	**1.1200e-003**	**1.0000e-005**	**1.1300e-003**	**3.0000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.9602**	**0.9602**	**2.0000e-005**	**0.0000**	**0.9608**

3.2 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7178	16.7178	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0903**	**0.0102**	**0.1006**	**0.0497**	**9.4000e-003**	**0.0591**	**0.0000**	**16.7178**	**16.7178**	**5.4100e-003**	**0.0000**	**16.8530**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.9000e-004	3.4000e-004	3.4600e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.0000e-004	0.0000	0.9602	0.9602	2.0000e-005	0.0000	0.9608
Total	**4.9000e-004**	**3.4000e-004**	**3.4600e-003**	**1.0000e-005**	**1.1200e-003**	**1.0000e-005**	**1.1300e-003**	**3.0000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.9602**	**0.9602**	**2.0000e-005**	**0.0000**	**0.9608**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0866	0.0000	0.0866	0.0453	0.0000	0.0453	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0309	0.3340	0.2141	4.0000e-004		0.0157	0.0157		0.0144	0.0144	0.0000	35.1725	35.1725	0.0114	0.0000	35.4569
Total	**0.0309**	**0.3340**	**0.2141**	**4.0000e-004**	**0.0866**	**0.0157**	**0.1023**	**0.0453**	**0.0144**	**0.0597**	**0.0000**	**35.1725**	**35.1725**	**0.0114**	**0.0000**	**35.4569**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-003	7.7000e-004	7.7700e-003	2.0000e-005	2.5200e-003	2.0000e-005	2.5300e-003	6.7000e-004	2.0000e-005	6.8000e-004	0.0000	2.1604	2.1604	6.0000e-005	0.0000	2.1617
Total	**1.1000e-003**	**7.7000e-004**	**7.7700e-003**	**2.0000e-005**	**2.5200e-003**	**2.0000e-005**	**2.5300e-003**	**6.7000e-004**	**2.0000e-005**	**6.8000e-004**	**0.0000**	**2.1604**	**2.1604**	**6.0000e-005**	**0.0000**	**2.1617**

3.3 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0866	0.0000	0.0866	0.0453	0.0000	0.0453	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0309	0.3339	0.2141	4.0000e-004		0.0157	0.0157		0.0144	0.0144	0.0000	35.1725	35.1725	0.0114	0.0000	35.4568
Total	**0.0309**	**0.3339**	**0.2141**	**4.0000e-004**	**0.0866**	**0.0157**	**0.1023**	**0.0453**	**0.0144**	**0.0597**	**0.0000**	**35.1725**	**35.1725**	**0.0114**	**0.0000**	**35.4568**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1000e-003	7.7000e-004	7.7700e-003	2.0000e-005	2.5200e-003	2.0000e-005	2.5300e-003	6.7000e-004	2.0000e-005	6.8000e-004	0.0000	2.1604	2.1604	6.0000e-005	0.0000	2.1617
Total	**1.1000e-003**	**7.7000e-004**	**7.7700e-003**	**2.0000e-005**	**2.5200e-003**	**2.0000e-005**	**2.5300e-003**	**6.7000e-004**	**2.0000e-005**	**6.8000e-004**	**0.0000**	**2.1604**	**2.1604**	**6.0000e-005**	**0.0000**	**2.1617**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0694	0.6363	0.6050	9.8000e-004		0.0350	0.0350		0.0329	0.0329	0.0000	84.5476	84.5476	0.0204	0.0000	85.0576
Total	**0.0694**	**0.6363**	**0.6050**	**9.8000e-004**		**0.0350**	**0.0350**		**0.0329**	**0.0329**	**0.0000**	**84.5476**	**84.5476**	**0.0204**	**0.0000**	**85.0576**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2300e-003	0.0774	0.0141	1.9000e-004	4.3800e-003	2.1000e-004	4.5800e-003	1.2600e-003	2.0000e-004	1.4600e-003	0.0000	18.1056	18.1056	1.4800e-003	0.0000	18.1427
Worker	0.0111	7.7400e-003	0.0785	2.4000e-004	0.0254	1.7000e-004	0.0256	6.7500e-003	1.5000e-004	6.9100e-003	0.0000	21.8064	21.8064	5.6000e-004	0.0000	21.8203
Total	**0.0133**	**0.0852**	**0.0925**	**4.3000e-004**	**0.0298**	**3.8000e-004**	**0.0302**	**8.0100e-003**	**3.5000e-004**	**8.3700e-003**	**0.0000**	**39.9120**	**39.9120**	**2.0400e-003**	**0.0000**	**39.9629**

3.4 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0694	0.6363	0.6050	9.8000e-004		0.0350	0.0350		0.0329	0.0329	0.0000	84.5475	84.5475	0.0204	0.0000	85.0575
Total	**0.0694**	**0.6363**	**0.6050**	**9.8000e-004**		**0.0350**	**0.0350**		**0.0329**	**0.0329**	**0.0000**	**84.5475**	**84.5475**	**0.0204**	**0.0000**	**85.0575**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.2300e-003	0.0774	0.0141	1.9000e-004	4.3800e-003	2.1000e-004	4.5800e-003	1.2600e-003	2.0000e-004	1.4600e-003	0.0000	18.1056	18.1056	1.4800e-003	0.0000	18.1427
Worker	0.0111	7.7400e-003	0.0785	2.4000e-004	0.0254	1.7000e-004	0.0256	6.7500e-003	1.5000e-004	6.9100e-003	0.0000	21.8064	21.8064	5.6000e-004	0.0000	21.8203
Total	**0.0133**	**0.0852**	**0.0925**	**4.3000e-004**	**0.0298**	**3.8000e-004**	**0.0302**	**8.0100e-003**	**3.5000e-004**	**8.3700e-003**	**0.0000**	**39.9120**	**39.9120**	**2.0400e-003**	**0.0000**	**39.9629**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.4200e-003	0.0969	0.1099	1.7000e-004		5.0800e-003	5.0800e-003		4.6800e-003	4.6800e-003	0.0000	15.0176	15.0176	4.8600e-003	0.0000	15.1390
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.4200e-003**	**0.0969**	**0.1099**	**1.7000e-004**		**5.0800e-003**	**5.0800e-003**		**4.6800e-003**	**4.6800e-003**	**0.0000**	**15.0176**	**15.0176**	**4.8600e-003**	**0.0000**	**15.1390**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1000e-004	4.3000e-004	4.3200e-003	1.0000e-005	1.4000e-003	1.0000e-005	1.4100e-003	3.7000e-004	1.0000e-005	3.8000e-004	0.0000	1.2002	1.2002	3.0000e-005	0.0000	1.2010
Total	**6.1000e-004**	**4.3000e-004**	**4.3200e-003**	**1.0000e-005**	**1.4000e-003**	**1.0000e-005**	**1.4100e-003**	**3.7000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.2002**	**1.2002**	**3.0000e-005**	**0.0000**	**1.2010**

3.5 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.4200e-003	0.0969	0.1099	1.7000e-004		5.0800e-003	5.0800e-003		4.6800e-003	4.6800e-003	0.0000	15.0176	15.0176	4.8600e-003	0.0000	15.1390
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.4200e-003**	**0.0969**	**0.1099**	**1.7000e-004**		**5.0800e-003**	**5.0800e-003**		**4.6800e-003**	**4.6800e-003**	**0.0000**	**15.0176**	**15.0176**	**4.8600e-003**	**0.0000**	**15.1390**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.1000e-004	4.3000e-004	4.3200e-003	1.0000e-005	1.4000e-003	1.0000e-005	1.4100e-003	3.7000e-004	1.0000e-005	3.8000e-004	0.0000	1.2002	1.2002	3.0000e-005	0.0000	1.2010
Total	**6.1000e-004**	**4.3000e-004**	**4.3200e-003**	**1.0000e-005**	**1.4000e-003**	**1.0000e-005**	**1.4100e-003**	**3.7000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.2002**	**1.2002**	**3.0000e-005**	**0.0000**	**1.2010**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2440					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0900e-003	7.6300e-003	9.0900e-003	1.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004	0.0000	1.2766	1.2766	9.0000e-005	0.0000	1.2788
Total	**0.2451**	**7.6300e-003**	**9.0900e-003**	**1.0000e-005**		**4.7000e-004**	**4.7000e-004**		**4.7000e-004**	**4.7000e-004**	**0.0000**	**1.2766**	**1.2766**	**9.0000e-005**	**0.0000**	**1.2788**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.1000e-004	2.1100e-003	1.0000e-005	6.8000e-004	0.0000	6.9000e-004	1.8000e-004	0.0000	1.9000e-004	0.0000	0.5868	0.5868	1.0000e-005	0.0000	0.5871
Total	**3.0000e-004**	**2.1000e-004**	**2.1100e-003**	**1.0000e-005**	**6.8000e-004**	**0.0000**	**6.9000e-004**	**1.8000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5868**	**0.5868**	**1.0000e-005**	**0.0000**	**0.5871**

3.6 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2440					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0900e-003	7.6300e-003	9.0900e-003	1.0000e-005		4.7000e-004	4.7000e-004		4.7000e-004	4.7000e-004	0.0000	1.2766	1.2766	9.0000e-005	0.0000	1.2788
Total	**0.2451**	**7.6300e-003**	**9.0900e-003**	**1.0000e-005**		**4.7000e-004**	**4.7000e-004**		**4.7000e-004**	**4.7000e-004**	**0.0000**	**1.2766**	**1.2766**	**9.0000e-005**	**0.0000**	**1.2788**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.1000e-004	2.1100e-003	1.0000e-005	6.8000e-004	0.0000	6.9000e-004	1.8000e-004	0.0000	1.9000e-004	0.0000	0.5868	0.5868	1.0000e-005	0.0000	0.5871
Total	**3.0000e-004**	**2.1000e-004**	**2.1100e-003**	**1.0000e-005**	**6.8000e-004**	**0.0000**	**6.9000e-004**	**1.8000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5868**	**0.5868**	**1.0000e-005**	**0.0000**	**0.5871**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Pedestrian Network

Provide Traffic Calming Measures

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0752	0.1771	0.7473	1.8300e-003	0.1637	1.6200e-003	0.1653	0.0437	1.5100e-003	0.0452	0.0000	166.1589	166.1589	9.1800e-003	0.0000	166.3884
Unmitigated	0.0765	0.1824	0.7771	1.9200e-003	0.1723	1.6900e-003	0.1740	0.0460	1.5700e-003	0.0476	0.0000	174.3282	174.3282	9.5100e-003	0.0000	174.5660

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	4.80	57.79	42.52	43,795	41,606
Single Family Housing	100.00	99.10	86.20	239,762	227,774
Condo/Townhouse	84.80	45.36	38.72	177,759	168,871
Total	189.60	202.25	167.44	461,316	438,250

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	14.70	6.60	6.60	33.00	48.00	19.00	66	28	6
Single Family Housing	11.01	5.13	4.47	45.60	19.00	35.40	86	11	3
Condo/Townhouse	11.01	5.13	4.47	45.60	19.00	35.40	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.515000	0.221000	0.164000	0.064000	0.002000	0.001000	0.007000	0.005000	0.000000	0.001000	0.012000	0.001000	0.007000
Condo/Townhouse	0.515000	0.221000	0.164000	0.064000	0.002000	0.001000	0.007000	0.005000	0.000000	0.001000	0.012000	0.001000	0.007000
City Park	0.506092	0.032602	0.169295	0.124521	0.019914	0.005374	0.021664	0.110051	0.001797	0.001623	0.005307	0.000969	0.000792

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	29.1663	29.1663	1.3200e-003	2.9000e-004	29.2851
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	32.5318	32.5318	1.4800e-003	3.2000e-004	32.6643
NaturalGas Mitigated	1.8600e-003	0.0159	6.7700e-003	1.0000e-004		1.2900e-003	1.2900e-003		1.2900e-003	1.2900e-003	0.0000	18.4238	18.4238	3.5000e-004	3.4000e-004	18.5333
NaturalGas Unmitigated	2.6700e-003	0.0228	9.7100e-003	1.5000e-004		1.8400e-003	1.8400e-003		1.8400e-003	1.8400e-003	0.0000	26.4187	26.4187	5.1000e-004	4.8000e-004	26.5757

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	174013	9.4000e-004	8.0200e-003	3.4100e-003	5.0000e-005		6.5000e-004	6.5000e-004		6.5000e-004	6.5000e-004	0.0000	9.2860	9.2860	1.8000e-004	1.7000e-004	9.3412
Single Family Housing	321056	1.7300e-003	0.0148	6.3000e-003	9.0000e-005		1.2000e-003	1.2000e-003		1.2000e-003	1.2000e-003	0.0000	17.1328	17.1328	3.3000e-004	3.1000e-004	17.2346
Total		**2.6700e-003**	**0.0228**	**9.7100e-003**	**1.4000e-004**		**1.8500e-003**	**1.8500e-003**		**1.8500e-003**	**1.8500e-003**	**0.0000**	**26.4187**	**26.4187**	**5.1000e-004**	**4.8000e-004**	**26.5757**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	123533	6.7000e-004	5.6900e-003	2.4200e-003	4.0000e-005		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004	0.0000	6.5922	6.5922	1.3000e-004	1.2000e-004	6.6313
Single Family Housing	221717	1.2000e-003	0.0102	4.3500e-003	7.0000e-005		8.3000e-004	8.3000e-004		8.3000e-004	8.3000e-004	0.0000	11.8317	11.8317	2.3000e-004	2.2000e-004	11.9020
Total		**1.8700e-003**	**0.0159**	**6.7700e-003**	**1.1000e-004**		**1.2900e-003**	**1.2900e-003**		**1.2900e-003**	**1.2900e-003**	**0.0000**	**18.4238**	**18.4238**	**3.6000e-004**	**3.4000e-004**	**18.5333**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	47336.2	10.8823	4.9000e-004	1.1000e-004	10.9267
Single Family Housing	94171.5	21.6495	9.8000e-004	2.1000e-004	21.7377
Total		**32.5318**	**1.4700e-003**	**3.2000e-004**	**32.6643**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Condo/Townhouse	42275.4	9.7189	4.4000e-004	1.0000e-004	9.7585
Single Family Housing	84592.9	19.4474	8.8000e-004	1.9000e-004	19.5267
Total		**29.1663**	**1.3200e-003**	**2.9000e-004**	**29.2851**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

Use only Natural Gas Hearths

Use Low VOC Cleaning Supplies

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1241	8.2500e-003	0.1336	5.0000e-005		1.2600e-003	1.2600e-003		1.2600e-003	1.2600e-003	0.0000	8.0095	8.0095	3.5000e-004	1.4000e-004	8.0609
Unmitigated	0.4561	0.0563	3.0814	9.6600e-003		0.4816	0.4816		0.4816	0.4816	64.3197	8.0161	72.3358	0.3010	1.4000e-004	79.9045

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0244					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1026					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.3250	0.0548	2.9474	9.6500e-003		0.4809	0.4809		0.4809	0.4809	64.3197	7.7977	72.1175	0.3008	1.4000e-004	79.6808
Landscaping	4.0600e-003	1.5500e-003	0.1340	1.0000e-005		7.4000e-004	7.4000e-004		7.4000e-004	7.4000e-004	0.0000	0.2184	0.2184	2.1000e-004	0.0000	0.2237
Total	**0.4561**	**0.0563**	**3.0814**	**9.6600e-003**		**0.4816**	**0.4816**		**0.4816**	**0.4816**	**64.3197**	**8.0161**	**72.3358**	**0.3010**	**1.4000e-004**	**79.9045**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0244					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0950					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	7.9000e-004	6.7300e-003	2.8700e-003	4.0000e-005		5.4000e-004	5.4000e-004		5.4000e-004	5.4000e-004	0.0000	7.7977	7.7977	1.5000e-004	1.4000e-004	7.8441
Landscaping	3.8700e-003	1.5100e-003	0.1308	1.0000e-005		7.2000e-004	7.2000e-004		7.2000e-004	7.2000e-004	0.0000	0.2118	0.2118	2.0000e-004	0.0000	0.2169
Total	**0.1241**	**8.2400e-003**	**0.1336**	**5.0000e-005**		**1.2600e-003**	**1.2600e-003**		**1.2600e-003**	**1.2600e-003**	**0.0000**	**8.0095**	**8.0095**	**3.5000e-004**	**1.4000e-004**	**8.0609**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Turf Reduction

Use Water Efficient Irrigation System

Use Water Efficient Landscaping

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.7367	0.0288	7.0000e-004	3.6649
Unmitigated	4.8610	0.0384	9.5000e-004	6.1035

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 3.02636	2.4351	1.1000e-004	2.0000e-005	2.4450
Condo/Townhouse	0.521232 / 0.328603	1.0782	0.0170	4.1000e-004	1.6260
Single Family Housing	0.65154 / 0.410754	1.3477	0.0213	5.1000e-004	2.0325
Total		**4.8610**	**0.0384**	**9.4000e-004**	**6.1035**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 1.36186	1.0958	5.0000e-005	1.0000e-005	1.1003
Condo/Townhouse	0.390924 / 0.147871	0.7293	0.0128	3.1000e-004	1.1399
Single Family Housing	0.488655 / 0.184839	0.9116	0.0160	3.8000e-004	1.4248
Total		**2.7367**	**0.0288**	**7.0000e-004**	**3.6649**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.4656	0.0866	0.0000	3.6310
Unmitigated	2.9312	0.1732	0.0000	7.2619

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.22	0.0447	2.6400e-003	0.0000	0.1106
Condo/Townhouse	3.68	0.7470	0.0442	0.0000	1.8507
Single Family Housing	10.54	2.1395	0.1264	0.0000	5.3006
Total		**2.9312**	**0.1732**	**0.0000**	**7.2619**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.11	0.0223	1.3200e-003	0.0000	0.0553
Condo/Townhouse	1.84	0.3735	0.0221	0.0000	0.9253
Single Family Housing	5.27	1.0698	0.0632	0.0000	2.6503
Total		**1.4656**	**0.0866**	**0.0000**	**3.6310**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Hash Farms Development Project Phase 4

San Joaquin Valley Unified APCD, Summary Report

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	10.00	Dwelling Unit	3.25	18,000.00	28
Condo/Townhouse	8.00	Dwelling Unit	0.50	8,000.00	23
City Park	2.54	Acre	2.54	110,642.40	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	506.83	**CH4 Intensity (lb/MWhr)**	0.023	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments

Only CalEEMod defaults were used.

Project Characteristics - Project includes single and multifamily units, and a neighborhood park. SCE intensity factors were adjusted to account for the utility Renewable Portfolio Standard rate forecast for 2020.

Land Use - Population modified to reflect City of Kingsburgs Urban Water Management Plan Population Estimates

Construction Phase - Applicant provided anticipated construction schedule

Off-road Equipment -

Vehicle Trips - Trip length adjusted per Caltrans' SB 43 compliance database. Used an average of defalut, clovis, selma, kingsburg, visalia and reedley. Weekday trip rate adjusted per Traffic Study prepared by Ruettgers & Schuler Civil Engineers.

Vehicle Emission Factors -

Vehicle Emission Factors -

Fleet Mix - fleet mix adjusted per SJVAPCD recommended residential mix

Mobile Land Use Mitigation - Project includes sidewalks connecting to existing neighborhood and intersections will have bulbouts and curb extensions.

Area Mitigation - Per state requirement

Energy Mitigation - In compliance with 2016 Title 24, and per project design elements

Water Mitigation - In compliance with state-required green building standard

Waste Mitigation - waste hauler is required to be in compliance with state mandates

2.0 Peak Daily Emissions

Peak Daily Construction Emissions

Peak Daily Construction Emissions

Hash Farms Development Project Phase 4 - San Joaquin Valley Unified APCD Air District, Summary Report

		Unmitigated						Mitigated					
		ROG	NOX	CO	SO2	PM10	PM2.5	ROG	NOX	CO	SO2	PM10	PM2.5
Year	Phase	lb/day											
2021	Site Preparation	3.9953 S	40.5718 W	21.9710 S	0.0404 S	20.3421 S	11.8739 S	3.9953 S	40.5718 W	21.9710 S	0.0404 S	20.3421 S	11.8739 S
2021	Grading	2.3796 S	24.7990 W	16.5381 S	0.0316 S	7.7676 S	4.4717 S	2.3796 S	24.7990 W	16.5381 S	0.0316 S	7.7676 S	4.4717 S
2021	Building Construction	2.2954 W	19.7781 W	19.4709 S	0.0395 S	1.8069 W	1.1361 W	2.2954 W	19.7781 W	19.4709 S	0.0395 S	1.8069 W	1.1361 W
2021	Paving	1.3448 S	12.9814 W	15.3339 S	0.0247 S	0.8705 S	0.6755 S	1.3448 S	12.9814 W	15.3339 S	0.0247 S	0.8705 S	0.6755 S
2021	Architectural Coating	49.0909 S	1.5725 W	2.3167 S	4.3900e-003 S	0.2355 S	0.1322 S	49.0909 S	1.5725 W	2.3167 S	4.3900e-003 S	0.2355 S	0.1322 S
	Peak Daily Total	49.0909 S	40.5718 W	21.9710 S	0.0404 S	20.3421 S	11.8739 S	49.0909 S	40.5718 W	21.9710 S	0.0404 S	20.3421 S	11.8739 S
	Air District Threshold												
	Exceed Significance?												

Peak Daily Operational Emissions

Peak Daily Operational Emissions

		Unmitigated						Mitigated					
		ROG	NOX	CO	SO2	PM10	PM2.5	ROG	NOX	CO	SO2	PM10	PM2.5
	Operational Activity	lb/day											
On-Site	Area	8.6684 S	1.3530 S	73.3773 S	0.2355 S	11.7375 S	11.7375 S	0.7164 S	0.1810 S	1.5226 S	1.1200e-003 S	0.0213 S	0.0213 S
On-Site	Energy	0.0146 S	0.1250 S	0.0532 S	8.0000e-004 S	0.0101 S	0.0101 S	0.0102 S	0.0872 S	0.0371 S	5.6000e-004 S	7.0500e-003 S	7.0500e-003 S
Off-Site	Mobile	0.6728 S	1.9298 W	5.8749 S	0.0160 S	1.2718 W	0.3482 W	0.6634 S	1.8784 W	5.6342 S	0.0152 S	1.2083 W	0.3308 W
	Peak Daily Total	9.3559 S	3.4078 W	79.3054 S	0.2522 S	13.0193 W	12.0957 W	1.3900 S	2.1466 W	7.1939 S	0.0169 S	1.2366 W	0.3592 W
	Air District Threshold												
	Exceed Significance?												

3.0 Annual GHG Emissions

Annual GHG

Annual GHG

		Unmitigated				Mitigated			
		CO2	CH4	N2O	CO2e	CO2	CH4	N2O	CO2e
GHG Activity	Year	MT/yr							
Construction	2021	197.5517	0.0443	0.0000	198.6589	197.5515	0.0443	0.0000	198.6587
Operational	2021	313.4067	0.5242	1.8960e-003	327.0764	225.9608	0.1266	1.4696e-003	229.5640
	Total								
	Significance Threshold								
	Exceed Significance?								

APPENDIX B

BIOLOGICAL RESOURCES

RECONNAISSANCE-LEVEL BIOLOGICAL EVALUATION OF POTENTIAL IMPACTS SENSITIVE AND LISTED SPECIES ON A 46-ACRE, 225-UNIT RESIDENTIAL SUBDIVISION IN KINGSBURG, FRESNO COUNTY, CALIFORNIA

Prepared for:
Crawford and Bowen Planning, Inc. and Steve Hash Farms

Prepared by:
Bobby Kamansky

Kamansky's Ecological Consulting
innovative solutions to complex problems

April 9, 2015

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EXECUTIVE SUMMARY

Crawford & Bowen Planning, Inc. contacted Kamansky's Ecological Consulting (KEC) for a biological survey at a 46-acre property in Kingsburg, Fresno County, California. The subject site is located east of Hwy 99 in Kingsburg, south of Hwy 201 and west of Rd. 16.

Because the project site is within the range of a variety of sensitive species, the planning firm requested that KEC conduct a biological evaluation to satisfy survey requirements for this site in the counties of Fresno and Tulare. On properties such as this in the Kingsburg area, the United States Department of Interior, Fish and Wildlife Service (USFWS) routinely recommends that a "trained biologist, familiar with the habitat requirements of listed and proposed species, should determine whether these species or habitats suitable for these species may be affected by the proposed action...prior to the environmental review process."

The field component of the biological evaluation was conducted on a site visit on July 21, 2014. Bobby Kamansky, John Kamansky, and Vaughan Williams conducted the initial site visit.

This investigation evaluates the species composition of the 46-acre project site. This will include species observed by KEC biologists as well as CNDDB records.

This report is submitted to the planning firm for its use in proceeding with the CEQA process.

At the time of the survey, all the land included or in close proximity to the site included farms, orchards, housing, and included possible habitat for various species of concern. Various large trees are found on and adjacent to the site that may provide habitat for nesting raptors.

While no Special Status animal or plant species were observed on the site, these species could move into the site prior to construction. Appropriate avoidance measures are proposed in the event that pre-construction surveys detect species in the area and prescribe compensation in the event that impacts cannot be avoided.

A. DESCRIPTION, BACKGROUND AND AGENCY INVOLVEMENT

A.1 Applicant and Project Description

Crawford & Bowen Planning, Inc. contacted Bobby Kamansky, Principal Biologist, Kamansky's Ecological Consulting (KEC) for a survey at Kingsburg subdivision site in Kingsburg, California.

Kamansky's Ecological Consulting was hired to provide a biological evaluation of the site. Sensitive species found on and within close proximity to the site were identified and evaluated in regards to future development.

The proposed project is to subdivide the 46-acre property into a 225-unit residential zone, including the undergrounding of approximately 2,000 feet of Cole Slough Canal.

A.2 Federal Agency Interaction on Resource Issues

Because the project site is within the range of the Swainson's hawk (*Buteo swainsoni*) and other listed and special status species, the Planning Firm requested that KEC conduct a survey of this property in the counties of Tulare and Fresno. On sites such as this in the Kingsburg area, the US Fish and Wildlife Service routinely recommends that a "trained biologist, familiar with the habitat requirements of listed and proposed species, should determine whether these species or habitats suitable for these species may be affected by the proposed action…prior to the environmental review process."

In a 1 April 1996 letter from USFWS to an applicant for a separate project in a neighboring County, USFWS stated:

> If a federal agency is involved with the permitting, funding, or carrying out of this Project, then initiation of formal consultation between the Agency and the Service pursuant to Section 7 of the [Endangered Species] Act is required **if** it is determined that the proposed Project may affect a federally listed species.

In situations where the project has no federal nexus, consultation between the Applicant and USFWS/CDFW pursuant to Section 10 of the [Endangered Species] Act is required **if** it is determined that the proposed project may affect

a federally listed species.

A.3 State Agency Interaction on Resource Issues

California Department of Fish and Wildlife (DFW) routinely recommends that applicants conduct a biological assessment for sensitive species and, in particular, a kit fox and raptor survey and avoidance prior to construction. In its role as a trustee agency, DFW works with project applicants to avoid or minimize adverse effects on fish, wildlife (including raptors), or native plants.

A.4 Project-related Mitigation Guidelines

USFWS and DFW work to avoid land use decisions that might restrict the range or reduce the numbers of rare or endangered species. Under the Endangered Species Act, if it is determined that listed species will be adversely affected (or if a project impact is likely to have an adverse effect on listed species), such impacts will need to be mitigated. Under these circumstances, Applicant should initiate informal consultation with USFWS to determine whether a Section 7 consultation is indicated.

Under CEQA, once a threshold for significance has been established (e.g. significant impacts to a natural community, to special status species, or to common wildlife species), applicant can address a range of mitigation options. In view of CEQA guidelines, DFW encourages project proponents (such as the Applicant) to take the following hierarchical approach to mitigate for any human impacts on natural communities and wildlife:

1) Ideally, any proposed project should be designed to <u>avoid</u> impacts to high quality habitat and sensitive species (e.g. San Joaquin kit fox, raptors, or Valley elderberry longhorn beetle).
2) If avoidance is not possible, DFW encourages project proponent to minimize loss of natural habitat and habitat quality. Habitat improvements, including revegetation with native species or enhancement of degraded habitat (including removal of non-native species), either on-site or off-site may be used as mitigation.
3) Another important component of effective mitigation includes efforts aimed at reducing human disturbance by controlling access to sensitive areas or devising plans for coexistence.
4) Short-term mitigation may be recommended during construction. Construction and maintenance personnel are instructed on "take"

avoidance. Native vegetation may be replanted, and protection recommended on the project site for habitat features critical to endangered and threatened species. Individual plants or animals may be relocated off-site by a qualified biologist.

5) Long-term mitigation may include control of alien and wild predators and invasive plant species, or encouraging growth of forage plants for native animal species.

A.5 Project Background

Crawford & Bowen Planning Inc. (Planning Firm) contacted Kamansky's Ecological Consulting (KEC) for a survey in Kingsburg, California (Figure 1). The subject property is located in northern Tulare County and southern Fresno County, east of Hwy 99 in Kingsburg, south of Hwy 201 and west of Rd. 16.

Kamansky's Ecological Consulting submits this report to the Planning Firm to inform about the site conditions and lay the foundation for the CEQA analysis.

It is agreed that the report of findings produced upon the conclusion of this reconnaissance level and focused biological survey will be used in the following manner ONLY: for consideration during any necessary NEPA/CEQA analysis and mitigation requirements or other permitting processes. It is understood that KEC does NOT make recommendations for approval or denial of the Project.

B. LOCATION OF SUBJECT PROPERTY

The subject property covered by this biological investigation is located in south-central Fresno County and northern Tulare County, California. The site occurs east of Hwy 99 in Kingsburg, south of Hwy 201 and west of Rd. 16. The property is along the south-east border of the Kingsburg city limits. The property Assessment Parcel Numbers are 077-060-009, 077-060-022 and 077-060-024. See Figure 1.

C. CURRENT LAND USE AND SITE CHARACTERISTICS

The site is currently an in a mixed state of agricultural use. Plums, peaches, and grapes are currently being grown on the site. At the time of field survey, a portion of the site in the north was left fallow. The Cole Slough canal runs inside the eastern edge of the site.

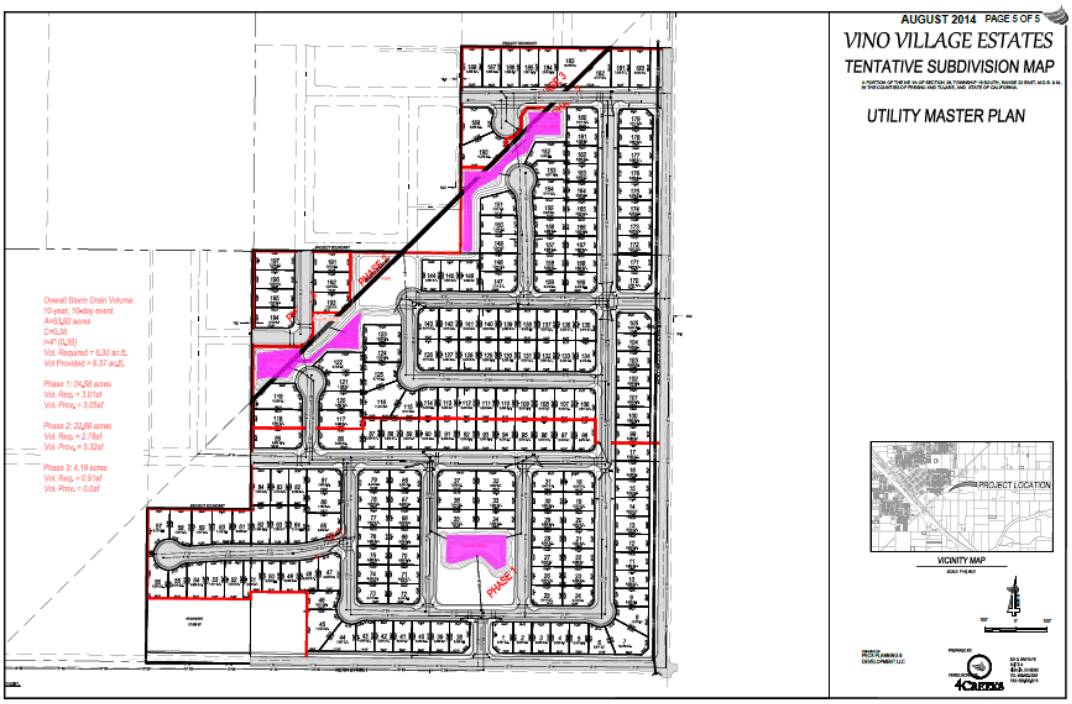

Figure 1. Project site plan and location.

D. SURVEY DATES AND SURVEY PERSONNEL

The field component of the biological evaluation was conducted on a site visit on July 21, 2014. Bobby Kamansky, John Kamansky, and Vaughan Williams conducted the initial site visit and Bobby Kamansky conducted another site visit on August 5, 2014.

E. STUDIES REQUIRED TO SATISFY ENDANGERED SPECIES LAWS

Several species of plants and animals within the state of California have low populations, limited distributions, or both. Such species may be considered "rare" and are vulnerable to extirpation as the state's human population grows and the habitats these species occupy are converted to agricultural and urban uses. State and federal laws have provided DFW and the USFWS with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. Many native plant and animal species have been formally designated as Threatened or Endangered under state and federal endangered species legislation. Others have been designated as "Species of Special Concern" by DFW. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened or endangered (CNPS 2001). Collectively, these plants and animals are referred to as Special Status Species.

F. STUDY METHODOLOGY

F.1 Literature Review

A review of literature was conducted to provide additional information about the relevant species.

F.2 Consultation with Experts on Species

Several biologists were consulted on this study to provide additional information. Kamansky's Ecological Consulting also provided additional species information and records from field notes by Bobby Kamansky to supplement CNDDB information about the area.

F.3 Survey Methods

Survey methods consisted of pedestrian surveys of the site and vehicular surveys on established roads around the site and some of the adjacent sites. Potential raptor nesting trees were identified and surveyed with high-powered optical equipment.

F.2 Consult California Natural Diversity Data Base (CNDDB)

The biological investigation conducted by KEC focused on the status of several Special Status Species. Species and the three habitats listed in the CNDDB are considered Special Status Species and are often treated as if they were listed under Federal or State Endangered Species Acts.

Additional species and records were added from field notes and documented during surveys. The likelihood of the species occurring on the site is categorized as present, absent, possible or unlikely, based on whether they were detected, are known to exist on the site or immediately adjacent (present), were not detected and not expected, owing to lack of habitat (absent), possibly occurring with suitable or suboptimal habitat present but not detected (possible), not likely to occur with no habitat or suboptimal habitat present and not detected (unlikely).

Twenty-five (25) Special Status Species are known to occur in the vicinity. Twenty-two (22) Special Status animal species are known to occur in the general vicinity of the Kingsburg development site (the subject area). All of these species were found in the CNDDB. Various other species are expected utilize the site; red-tailed hawks, great-horned owls and barn owls are all known to forage and nest in the vicinity.

Eight (8) Special Status plant species were included in the CNDDB printout for the nine relevant quadrangles. None of these species are known to occur

in the immediate vicinity of the site. The site and the surrounding areas generally serve as poor habitat for many Special Status Species.

Three native plant communities, valley sacaton grassland, northern claypan vernal pool, great valley mixed riparian forest were listed in the CNDDB.

Table 1 below summarizes the species and habitats that were listed in the California Natural Diversity Database and their occurrence summaries.

G. VEGETATION ON THE PROPOSED KINGSBURG SUBDIVISION

G.1 Natural Communities

Associations of plant species that grow in assemblages under similar ecological conditions are called plant communities (also known as natural communities or biotic communities). Generally, they are named for the dominant species found in the association. Definition of plant communities is important not only because it identifies types of plants that are present, but also because it indicates habitat types and animal species which may be found in the community. In this section, common names and scientific (Latin binomial) names of plants will both be given the first time they are mentioned; thereafter only common names will be used.

G.2 Native Plant Communities

The land on the subject property is disturbed and does not support historical flora. According to the natural community classification scheme used by Holland (1986), the Kingsburg site is located in a part of the southern San Joaquin Valley that originally contained components of two natural communities prior to development: Valley Grassland and Valley Oak Riparian Woodland.

G.3 Plant Species Composition on the Kingsburg site

The subject property currently supports relatively low species richness of wild, native plants. There are no substantial patches of native vegetation on the subject property. A single Valley oak (*Quercus lobata*) grows on the subject property.

G.3.a Valley Grassland

Dominant species observed on the subject property during the field survey, aside from cultivated crops, include the following annuals in the grassland: hare barley (*Hordeum marinum* ssp. *leporinum*), whitestem filaree (*Erodium moschatum*), redstem filaree (*Erodium cicutarium*), ripgut

#	QUAD NAME	SCIENTIFIC NAME	COMMON NAME	FED STATUS	CAL STATUS	CDF W	CNPS	OCCURRENCE SUMMARY
1	Malaga	*Efferia antiochi*	Antioch efferian robberfly	None	None	-	-	Unlikely. The dunes this species inhabits do not exist on or near the site.
2	Laton	*Atriplex depressa*	brittlescale	None	None	-	1B.2	
	Traver	*Atriplex depressa*	brittlescale	None	None	-	1B.2	Unlikely. Little to no undisturbed habitat exists on the site.
3	Traver	*Athene cunicularia*	burrowing owl	None	None	SSC	-	
	Burris Park	*Athene cunicularia*	burrowing owl	None	None	SSC	-	
	Conejo	*Athene cunicularia*	burrowing owl	None	None	SSC	-	
	Selma	*Athene cunicularia*	burrowing owl	None	None	SSC	-	
	Reedley	*Athene cunicularia*	burrowing owl	None	None	SSC	-	Possible. Although a large portion of the site is fallow field, or cultivated, owls could nest on the site.
4	Malaga	*Caulanthus californicus*	California jewelflower	Endangered	Endangered	-	1B.1	Unlikely. Habitat includes chenopod scrub, pinyon and juniper woodland, valley and foothill grassland. Appropriate habitat does not exist on the site.
5	Wahtoke	*Imperata brevifolia*	California satintail	None	None	-	2B.1	
	Malaga	*Imperata brevifolia*	California satintail	None	None	-	2B.1	
	Reedley	*Imperata brevifolia*	California satintail	None	None	-	2B.1	Unlikely. Found in wetland habitat, which could exist on the site. The canal on the east site of the site may provide habitat but the species was not observed during field study.
6	Burris Park	*Ambystoma californiense*	California tiger salamander	Threatened	Threatened	SSC	-	
	Wahtoke	*Ambystoma californiense*	California tiger salamander	Threatened	Threatened	SSC	-	

	Malaga	*Ambystoma californiense*	California tiger salamander	Threatened	Threatened	SSC	-	Unlikely. This species requires aquatic habitat for reproduction and early life stages. Little potential habitat exists on the project site. The canal on the east site of the site may provide habitat but the species was not observed during field study
7	Malaga	*Tropidocarpum capparideum*	caper-fruited tropidocarpum	None	None	-	1B.1	Unlikely. Historical habitat (alkaline hills) is not present and species has not been recorded in over 50 years.
8	Malaga	*Phrynosoma blainvillii*	coast horned lizard	None	None	SSC	-	Unlikely. Although this species could inhabit fallow, undisturbed fields, the frequency and size of this habitat would make this species uncommon.
9	Traver	*Atriplex cordulata var. erecticaulis*	Earlimart orache	None	None	-	1B.2	Unlikely. Very little undisturbed habitat occupies the site.
10	Wahtoke	*Great Valley Mixed Riparian Forest*	Great Valley Mixed Riparian Forest	None	None	-	-	Absent. No undisturbed habitat exists on or near the site.
11	Sanger	*Tuctoria greenei*	Greene's tuctoria	Endangered	Rare	-	1B.1	Unlikely. This species is found in vernal pools. No vernal pools were found on or adjacent to the site.
12	Reedley	*Lasiurus cinereus*	hoary bat	None	None	-	-	Unlikely. Although roosting trees do occupy the site, dense vegetation for foraging is lacking.
13	Malaga	*Metapogon hurdi*	Hurd's metapogon robberfly	None	None	-	-	Absent. This species was not observed during field study.
14	Traver	*Atriplex minuscula*	lesser saltscale	None	None	-	1B.1	Unlikely. Suitable undisturbed habitat does not exist on the site.
15	Traver	*Lanius ludovicianus*	loggerhead shrike	None	None	SSC	-	Possible. Fallow fields occupy a portion of the site. This area may provide foraging habitat for this species.
16	Malaga	*Leptosiphon serrulatus*	Madera leptosiphon	None	None	-	1B.2	Unlikely. Record is out of date. Found on dry slopes; often on decomposed granite in woodland between 80-1575m. Habitat does not exist on site.
17	Malaga	*Lytta molesta*	molestan blister beetle	None	None	-	-	Unlikely. This species is found near vernal pools. No vernal pools were found on or adjacent to the site.
18	Traver	*Northern Claypan Vernal Pool*	Northern Claypan Vernal Pool	None	None	-	-	Absent. Habitat does not exist on the project site.
19	Reedley	*Antrozous pallidus*	pallid bat	None	None	SSC	-	Possible. Site provides little suitable roosting and foraging habitat.

20	Wahtoke	*Pseudobahia peirsonii*	San Joaquin adobe sunburst	Threatened	Endangered	-	1B.1	
	Reedley	*Pseudobahia peirsonii*	San Joaquin adobe sunburst	Threatened	Endangered	-	1B.1	Unlikely. Undisturbed habitat does not exist on the site.
21	Sanger	*Vulpes macrotis mutica*	San Joaquin kit fox	Endangered	Threatened	-	-	
	Laton	*Vulpes macrotis mutica*	San Joaquin kit fox	Endangered	Threatened	-	-	
	Burris Park	*Vulpes macrotis mutica*	San Joaquin kit fox	Endangered	Threatened	-	-	
	Traver	*Vulpes macrotis mutica*	San Joaquin kit fox	Endangered	Threatened	-	-	Possible. Burrows were not observed during field study, some marginal habitat exists on the site and in the area.
22	Wahtoke	*Orcuttia inaequalis*	San Joaquin Valley Orcutt grass	Threatened	Endangered	-	1B.1	Absent. This species is found in vernal pool habitat. No vernal pools were found on or adjacent to the site.
23	Wahtoke	*Convolvulus simulans*	small-flowered morning-glory	None	None	-	4.2	Unlikely. Habitat includes chaparral (openings), coastal scrub, and valley/foothill grassland. Habitat does not exist on site.
24	Wahtoke	*Eryngium spinosepalum*	spiny-sepaled button-celery	None	None	-	1B.2	Unlikely. Found near vernal pools and in grassland habitat, little to none is not found on the site.
25	Traver	*Buteo swainsoni*	Swainson's hawk	None	Threatened	-	-	
	Selma	*Buteo swainsoni*	Swainson's hawk	None	Threatened	-	-	
	Conejo	*Buteo swainsoni*	Swainson's hawk	None	Threatened	-	-	
	Malaga	*Buteo swainsoni*	Swainson's hawk	None	Threatened	-	-	Possible. Roosting trees do exist on or near the site. No nests were identified and individuals were not observed during field study.
26	Traver	*Agelaius tricolor*	tricolored blackbird	None	None	SSC	-	Unlikely. Nesting habitat does not exist, but the fallow field found on site may provide foraging habitat.
27	Sanger	*Desmocerus californicus dimorphus*	valley elderberry longhorn beetle	Threatened	None	-	-	
	Wahtoke	*Desmocerus californicus*	valley elderberry	Threatened	None	-	-	

		dimorphus	longhorn beetle					
	Laton	*Desmocerus californicus dimorphus*	valley elderberry longhorn beetle	Threatened	None	-	-	
	Reedley	*Desmocerus californicus dimorphus*	valley elderberry longhorn beetle	Threatened	None	-	-	Absent. No elderberry plants were identified on or near the site. Elderberry must exist for suitable habitat.
28	Traver	*Valley Sacaton Grassland*	Valley Sacaton Grassland	None	None	-	-	
	Burris Park	*Valley Sacaton Grassland*	Valley Sacaton Grassland	None	None	-	-	Absent. Habitat does not exist on project site.
29	Burris Park	*Branchinecta lynchi*	vernal pool fairy shrimp	Threatened	None	-	-	
	Traver	*Branchinecta lynchi*	vernal pool fairy shrimp	Threatened	None	-	-	
	Wahtoke	*Branchinecta lynchi*	vernal pool fairy shrimp	Threatened	None	-	-	Unlikely. This species is found in vernal pools. No vernal pools were found on or adjacent to the site.
30	Traver	*Lepidurus packardi*	vernal pool tadpole shrimp	Endangered	None	-	-	
	Burris Park	*Lepidurus packardi*	vernal pool tadpole shrimp	Endangered	None	-	-	Unlikely. This species is found in vernal pools. No vernal pools were found on or adjacent to the site.
31	Traver	*Eumops perotis californicus*	western mastiff bat	None	None	SSC	-	
	Selma	*Eumops perotis californicus*	western mastiff bat	None	None	SSC	-	Possible. Although foraging sites may exist in small quantity near the site, no cliffs but a few buildings for roosting do occur.
32	Reedley	*Emys marmorata*	western pond turtle	None	None	SSC	-	
	Wahtoke	*Emys marmorata*	western pond turtle	None	None	SSC	-	Unlikely. This species occupies in streams and ponds. A canal does exist on the border of the property to the east which could provide habitat for this species.
33	Burris Park	*Spea hammondii*	western spadefoot	None	None	SSC	-	
	Traver	*Spea hammondii*	western spadefoot	None	None	SSC	-	Unlikely. Possible wetland habitat was observed on site during field surveys, but this species was not

								observed. A canal does exist on the border of the property to the east
34	Malaga	*Coccyzus americanus occidentalis*	western yellow-billed cuckoo	Proposed Threatened	Endangered	-	-	
	Sanger	*Coccyzus americanus occidentalis*	western yellow-billed cuckoo	Proposed Threatened	Endangered	-	-	Absent. Habitat extirpated and does not exist on site.
35	Conejo	*Pica nuttalli*	yellow-billed magpie	None	None	-	-	Absent. Record may be an error.
36	Malaga	*Xanthocephalus xanthocephalus*	yellow-headed blackbird	None	None	SSC	-	Unlikely. Often nest in marshes/wetlands with tules or cattails. The fallow field on the site may provide some foraging habitat.

**Present – Species observed on the site during the study.
Possible – Species reasonably likely to occur because good habitat exists and/or species observed adjacent to the site.
Absent – No habitat is present on the site and there are no historical records on or near the site.
Unlikely - Species reasonably unlikely to occur because no adequate habitat exists and/or species was not observed adjacent to the site.

Federal status:

FE Listed as endangered under the Federal Endangered Species Act
FT Listed as threatened under the Federal Endangered Species Act
FPT Proposed for listing as threatened under the Federal Endangered Species Act
FSC Species of concern as identified by the U.S. Fish and Wildlife Service

State status:

SE Listed as endangered under the California Endangered Species Act
ST Listed as threatened under the California Endangered Species Act
CFP Listed as fully protected by the California Department of Fish and Game
CSC Species of concern as identified by the California Department of Fish and Game
1B Plant species that are rare, threatened, or endangered in California and elsewhere.

grass (*Bromus diandrus*),

H. INVERTEBRATES

The site is within close proximity (< ¼ mile) to row crop fields where there are rich invertebrate species. These animals provide food for many predators, including hawks, which may be observed in the area.

I. VERTEBRATE ANIMALS ON THE KINGSBURG SITE Thirteen vertebrate species were recorded at the Kingsburg site (See Appendix B). California ground squirrels were observed directly adjacent to the site.

I.1 Amphibians

Two amphibian species were observed on the subject property during field work. Western toad (*Anaxyrus boreas*) and American bullfrog (*Lithobates catesbeianus*) (DOA) were observed along the Cole Slough canal.

I.2 Reptiles

No reptiles were observed on the subject property during field work. The site does provide habitat for common species such as western fence lizards (*Sceloporus occidentalis*).

I.3 Birds

Nine bird species were observed on the site during survey times and dates. The grasslands on the site support common species such as doves and the treed areas support winter resident birds, neotropical migrants such as kingbirds (*Tyrannus verticalis*) and raptors such as red-tailed hawks (*Buteo jamacansis*), barn owls (*Tyto alba*) and for Swainson's hawks.

I.4 Mammals

Tracks were observed along the Cole Sough canal. Tracks determined to be: Racoon (*Procyon lotor*), and grey fox (*Urocyon cinereoargenteus*).

J. RESULTS OF BIOLOGICAL EVALUATION

J.1 SPECIAL STATUS PLANT SPECIES

J.1.a California jewel-flower (*Caulanthus califonrica*) Fed Endangered, State Endangered CNPS 1B.1

There is one quad with records for the California jewel flower: Malaga.

No California jewel flower was found on the site. Habitat for this species

is listed by CNPS as chenopod scrub, valley and foothill grassland, and pinyon-juniper woodland. No habitat of these types and no undisturbed grassland exist along the site.

J.1.b California satintail (*Imperrata brevifolia*) CNPS 2B.1
This species has records in the Wahtoke, Malaga, and Reedley quads.

No California satintail was found on the site. This species is likely to occur in alkali meadows and seeps which are not found on the site.

J.1.c Earlimart orache (*Atriplex erecticalis*) CNPS 1B.2
This CNPS species profile mentions records of Earlimart orache on the Traver quad.

No Earlimart orache, or any annual saltbush (Atriplex) species, was found on the site. Earlimart orache grows on Valley and foothill grassland. This vegetation community does not exist undisturbed on the project site.

J.1.d Lesser saltscale (*Atriplex miniscula*) CNPS 1B.1
There are records of this species from the Traver Quad.

No lesser saltscale, or any annual saltbush (Atriplex) species, was found on the site. Lesser saltscale grows on Chenopod scrub, playas, sandy soils in alkaline areas, and Valley and foothill grassland often in association with slough systems and river floodplains. None of these plant communities occur on the site.

J.1.e San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*) Fed Threatened, State Endangered, CNPS 1B.1
The Wahtoke Quad contains the only record of this plant in the vicinity.

No San Joaquin Orcutt grass was found on the site. This species is a vernal pool obligate. No vernal pools were observed on the on or adjacent to the site.

J.1.f San Joaquin adobe sunburst (*Pseudobahia peirsonii*) Fed Threatened, State Endangered, CNPS 1B.1
The record for the San Joaquin adobe sunburst is in the Wahtoke and Reedley quads.

No San Joaquin adobe sunbursts were found on the site. Habitat for this

species is grasslands and woodlands with heavy adobe clay soils, these elements were not found on the site.

J.1.g Brittlescale (*Atriplex depressa*) CNPS 1B.2
This species was recorded in the Traver and Laton quads.

No brittlescale was found on the site/alignment. Habitat for this species is saline and alkaline soils. Owing to the highly disturbed nature of the site, this species is not expected to occur.

J.1.h Spiny-sepaled button-celery (*Eryngium spinosepalum*) CNPS 1B.2
This species was recorded in the Wahtoke Quad.
No spiny-sepaled button-celery was observed on the site. This species is associated with Valley and foothill grassland and vernal pools. These communities do not exist on or near the site.

J.1.1 SPECIAL STATUS PLANT COMMUNITIES

J1.1.a Northern Claypan Vernal Pool
This community was listed within the Traver Quad.

No Northern Claypan Vernal Pools were found on the site. The site appears to have been deep-ripped. Thus, there does not appear to be duripan or other impermeable layer sub-surface on the site, precluding ponding.

J1.1.b Great Valley Mixed Riparian Forest
This community was recorded in the Wahtoke Quad.

No Great Valley Mixed Riparian Forest was found on the site. No Patches of riparian vegetation exist on the site.

J1.1.c Valley Sacaton Grassland
This community was recorded in the Burris Park and Traver quads.

The site is heavily disturbed and no perennial, native grasses occur on the site. *No Valley Sacaton Grassland was found on the site.*

J.2 SPECIAL STATUS INVERTEBRATES

J.2.a Vernal pool fairy shrimp (*Branchinecta lynchii*) FT

Three quads with records of this species were found: Burris Park, Traver, and Wahtoke.

No vernal pool fairy shrimp were found on the site. No vernal pools were observed during surveys.

Vernal pool fairy shrimp are entirely dependent on vernal pool habitat associated with particular soils. Vernal pool fairy shrimp are unlikely to occur anywhere on the site because there are no vernal pools located anywhere on or adjacent to the site.

J.2.b Vernal pool tadpole shrimp (*Lepidurus packardii*) Fed Threatened

This species was recorded in the Traver and Burris Park quads.

No vernal pool tadpole shrimp were found on the site. No vernal pools occur were observed during surveys.

Vernal pool tadpole shrimp are entirely dependent on vernal pool habitat associated with particular soils. Vernal pool tadpole shrimp are unlikely to occur anywhere on the site because there are no vernal pools located anywhere on or adjacent to the site.

J.2.c Antioch efferian robberfly (*Efferia antiochi*)

Malaga is the only quad in which this species is recorded.

No Antioch efferian robberflies were found on the site. This species is endemic to the Antioch Dunes.

J.2.d Hurd's metapogon robberfly (*Metapogon hurdi*)

The Malaga quad contains records of this species in the vicinity.

No Hurd's efferian robberflies were found on the site. Known only from the sand dunes at Antioch and San Joaquin Valley. No suitable habitat present.

J.2.e Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) Fed Threatened in Fresno County north.

The Sanger, Wahtoke, Laton, and Reedley quads have records of this species.

No valley elderberry longhorn beetles were found on the site. This species relies on the presence of elderberry plants. No elderberries were found on

the site.

J.2.f molestan blister beetle (*Lytta molesta*)
This species has been found in the Malaga quad.

No molestan blister beetles were observed on the site. This species is found in vernal pool habitat. No vernal pools were observed on the site.

J.3 SPECIAL STATUS AMPHIBIANS AND REPTILES

J.3.a Western spadefoot (*Spea Hammondii*) DFW SSC
This species was not observed on the site. The site provides little to no habitat for this species. The twelve quad CNDDB printout includes two quads containing occurrences of western spadefoot: the Burris Park and Traver quads.

No Western spadefoot toads were found on the site. Western spadefoot toads are found primarily in annual grasslands with vernal pools. No vernal pools occur on the site. Western spadefoot toad is unlikely to occur anywhere on the site because there are no grasslands with vernal pools located anywhere on or adjacent to the site. A slough channel with appropriate soil and possible hydrological conditions does exist on eastern edge of the project area.

J.3.b California tiger salamander (*Ambystoma californiense)* Fed Threatened, State Threatened, SSC
This species has been recorded in the Burris Park, Wahtoke, and Malaga quads.

No California tiger salamanders were observed on the site. Possible suitable aquatic habitat was found on the eastern boundary of the site.

J.3.c Coast horned lizard (*Phrynosoma blainvillii*) SSC
This species has been observed within the Malaga Quad.

No coast horned lizards were observed on the site. Because of the disturbed nature of the site and surrounding fields, very little habitat exists on the site for this species.

J.3.d Western pond turtle (*Emys marmorata*) SSC
This species has been found in the Wahtoke and Reedley quads.

No western pond turtles were found on the site. Riparian habitats, pools or flowing water were not observed during field surveys. However, a slough channel with possibly suitable hydrological conditions does exist on the eastern boundary of the project area.

J.4 SPECIAL STATUS BIRDS

J.4.a Swainson's hawk (*Buteo swainsoni*) (nesting) State Threatened

Swainson's hawk records are found in the Traver, Selma, Conejo, and Malaga quads.

In the adjacent Tulare County and Kings County, more than 33 Swainson's hawk nests have been located in isolated trees or small groves of eucalyptus (18), valley oak (8), Fremont's cottonwood (4), Goodding's black willow (3), and deodar cedar (1). Nest trees stand in (or adjacent to) open agricultural land (16), along riparian corridors or irrgation channels (16), or at the edge of a tailwater pond (1). Foraging habitat surrounding the nest trees is chiefly alfalfa or other row crops (30) but also includes expanses of grassland and scrub habitat (3) (Hansen 2005d).

Swainson's hawks prefer open habitats, including mixed and short grass grasslands with scattered trees or shrubs for perching; dry grasslands; irrigated meadows; and edges between two habitat types.

No Swainson's hawks were observed on the site.

Appropriate avoidance measures should be employed such as pre-construction surveys and construction monitoring for this and other raptors. It may be necessary to consult with DFW to determine if additional avoidance is necessary to protect this species during construction.

J.4.b Western burrowing owl (*Athene cunicularia*) SSC

Records for this species are on the Traver, Burris Park, Conejo, Selma, and Reedley quads. This species prefers short grass prairie and other sparsely-vegetated areas where foraging is optimal. Ground squirrel burrows suitable for burrowing owls were observed directly adjacent to the site.

No western burrowing owls were found on or near the site. It is possible that they could be denning and foraging in the fallow fields and farm edges nearby or could move into the proposed Project area prior to construction.

J.4.c Yellow-billed magpie (*Pica nuttalli*)
This species has been observed within the Conejo Quad.

No yellow-billed magpies were seen on the site. As this species is not known to be present in this area, the record is either inaccurate or a vagrant.

J.4.d Yellow-headed blackbird (*Xanthocephalus zanthocephalus*) SSC
This species has been observed in the Malaga Quad.
No yellow-headed blackbirds were observed while surveying the site. This species is known to breed in the San Joaquin Valley near wetlands. They are likely to be found foraging and nesting in active agricultural fields if there are wetlands nearby with suitable hydrology and nesting substrate. KEC did not detect appropriate habitat in the vicinity.

J.4.e Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) Fed Threatened, State Endangered
The Malaga and Sanger quads contain records of this species.

No western yellow-billed cuckoos were observed while surveying the site. This species was extirpated from this area. There are no riparian forests of suitable size and composition to support this species in this part of Fresno County. The nearest population of this species can be found at the Audubon Kern River Preserve in eastern Kern County (B. Kamansky field notes, Reed Tollefson, personal communication).

J.4.f Loggerhead shrike (*Lanius ludovicianus*) SSC
The Traver Quad contains the only record for this species in the area.

No Loggerhead shrikes were observed on the site during the survey. They can typically be seen foraging in fallow fields and grassland habitats and nest in dense vegetation. Small suitable habitat patches exist on and nearby the proposed Project site.

J.4.g Tricolored blackbird (*Agelaius tricolor*) SSC
This species has been observed in the Traver Quad.

No tricolored blackbirds were observed on the site. This species forages and nests in dense riparian vegetation near wetlands and often near dairies. While no such habitat exists on the site, the Kings River lies several miles east of the site and this area provides habitat for this species.

J.5 SPECIAL STATUS MAMMALS

J.5.a Western mastiff bat (*Eumops perotis californicus*) SSC

The Traver and Selma quads contain records of this species.

No western mastiff bats were observed during the field survey. This species is known to forage in a variety of habitats including agricultural lands, which occur on and adjacent to the site. There are also a few suitable potential roosting sites in the area; however, because of the existing site disturbance history, the proposed Project site lacks substantial breeding ground for the bat.

J.5.b San Joaquin kit fox, *Vulpes macrotis mutica* Fed Endangered, State Threatened

Records of San Joaquin kit fox in this part of Tulare County come from eight quads: Visalia, Paige, Goshen, Tulare, Waukena, Traver, Monson, and Remnoy. These widespread occurrences suggest widespread activity in the area.

The Endangered Species Recovery Program (ESRP) text on San Joaquin kit fox below, passages most pertinent to the site are highlighted in *italic* type:

San Joaquin kit foxes inhabit grasslands and scrublands, many of which have been *extensively modified.* Types of modified habitats include…grazed annual grasslands. Oak woodland, alkali sink scrubland, and vernal pool and alkali meadow communities also provide habitat for kit foxes. Dens are scarce in areas with shallow soils because of the proximity to bedrock, high water tables, or impenetrable hardpan [or claypan] layers. Kit foxes are active year-round and are primarily nocturnal. (To view a species profile for San Joaquin kit fox, see the ESRP URL: http://esrpweb.csustan.edu/speciesprofiles/profile.php?sp=vuma

No San Joaquin kit fox were observed during this field survey. San

Joaquin kit fox is a species that is both Federally Endangered and State Threatened. Records of San Joaquin kit fox occurrences are widespread within the proposed Project area. The proposed Project site is sub-optimal kit fox habitat because it does not provide important intrinsic habitat values unique to the area and has an extensive history of disturbance. However, some possible movement corridors are in the area and San Joaquin kit fox may occasionally pass through the site while foraging. Based on habitat characteristics and prey availability, this species would not be expected to den on the site; however, it is within the range of this species and potential kit fox dens were observed on and directly adjacent to the site. It should be noted though that no evidence of kit fox tracks or scat was found anywhere on the site.

J.5.c Hoary bat (*Lasiurus cinereus*)

The Reedley Quad contains records of this species. The records are likely from the Kings River riparian forest.

No Hoary bats were observed during field survey. Possible roosting trees were found on and adjacent to the site and there are foraging opportunities throughout the site and the surrounding areas.

J.5.d Pallid bat (*Antrozous pallidus*) SSC

The Reedley Quad contains records of this species. The records may come from the Kings River riparian forest.

No pallid bats were observed during field study. Pallid bats' habitat includes arid, rocky sites. The site does not contain such habitat.

K. IMPACT ANALYSIS AND MITIGATION

K.1 SIGNIFICANCE CRITERIA

General plans, area plans, and specific projects are subject to the provisions of the California Environmental Quality Act (CEQA) to assess the impacts of proposed projects on the environment before they are constructed. For example, site development may require the removal of some or all of a site's existing vegetation. Animals associated with this vegetation could be destroyed or displaced**.** Plants and animals adapted to humans, roads, buildings, pets, etc. may replace those species which formerly occurred on the site. Plants and animals that are state and/or federally listed as threatened or endangered may be destroyed or displaced. Sensitive habitats such as wetlands and riparian woodlands

may be altered or destroyed. These impacts may be considered significant or not. According to Guide to the California Environmental Quality Act (Remy et al. 1999), "Significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest. Specific project impacts to biological resources may be considered "significant" if they will:

- have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species (including threatened and endangered species) in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;

- have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;

- have a substantial adverse effect on federally protected wetlands as defined by Section 404 of The Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site;
- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- conflict with the provisions of an adopted Habitat Conservation Plan, or other approved local, regional, or state habitat conservation plan (Remy et al. 1999).

Furthermore, CEQA Guidelines Section 15065 states that a project may trigger the requirement to make a "mandatory findings of significance" if "the Project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species,

cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory."

In a Draft EIS/EIR prepared for a Project in Kings County by the United States Army Corps of Engineers (USACE), the document states,

> For this section [Section 4.12 Effects on Endangered Species], any project action which would affect the continued existence of an endangered or threatened species or a species of special concern is considered to be a significant adverse affect [*sic*].

If the lead agency can demonstrate that potential impacts to biological resources will be avoided, then these impacts should be considered less-than-significant for the purpose of a CEQA review.

K.2 RELEVANT GOALS, POLICIES, AND LAWS

K.2.1 Threatened and Endangered Species

State and federal "endangered species" legislation has provided DFW and the USFWS with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Species listed as threatened or endangered under provisions of the state and federal endangered species acts, candidate species for such listing, state species of special concern, and some plants listed as endangered by the California Native Plant Society are collectively referred to as "species of special status". Permits may be required from both the DFW and USFWS if activities associated with a proposed project will result in the "take" of a listed species. "Take" is defined by the state of California as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (California Fish and Wildlife Code, Section 86). "Take" is more broadly defined by the federal Endangered Species Act to include "harm" (16 USC, Section 1532 (19), 50 CFR, Section 17.3). Furthermore, the CDF&W and the USFWS are responding agencies under the California Environmental Quality Act (CEQA). Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues to make project-specific recommendations for their conservation.

K.2.2 Migratory Birds

State and federal laws also protect most birds. The Federal Migratory Bird Treaty Act (FMBTA: 16 U.S.C., scc. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

Construction disturbances during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the DFW.

K.2.3 Birds of Prey

Birds of prey are also protected in California under provisions of the State Fish and Wildlife Code, Section 3503.5,(1992), which states that it is "unlawful to take, possess, or destroy any birds in the Order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto". Construction disturbances during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the DFW.

K.2.4 Wetlands and Other "Jurisdictional Waters"

Natural drainage channels and wetlands are considered "Waters of the United States" (hereafter referred to as "jurisdictional waters"). The U.S. Army Corps of Engineers (USACE) regulates the filling or grading of such waters under the authority of Section 404 of The Clean Water Act (Wetland Training Institute, Inc. 1990). The extent of jurisdiction within drainage channels is defined by "ordinary high water marks" on opposing channel banks. Wetlands are habitats with soils that are intermittently or permanently saturated, or inundated. The resulting anaerobic conditions select for plant species known as hydrophytes that show a high degree of fidelity to such soils. Wetlands are identified by the presence of hydrophytic vegetation, hydric soils (soils saturated intermittently or permanently saturated by water), and wetland hydrology according to methodologies outlined in the 1987 Corps of Engineers Wetlands Delineation Manual (USACE 1987).

All activities that involve the discharge of fill into jurisdictional waters are subject to the permit requirements of the USACE (Wetland Training Institute, Inc. 1991). Such permits are typically issued on the condition that the applicant agrees to provide mitigation that results in no net loss of wetland functions or values. No permit can be issued until the Regional Water Quality Control Board (RWQCB) issues a certification (or waiver of such certification) that the proposed activity will meet state water quality standards. The RWCQB is also responsible for enforcing National Pollution Discharge Elimination System (NPDES) permits, including the General Construction Activity Storm Water Permit. All projects requiring federal money must also comply with Executive Order 11990 (Protection of Wetlands).

The California Department of Fish and Wildlife has jurisdiction over the bed and bank of natural drainages according to provisions of Section 1601 and 1603 of the California Fish and Wildlife Code (California Department of Fish and Wildlife 1995). Activities that would disturb these drainages are regulated by the DFW via a Streambed Alteration Agreement. Such an agreement typically stipulates that certain measures will be implemented which protect the habitat values of the drainage in question.

K.3 ENVIRONMENTAL IMPACT/MITIGATION

K.3.1 Impacts on Special Status Plant Species?

Impact
The current nature of the site and its long disturbance history does not provide suitable habitat for many of the Special Status plant species that are listed in the CNDDB.

Avoidance
Because no impacts to Special Status plant species were observed, no avoidance of plant species is required.

Minimization
Because no impacts to Special Status plant species are anticipated, no minimization is required.

Compensation
No compensation is required.

Monitoring
No monitoring is required.

K.3.2 Impacts on Special Status Animal Species?
Will the construction or land modification have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Impact
Twenty-one (21) Special Status animal species are known to occur in the general vicinity of the Kingsburg site. KEC inspected the site and noted that all lands on the Project site have been disturbed to some degree by leveling, disking, farming, etc.

Amphibians were detected along the Cole Slough Canal at the eastern edge of the property. The plan for this water body is to fill and pipe the water for approximately 2000 feet along the eastern edge of the property.

Various large nesting trees border or are present on the site. No raptors or nests were observed on the site, but are present in the general vicinity (see Appendix maps). Although the site is sub-optimal kit fox habitat, it is within the range of this species and potential kit fox dens were observed directly adjacent to the site. Dens could also be used by burrowing owls. Neo-tropical migratory birds occupied the site at the time of the biological surveys. To avoid these protected species, preconstruction surveys will be required to identify and avoid any Special Status Species on the Project Site prior to construction.

Avoidance
Take of Special Status Species as a result of any project-related construction or earth-moving work would be considered a significant environmental impact. Thus, impacts to amphibians such as western spadefoot, raptors in nest trees located on/near the site would need to be avoided, or compensated for to bring impacts below the level of significance. Impacts to burrowing owls and kit foxes that might occupy the site must also be avoided. Because habitat for Special Status animal species occurs on and adjacent the subject property, avoidance and minimization measures are warranted.

In order to avoid impacts, the Applicant shall perform amphibian surveys after approximately 1-2 inches of precipitation in the fall to detect spadefoots, tiger salamanders and construct the project outside of the nesting season for raptors and migratory birds (March - August). Because of the potential kit fox and burrowing owl dens, spadefoots, western pond turtles, the migratory birds and the nests and potential foraging habitat on adjacent agricultural land, standardized preconstruction surveys shall be required to avoid impacts to this species. Preconstruction surveys should follow the San Joaquin kit fox and burrowing owl standardized recommendations for avoiding impacts during ground disturbance (USFWS 1999). If preconstruction surveys detect Swainson's hawks or other raptors nesting on the site or adjacent to the site, the Applicant should initiate consultation with DWF and/or USFWS to clarify the avoidance requirements; ½ mile from nest trees is standard avoidance. Preconstruction avian surveys should also identify if any neotropical migrants nest on the site. If nesting behavior or nests are observed, 500-foot buffer areas will need to be established to protect nests and ensure avoidance. Passive relocation for amphibians, project postponement or other measures shall be required if pre-construction surveys detect sensitive amphibians or reptiles.

Because take of raptors or other Special Status Species as a result of any project-related construction or earth-moving work would be considered a significant environmental impact, impacts to sensitive amphibians, reptiles and raptors in nest trees located on/near the site would need to be avoided, or compensated to bring impacts below the level of significance.

Monitoring

If pre-construction surveys detect species on site or adjacent, a biologist will need to be onsite to educate workers, monitor compliance, best management practices and to identify and protect natural resources while construction occurs. The monitor will be responsible for ensuring that appropriate measures are taken to prevent disturbance of core avoidance areas. Any unauthorized take of Special Status species will be immediately reported to DFW by the monitor. The monitor will also notify the Project Coordinator who will stop work until corrective measures are implemented.

Mitigation

Although San Joaquin kit foxes have been reported in the CNDDB, the site is not considered optimal kit-fox habitat and kits foxes have not been confirmed in the vicinity in some time. Swainson's hawks, burrowing owls or other raptors could forage or nest on the site and in the adjacent agriculture fields and DFW should be consulted in order to determine if proposed measures for those species are adequate as part of the review process. Preconstruction surveys shall be conducted before any ground-disturbing activities begin. If the surveys detect the presence of listed species or migratory birds, then the Project shall be paused until appropriate measures or consultation with the USFWS/DFW can take place.

If preconstruction surveys find that no special-status species are present on or adjacent to the property, then the potential construction may proceed. The Applicant shall implement the following environmental protection measures to reduce environmental consequences associated with construction. Based on this analysis, implementation of mitigation measures would reduce potential Project-specific impacts to less than significant.

Environmental Protection Measures

The United States Fish and Wildlife Service (USFWS) approved pre-construction surveys for San Joaquin kit fox shall be conducted no fewer than 14 days and no more than 30 days prior to the onset of any ground-disturbing activity (USFWS 1999). The Applicant would follow standardized Recommendations for Protection of the San Joaquin kit fox prior to and during ground disturbance (USFWS 1999). These surveys will also detect raptor and migratory songbirds activity in the area and recommend appropriate avoidance and minimization measures.

If activities take place during avian nesting season (March 1 - August 1), a qualified biologist will conduct nest surveys within a 500-ft radius of the construction site, with an emphasis on Swainson's hawks (USFWS 1994), burrowing owls and other raptors. Appropriate measures shall be determined in consultation with the California Department of Fish and Wildlife (DFW) in the event an active nest is located in an area subject to disturbance (within ½ mile). No restrictions are required for avian species for construction activities that occur during the non-breeding season (August 1 through February 28) or after the young have fledged.

Protection of Swainson's hawks and other raptors and migratory birds (including Loggerhead Shrike).

- Pre-construction surveys shall be conducted to determine the presence of nesting birds if ground clearing or construction activities will be initiated during the breeding season (February 15 through September 15). Potential nesting areas on the proposed Project site and potential nesting areas within 500 feet of the site should be surveyed 14 to 30 days prior to the initiation of construction. Surveys shall be performed by a qualified biologist to verify the presence or absence of nesting birds. Construction shall not occur within a 500 foot buffer surrounding active nests of raptors or a 250 foot buffer surrounding active nests of migratory birds. If construction within these buffer areas is required or if nests must be removed to allow continuation of construction, then approval and specific removal methodologies should be obtained in consultation with California Department of Fish and Wildlife.
- All trees which are suitable for Swainson's hawk nesting that are within 2,640 feet of construction activities shall be inspected by a qualified biologist.

If raptor nests such as Swainson's hawk are found during the inspection, then surveys shall be conducted at the following intensities, depending upon dates of initiation of construction:

If Swainson's hawks are detected to be actively nesting in trees within 2,640 feet of the construction area, construction shall not occur within this zone until after young Swainson's hawks have fledged (this usually occurs by early June). The nest shall be monitored by a qualified biologist to determine fledging date.

If other nesting birds (particularly non-raptor species listed on the MBTA) are found actively nesting within 250 feet of the construction area, construction should be postponed until after young have fledged. The date of fledging should be determined by a qualified biologist. If construction cannot be delayed within this zone, the CDFW and/or the USFWS shall be consulted and alternative protection measures required by the CDFW and/or the USFWS shall be followed.

Protection of San Joaquin kit fox

A standarized pre-construction/pre-activity survey shall be conducted no

less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any Project activity likely to impact the San Joaquin kit fox. Surveys shall identify kit fox habitat features on the Project site and evaluate use by kit fox and, if possible, assess the potential impacts to the kit fox by the proposed activity. The status of all dens shall be determined and mapped. Written results of pre-construction/pre-activity surveys must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities. Disturbance to all San Joaquin kit fox dens shall be avoided to the maximum extent possible.

If a natal/pupping den is discovered within the Project area or within 200-feet of the site boundary, USFWS shall be immediately notified and under no circumstances should the den be disturbed or destroyed without prior authorization. If the pre-construction/pre-activity survey reveals an active natal pupping or new information, the Project applicant shall contact USFWS immediately to obtain the necessary take authorization/permit.

Destruction of any den shall be accomplished by careful excavation until it is certain that no kit foxes are inside. The den shall be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period.

If at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above shall be resumed. Destruction of the den may be completed when, in the judgment of the qualified biologist, the animal has escaped without further disturbance from the partially destroyed den.

Project-related vehicles shall observe a daytime speed limit not to exceed 20-mph throughout the site in all proposed Project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. Night-time construction shall be minimized to the extent possible. However if it does occur, then the speed limit shall be reduced to 10-mph. Off-road traffic outside of designated project areas shall be prohibited.

To prevent inadvertent entrapment of kit fox or other animals during the

construction phase of the proposed Project, all excavated, steep-walled holes or trenches more than 2-feet deep shall be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks shall be installed. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS and the California Department of Fish and Wildlife shall be contacted as noted under Mitigation Measure 4-20 referenced below.

Kit fox are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit fox before the pipe is used or moved, buried, or capped in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the CFW has been consulted. If necessary, and under the direct supervision of a qualified biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.

All food-related trash outside of the enclosed facility such as wrappers, cans, bottles, and food scraps shall be disposed of daily in securely closed containers and removed at least once a week during both construction and operational phases.

No pets, such as dogs or cats, shall be allowed on the Project site in order to prevent harassment, mortality of kit fox, or destruction of dens. Use of rodenticides and herbicides in Project areas shall be restricted. If rodent control must be used it shall be limited to the use of zinc phosphide because of its demonstrated lower risk to kit fox.

A representative shall be appointed by the Project Applicant to serve as the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative will be identified during the employee education program and their name, telephone number, or other pertinent contact information shall be provided to the Service.
An employee education program shall be conducted to alert employees of potential impacts to kit fox or other species of concern. The program shall consist of a brief presentation by persons knowledgeable in kit fox

biology and legislative protection to explain endangered species concerns to contractors, their employees, and military and/or agency personnel involved in the project. The program shall include the following: A description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of kit fox in the Project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during Project construction and implementation. A fact sheet conveying this information shall be prepared for distribution to the previously referenced people and anyone else who may enter the Project site.
Any contractor, employee, or military or agency personnel who are responsible for inadvertently killing or injuring a San Joaquin kit fox shall immediately report the incident to their representative. The Sacramento Fish and Wildlife Office and CFW shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The Sacramento Fish and Wildlife Office contact is:

Mr. Paul Hoffman
1701 Nimbus Road, Suite A,
Rancho Cordova, California 95670
(530) 934-9309

New sightings of kit fox shall be reported to the California Natural Diversity Database (CNDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed shall also be provided to Fish and Wildlife at the address below.

Endangered Species Division
2800 Cottage Way, Suite W2605
Sacramento, California 95825-1846
(916) 414-6620 or (916) 414-6600

Protection of burrowing owl
In accordance with DFW's 2012 Staff Report on Burrowing Owl Mitigation, a qualified biologist shall conduct three surveys for burrowing owls where potential burrowing owl habitat occurs within 500 feet of Project activities. Surveys shall occur during the peak-breeding season for this species (15 April through 15 July), and spaced three weeks apart.

If active burrowing owl burrows are identified within 500 feet of the Project site, then avoidance, take avoidance surveys, site surveillance, minimization, and buffer mitigation measures shall be implemented, in accordance with the 2012 DFG Staff Report and direct consultation with DFW.

Protection of Sensitive Amphibians and Reptiles
Cole Slough provides potential habitat for western spadefoot, California tiger salamander and western pond turtle. Preconstruction surveys shall be conducted during a period of high hydrological activity for the Slough. This may coincide with irrigation deliveries to downstream agriculture, typically an initial release from dams occurs in February-March and May-July. These surveys will detect tiger salamanders (early survey) and western pond turtles (late survey), if present. For spadefoots, survey shall be conducted after they emerge subsequent to 1-2 inches of precipitation at the start of the rainy season (usually around the beginning of December). If surveys detect these species, they shall be allowed to passively relocate of the site before construction on the Slough begins.

K.3.3. Adverse Effects on Riparian Habitat or other Sensitive Natural Communities? Will the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Impact
No impact to this community is anticipated. However, the canal along the eastern boundary of the project site may be a wetland. The Applicant plans to pipe the canal. If the canal is a wetland, wetland impacts shall be assessed and compensated, if necessary.

Mitigation
None required, but see above.

K.3.4. Adverse Effects on Federally Protected Wetlands? Will the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Impact
No marshes or vernal pools occur on the property. However, the canal along the eastern edge of the property could be a wetland. It is hydrologically connected to Cole Slough and thus, the Kings River. A wetland determination and delineation may be required to identify if a wetland exists on the site and where the perimeter of the potential wetland is situated. The Applicant should consult with the Army Corps of Engineers and the Regional Water Quality Control Board to determine if a delineation, waiver, certificate or permit is required.

Mitigation
None anticipated. However, if the Cole Slough is a wetland, compensation may be required.

K.3.5. Interference with Wildlife Movement and Wildlife Corridors? Will the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site?

Impact
The Kings River corridor does lie east of the project site several miles. However, the subject property is not situated on any known substantial wildlife corridor, and the proposed actions have limited scope and should not obstruct wildlife movement.

A considerable amount of open space lands in the vicinity of the subject property will continue to be used by native species for home range and dispersal movements. Therefore, potential construction will result in a less than significant effect on regional wildlife movements.

Mitigation
Because this potential Project will result in a less than significant effect on regional wildlife movements, mitigation measures are not considered warranted.

K.3.6. Substantial Reductions in Fish & Wildlife Habitat? Will the project reduce substantially the habitat of a fish or wildlife species, including causing a fish or wildlife population to drop below

self-sustaining levels or threaten to eliminate an animal community?

Impact
The site is already heavily disturbed. Therefore, potential project construction would not result in substantial reduction in fish or wildlife habitat.

Mitigation
Because construction on the site will have a less than significant effect on habitat for common native wildlife occurring in this portion of Tulare County, mitigation measures for common species are not considered warranted. No fish or wildlife populations are likely to drop below self-sustaining levels because of potential activities. The potential project basin does not threaten to eliminate any animal community, so mitigation measures for animal communities are not warranted.

K.3.7 Conflicts with Local Policies or Ordinances?
Will the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Impact
The project appears to be consistent with the General Plan Policies of Tulare County that are relevant to natural resource protection. No County ordinances protect the types of biological resources found on the subject property, except raptor species. Therefore, as long as the Applicant implements avoidance measures and consults with DFW and any other agencies regarding potential impacts to raptors.

Mitigation
Because the potential project appears to be consistent with the General Plan Policies of Tulare County relevant to natural resource protection, mitigation measures, other than the afore-mentioned avoidance, further protecting biological resources are not considered warranted.

K.3.8 Conflicts with Adopted Conservation Plans?
Will the project conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state habitat

conservation plan?

Impact
Only three HCPs, and no NCCP, or conservation plan have been instituted (or proposed) for Tulare County. The HCPs do not address the species on the site. Therefore, construction will not conflict with any such plan.

Mitigation
None required.

K.3.9 Degradation of Water Quality?
Will the project result in the degradation of water quality in seasonal creeks, reservoirs and downstream waters?

Impact
The excavation of loose soils often creates conditions conducive to erosion and the concomitant deposition of sediment in adjacent drainages. No known water quality risks area associated with the site or potential project.

Mitigation
Because the potential project construction will result in a less than significant impact on water quality in nearby creeks and rivers, mitigation measures are not considered warranted.

K.3.10 Disturbance to Active Raptor Nests?
Will construction activities during the project disturb any active raptor nests?

Impact
The site and area immediately adjacent to the property currently does provide nesting and foraging habitat for raptor species such as Swainson's and red-tailed hawks. Surveys may be required to avoid any raptor impacts if construction occurs during breeding season.

Avoidance
The Migratory Bird Treaty Act (MBTA) protects raptors from disturbances. Swainson's hawks are found in the grasslands and agricultural lands of California's Central Valley during the spring and

summer. They exhibit a high degree of nest site fidelity and nests are constructed in trees, and include Fremont cottonwood (*Populus fremontia*), willow (*Salix* spp.), Valley oak (*Quercus lobata*), and eucalyptus (*Eucalyptus* spp.) (Bloom 1980). The nesting season for Swainson's hawk occurs from March 1 through September 15. This species spends large amounts of time soaring over grasslands and agricultural fields in the Central Valley and can travel up to 29 kilometers to forage for prey (Estep 1989). Swainson's hawks will forage for prey in row crops (Estep 1989) on small mammals, insects, and birds. Several CNDDB-recorded occurrences, past observations and present survey observations indicate Swainson's hawk occur within a 10 mile radius of the subject property area (See map in Appendix, CNDDB 2014 and B. Kamansky field notes) and other raptors occur or forage on the site or nest adjacent to the site.

Preconstruction surveys will be required to identify and avoid raptors and raptor nest as well as other species (see above). During any construction activities, any raptors will need to be designated as an avoidance area that will need to be protected from disturbance or monitored avoided and/or excavated in coordination with DFW. This avoidance area will be clearly defined by erecting exclusionary fences or flagging with orange geo-webbing nor ribbon prior to construction. Any construction-related disturbance within the buffer zone will be minimized and promptly restored to its original condition following construction. DFW will be provided with a map and written details identifying avoidance areas.

Mitigation
If avoidance measures are implemented appropriately, no mitigation for raptors would be anticipated as a result of a potential project. However, in the event that foraging habitat or nesting areas would be impacted, then mitigation, compensation and consultation will be needed.

K.3.11 Cumulative Impacts?

The geographic area of this cumulative analysis is the San Joaquin Valley. While the study area is limited to Tulare County, sensitive species with similar habitat requirements may exist in other portions of the San Joaquin Valley, and therefore cumulative impacts would extend beyond Tulare County political boundaries.

The proposed Project would only contribute to cumulative impacts related to this item if Project-specific impacts were to occur. As the proposed Project does not result in significant loss of habitat or direct impact to these special status species, cumulative impacts will be less than significant.

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APPENDIX A: Plant List

ANNOTATED CHECK LIST OF NATIVE AND INTRODUCED PLANTS OBSERVED ON APPROXIMATELY 39 ACRES DURING BIOLOGICAL EVALUATION OF POTENTIAL IMPACTS TO SPECIAL STATUS SPECIES (ENDANGERED, THREATENED, AND CANDIDATE SPECIES AND SPECIES OF SPECIAL CONCERN) AND NATURAL HABITAT AREAS ON THE KINGSBURG SUBDIVISION SITE IN TULARE AND FRESNO COUNTIES, CALIFORNIA

Taxonomic nomenclature (except for several common names) and sequence of major taxonomic groups follows Hickman (1993). Within major taxa, Family and Genus names are listed alphabetically rather than in phylogenetic sequence.

Common names are principally those used by Abrams (1923-1947), Cooperative Extension (1978), Crampton (1974), Munz and Keck (1968), Niehaus (1976), and Texas A&M University Bioinformatics Working Group Biota of North America Program (1997).

Common Name	*Scientific Name*	Class	Plant Family
Barnyard grass (i)	*Echinochloa sp.*	monocot	Poaceae
Bermuda Grass (i)	*Cynodon dactylon*	monocot	Poaceae
Cultivated oat (i)	*Avena sativa*	monocot	Poaceae
dallis grass (i)	*Paspalpum sp.*	monocot	Poaceae
Italian ryegrass (i)	*Lolium multiflorum*	monocot	Poaceae
Mediterranean barley (i)	*Hordeum murinum*	monocot	Poaceae
Mexican sprangletop	*Leptochloa fusca*	monocot	Poaceae
Ripgut brome (i)	*Bromus diandrus*	monocot	Poaceae
Washingtonia palm (i)	*Washingtonia robusta*	monocot	Arecaceae
Cheeseweed (i)	*Malva parviflora*	dicot	Malvaceae
Curly Doc (i)	*Rumex crispus*	dicot	Polygonaceae
Datura	*Datura sp.*	dicot	Solanaceae
Five-hook bassia (i)	*Bassia hyssopifolia*	dicot	Amaranthaceae
Fleabane	*Erigeron sp.*	dicot	Asteraceae
Lamb's quarters (i)	*Chenopodium album*	dicot	Chenopodiaceae
Lotus	*Lotus sp.*	dicot	Fabaceae
Marestail	*Conyza canadensis*	dicot	Asteraceae
Pale smartweed	*Persicaria lapathifolia*	dicot	Polygonaceae
Palmer's amaranth	*Amaranthus palmeri*	dicot	Amaranthaceae
Prostrate Pigweed (i)	*Amaranthus albus*	dicot	Amaranthaceae
Puncture vine (i)	*Tibulus terrestris*	dicot	Zygophyllaceae

Ragweed (i)	*Ambrosia sp.*	dicot	Asteraceae
Russian thistle (i)	*Xanthium strumarium L.*	dicot	Asteraceae
Sunflower, annual	*Helianthus annuus*	dicot	Asteraceae
Telegraph weed	*Heterotheca grandiflora*	dicot	Asteraceae
Tree of heaven (i)	*Ailanthus altissima*	dicot	Simaroubaceae
Valley oak	*Quercus lobata*	dicot	Fagaceae
Wire lettuce	*Stephanomeria sp.*	dicot	Asteraceae

PLANT SPECIES STATUS

TOTAL Number of NATIVE Species: 11

TOTAL Number of INTRODUCED Species: 17

GRAND TOTAL OF ALL PLANT SPECIES: 28

APPENDIX B: Animal List

**ANNOTATED CHECK LIST OF VERTABRATE ANIMALS
OBSERVED ON APPROXIMATELY 39 ACRES
DURING BIOLOGICAL EVALUATION
OF POTENTIAL IMPACTS TO SPECIAL STATUS SPECIES
(ENDANGERED, THREATENED, AND CANDIDATE SPECIES
AND SPECIES OF SPECIAL CONCERN)
AND NATURAL HABITAT AREAS
ON THE KINGSBURG SUBDIVISION SITE
IN TULARE AND FRESNO COUNTIES, CALIFORNIA**

Species observed includes species which were identified by tracks, dens, vocalizations, and other sign.
CSC = California State Species of Special Concern
I = an Introduced (aka invasive, exotic or non-native) species

Bird families and species are listed in phylogenetic order based on the Check-list of North American Birds: Species of Birds of North America from the Arctic through Panama, Including the West Indies and Hawaiian Islands. 7th ed. (American Ornithologist's Union, 1998).

Class: **AVES. Birds**

Order: **CHARADRIIFORMES. Shorebirds, Gulls, and Alcids**

Family: **CHARADRIIDAE. Plovers**

Charadrius vociferous	killdeer

Order: **COLUMBIFORMES**

Family: **COLUMBIDAE. Pigeons and Doves**

Columba livia	rock dove
Zenaida macroura	Mourning dove

Order: **APODIFORMES**

Family: **TROCHILIDAE. Hummingbirds**

Calypte anna	Anna's hummingbird

Order: **PICOFORMES**

Family: **PICINAE. Woodpeckers**

Colaptes auratus	northern flicker

Order: **PASSERIFORMES. Perching birds**

Family: **CORVIDAE. Jays, Magpies, and Crows**

Aphelocoma californica	western scrub-jay

Family: **MIMIDAE. Mockingbirds and Thrashers**

Mimus polyglottos	northern mockingbird

Family: **ICTERIDAE. Blackbirds**

Molothrus ater	brown-headed cowbird

Class: **MAMMALIA. Mammals**

Order: **RODENTIA. Squirrels, Rats, Mice, and Relatives**

Family: **SCIURIDAE. Squirrels**

Otospermophilus beecheyi	California ground squirrel (adjacent to site)

Order: **CARNIVORA.**
Family: **CANIDAE.**

Urocyon cinereoargenteus	grey fox

Family: **PROCYONIDAE.**

Procyon lotor	raccoon

VERTEBRATE SPECIES OBSERVED ON THE KINGSBURG SITE:

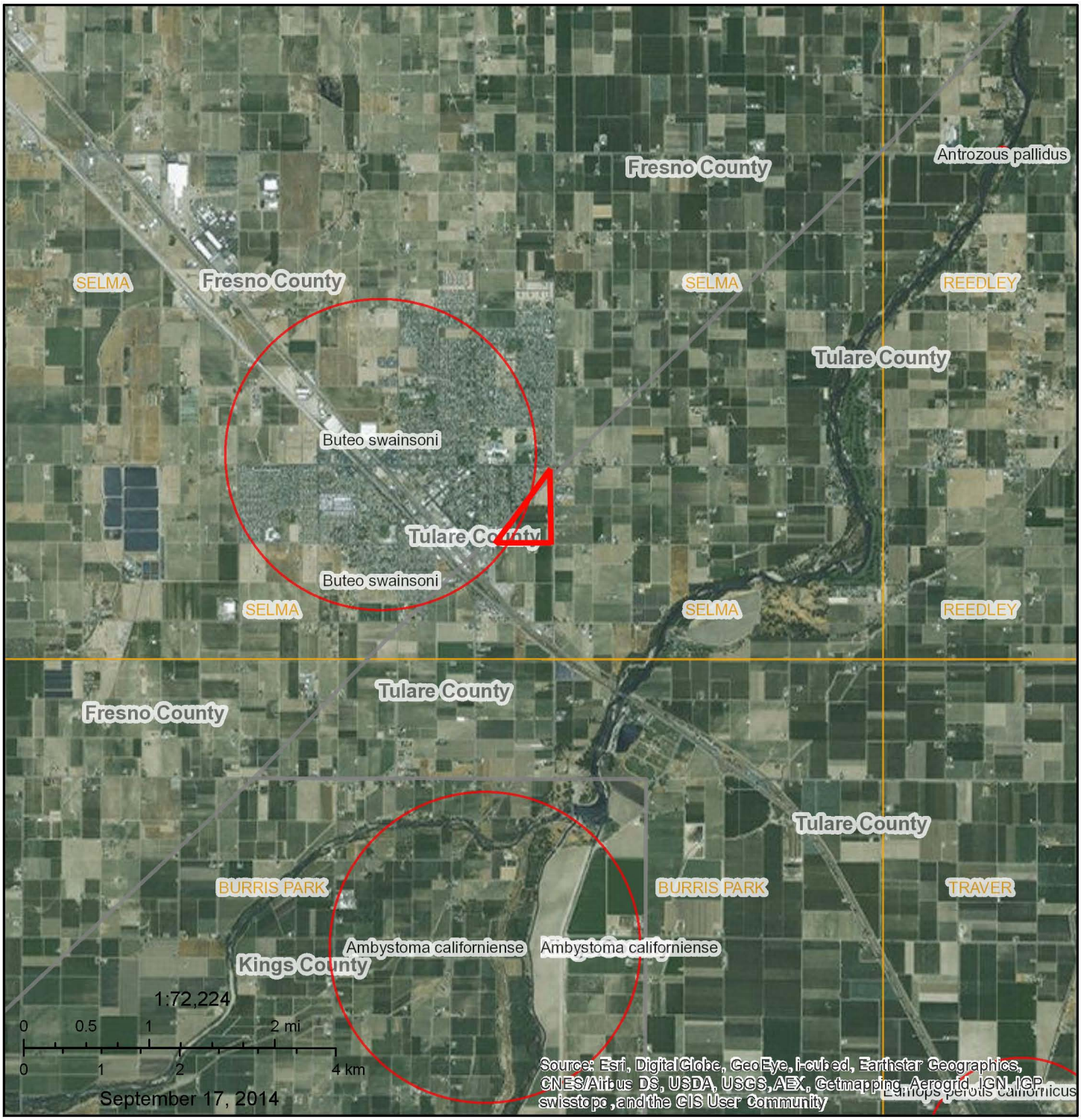
AMPHIBIANS:	**0**
REPTILES:	**0**
BIRDS:	**8**
MAMMALS:	**3**

TOTAL NUMBER OF VERTEBRATE OBSERVED: 11

APPENDIX C: MAPS

1. **California Natural Diversity Database Element Occurrence Map**
2. **National Wetlands Inventory Map**

Map of Project Area



- Plant (80m)
- Plant (specific)
- Plant (non-specific)
- Plant (circular)
- Animal (80m)
- Animal (specific)
- Animal (non-specific)
- Animal (circular)
- Terrestrial Comm. (80m)
- Terrestrial Comm. (specific)
- Terrestrial Comm. (non-specific)
- Terrestrial Comm. (circular)
- Aquatic Comm. (80m)
- Aquatic Comm. (specific)
- Aquatic Comm. (non-specific)
- Aquatic Comm. (circular)
- Multiple (80m)
- Multiple (specific)
- Multiple (non-specific)
- Multiple (circular)
- Sensitive EO's (Commercial only)

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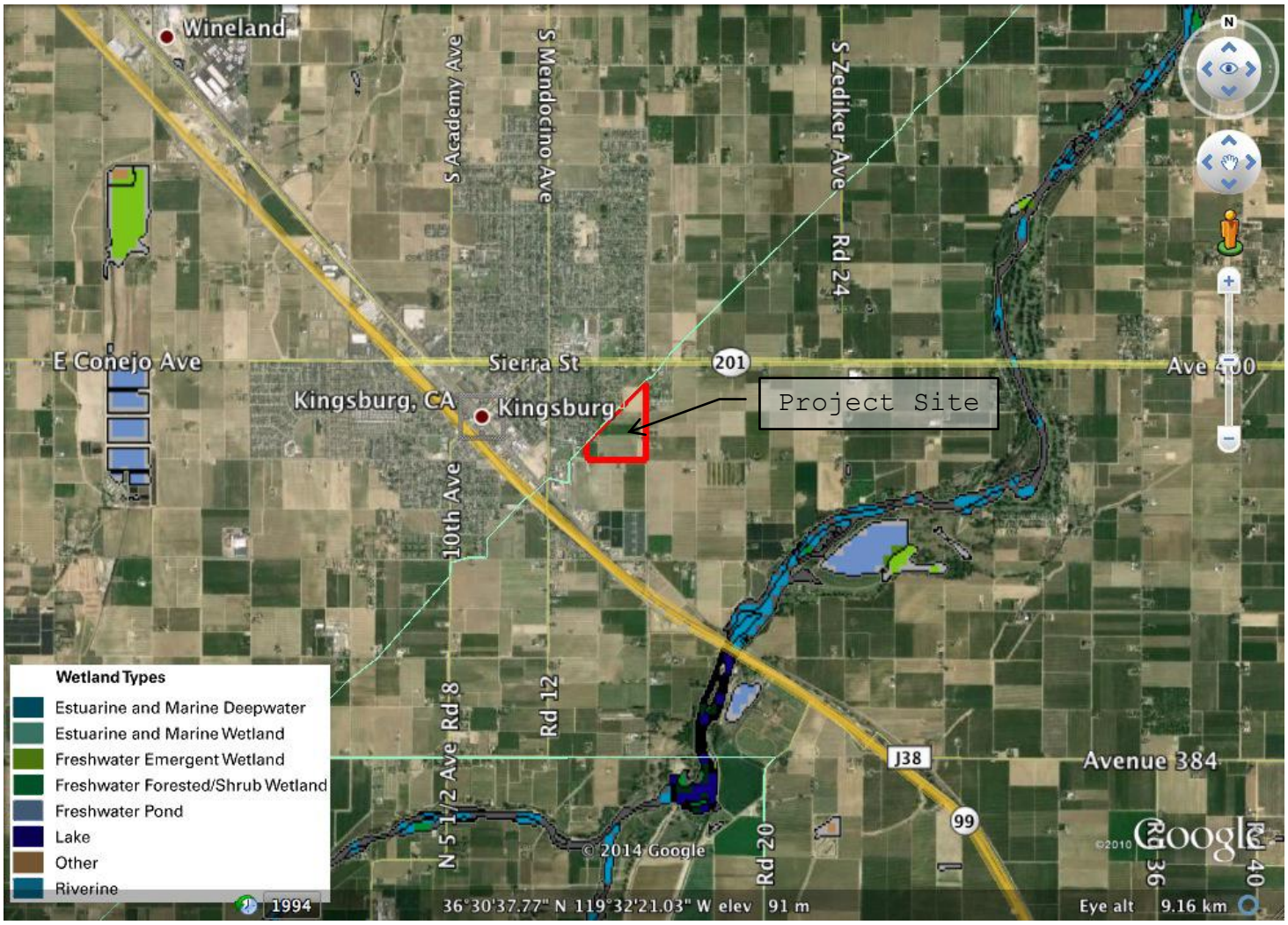

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Appendix D: San Joaquin Kit fox Survey Protocol

U.S. FISH AND WILDLIFE SERVICE STANDARDIZED RECOMMENDATIONS FOR PROTECTION OF THE ENDANGERED SAN JOAQUIN KIT FOX PRIOR TO OR DURING GROUND DISTURBANCE

Prepared by the Sacramento Fish and Wildlife Office
January 2011

INTRODUCTION

The following document includes many of the San Joaquin kit fox (*Vulpes macrotis mutica*) protection measures typically recommended by the U. S. Fish and Wildlife Service (Service), prior to and during ground disturbance activities. **However, incorporating relevant sections of these guidelines into the proposed project is not the only action required under the Endangered Species Act of 1973, as amended (Act) and does not preclude the need for section 7 consultation or a section 10 incidental take permit for the proposed project.** Project applicants should contact the Service in Sacramento to determine the full range of requirements that apply to your project; the address and telephone number are given at the end of this document. Implementation of the measures presented in this document may be necessary to avoid violating the provisions of the Act, including the prohibition against "take" (defined as killing, harming, or harassing a listed species, including actions that damage or destroy its habitat). These protection measures may also be required under the terms of a biological opinion pursuant to section 7 of the Act resulting in incidental take authorization (authorization), or an incidental take permit (permit) pursuant to section 10 of the Act. The specific measures implemented to protect kit fox for any given project shall be determined by the Service based upon the applicant's consultation with the Service.

The purpose of this document is to make information on kit fox protection strategies readily available and to help standardize the methods and definitions currently employed to achieve kit fox protection. The measures outlined in this document are subject to modification or revision at the discretion of the Service.

IS A PERMIT NECESSARY?

Certain acts need a permit from the Service which includes destruction of any known (occupied or unoccupied) or natal/pupping kit fox dens. Determination of the presence or absence of kit foxes and /or their dens should be made during the environmental review process. All surveys and monitoring described in this document must be conducted by a qualified biologist and these activities do not require a permit. A qualified biologist (biologist) means any person who has completed at least four years of university training in wildlife biology or a related science and/or has demonstrated field experience in the identification and life history of the San Joaquin kit fox. In addition, the biologist(s) must be able to identify coyote, red fox,

gray fox, and kit fox tracks, and to have seen a kit fox in the wild, at a zoo, or as a museum mount. Resumes of biologists should be submitted to the Service for review and approval prior to an6y survey or monitoring work occurring.

SMALL PROJECTS

Small projects are considered to be those projects with small foot prints, of approximately one acre or less, such as an individual in-fill oil well, communication tower, or bridge repairs. These projects must stand alone and not be part of, or in any way connected to larger projects (i.e., bridge repair or improvement to serve a future urban development). The Service recommends that on these small projects, the biologist survey the proposed project boundary and a 200-foot area outside of the project footprint to identify habitat features and utilize this information as guidance to situate the project to minimize or avoid impacts. If habitat features cannot be completely avoided, then surveys should be conducted and the Service should be contacted for technical assistance to determine the extent of possible take.

Preconstruction/preactivity surveys shall be conducted no less than 14 days and no more than 30 days prior to the beginning of ground disturbance and/or construction activities or any project activity likely to impact the San Joaquin kit fox. Kit foxes change dens four or five times during the summer months, and change natal dens one or two times per month (Morrell 1972). Surveys should identify kit fox habitat features on the project site and evaluate use by kit fox and, if possible, assess the potential impacts to the kit fox by the proposed activity. The status of all dens should be determined and mapped (see Survey Protocol). Written results of preconstruction/preactivity surveys must be received by the Service within five days after survey completion and prior to the start of ground disturbance and/or construction activities.

If a natal/pupping den is discovered within the project area or within 200-feet of the project boundary, the Service shall be immediately notified and under no circumstances should the den be disturbed or destroyed without prior authorization. If the preconstruction/preactivity survey reveals an active natal pupping or new information, the project applicant should contact the Service immediately to obtain the necessary take authorization/permit.

If the take authorization/permit has already been issued, then the biologist may proceed with den destruction within the project boundary, except natal/pupping den which may not be destroyed while occupied. A take authorization/permit is required to destroy these dens even after they are vacated. Protective exclusion zones can be placed around all known and potential dens which occur outside the project footprint (conversely, the project boundary can be demarcated, see den destruction section).

OTHER PROJECTS

It is likely that all other projects occurring within kit fox habitat will require a take authorization/permit from the Service. This determination would be made by the Service during the early evaluation process (see Survey Protocol). These other projects would include, but are not limited to: Linear projects; projects with large footprints such as urban development; and projects which in themselves may be small but have far reaching impacts (i.e., water storage or conveyance facilities that promote urban growth or agriculture, etc.).

The take authorization/permit issued by the Service may incorporate some or all of the protection measures presented in this document. The take authorization/permit may include measures specific to the needs of the project and those requirements supersede any requirements found in this document.

EXCLUSION ZONES

In order to avoid impacts, construction activities must avoid their dens. The configuration of exclusion zones around the kit fox dens should have a radius measured outward from the entrance or cluster of entrances due to the length of dens underground. The following distances are **minimums**, and if they cannot be followed the Service must be contacted. Adult and pup kit foxes are known to sometimes rest and play near the den entrance in the afternoon, but most above-ground activities begin near sunset and continue sporadically throughout the night. Den definitions are attached as Exhibit A.

Potential den**	50 feet
Atypical den**	50 feet
Known den*	100 feet
Natal/pupping den (occupied and unoccupied)	Service must be contacted

*Known den: To ensure protection, the exclusion zone should be demarcated by fencing that encircles each den at the appropriate distance and does not prevent access to the den by kit foxes. Acceptable fencing includes untreated wood particle-board, silt fencing, orange construction fencing or other fencing as approved by the Service as long as it has openings for kit fox ingress/egress and keeps humans and equipment out. Exclusion zone fencing should be maintained until all construction related or operational disturbances have been terminated. At that time, all fencing shall be removed to avoid attracting subsequent attention to the dens.

**Potential and Atypical dens: Placement of 4-5 flagged stakes 50 feet from the den entrance(s) will suffice to identify the den location; fencing will not be required, but the exclusion zone must be observed.

Only essential vehicle operation on existing roads and foot traffic should be permitted. Otherwise, all construction, vehicle operation, material storage, or any other type of surface-disturbing activity should be prohibited or greatly restricted within the exclusion zones.

DESTRUCTION OF DENS

Limited destruction of kit fox dens may be allowed, if avoidance is not a reasonable alternative, provided the following procedures are observed. The value to kit foxes of potential, known, and natal/pupping dens differ and therefore, each den type needs a different level of protection. **Destruction of any known or natal/pupping kit fox den requires take authorization/permit from the Service**.

Destruction of the den should be accomplished by careful excavation until it is certain that no kit foxes are inside. The den should be fully excavated, filled with dirt and compacted to ensure that kit foxes cannot reenter or use the den during the construction period. If at any point during excavation, a kit fox is discovered inside the den, the excavation activity shall cease immediately and monitoring of the den as described above should be resumed. Destruction of the den may be completed when in the judgment of the biologist, the animal has escaped, without further disturbance, from the partially destroyed den.

Natal/pupping dens: Natal or pupping dens which are occupied will not be destroyed until the pups and adults have vacated and then only after consultation with the Service. Therefore, project activities at some den sites may have to be postponed.

Known Dens: Known dens occurring within the footprint of the activity must be monitored for three days with tracking medium or an infra-red beam camera to determine the current use. If no kit fox activity is observed during this period, the den should be destroyed immediately to preclude subsequent use.

If kit fox activity is observed at the den during this period, the den should be monitored for at least five consecutive days from the time of the observation to allow any resident animal to move to another den during its normal activity. Use of the den can be discouraged during this period by partially plugging its entrances(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of the biologist. If the animal is still present after five or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a biologist, it is temporarily vacant, for example during the animal's normal foraging activities.

The Service encourages hand excavation, but realizes that soil conditions may necessitate the use of excavating equipment. However, extreme caution must be exercised.

Potential Dens: If a take authorization/permit has been obtained from the Service, den destruction may proceed without monitoring, unless other restrictions were issued with the take authorization/permit. If no take authorization/permit has been issued, then potential dens should be monitored as if they were known dens. If any den was considered to be a potential den, but is later determined during monitoring or destruction to be currently, or previously used by kit fox (e.g., if kit fox sign is found inside), then all construction activities shall cease and the Service shall be notified immediately.

CONSTRUCTION AND ON-GOING OPERATIONAL REQUIREMENTS

Habitat subject to permanent and temporary construction disturbances and other types of ongoing project-related disturbance activities should be minimized by adhering to the following activities. Project designs should limit or cluster permanent project features to the smallest area possible while still permitting achievement of project goals. To minimize temporary disturbances, all project-related vehicle traffic should be restricted to established roads, construction areas, and other designated areas. These areas should also be included in preconstruction surveys and, to the extent possible, should be established in locations disturbed by previous activities to prevent further impacts.

1. Project-related vehicles should observe a daytime speed limit of 20-mph throughout the site in all project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. Night-time construction should be minimized to the extent possible. However if it does occur, then the speed limit should be reduced to 10-mph. Off-road traffic outside of designated project areas should be prohibited.

2. To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2-feet deep should be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks shall be installed. Before such holes or trenches are filled, they should be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the Service and the California Department of Fish and Game (CDFG) shall be contacted as noted under measure 13 referenced below.

3. Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is

discovered inside a pipe, that section of pipe should not be moved until the Service has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.

4. All food-related trash items such as wrappers, cans, bottles, and food scraps should be disposed of in securely closed containers and removed at least once a week from a construction or project site.

5. No firearms shall be allowed on the project site.

6. No pets, such as dogs or cats, should be permitted on the project site to prevent harassment, mortality of kit foxes, or destruction of dens.

7. Use of rodenticides and herbicides in project areas should be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds should observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by the Service. If rodent control must be conducted, zinc phosphide should be used because of a proven lower risk to kit fox.

8. A representative shall be appointed by the project proponent who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative will be identified during the employee education program and their name and telephone number shall be provided to the Service.

9. An employee education program should be conducted for any project that has anticipated impacts to kit fox or other endangered species. The program should consist of a brief presentation by persons knowledgeable in kit fox biology and legislative protection to explain endangered species concerns to contractors, their employees, and military and/or agency personnel involved in the project. The program should include the following: A description of the San Joaquin kit fox and its habitat needs; a report of the occurrence of kit fox in the project area; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information should be prepared for distribution to the previously referenced people and anyone else who may enter the project site.

10. Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. should be

re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas should be determined on a site-specific basis in consultation with the Service, California Department of Fish and Game (CDFG), and revegetation experts.

11. In the case of trapped animals, escape ramps or structures should be installed immediately to allow the animal(s) to escape, or the Service should be contacted for guidance.

12. Any contractor, employee, or military or agency personnel who are responsible for inadvertently killing or injuring a San Joaquin kit fox shall immediately report the incident to their representative. This representative shall contact the CDFG immediately in the case of a dead, injured or entrapped kit fox. The CDFG contact for immediate assistance is State Dispatch at (916)445-0045. They will contact the local warden or Mr. Paul Hoffman, the wildlife biologist, at (530)934-9309. The Service should be contacted at the numbers below.

13. The Sacramento Fish and Wildlife Office and CDFG shall be notified in writing within three working days of the accidental death or injury to a San Joaquin kit fox during project related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal and any other pertinent information. The Service contact is the Chief of the Division of Endangered Species, at the addresses and telephone numbers below. The CDFG contact is Mr. Paul Hoffman at 1701 Nimbus Road, Suite A, Rancho Cordova, California 95670, (530) 934-9309.

14. New sightings of kit fox shall be reported to the California Natural Diversity Database (CNDDB). A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed should also be provided to the Service at the address below.

Any project-related information required by the Service or questions concerning the above conditions or their implementation may be directed in writing to the U.S. Fish and Wildlife Service at:

Endangered Species Division
2800 Cottage Way, Suite W2605
Sacramento, California 95825-1846
(916) 414-6620 or (916) 414-6600

EXHIBIT "A" - DEFINITIONS

"Take" - Section 9 of the Endangered Species Act of 1973, as amended (Act) prohibits the "take" of any federally listed endangered species by any person (an individual, corporation, partnership, trust, association, etc.) subject to the jurisdiction of the United States. As defined in the Act, take means " . . . to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct". Thus, not only is a listed animal protected from activities such as hunting, but also from actions that damage or destroy its habitat.

"Dens" - San Joaquin kit fox dens may be located in areas of low, moderate, or steep topography. Den characteristics are listed below, however, the specific characteristics of individual dens may vary and occupied dens may lack some or all of these features. Therefore, caution must be exercised in determining the status of any den. Typical dens may include the following: (1) one or more entrances that are approximately 5 to 8 inches in diameter; (2) dirt berms adjacent to the entrances; (3) kit fox tracks, scat, or prey remains in the vicinity of the den; (4) matted vegetation adjacent to the den entrances; and (5) manmade features such as culverts, pipes, and canal banks.

"Known den" - Any existing natural den or manmade structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records, past or current radiotelemetry or spotlighting data, kit fox sign such as tracks, scat, and/or prey remains, or other reasonable proof that a given den is being or has been used by a kit fox. The Service discourages use of the terms "active" and "inactive" when referring to any kit fox den because a great percentage of occupied dens show no evidence of use, and because kit foxes change dens often, with the result that the status of a given den may change frequently and abruptly.

"Potential Den" - Any subterranean hole within the species' range that has entrances of appropriate dimensions for which available evidence is insufficient to conclude that it is being used or has been used by a kit fox. Potential dens shall include the following: (1) any suitable subterranean hole; or (2) any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for kit fox use.

"Natal or Pupping Den" - Any den used by kit foxes to whelp and/or rear their pups. Natal/pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the vicinity of the den, and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two, therefore, for purposes of this definition either term applies.

"Atypical Den" - Any manmade structure which has been or is being occupied by a San Joaquin kit fox. Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings.

Appendix E: 2012 California Department of Fish and Wildlife Burrowing Owl Staff Report

Staff Report on Burrowing Owl Mitigation

State of California

Natural Resources Agency

Department of Fish and Game

March 7, 2012[1]

[1] This document replaces the Department of Fish and Game 1995 Staff Report On Burrowing Owl Mitigation.

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INTRODUCTION AND PURPOSE

Maintaining California's rich biological diversity is dependent on the conservation of species and their habitats. The California Department of Fish and Game (Department) has designated certain species as "species of special concern" when their population viability and survival is adversely affected by risk factors such as precipitous declines or other vulnerability factors (Shuford and Gardali 2008). Preliminary analyses of regional patterns for breeding populations of burrowing owls (*Athene cunicularia*) have detected declines both locally in their central and southern coastal breeding areas, and statewide where the species has experienced modest breeding range retraction (Gervais et al. 2008). In California, threat factors affecting burrowing owl populations include habitat loss, degradation and modification, and eradication of ground squirrels resulting in a loss of suitable burrows required by burrowing owls for nesting, protection from predators, and shelter (See Appendix A).

The Department recognized the need for a comprehensive conservation and mitigation strategy for burrowing owls, and in 1995 directed staff to prepare a report describing mitigation and survey recommendations. This report, "1995 Staff Report on Burrowing Owl Mitigation," (Staff Report) (CDFG 1995), contained Department-recommended burrowing owl and burrow survey techniques and mitigation measures intended to offset the loss of habitat and slow or reverse further decline of this species. Notwithstanding these measures, over the past 15+ years, burrowing owls have continued to decline in portions of their range (DeSante et al. 2007, Wilkerson and Siegel, 2010). The Department has determined that reversing declining population and range trends for burrowing owls will require implementation of more effective conservation actions, and evaluating the efficacy of the Department's existing recommended avoidance, minimization and mitigation approaches for burrowing owls.

The Department has identified three main actions that together will facilitate a more viable, coordinated, and concerted approach to conservation and mitigation for burrowing owls in California. These include:

1. Incorporating burrowing owl comprehensive conservation strategies into landscape-based planning efforts such as Natural Community Conservation Plans (NCCPs) and multi-species Habitat Conservation Plans (HCPs) that specifically address burrowing owls.
2. Developing and implementing a statewide conservation strategy (Burkett and Johnson, 2007) and local or regional conservation strategies for burrowing owls, including the development and implementation of a statewide burrowing owl survey and monitoring plan.
3. Developing more rigorous burrowing owl survey methods, working to improve the adequacy of impacts assessments; developing clear and effective avoidance and minimization measures; and developing mitigation measures to ensure impacts to the species are effectively addressed at the project, local, and/or regional level (the focus of this document).

This Report sets forth the Department's recommendations for implementing the third approach identified above by revising the 1995 Staff Report, drawing from the most relevant and current knowledge and expertise, and incorporating the best scientific information

available pertaining to the species. It is designed to provide a compilation of the best available science for Department staff, biologists, planners, land managers, California Environmental Quality Act (CEQA) lead agencies, and the public to consider when assessing impacts of projects or other activities on burrowing owls.

This revised Staff Report takes into account the California Burrowing Owl Consortium's Survey Protocol and Mitigation Guidelines (CBOC 1993, 1997) and supersedes the survey, avoidance, minimization and mitigation recommendations in the 1995 Staff Report. Based on experiences gained from implementing the 1995 Staff Report, the Department believes revising that report is warranted. This document also includes general conservation goals and principles for developing mitigation measures for burrowing owls.

DEPARTMENT ROLE AND LEGAL AUTHORITIES

The mission of the Department is to manage California's diverse fish, wildlife and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. The Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitats necessary to maintain biologically sustainable populations of those species (Fish and Game Code (FGC) §1802). The Department, as trustee agency pursuant to CEQA (See CEQA Guidelines, §15386), has jurisdiction by law over natural resources, including fish and wildlife, affected by a project, as that term is defined in Section 21065 of the Public Resources Code. The Department exercises this authority by reviewing and commenting on environmental documents and making recommendations to avoid, minimize, and mitigate potential negative impacts to those resources held in trust for the people of California.

Field surveys designed to detect the presence of a particular species, habitat element, or natural community are one of the tools that can assist biologists in determining whether a species or habitat may be significantly impacted by land use changes or disturbance. The Department reviews field survey data as well as site-specific and regional information to evaluate whether a project's impacts may be significant. This document compiles the best available science for conducting habitat assessments and surveys, and includes considerations for developing measures to avoid impacts or mitigate unavoidable impacts.

CEQA

CEQA requires public agencies in California to analyze and disclose potential environmental impacts associated with a project that the agency will carry out, fund, or approve. Any potentially significant impact must be mitigated to the extent feasible. Project-specific CEQA mitigation is important for burrowing owls because most populations exist on privately owned parcels that, when proposed for development or other types of modification, may be subject to the environmental review requirements of CEQA.

Take

Take of individual burrowing owls and their nests is defined by FGC section 86, and prohibited by sections 3503, 3503.5 and 3513. Take is defined in FGC Section 86 as "hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture or kill."

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the United States and Canada, Japan, Mexico, and Russia for the protection of migratory birds, including the burrowing owl (50 C.F.R. § 10). The MBTA protects migratory bird nests from possession, sale, purchase, barter, transport, import and export, and collection. The other prohibitions of the MBTA - capture, pursue, hunt, and kill - are inapplicable to nests. The regulatory definition of take, as defined in Title 50 C.F.R. part 10.12, means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to hunt, shoot, wound, kill, trap, capture, or collect. Only the verb "collect" applies to nests. It is illegal to collect, possess, and by any means transfer possession of any migratory bird nest. The MBTA prohibits the destruction of a nest when it contains birds or eggs, and no possession shall occur during the destruction (see Fish and Wildlife Service, Migratory Bird Permit Memorandum, April 15, 2003). Certain exceptions to this prohibition are included in 50 C.F.R. section 21. Pursuant to Fish & Game Code section 3513, the Department enforces the Migratory Bird Treaty Act consistent with rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Treaty Act.

Regional Conservation Plans

Regional multiple species conservation plans offer long-term assurances for conservation of covered species at a landscape scale, in exchange for biologically appropriate levels of incidental take and/or habitat loss as defined in the approved plan. California's NCCP Act (FGC §2800 et seq.) governs such plans at the state level, and was designed to conserve species, natural communities, ecosystems, and ecological processes across a jurisdiction or a collection of jurisdictions. Complementary federal HCPs are governed by the Endangered Species Act (7 U.S.C. § 136, 16 U.S.C.§ 1531 et seq.) (ESA). Regional conservation plans (and certain other landscape-level conservation and management plans), may provide conservation for unlisted as well as listed species. Because the geographic scope of NCCPs and HCPs may span many hundreds of thousands of acres, these planning tools have the potential to play a significant role in conservation of burrowing owls, and grasslands and other habitats.

Fish and Game Commission Policies

There are a number of Fish and Game Commission policies (see FGC §2008) that can be applied to burrowing owl conservation. These include policies on: Raptors, Cooperation, Endangered and Threatened Species, Land Use Planning, Management and Utilization of Fish and Wildlife on Federal Lands, Management and Utilization of Fish and Wildlife on Private Lands, and Research.

GUIDING PRINCIPLES FOR CONSERVATION

Unless otherwise provided in a statewide, local, or regional conservation strategy, surveying and evaluating impacts to burrowing owls, as well as developing and implementing avoidance, minimization, and mitigation and conservation measures incorporate the following principles. These principles are a summary of Department staff expert opinion and were used to guide the preparation of this document.

1. Use the Precautionary Principle (Noss et al.1997), by which the alternative of increased conservation is deliberately chosen in order to buffer against incomplete knowledge of burrowing owl ecology and uncertainty about the consequences to burrowing owls of potential impacts, including those that are cumulative.
2. Employ basic conservation biology tenets and population-level approaches when determining what constitutes appropriate avoidance, minimization, and mitigation for impacts. Include mitigation effectiveness monitoring and reporting, and use an adaptive management loop to modify measures based on results.
3. Protect and conserve owls in wild, semi-natural, and agricultural habitats (conserve is defined at FGC §1802).
4. Protect and conserve natural nest burrows (or burrow surrogates) previously used by burrowing owls and sufficient foraging habitat and protect auxiliary "satellite" burrows that contribute to burrowing owl survivorship and natural behavior of owls.

CONSERVATION GOALS FOR THE BURROWING OWL IN CALIFORNIA

It is Department staff expert opinion that the following goals guide and contribute to the short and long-term conservation of burrowing owls in California:

1. Maintain size and distribution of extant burrowing owl populations (allowing for natural population fluctuations).
2. Increase geographic distribution of burrowing owls into formerly occupied historical range where burrowing owl habitat still exists, or where it can be created or enhanced, and where the reason for its local disappearance is no longer of concern.
3. Increase size of existing populations where possible and appropriate (for example, considering basic ecological principles such as carrying capacity, predator-prey relationships, and inter-specific relationships with other species at risk).
4. Protect and restore self-sustaining ecosystems or natural communities which can support burrowing owls at a landscape scale, and which will require minimal long-term management.
5. Minimize or prevent unnatural causes of burrowing owl population declines (e.g., nest burrow destruction, chemical control of rodent hosts and prey).
6. Augment/restore natural dynamics of burrowing owl populations including movement and genetic exchange among populations, such that the species does not require future listing and protection under the California Endangered Species Act (CESA) and/or the federal Endangered Species Act (ESA).
7. Engage stakeholders, including ranchers; farmers; military; tribes; local, state, and federal agencies; non-governmental organizations; and scientific research and education communities involved in burrowing owl protection and habitat management.

ACTIVITIES WITH THE POTENTIAL TO TAKE OR IMPACT BURROWING OWLS

The following activities are examples of activities that have the potential to take burrowing owls, their nests or eggs, or destroy or degrade burrowing owl habitat: grading, disking, cultivation, earthmoving, burrow blockage, heavy equipment compacting and crushing burrow tunnels, levee maintenance, flooding, burning and mowing (if burrows are impacted), and operating wind turbine collisions (collectively hereafter referred to as "projects" or "activities"

whether carried out pursuant to CEQA or not). In addition, the following activities may have impacts to burrowing owl populations: eradication of host burrowers; changes in vegetation management (i.e. grazing); use of pesticides and rodenticides; destruction, conversion or degradation of nesting, foraging, over-wintering or other habitats; destruction of natural burrows and burrow surrogates; and disturbance which may result in harassment of owls at occupied burrows.

PROJECT IMPACT EVALUATIONS

The following three progressive steps are effective in evaluating whether projects will result in impacts to burrowing owls. The information gained from these steps will inform any subsequent avoidance, minimization and mitigation measures. The steps for project impact evaluations are: 1) habitat assessment, 2) surveys, and 3) impact assessment. Habitat assessments are conducted to evaluate the likelihood that a site supports burrowing owl. Burrowing owl surveys provide information needed to determine the potential effects of proposed projects and activities on burrowing owls, and to avoid take in accordance with FGC sections 86, 3503, and 3503.5. Impact assessments evaluate the extent to which burrowing owls and their habitat may be impacted, directly or indirectly, on and within a reasonable distance of a proposed CEQA project activity or non-CEQA project. These three site evaluation steps are discussed in detail below.

Biologist Qualifications

The current scientific literature indicates that only individuals meeting the following minimum qualifications should perform burrowing owl habitat assessments, surveys, and impact assessments:

1. Familiarity with the species and its local ecology;
2. Experience conducting habitat assessments and non-breeding and breeding season surveys, or experience with these surveys conducted under the direction of an experienced surveyor;
3. Familiarity with the appropriate state and federal statutes related to burrowing owls, scientific research, and conservation;
4. Experience with analyzing impacts of development on burrowing owls and their habitat.

Habitat Assessment Data Collection and Reporting

A habitat assessment is the first step in the evaluation process and will assist investigators in determining whether or not occupancy surveys are needed. Refer to Appendix B for a definition of burrowing owl habitat. Compile the detailed information described in Appendix C when conducting project scoping, conducting a habitat assessment site visit and preparing a habitat assessment report.

Surveys

Burrowing owl surveys are the second step of the evaluation process and the best available scientific literature recommends that they be conducted whenever burrowing owl habitat or sign (see Appendix B) is encountered on or adjacent to (within 150 meters) a project site

(Thomsen 1971, Martin 1973). Occupancy of burrowing owl habitat is confirmed at a site when at least one burrowing owl, or its sign at or near a burrow entrance, is observed within the last three years (Rich 1984). Burrowing owls are more detectable during the breeding season with detection probabilities being highest during the nestling stage (Conway et al. 2008). In California, the burrowing owl breeding season extends from 1 February to 31 August (Haug et al. 1993, Thompsen 1971) with some variances by geographic location and climatic conditions. Several researchers suggest three or more survey visits during daylight hours (Haug and Diduik 1993, CBOC 1997, Conway and Simon 2003) and recommend each visit occur at least three weeks apart during the peak of the breeding season, commonly accepted in California as between 15 April and 15 July (CBOC 1997). Conway and Simon (2003) and Conway et al. (2008) recommended conducting surveys during the day when most burrowing owls in a local area are in the laying and incubation period (so as not to miss early breeding attempts), during the nesting period, and in the late nestling period when most owls are spending time above ground.

Non-breeding season (1 September to 31 January) surveys may provide information on burrowing owl occupancy, but do not substitute for breeding season surveys because results are typically inconclusive. Burrowing owls are more difficult to detect during the non-breeding season and their seasonal residency status is difficult to ascertain. Burrowing owls detected during non-breeding season surveys may be year-round residents, young from the previous breeding season, pre-breeding territorial adults, winter residents, dispersing juveniles, migrants, transients or new colonizers. In addition, the numbers of owls and their pattern of distribution may differ during winter and breeding seasons. However, on rare occasions, non-breeding season surveys may be warranted (i.e., if the site is believed to be a wintering site only based on negative breeding season results). Refer to Appendix D for information on breeding season and non-breeding season survey methodologies.

Survey Reports

Adequate information about burrowing owls present in and adjacent to an area that will be disturbed by a project or activity will enable the Department, reviewing agencies and the public to effectively assess potential impacts and will guide the development of avoidance, minimization, and mitigation measures. The survey report includes but is not limited to a description of the proposed project or proposed activity, including the proposed project start and end dates, as well as a description of disturbances or other activities occurring on-site or nearby. Refer to Appendix D for details included in a survey report.

Impact Assessment

The third step in the evaluation process is the impact assessment. When surveys confirm occupied burrowing owl habitat in or adjoining the project area, there are a number of ways to assess a project's potential significant impacts to burrowing owls and their habitat. Richardson and Miller (1997) recommended monitoring raptor behavior prior to developing management recommendations and buffers to determine the extent to which individuals have been sensitized to human disturbance. Monitoring results will also provide detail necessary for developing site-specific measures. Postovit and Postovit (1987) recommended an analytical approach to mitigation planning: define the problem (impact), set goals (to guide mitigation development), evaluate and select mitigation methods, and monitor the results.

Define the problem. The impact assessment evaluates all factors that could affect burrowing owls. Postovit and Postovit (1987) recommend evaluating the following in assessing impacts to raptors and planning mitigation: type and extent of disturbance, duration and timing of disturbance, visibility of disturbance, sensitivity and ability to habituate, and influence of environmental factors. They suggest identifying and addressing all potential direct and indirect impacts to burrowing owls, regardless of whether or not the impacts will occur during the breeding season. Several examples are given for each impact category below; however, examples are not intended to be used exclusively.

Type and extent of the disturbance. The impact assessment describes the nature (source) and extent (scale) of potential project impacts on occupied, satellite and unoccupied burrows including acreage to be lost (temporary or permanent), fragmentation/edge being created, increased distance to other nesting and foraging habitat, and habitat degradation. Discuss any project activities that impact either breeding and/or non-breeding habitat which could affect owl home range size and spatial configuration, negatively affect onsite and offsite burrowing owl presence, increase energetic costs, lower reproductive success, increase vulnerability to predation, and/or decrease the chance of procuring a mate.

Duration and timing of the impact. The impact assessment describes the amount of time the burrowing owl habitat will be unavailable to burrowing owls (temporary or permanent) on the site and the effect of that loss on essential behaviors or life history requirements of burrowing owls, the overlap of project activities with breeding and/or non-breeding seasons (timing of nesting and/or non-breeding activities may vary with latitude and climatic conditions, which should be considered with the timeline of the project or activity), and any variance of the project activities in intensity, scale and proximity relative to burrowing owl occurrences.

Visibility and sensitivity. Some individual burrowing owls or pairs are more sensitive than others to specific stimuli and may habituate to ongoing visual or audible disturbance. Site-specific monitoring may provide clues to the burrowing owl's sensitivities. This type of assessment addresses the sensitivity of burrowing owls within their nesting area to humans on foot, and vehicular traffic. Other variables are whether the site is primarily in a rural versus urban setting, and whether any prior disturbance (e.g., human development or recreation) is known at the site.

Environmental factors. The impact assessment discusses any environmental factors that could be influenced or changed by the proposed activities including nest site availability, predators, prey availability, burrowing mammal presence and abundance, and threats from other extrinsic factors such as human disturbance, urban interface, feral animals, invasive species, disease or pesticides.

Significance of impacts. The impact assessment evaluates the potential loss of nesting burrows, satellite burrows, foraging habitat, dispersal and migration habitat, wintering habitat, and habitat linkages, including habitat supporting prey and host burrowers and other essential habitat attributes. This assessment determines if impacts to the species will result in significant impacts to the species locally, regionally and range-wide per CEQA Guidelines §15382 and Appendix G. The significance of the impact to habitat depends on the extent of habitat disturbed and length of time the habitat is unavailable (for example: minor – several days, medium – several weeks to months, high - breeding season affecting juvenile survival,

or over winter affecting adult survival).

Cumulative effects. The cumulative effects assessment evaluates two consequences: 1) the project's proportional share of reasonably foreseeable impacts on burrowing owls and habitat caused by the project or in combination with other projects and local influences having impacts on burrowing owls and habitat, and 2) the effects on the regional owl population resulting from the project's impacts to burrowing owls and habitat.

Mitigation goals. Establishing goals will assist in planning mitigation and selecting measures that function at a desired level. Goals also provide a standard by which to measure mitigation success. Unless specifically provided for through other FGC Sections or through specific regulations, take, possession or destruction of individual burrowing owls, their nests and eggs is prohibited under FGC sections 3503, 3503.5 and 3513. Therefore, a required goal for all project activities is to avoid take of burrowing owls. Under CEQA, goals would consist of measures that would avoid, minimize and mitigate impacts to a less than significant level. For individual projects, mitigation must be roughly proportional to the level of impacts, including cumulative impacts, in accordance with the provisions of CEQA (CEQA Guidelines, §§ 15126.4(a)(4)(B), 15064, 15065, and 16355). In order for mitigation measures to be effective, they must be specific, enforceable, and feasible actions that will improve environmental conditions. As set forth in more detail in Appendix A, the current scientific literature supports the conclusion that mitigation for permanent habitat loss necessitates replacement with an equivalent or greater habitat area for breeding, foraging, wintering, dispersal, presence of burrows, burrow surrogates, presence of fossorial mammal dens, well drained soils, and abundant and available prey within close proximity to the burrow.

MITIGATION METHODS

The current scientific literature indicates that any site-specific avoidance or mitigation measures developed should incorporate the best practices presented below or other practices confirmed by experts and the Department. The Department is available to assist in the development of site-specific avoidance and mitigation measures.

Avoiding. A primary goal is to design and implement projects to seasonally and spatially avoid negative impacts and disturbances that could result in take of burrowing owls, nests, or eggs. Other avoidance measures may include but not be limited to:

- Avoid disturbing occupied burrows during the nesting period, from 1 February through 31 August.
- Avoid impacting burrows occupied during the non-breeding season by migratory or non-migratory resident burrowing owls.
- Avoid direct destruction of burrows through chaining (dragging a heavy chain over an area to remove shrubs), disking, cultivation, and urban, industrial, or agricultural development.
- Develop and implement a worker awareness program to increase the on-site worker's recognition of and commitment to burrowing owl protection.
- Place visible markers near burrows to ensure that farm equipment and other machinery does not collapse burrows.
- Do not fumigate, use treated bait or other means of poisoning nuisance animals in areas where burrowing owls are known or suspected to occur (e.g., sites observed with nesting

owls, designated use areas).
- Restrict the use of treated grain to poison mammals to the months of January and February.

Take avoidance (pre-construction) surveys. Take avoidance surveys are intended to detect the presence of burrowing owls on a project site at a fixed period in time and inform necessary take avoidance actions. Take avoidance surveys may detect changes in owl presence such as colonizing owls that have recently moved onto the site, migrating owls, resident burrowing owls changing burrow use, or young of the year that are still present and have not dispersed. Refer to Appendix D for take avoidance survey methodology.

Site surveillance. Burrowing owls may attempt to colonize or re-colonize an area that will be impacted; thus, the current scientific literature indicates a need for ongoing surveillance at the project site during project activities is recommended. The surveillance frequency/effort should be sufficient to detect burrowing owls if they return. Subsequent to their new occupancy or return to the site, take avoidance measures should assure with a high degree of certainty that take of owls will not occur.

Minimizing. If burrowing owls and their habitat can be protected in place on or adjacent to a project site, the use of buffer zones, visual screens or other measures while project activities are occurring can minimize disturbance impacts. Conduct site-specific monitoring to inform development of buffers (see Visibility and sensitivity above). The following general guidelines for implementing buffers should be adjusted to address site-specific conditions using the impact assessment approach described above. The CEQA lead agency and/or project proponent is encouraged to consult with the Department and other burrowing owl experts for assistance in developing site-specific buffer zones and visual screens.

Buffers. Holroyd et al. (2001) identified a need to standardize management and disturbance mitigation guidelines. For instance, guidelines for mitigating impacts by petroleum industries on burrowing owls and other prairie species (Scobie and Faminow, 2000) may be used as a template for future mitigation guidelines (Holroyd et al. 2001). Scobie and Faminow (2000) developed guidelines for activities around occupied burrowing owl nests recommending buffers around low, medium, and high disturbance activities, respectively (see below).

Recommended restricted activity dates and setback distances by level of disturbance for burrowing owls (Scobie and Faminow 2000).

Location	Time of Year	Level of Disturbance		
		Low	Med	High
Nesting sites	April 1-Aug 15	200 m*	500 m	500 m
Nesting sites	Aug 16-Oct 15	200 m	200 m	500 m
Nesting sites	Oct 16-Mar 31	50 m	100 m	500 m

* meters (m)

Based on existing vegetation, human development, and land uses in an area, resource managers may decide to allow human development or resource extraction closer to these area/sites than recommended above. However, if it is decided to allow activities closer than

the setback distances recommended, a broad-scale, long-term, scientifically-rigorous monitoring program ensures that burrowing owls are not detrimentally affected by alternative approaches.

Other minimization measures include eliminating actions that reduce burrowing owl forage and burrowing surrogates (e.g. ground squirrel), or introduce/facilitate burrowing owl predators. Actions that could influence these factors include reducing livestock grazing rates and/or changing the timing or duration of grazing or vegetation management that could result in less suitable habitat.

Burrow exclusion and closure. Burrow exclusion is a technique of installing one-way doors in burrow openings during the non-breeding season to temporarily exclude burrowing owls, or permanently exclude burrowing owls and close burrows after verifying burrows are empty by site monitoring and scoping. Exclusion in and of itself is not a take avoidance, minimization or mitigation method. Eviction of burrowing owls is a potentially significant impact under CEQA.

The long-term demographic consequences of these techniques have not been thoroughly evaluated, and the fate of evicted or excluded burrowing owls has not been systematically studied. Because burrowing owls are dependent on burrows at all times of the year for survival and/or reproduction, evicting them from nesting, roosting, and satellite burrows may lead to indirect impacts or take. Temporary or permanent closure of burrows may result in significant loss of burrows and habitat for reproduction and other life history requirements. Depending on the proximity and availability of alternate habitat, loss of access to burrows will likely result in varying levels of increased stress on burrowing owls and could depress reproduction, increase predation, increase energetic costs, and introduce risks posed by having to find and compete for available burrows. Therefore, exclusion and burrow closure are not recommended where they can be avoided. The current scientific literature indicates consideration of all possible avoidance and minimization measures before temporary or permanent exclusion and closure of burrows is implemented, in order to avoid take.

The results of a study by Trulio (1995) in California showed that burrowing owls passively displaced from their burrows were quickly attracted to adjacent artificial burrows at five of six passive relocation sites. The successful sites were all within 75 meters (m) of the destroyed burrow, a distance generally within a pair's territory. This researcher discouraged using passive relocation to artificial burrows as a mitigation measure for lost burrows without protection of adjacent foraging habitat. The study results indicated artificial burrows were used by evicted burrowing owls when they were approximately 50-100 m from the natural burrow (Thomsen 1971, Haug and Oliphant 1990). Locating artificial or natural burrows more than 100 m from the eviction burrow may greatly reduce the chances that new burrows will be used. Ideally, exclusion and burrow closure is employed only where there are adjacent natural burrows and non-impacted, sufficient habitat for burrowing owls to occupy with permanent protection mechanisms in place. Any new burrowing owl colonizing the project site after the CEQA document has been adopted may constitute changed circumstances that should be addressed in a re-circulated CEQA document.

The current scientific literature indicates that burrow exclusion should only be conducted by qualified biologists (meeting the Biologist's Qualifications above) during the non-breeding

season, before breeding behavior is exhibited and after the burrow is confirmed empty by site surveillance and/or scoping. The literature also indicates that when temporary or permanent burrow exclusion and/or burrow closure is implemented, burrowing owls should not be excluded from burrows unless or until:

- A Burrowing Owl Exclusion Plan (see Appendix E) is developed and approved by the applicable local DFG office;
- Permanent loss of occupied burrow(s) and habitat is mitigated in accordance with the Mitigating Impacts sections below. Temporary exclusion is mitigated in accordance with the item #1 under Mitigating Impacts below.
- Site monitoring is conducted prior to, during, and after exclusion of burrowing owls from their burrows sufficient to ensure take is avoided. Conduct daily monitoring for one week to confirm young of the year have fledged if the exclusion will occur immediately after the end of the breeding season.
- Excluded burrowing owls are documented using artificial or natural burrows on an adjoining mitigation site (if able to confirm by band re-sight).

Translocation (Active relocation offsite >100 meters). At this time, there is little published information regarding the efficacy of translocating burrowing owls, and additional research is needed to determine subsequent survival and breeding success (Klute et al. 2003, Holroyd et al. 2001). Study results for translocation in Florida implied that hatching success may be decreased for populations of burrowing owls that undergo translocation (Nixon 2006). At this time, the Department is unable to authorize the capture and relocation of burrowing owls except within the context of scientific research (FGC §1002) or a NCCP conservation strategy.

Mitigating impacts. Habitat loss and degradation from rapid urbanization of farmland in the core areas of the Central and Imperial valleys is the greatest of many threats to burrowing owls in California (Shuford and Gardali, 2008). At a minimum, if burrowing owls have been documented to occupy burrows (see Definitions, Appendix B) at the project site in recent years, the current scientific literature supports the conclusion that the site should be considered occupied and mitigation should be required by the CEQA lead agency to address project-specific significant and cumulative impacts. Other site-specific and regionally significant and cumulative impacts may warrant mitigation. The current scientific literature indicates the following to be best practices. If these best practices cannot be implemented, the lead agency or lead investigator may consult with the Department to develop effective mitigation alternatives. The Department is also available to assist in the identification of suitable mitigation lands.

1. Where habitat will be temporarily disturbed, restore the disturbed area to pre-project condition including decompacting soil and revegetating. Permanent habitat protection may be warranted if there is the potential that the temporary impacts may render a nesting site (nesting burrow and satellite burrows) unsustainable or unavailable depending on the time frame, resulting in reduced survival or abandonment. For the latter potential impact, see the permanent impact measures below.
2. Mitigate for permanent impacts to nesting, occupied and satellite burrows and/or burrowing owl habitat such that the habitat acreage, number of burrows and burrowing owls impacted are replaced based on the information provided in Appendix A. Note: A

minimum habitat replacement recommendation is not provided here as it has been shown to serve as a default, replacing any site-specific analysis and discounting the wide variation in natal area, home range, foraging area, and other factors influencing burrowing owls and burrowing owl population persistence in a particular area.

3. Mitigate for permanent impacts to nesting, occupied and satellite burrows and burrowing owl habitat with (a) permanent conservation of similar vegetation communities (grassland, scrublands, desert, urban, and agriculture) to provide for burrowing owl nesting, foraging, wintering, and dispersal (i.e., during breeding and non-breeding seasons) comparable to or better than that of the impact area, and (b) sufficiently large acreage, and presence of fossorial mammals. The mitigation lands may require habitat enhancements including enhancement or expansion of burrows for breeding, shelter and dispersal opportunity, and removal or control of population stressors. If the mitigation lands are located adjacent to the impacted burrow site, ensure the nearest neighbor artificial or natural burrow clusters are at least within 210 meters (Fisher et al. 2007).
4. Permanently protect mitigation land through a conservation easement deeded to a non-profit conservation organization or public agency with a conservation mission, for the purpose of conserving burrowing owl habitat and prohibiting activities incompatible with burrowing owl use. If the project is located within the service area of a Department-approved burrowing owl conservation bank, the project proponent may purchase available burrowing owl conservation bank credits.
5. Develop and implement a mitigation land management plan to address long-term ecological sustainability and maintenance of the site for burrowing owls (see Management Plan and Artificial Burrow sections below, if applicable).
6. Fund the maintenance and management of mitigation land through the establishment of a long-term funding mechanism such as an endowment.
7. Habitat should not be altered or destroyed, and burrowing owls should not be excluded from burrows, until mitigation lands have been legally secured, are managed for the benefit of burrowing owls according to Department-approved management, monitoring and reporting plans, and the endowment or other long-term funding mechanism is in place or security is provided until these measures are completed.
8. Mitigation lands should be on, adjacent or proximate to the impact site where possible and where habitat is sufficient to support burrowing owls present.
9. Where there is insufficient habitat on, adjacent to, or near project sites where burrowing owls will be excluded, acquire mitigation lands with burrowing owl habitat away from the project site. The selection of mitigation lands should then focus on consolidating and enlarging conservation areas located outside of urban and planned growth areas, within foraging distance of other conserved lands. If mitigation lands are not available adjacent to other conserved lands, increase the mitigation land acreage requirement to ensure a selected site is of sufficient size. Offsite mitigation may not adequately offset the biological and habitat values impacted on a one to one basis. Consult with the Department when determining offsite mitigation acreages.
10. Evaluate and select suitable mitigation lands based on a comparison of the habitat attributes of the impacted and conserved lands, including but not limited to: type and structure of habitat being impacted or conserved; density of burrowing owls in impacted and conserved habitat; and significance of impacted or conserved habitat to the species range-wide. Mitigate for the highest quality burrowing owl habitat impacted first and foremost when identifying mitigation lands, even if a mitigation site is located outside of

a lead agency's jurisdictional boundary, particularly if the lead agency is a city or special district.

11. Select mitigation lands taking into account the potential human and wildlife conflicts or incompatibility, including but not limited to, human foot and vehicle traffic, and predation by cats, loose dogs and urban-adapted wildlife, and incompatible species management (i.e., snowy plover).
12. Where a burrowing owl population appears to be highly adapted to heavily altered habitats such as golf courses, airports, athletic fields, and business complexes, permanently protecting the land, augmenting the site with artificial burrows, and enhancing and maintaining those areas may enhance sustainability of the burrowing owl population onsite. Maintenance includes keeping lands grazed or mowed with weed-eaters or push mowers, free from trees and shrubs, and preventing excessive human and human-related disturbance (e.g., walking, jogging, off-road activity, dog-walking) and loose and feral pets (chasing and, presumably, preying upon owls) that make the environment uninhabitable for burrowing owls (Wesemann and Rowe 1985, Millsap and Bear 2000, Lincer and Bloom 2007). Items 4, 5 and 6 also still apply to this mitigation approach.
13. If there are no other feasible mitigation options available and a lead agency is willing to establish and oversee a Burrowing Owl Mitigation and Conservation Fund that funds on a competitive basis acquisition and permanent habitat conservation, the project proponent may participate in the lead agency's program.

Artificial burrows. Artificial burrows have been used to replace natural burrows either temporarily or long-term and their long-term success is unclear. Artificial burrows may be an effective addition to in-perpetuity habitat mitigation if they are augmenting natural burrows, the burrows are regularly maintained (i.e., no less than annual, with biennial maintenance recommended), and surrounding habitat patches are carefully maintained. There may be some circumstances, for example at airports, where squirrels will not be allowed to persist and create a dynamic burrow system, where artificial burrows may provide some support to an owl population.

Many variables may contribute to the successful use of artificial burrows by burrowing owls, including pre-existence of burrowing owls in the area, availability of food, predators, surrounding vegetation and proximity, number of natural burrows in proximity, type of materials used to build the burrow, size of the burrow and entrance, direction in which the burrow entrance is facing, slope of the entrance, number of burrow entrances per burrow, depth of the burrow, type and height of perches, and annual maintenance needs (Belthoff and King 2002, Smith et al. 2005, Barclay et al. 2011). Refer to Barclay (2008) and (2011) and to Johnson et al. 2010 (unpublished report) for guidance on installing artificial burrows including recommendations for placement, installation and maintenance.

Any long-term reliance on artificial burrows as natural burrow replacements must include semi-annual to annual cleaning and maintenance and/or replacement (Barclay et al. 2011, Smith and Conway 2005, Alexander et al. 2005) as an ongoing management practice. Alexander et al. (2005), in a study of the use of artificial burrows found that all of 20 artificial burrows needed some annual cleaning and maintenance. Burrows were either excavated by predators, blocked by soil or vegetation, or experienced substrate erosion forming a space beneath the tubing that prevented nestlings from re-entering the burrow.

Mitigation lands management plan. Develop a Mitigation Lands Management Plan for projects that require off-site or on-site mitigation habitat protection to ensure compliance with and effectiveness of identified management actions for the mitigation lands. A suggested outline and related vegetation management goals and monitoring success criteria can be found in Appendix E.

Mitigation Monitoring and Reporting

Verify the compliance with required mitigation measures, the accuracy of predictions, and ensure the effectiveness of all mitigation measures for burrowing owls by conducting follow-up monitoring, and implementing midcourse corrections, if necessary, to protect burrowing owls. Refer to CEQA Guidelines Section 15097 and the CEQA Guidelines for additional guidance on mitigation, monitoring and reporting. Monitoring is qualitatively different from site surveillance; monitoring normally has a specific purpose and its outputs and outcomes will usually allow a comparison with some baseline condition of the site before the mitigation (including avoidance and minimization) was undertaken. Ideally, monitoring should be based on the Before-After Control-Impact (BACI) principle (McDonald et al. 2000) that requires knowledge of the pre-mitigation state to provide a reference point for the state and change in state after the project and mitigation have been implemented.

ACKNOWLEDGEMENTS

We thank Jack Barclay, Jeff Lincer, David Plumpton, Jeff Kidd, Carol Roberts and other reviewers for their valuable comments on this report. We also want to acknowledge all the hard work of the Department team, especially T. Bartlett, K. Riesz, S. Wilson, D. Gifford, D. Mayer, J. Gan, L. Connolly, D. Mayer, A. Donlan, L. Bauer, L. Comrack, D. Lancaster, E. Burkett, B. Johnson, D. Johnston, A. Gonzales, S. Morey and K. Hunting.

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Appendix A. Burrowing Owl Natural History and Threats

Diet

Burrowing owl diet includes arthropods, small rodents, birds, amphibians, reptiles, and carrion (Haug et al. 1993).

Breeding

In California, the breeding season for the burrowing owl typically occurs between 1 February and 31 August although breeding in December has been documented (Thompson 1971, Gervais et al. 2008); breeding behavior includes nest site selection by the male, pair formation, copulation, egg laying, hatching, fledging, and post-fledging care of young by the parents. The peak of the breeding season occurs between 15 April and 15 July and is the period when most burrowing owls have active nests (eggs or young). The incubation period lasts 29 days (Coulombe 1971) and young fledge after 44 days (Haug et al. 1993). Note that the timing of nesting activities may vary with latitude and climatic conditions. Burrowing owls may change burrows several times during the breeding season, starting when nestlings are about three weeks old (Haug et al. 1993).

Dispersal

The following discussion is an excerpt from Gervais et al (2008):

> "The burrowing owl is often considered a sedentary species (e.g., Thomsen 1971). A large proportion of adults show strong fidelity to their nest site from year to year, especially where resident, as in Florida (74% for females, 83% for males; Millsap and Bear 1997). In California, nest-site fidelity rates were 32%–50% in a large grassland and 57% in an agricultural environment (Ronan 2002, Catlin 2004, Catlin et al. 2005). Differences in these rates among sites may reflect differences in nest predation rates (Catlin 2004, Catlin et al. 2005). Despite the high nest fidelity rates, dispersal distances may be considerable for both juveniles (natal dispersal) and adults (postbreeding dispersal), but this also varied with location (Catlin 2004, Rosier et al. 2006). Distances of 53 km to roughly 150 km have been observed in California for adult and natal dispersal, respectively (D. K. Rosenberg and J. A. Gervais, unpublished data), despite the difficulty in detecting movements beyond the immediate study area (Koenig et al. 1996)."

Habitat

The burrowing owl is a small, long-legged, ground-dwelling bird species, well-adapted to open, relatively flat expanses. In California, preferred habitat is generally typified by short, sparse vegetation with few shrubs, level to gentle topography and well-drained soils (Haug et al. 1993). Grassland, shrub steppe, and desert are naturally occurring habitat types used by the species. In addition, burrowing owls may occur in some agricultural areas, ruderal grassy fields, vacant lots and pastures if the vegetation structure is suitable and there are useable burrows and foraging habitat in proximity (Gervais et al 2008). Unique amongst North

American raptors, the burrowing owl requires underground burrows or other cavities for nesting during the breeding season and for roosting and cover, year round. Burrows used by the owls are usually dug by other species termed host burrowers. In California, California ground squirrel (*Spermophilus beecheyi*) and round-tailed ground squirrel (*Citellus tereticaudus*) burrows are frequently used by burrowing owls but they may use dens or holes dug by other fossorial species including badger (*Taxidea taxus*), coyote (*Canis latrans*), and fox (e.g., San Joaquin kit fox, *Vulpes macrotis mutica*; Ronan 2002). In some instances, owls have been known to excavate their own burrows (Thompson 1971, Barclay 2007). Natural rock cavities, debris piles, culverts, and pipes also are used for nesting and roosting (Rosenberg et al. 1998). Burrowing owls have been documented using artificial burrows for nesting and cover (Smith and Belthoff, 2003).

Foraging habitat. Foraging habitat is essential to burrowing owls. The following discussion is an excerpt from Gervais et al. (2008):

> "Useful as a rough guide to evaluating project impacts and appropriate mitigation for burrowing owls, adult male burrowing owls home ranges have been documented (calculated by minimum convex polygon) to comprise anywhere from 280 acres in intensively irrigated agroecosystems in Imperial Valley (Rosenberg and Haley 2004) to 450 acres in mixed agricultural lands at Lemoore Naval Air Station, CA (Gervais et al. 2003), to 600 acres in pasture in Saskatchewan, Canada (Haug and Oliphant 1990). But owl home ranges may be much larger, perhaps by an order of magnitude, in non-irrigated grasslands such as at Carrizo Plain, California (Gervais et al. 2008), based on telemetry studies and distribution of nests. Foraging occurs primarily within 600 m of their nests (within approximately 300 acres, based on a circle with a 600 m radius) during the breeding season."

Importance of burrows and adjacent habitat. Burrows and the associated surrounding habitat are essential ecological requisites for burrowing owls throughout the year and especially during the breeding season. During the non-breeding season, burrowing owls remain closely associated with burrows, as they continue to use them as refuge from predators, shelter from weather and roost sites. Resident populations will remain near the previous season's nest burrow at least some of the time (Coulombe 1971, Thomsen 1971, Botelho 1996, LaFever et al. 2008).

In a study by Lutz and Plumpton (1999) adult males and females nested in formerly used sites at similar rates (75% and 63%, respectively) (Lutz and Plumpton 1999). Burrow fidelity has been reported in some areas; however, more frequently, burrowing owls reuse traditional nesting areas without necessarily using the same burrow (Haug et al. 1993, Dechant et al. 1999). Burrow and nest sites are re-used at a higher rate if the burrowing owl has reproduced successfully during the previous year (Haug et al. 1993) and if the number of burrows isn't limiting nesting opportunity.

Burrowing owls may use "satellite" or non-nesting burrows, moving young at 10-14 days, presumably to reduce risk of predation (Desmond and Savidge 1998) and possibly to avoid nest parasites (Dechant et al. 1999). Successful nests in Nebraska had more active satellite burrows within 75 m of the nest burrow than unsuccessful nests (Desmond and Savidge

1999). Several studies have documented the number of satellite burrows used by young and adult burrowing owls during the breeding season as between one and 11 burrows with an average use of approximately five burrows (Thompsen 1984, Haug 1985, Haug and Oliphant 1990). Supporting the notion of selecting for nest sites near potential satellite burrows, Ronan (2002) found burrowing owl families would move away from a nest site if their satellite burrows were experimentally removed through blocking their entrance.

Habitat adjacent to burrows has been documented to be important to burrowing owls. Gervais et al. (2003) found that home range sizes of male burrowing owls during the nesting season were highly variable within but not between years. Their results also suggested that owls concentrate foraging efforts within 600 meters of the nest burrow, as was observed in Canada (Haug and Oliphant 1990) and southern California (Rosenberg and Haley 2004). James et al. (1997), reported habitat modification factors causing local burrowing owl declines included habitat fragmentation and loss of connectivity.

In conclusion, the best available science indicates that essential habitat for the burrowing owl in California must include suitable year-round habitat, primarily for breeding, foraging, wintering and dispersal habitat consisting of short or sparse vegetation (at least at some time of year), presence of burrows, burrow surrogates or presence of fossorial mammal dens, well-drained soils, and abundant and available prey within close proximity to the burrow.

Threats to Burrowing Owls in California

Habitat loss. Habitat loss, degradation, and fragmentation are the greatest threats to burrowing owls in California. According to DeSante et al. (2007), "the vast majority of burrowing owls [now] occur in the wide, flat lowland valleys and basins of the Imperial Valley and Great Central Valley [where] for the most part,...the highest rates of residential and commercial development in California are occurring." Habitat loss from the State's long history of urbanization in coastal counties has already resulted in either extirpation or drastic reduction of burrowing owl populations there (Gervais et al. 2008). Further, loss of agricultural and other open lands (such as grazed landscapes) also negatively affect owl populations. Because of their need for open habitat with low vegetation, burrowing owls are unlikely to persist in agricultural lands dominated by vineyards and orchards (Gervais et al. 2008).

Control of burrowing rodents. According to Klute et al. (2003), the elimination of burrowing rodents through control programs is a primary factor in the recent and historical decline of burrowing owl populations nationwide. In California, ground squirrel burrows are most often used by burrowing owls for nesting and cover; thus, ground squirrel control programs may affect owl numbers in local areas by eliminating a necessary resource.

Direct mortality. Burrowing owls suffer direct losses from a number of sources. Vehicle collisions are a significant source of mortality especially in the urban interface and where owls nest alongside roads (Haug et al. 1993, Gervais et al. 2008). Road and ditch maintenance, modification of water conveyance structures (Imperial Valley) and discing to control weeds in fallow fields may destroy burrows (Rosenberg and Haley 2004, Catlin and Rosenberg 2006) which may trap or crush owls. Wind turbines at Altamont Pass Wind Resource Area are known to cause direct burrowing owl mortality (Thelander et al. 2003). Exposure to

pesticides may pose a threat to the species but is poorly understood (Klute et al. 2003, Gervais et al. 2008).

Appendix B. Definitions

Some key terms that appear in this document are defined below.

Adjacent habitat means burrowing owl habitat that abuts the area where habitat and burrows will be impacted and rendered non-suitable for occupancy.

Breeding (nesting) season begins as early as 1 February and continues through 31 August (Thomsen 1971, Zarn 1974). The timing of breeding activities may vary with latitude and climatic conditions. The breeding season includes pairing, egg-laying and incubation, and nestling and fledging stages.

Burrow exclusion is a technique of installing one-way doors in burrow openings during the non-breeding season to temporarily exclude burrowing owls or permanently exclude burrowing owls and excavate and close burrows after confirming burrows are empty.

Burrowing owl habitat generally includes, but is not limited to, short or sparse vegetation (at least at some time of year), presence of burrows, burrow surrogates or presence of fossorial mammal dens, well-drained soils, and abundant and available prey.

Burrow surrogates include culverts, piles of concrete rubble, piles of soil, burrows created along soft banks of ditches and canals, pipes, and similar structures.

Civil twilight - Morning civil twilight begins when the geometric center of the sun is 6 degrees below the horizon (civil dawn) and ends at sunrise. Evening civil twilight begins at sunset and ends when the geometric center of the sun reaches 6 degrees below the horizon (civil dusk). During this period there is enough light from the sun that artificial sources of light may not be needed to carry on outdoor activities. This concept is sometimes enshrined in laws, for example, when drivers of automobiles must turn on their headlights (called lighting-up time in the UK); when pilots may exercise the rights to fly aircraft. Civil twilight can also be described as the limit at which twilight illumination is sufficient, under clear weather conditions, for terrestrial objects to be clearly distinguished; at the beginning of morning civil twilight, or end of evening civil twilight, the horizon is clearly defined and the brightest stars are visible under clear atmospheric conditions.

Conservation for burrowing owls may include but may not be limited to protecting remaining breeding pairs or providing for population expansion, protecting and enhancing breeding and essential habitat, and amending or augmenting land use plans to stabilize populations and other specific actions to avoid the need to list the species pursuant to California or federal Endangered Species Acts.

Contiguous means connected together so as to form an uninterrupted expanse in space.

Essential habitat includes nesting, foraging, wintering, and dispersal habitat.

Foraging habitat is habitat within the estimated home range of an occupied burrow, supports suitable prey base, and allows for effective hunting.

Host burrowers include ground squirrels, badgers, foxes, coyotes, gophers etc.

Locally significant species is a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region (CEQA §15125 (c)) or is so designated in local or regional plans, policies, or ordinances (CEQA Guidelines, Appendix G). Examples include a species at the outer limits of its known range or occurring in a unique habitat type.

Non-breeding season is the period of time when nesting activity is not occurring, generally September 1 through January 31, but may vary with latitude and climatic conditions.

Occupied site or occupancy means a site that is assumed occupied if at least one burrowing owl has been observed occupying a burrow within the last three years (Rich 1984). Occupancy of suitable burrowing owl habitat may also be indicated by owl sign including its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance or perch site.

Other impacting activities may include but may not be limited to agricultural practices, vegetation management and fire control, pest management, conversion of habitat from rangeland or natural lands to more intensive agricultural uses that could result in “take”. These impacting activities may not meet the definition of a project under CEQA.

Passive relocation is a technique of installing one-way doors in burrow openings to temporarily or permanently evict burrowing owls and prevent burrow re-occupation.

Peak of the breeding season is between 15 April and 15 July.

Sign includes its tracks, molted feathers, cast pellets (defined as 1-2” long brown to black regurgitated pellets consisting of non-digestible portions of the owls’ diet, such as fur, bones, claws, beetle elytra, or feathers), prey remains, egg shell fragments, owl white wash, nest burrow decoration materials (e.g., paper, foil, plastic items, livestock or other animal manure, etc.), possible owl perches, or other items.

Appendix C. Habitat Assessment and Reporting Details

Habitat Assessment Data Collection and Reporting

Current scientific literature indicates that it would be most effective to gather the data in the manner described below when conducting project scoping, conducting a habitat assessment site visit and preparing a habitat assessment report:

1. Conduct at least one visit covering the entire potential project/activity area including areas that will be directly or indirectly impacted by the project. Survey adjoining areas within 150 m (Thomsen 1971, Martin 1973), or more where direct or indirect effects could potentially extend offsite. If lawful access cannot be achieved to adjacent areas, surveys can be performed with a spotting scope or other methods.
2. Prior to the site visit, compile relevant biological information for the site and surrounding area to provide a local and regional context.
3. Check all available sources for burrowing owl occurrence information regionally prior to a field inspection. The CNDDB and BIOS (see References cited) may be consulted for known occurrences of burrowing owls. Other sources of information include, but are not limited to, the Proceedings of the California Burrowing Owl Symposium (Barclay et al. 2007), county bird atlas projects, Breeding Bird Survey records, eBIRD (http://ebird.org), Gervais et al. (2008), local reports or experts, museum records, and other site-specific relevant information.
4. Identify vegetation and habitat types potentially supporting burrowing owls in the project area and vicinity.
5. Record and report on the following information:
    a. A full description of the proposed project, including but not limited to, expected work periods, daily work schedules, equipment used, activities performed (such as drilling, construction, excavation, etc.) and whether the expected activities will vary in location or intensity over the project's timeline;
    b. A regional setting map, showing the general project location relative to major roads and other recognizable features;
    c. A detailed map (preferably a USGS topo 7.5' quad base map) of the site and proposed project, including the footprint of proposed land and/or vegetation-altering activities, base map source, identifying topography, landscape features, a north arrow, bar scale, and legend;
    d. A written description of the biological setting, including location (Section, Township, Range, baseline and meridian), acreage, topography, soils, geographic and hydrologic characteristics, land use and management history on and adjoining the site (i.e., whether it is urban, semi-urban or rural; whether there is any evidence of past or current livestock grazing, mowing, disking, or other vegetation management activities);
    e. An analysis of any relevant, historical information concerning burrowing owl use or occupancy (breeding, foraging, over-wintering) on site or in the assessment area;
    f. Vegetation type and structure (using Sawyer et al. 2009), vegetation height, habitat types and features in the surrounding area plus a reasonably sized (as supported with logical justification) assessment area; (Note: use caution in discounting habitat based on grass height as it can be a temporary condition variable by season and conditions (such as current grazing regime) or may be distributed as a mosaic).

g. The presence of burrowing owl individuals or pairs or sign (see Appendix B);
h. The presence of suitable burrows and/or burrow surrogates (>11 cm in diameter (height and width) and >150 cm in depth) (Johnson et al. 2010), regardless of a lack of any burrowing owl sign and/or burrow surrogates; and burrowing owls and/or their sign that have recently or historically (within the last 3 years) been identified on or adjacent to the site.

Appendix D. Breeding and Non-breeding Season Surveys and Reports

Current scientific literature indicates that it is most effective to conduct breeding and non-breeding season surveys and report in the manner that follows:

Breeding Season Surveys

Number of visits and timing. Conduct 4 survey visits: 1) at least one site visit between 15 February and 15 April, and 2) a minimum of three survey visits, at least three weeks apart, between 15 April and 15 July, with at least one visit after 15 June. Note: many burrowing owl migrants are still present in southwestern California during mid-March, therefore, exercise caution in assuming breeding occupancy early in the breeding season.

Survey method. Rosenberg et al. (2007) confirmed walking line transects were most effective in smaller habitat patches. Conduct surveys in all portions of the project site that were identified in the Habitat Assessment and fit the description of habitat in Appendix A. Conduct surveys by walking straight-line transects spaced 7 m to 20 m apart, adjusting for vegetation height and density (Rosenberg et al. 2007). At the start of each transect and, at least, every 100 m, scan the entire visible project area for burrowing owls using binoculars. During walking surveys, record all potential burrows used by burrowing owls as determined by the presence of one or more burrowing owls, pellets, prey remains, whitewash, or decoration. Some burrowing owls may be detected by their calls, so observers should also listen for burrowing owls while conducting the survey.

Care should be taken to minimize disturbance near occupied burrows during all seasons and not to "flush" burrowing owls especially if predators are present to reduce any potential for needless energy expenditure or burrowing owl mortality. Burrowing owls may flush if approached by pedestrians within 50 m (Conway et al. 2003). If raptors or other predators are present that may suppress burrowing owl activity, return at another time or later date for a follow-up survey.

Check all burrowing owls detected for bands and/or color bands and report band combinations to the Bird Banding Laboratory (BBL). Some site-specific variations to survey methods discussed below may be developed in coordination with species experts and Department staff.

Weather conditions. Poor weather may affect the surveyor's ability to detect burrowing owls, therefore, avoid conducting surveys when wind speed is >20 km/hr, and there is precipitation or dense fog. Surveys have greater detection probability if conducted when ambient temperatures are >20º C, <12 km/hr winds, and cloud cover is <75% (Conway et al. 2008).

Time of day. Daily timing of surveys varies according to the literature, latitude, and survey method. However, surveys between morning civil twilight and 10:00 AM and two hours before sunset until evening civil twilight provide the highest detection probabilities (Barclay pers. comm. 2012, Conway et al. 2008).

Alternate methods. If the project site is large enough to warrant an alternate method, consult current literature for generally accepted survey methods and consult with the Department on the proposed survey approach.

Additional breeding season site visits. Additional breeding season site visits may be necessary, especially if non-breeding season exclusion methods are contemplated. Detailed information, such as approximate home ranges of each individual or of family units, as well as foraging areas as related to the proposed project, will be important to document for evaluating impacts, planning avoidance measure implementation and for mitigation measure performance monitoring.

Adverse conditions may prevent investigators from determining presence or occupancy. Disease, predation, drought, high rainfall or site disturbance may preclude presence of burrowing owls in any given year. Any such conditions should be identified and discussed in the survey report. Visits to the site in more than one year may increase the likelihood of detection. Also, visits to adjacent known occupied habitat may help determine appropriate survey timing.

Given the high site fidelity shown by burrowing owls (see Appendix A, Importance of burrows), conducting surveys over several years may be necessary when project activities are ongoing, occur annually, or start and stop seasonally. (See Negative surveys).

Non-breeding Season Surveys

If conducting non-breeding season surveys, follow the methods described above for breeding season surveys, but conduct at least four (4) visits, spread evenly, throughout the non-breeding season. Burrowing owl experts and local Department staff are available to assist with interpreting results.

Negative Surveys

Adverse conditions may prevent investigators from documenting presence or occupancy. Disease, predation, drought, high rainfall or site disturbance may preclude presence of burrowing owl in any given year. Discuss such conditions in the Survey Report. Visits to the site in more than one year increase the likelihood of detection and failure to locate burrowing owls during one field season does not constitute evidence that the site is no longer occupied, particularly if adverse conditions influenced the survey results. Visits to other nearby known occupied sites can affirm whether the survey timing is appropriate.

Take Avoidance Surveys

Field experience from 1995 to present supports the conclusion that it would be effective to complete an initial take avoidance survey no less than 14 days prior to initiating ground disturbance activities using the recommended methods described in the Detection Surveys section above. Implementation of avoidance and minimization measures would be triggered by positive owl presence on the site where project activities will occur. The development of avoidance and minimization approaches would be informed by monitoring the burrowing owls.

Burrowing owls may re-colonize a site after only a few days. Time lapses between project activities trigger subsequent take avoidance surveys including but not limited to a final survey conducted within 24 hours prior to ground disturbance.

Survey Reports

Report on the survey methods used and results including the information described in the Summary Report and include the reports within the CEQA documentation:

1. Date, start and end time of surveys including weather conditions (ambient temperature, wind speed, percent cloud cover, precipitation and visibility);
2. Name(s) of surveyor(s) and qualifications;
3. A discussion of how the timing of the survey affected the comprehensiveness and detection probability;
4. A description of survey methods used including transect spacing, point count dispersal and duration, and any calls used;
5. A description and justification of the area surveyed relative to the project area;
6. A description that includes: number of owls or nesting pairs at each location (by nestlings, juveniles, adults, and those of an unknown age), number of burrows being used by owls, and burrowing owl sign at burrows. Include a description of individual markers, such as bands (numbers and colors), transmitters, or unique natural identifying features. If any owls are banded, request documentation from the BBL and bander to report on the details regarding the known history of the banded burrowing owl(s) (age, sex, origins, whether it was previously relocated) and provide with the report if available;
7. A description of the behavior of burrowing owls during the surveys, including feeding, resting, courtship, alarm, territorial defense, and those indicative of parents or juveniles;
8. A list of possible burrowing owl predators present and documentation of any evidence of predation of owls;
9. A detailed map (1:24,000 or closer to show details) showing locations of all burrowing owls, potential burrows, occupied burrows, areas of concentrated burrows, and burrowing owl sign. Locations documented by use of global positioning system (GPS) coordinates must include the datum in which they were collected. The map should include a title, north arrow, bar scale and legend;
10. Signed field forms, photos, etc., as appendices to the field survey report;
11. Recent color photographs of the proposed project or activity site; and
12. Original CNDDB Field Survey Forms should be sent directly to the Department's CNDDB office, and copies should be included in the environmental document as an appendix. (http://www.dfg.ca.gov/bdb/html/cnddb.html).

Appendix E. Example Components for Burrowing Owl Artificial Burrow and Exclusion Plans

Whereas the Department does not recommend exclusion and burrow closure, current scientific literature and experience from 1995 to present, indicate that the following example components for burrowing owl artificial burrow and exclusion plans, combined with consultation with the Department to further develop these plans, would be effective.

Artificial Burrow Location

If a burrow is confirmed occupied on-site, artificial burrow locations should be appropriately located and their use should be documented taking into consideration:

1. A brief description of the project and project site pre-construction;
2. The mitigation measures that will be implemented;
3. Potential conflicting site uses or encumbrances;
4. A comparison of the occupied burrow site(s) and the artificial burrow site(s) (e.g., vegetation, habitat types, fossorial species use in the area, and other features);
5. Artificial burrow(s) proximity to the project activities, roads and drainages;
6. Artificial burrow(s) proximity to other burrows and entrance exposure;
7. Photographs of the site of the occupied burrow(s) and the artificial burrows;
8. Map of the project area that identifies the burrow(s) to be excluded as well as the proposed sites for the artificial burrows;
9. A brief description of the artificial burrow design;
10. Description of the monitoring that will take place during and after project implementation including information that will be provided in a monitoring report.
11. A description of the frequency and type of burrow maintenance.

Exclusion Plan

An Exclusion Plan addresses the following including but not limited to:

1. Confirm by site surveillance that the burrow(s) is empty of burrowing owls and other species preceding burrow scoping;
2. Type of scope and appropriate timing of scoping to avoid impacts;
3. Occupancy factors to look for and what will guide determination of vacancy and excavation timing (one-way doors should be left in place 48 hours to ensure burrowing owls have left the burrow before excavation, visited twice daily and monitored for evidence that owls are inside and can't escape i.e., look for sign immediately inside the door).
4. How the burrow(s) will be excavated. Excavation using hand tools with refilling to prevent reoccupation is preferable whenever possible (may include using piping to stabilize the burrow to prevent collapsing until the entire burrow has been excavated and it can be determined that no owls reside inside the burrow);
5. Removal of other potential owl burrow surrogates or refugia on site;
6. Photographing the excavation and closure of the burrow to demonstrate success and sufficiency;

7. Monitoring of the site to evaluate success and, if needed, to implement remedial measures to prevent subsequent owl use to avoid take;
8. How the impacted site will continually be made inhospitable to burrowing owls and fossorial mammals (e.g., by allowing vegetation to grow tall, heavy disking, or immediate and continuous grading) until development is complete.

Appendix F. Mitigation Management Plan and Vegetation Management Goals

Mitigation Management Plan

A mitigation site management plan will help ensure the appropriate implementation and maintenance for the mitigation site and persistence of the burrowing owls on the site. For an example to review, refer to Rosenberg et al. (2009). The current scientific literature and field experience from 1995 to present indicate that an effective management plan includes the following:

1. Mitigation objectives;
2. Site selection factors (including a comparison of the attributes of the impacted and conserved lands) and baseline assessment;
3. Enhancement of the conserved lands (enhancement of reproductive capacity, enhancement of breeding areas and dispersal opportunities, and removal or control of population stressors);
4. Site protection method and prohibited uses;
5. Site manager roles and responsibilities;
6. Habitat management goals and objectives:
    a. Vegetation management goals,
        i. Vegetation management tools:
            1. Grazing
            2. Mowing
            3. Burning
            4. Other
    b. Management of ground squirrels and other fossorial mammals,
    c. Semi-annual and annual artificial burrow cleaning and maintenance,
    d. Non-natives control – weeds and wildlife,
    e. Trash removal;
7. Financial assurances:
    a. Property analysis record or other financial analysis to determine long-term management funding,
    b. Funding schedule;
8. Performance standards and success criteria;
9. Monitoring, surveys and adaptive management;
10. Maps;
11. Annual reports.

Vegetation Management Goals

- Manage vegetation height and density (especially in immediate proximity to burrows). Suitable vegetation structure varies across sites and vegetation types, but should generally be at the average effective vegetation height of 4.7 cm (Green and Anthony 1989) and <13 cm average effective vegetation height (MacCracken et al. 1985*a)*.
- Employ experimental prescribed fires (controlled, at a small scale) to manage vegetation structure;

- Vegetation reduction or ground disturbance timing, extent, and configuration should avoid take. While local ordinances may require fire prevention through vegetation management, activities like disking, mowing, and grading during the breeding season can result in take of burrowing owls and collapse of burrows, causing nest destruction. Consult the take avoidance surveys section above for pre-management avoidance survey recommendations;
- Promote natural prey distribution and abundance, especially in proximity to occupied burrows; and
- Promote self-sustaining populations of host burrowers by limiting or prohibiting lethal rodent control measures and by ensuring food availability for host burrowers through vegetation management.

Refer to Rosenberg et al. (2009) for a good discussion of managing grasslands for burrowing owls.

Mitigation Site Success Criteria

In order to evaluate the success of mitigation and management strategies for burrowing owls, monitoring is required that is specific to the burrowing owl management plan. Given limited resources, Barclay et al. (2011) suggests managers focus on accurately estimating annual adult owl populations rather than devoting time to estimating reproduction, which shows high annual variation and is difficult to accurately estimate. Therefore, the key objective will be to determine accurately the number of adult burrowing owls and pairs, and if the numbers are maintained. A frequency of 5-10 years for surveys to estimate population size may suffice if there are no changes in the management of the nesting and foraging habitat of the owls.

Effective monitoring and evaluation of off-site and on-site mitigation management success for burrowing owls includes (Barclay, pers. comm.):

- Site tenacity;
- Number of adult owls present and reproducing;
- Colonization by burrowing owls from elsewhere (by band re-sight);
- Evidence and causes of mortality;
- Changes in distribution; and
- Trends in stressors.

APPENDIX C

CULTURAL AND TRIBAL CULTURAL RESOURCES

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

FRESNO KERN KINGS MADERA TULARE

Southern San Joaquin Valley Information Center
California State University, Bakersfield
Mail Stop: 46 MEC
9001 Stockdale Highway
Bakersfield, California 93311-1022
(661) 654-2289 FAX (661) 654-2415
E-mail: ssjvic@csub.edu

To: Emily Bowen
Crawford Bowen Planning, Inc.
113 N. Church Street, Suite 302
Visalia, CA 93291

Record Search 15-134

Date: March 30, 2015

Re: Hash Farms Development Project

County: Fresno & Tulare

Map(s): Selma 7.5'

CULTURAL RESOURCES RECORDS SEARCH

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law. The following are the results of a search of the cultural resource files at the Southern San Joaquin Valley Information Center. These files include known and recorded cultural resources sites, inventory and excavation reports filed with this office, and resources listed on the National Register of Historic Places, Historic Property Directory (3/18/13), California State Historical Landmarks, California Register of Historical Resources, California Inventory of Historic Resources, and California Points of Historical Interest. Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area.

PRIOR CULTURAL RESOURCE STUDIES CONDUCTED WITHIN THE PROJECT AREA AND THE ONE-HALF MILE RADIUS

According to the information in our files, there have been no previous cultural resource studies conducted within the project area. There have been five studies conducted within the one-half mile radius, FR-00135 (TU-00102), FR-00671, FR-01940 (TU-01158), FR-02287 (TU-01324), and FR-02414 (TU-01498).

Record Search 15-134

KNOWN/RECORDED CULTURAL RESOURCES WITHIN THE PROJECT AREA AND THE ONE-HALF MILE RADIUS

There are no recorded cultural resources within the project area. There is one recorded resource within the one-half mile radius, P-54-004611 (historic Fresno/Tulare County Line marker post).

There are 52 historic properties within the one-half mile radius that have been given a National Register Status Code of 2S2. This code indicates these individual properties have been determined eligible for this in the National Register of Historic Places by a consensus through the Section 106 process. They are also listed in the California Register of Historical Resources. A list is enclosed. There are no other recorded cultural resources within the project area or radius that are listed in the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historical Interest, California Inventory of Historic Resources, or the California State Historic Landmarks.

COMMENTS AND RECOMMENDATIONS

We understand this project consists of the construction of an approximately 200 unit residential housing development. Further, we understand this project area has previously been and is currently being used for agricultural purposes. Please note that farming does not constitute development, as it does not destroy cultural resources, but merely moves them around within the plow zone. Because this project area has never been surveyed, it is not known if cultural resources exist there. Therefore, prior to any ground disturbance activities, we recommend a qualified, professional archaeologist conduct a field survey to determine if cultural resources are present. A list of professionals is available at www.chrisinfo.org.

We also recommend that you contact the Native American Heritage Commission in Sacramento. They will provide you with a current list of Native American individuals/organizations that can assist you with information regarding cultural resources that may not be included in the CHRIS Inventory and that may be of concern to the Native groups in the area. The Commission will consult their "Sacred Lands Inventory" file in order to determine what sacred resources, if any, exist within this project area and the way in which these resources might be managed. Finally, please consult with the lead agency on this project to determine if any other cultural resource investigation is required. If you need any additional information or have any questions or concerns, please contact our office at (661) 654-2289.

By:

Celeste M. Thomson, Coordinator **Date:** March 30, 2015

Please note that invoices for Information Center services will be sent under separate cover from the California State University, Bakersfield Accounting Office.

Record Search 15-134

2S2 Listed Properties in Project Radius

Property #	Property Name	Address	City
102612	Matic House	1516 20th Street	Kingsburg, CA
102613	Heineman House	1524 20th Street	Kingsburg, CA
102614	Jensen House	1548 20th Street	Kingsburg, CA
102615	McCreary House	1560 20th Street	Kingsburg, CA
102610	Whitemore House	1579 20th Street	Kingsburg, CA
102617	Brady House	1660 20th Street	Kingsburg, CA
102607	Bartel House	1661 20th Street	Kingsburg, CA
102603	Wilson House	1701 20th Street	Kingsburg, CA
102601	Banks House	1721 20th Street	Kingsburg, CA
102602	Banks House (2nd of Two)	1721 20th Street	Kingsburg, CA
114159	No Name	1741 20th Street	Kingsburg, CA
102618	Carlson House	1780 20th Street	Kingsburg, CA
114157	No Name	1781 20th Street	Kingsburg, CA
102600	No Name	1801 20th Street	Kingsburg, CA
102619	Stone House	1824 20th Street	Kingsburg, CA
102599	Cameron House	1831 20th Street	Kingsburg, CA
102620	Huddleston House	1848 20th Street	Kingsburg, CA
102598	Carlson House	1861 20th Street	Kingsburg, CA
102597	Warren House	1873 20th Street	Kingsburg, CA
114154	Manfredi House	1891 20th Street	Kingsburg, CA
102624	Burnett House	21st Street	Kingsburg, CA
103729	Sorenson House	1490 21st Street	Kingsburg, CA
103730	Cauwels House	1536 21st Street	Kingsburg, CA
103728	Britton House	1549 21st Street	Kingsburg, CA
103731	Shoebridge House	1578 21st Street	Kingsburg, CA
103732	Morton House	1584 21st Street	Kingsburg, CA
103733	Horton House	1600 21st Street	Kingsburg, CA
103734	Atchley House	1640 21st Street	Kingsburg, CA
103735	Nielsen House	1680 21st Street	Kingsburg, CA
103727	Apperson House	1701 21st Street	Kingsburg, CA
103736	Grandal House	1730 21st Street	Kingsburg, CA
103726	Hussey House	1731 21st Street	Kingsburg, CA
103737	Horiachi House	1770 21st Street	Kingsburg, CA
103725	Malek House	1771 21st Street	Kingsburg, CA
102626	Adams House	1801 21st Street	Kingsburg, CA
103739	Jacobson House	1812 21st Street	Kingsburg, CA
103740	Plagenza House	1830 21st Street	Kingsburg, CA
102624	Havenstein House	1831 21st Street	Kingsburg, CA
103741	Havenstein House (2)	1842 21st Street	Kingsburg, CA
114162	No Name	1849 21st Street	Kingsburg, CA
103742	Perry House	1854 21st Street	Kingsburg, CA
103791	No Name	1872 21st Street	Kingsburg, CA
102623	Sanchez/Escovedo House	1873 21st Street	Kingsburg, CA
114161	No Name	1873 21st Street	Kingsburg, CA
103743	Cronin House	1890 21st Street	Kingsburg, CA
102622	Harris House	1891 21st Street	Kingsburg, CA

Record Search 15-134

2S2 Listed Properties in Project Radius

Property #	Property Name	Address	City
103771	Lindell Ranch	1746 Avenue 400	Kingsburg, CA
102609	Freeman House	1949 Plumas Street	Kingsburg, CA
102608	Johnson House	1981 Plumas Street	Kingsburg, CA
102616	Amorino House	2033 Plumas Street	Kingsburg, CA
102596	Concordia Luthern Church	1800 Sierra Street	Kingsburg, CA
102621	White House	2001 Sierra Street	Kingsburg, CA

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 FAX

August 25, 2016

Hector Guerra
Tulare County Resource Management Agency

Sent by E-mail: hguerra@co.tulare.ca.us

RE: Proposed Hash Farms Subdivision Project, City of Kingsburg; Selma USGS Quadrangle, Tulare County, California

Dear Mr. Guerra:

Attached is a consultation list of tribes with traditional lands or cultural places located within the boundaries of the above referenced counties. Please note that the intent of the reference codes below is to avoid or mitigate impacts to tribal cultural resources, as defined, for California Environmental Quality Act (CEQA) projects under AB-52.

As of July 1, 2015, Public Resources Code Sections 21080.3.1 and 21080.3.2 **require public agencies** to consult with California Native American tribes identified by the Native American Heritage Commission (NAHC) for the purpose mitigating impacts to tribal cultural resources:

> **Within 14 days** of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section. (Public Resources Code Section 21080.3.1(d))

The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.3.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC believes that agencies should also include with their notification letters information regarding any cultural resources assessment that has been completed on the APE, such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

   - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
   - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
   - If the probability is low, moderate, or high that cultural resources are located in the APE.
   - Whether the records search indicates a low, moderate or high probability that unrecorded cultural resources are located in the potential APE; and
   - If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measurers.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure in accordance with Government Code Section 6254.10.

3. The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission.

4. Any ethnographic studies conducted for any area including all or part of the potential APE; and

5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the case that they do, having the information beforehand well help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

Native American Heritage Commission
Tribal Consultation List
Tulare County
8/25/2016

Kitanemuk & Yowlumne Tejon Indians
Delia Dominguez, Chairperson
115 Radio Street
Bakersfield, CA, 93305
Phone: (626)339-6785
deedominguez@juno.com

Kitanemuk
Southern Valley
Yokut

Santa Rosa Rancheria Tachi Yokut Tribe
Rueben Barrios, Chairperson
P.O. Box 8
Lemoore, CA, 93245
Phone: (559)924-1278
Fax: (559) 924-3583

Southern Valley
Yokut

Table Mountain Rancheria
Leanne Walker-Grant, Chairperson
P.O. Box 410
Friant, CA, 93626
Phone: (559)822-2587
Fax: (559) 822-2693

Yokut

Tule River Indian Tribe
Neil Peyron, Chairperson
P.O. Box 589
Porterville, CA, 93258
Phone: (559)781-4271
Fax: (559) 781-4610
chairman@tulerivertribe-nsn.gov

Yokut

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 6097.98 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Hash Farms Subdivision, Tulare County.

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710
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August 25, 2016

Hector Guerra
Tulare County Resource Management Agency

Sent by E-mail: hguerra@co.tulare.ca.us

RE: Proposed Hash Farms Subdivision Project, City of Kingsburg; Selma USGS Quadrangle, Tulare County, California

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The law does not preclude agencies from initiating consultation with the tribes that are culturally and traditionally affiliated with their jurisdictions. The NAHC believes that in fact that this is the best practice to ensure that tribes are consulted commensurate with the intent of the law.

In accordance with Public Resources Code Section 21080.3.1(d), formal notification must include a brief description of the proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation. The NAHC believes that agencies should also include with their notification letters information regarding any cultural resources assessment that has been completed on the APE, such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

   - A listing of any and all known cultural resources have already been recorded on or adjacent to the APE;
   - Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;
   - If the probability is low, moderate, or high that cultural resources are located in the APE.
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   - If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

   - Any report that may contain site forms, site significance, and suggested mitigation measurers.

     All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure in accordance with Government Code Section 6254.10.

3. The results of any Sacred Lands File (SFL) check conducted through Native American Heritage Commission. A search of the SFL was completed for the USGS quadrangle information provided with negative results.

4. Any ethnographic studies conducted for any area including all or part of the potential APE; and

5. Any geotechnical reports regarding all or part of the potential APE.

Lead agencies should be aware that records maintained by the NAHC and CHRIS is not exhaustive, and a negative response to these searches does not preclude the existence of a cultural place. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

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If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance we are able to assure that our consultation list contains current information.

If you have any questions, please contact me at my email address: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

SB 18 and AB 52 Consultation Notice – Hash Farms Development Project													
TRIBE CONTACTED	REQUEST TYPE		DOCUMENTS SENT					MAILED				CONSULTATION PERIOD	
	AB 52	SB 18	Map	Project Description	SLF Search	CHRIS	Other	Date	E-mail	FedEx	Certified US Mail	Return Receipt	Period Ends
SACRED LAND FILE (SLF) REQUEST													
NAHC – Gayle Totton	X		X	X	X			8/24/16	X			8/25/16 Search had negative returns	
CONSULTATION REQUEST LETTERS (CONCURRENT WITH SLF REQUEST)													
Big Sandy Rancheria Elizabeth D. Kipp, Chairperson P.O. Box 337 Auberry, CA 93602	X	X	X					8/25/16			X	8/29/16	9/28/16 & 11/27/16
Cold Springs Rancheria of Mono Indians Carol Bill, Chairperson P.O. Box 209 Tollhouse, CA 93667	X	X	X					8/25/16			X	9/8/16	10/8/16 & 12/7/16
Dumna Wo-Wah Tribal Government Robert Ledger, Chairperson 2216 East Hammond Street Fresno, CA, 93703	X	X	X					8/25/16			X	8/27/16	9/26/16
Dunlap Band of Mono Indians Dunlap Chairperson Box 44 Dunlap, CA 93621	X	X	X					8/25/16			X	8/29/16	9/28/16
Kern Valley Indian Council Robert Robinson, Co-Chairperson PO Box 401 Weldon, CA 93283	X	X	X					8/25/16			X	8/31/16	9/30/16 & 11/29/16
Kern Valley Indian Council Julie Turner, Secretary P. Box 1010 Lake Isabella, CA 93240	X	X	X					8/25/16			X	8/29/16	9/28/16 & 11/27/16
Kings River Choinumni Farm Tribe Stan Alec 3515 East Fedora Avenue Fresno, CA, 93726	X	X	X					8/25/16			X	returned to County undelivered	---
Kitanemuk & Yowlumne Tejon Indians Delia Dominguez, Chairperson 115 Radio Street Bakersfield, CA, 93305	X	X	X					8/25/16			X	9/26/16	10/26/16
Mono Lake Indian Community Charlotte Lange, Chairperson P.O. Box 117 Big Pine, CA 93513	X	X	X					8/25/16			X	9/7/16	10/7/16

SB 18 and AB 52 Consultation Notice – Hash Farms Development Project													
TRIBE CONTACTED	REQUEST TYPE		DOCUMENTS SENT					MAILED				CONSULTATION PERIOD	
	AB 52	SB 18	Map	Project Description	SLF Search	CHRIS	Other	Date	E-mail	FedEx	Certified US Mail	Return Receipt	Period Ends
North Fork Mono Tribe Ron Goode, Chairperson 13396 Tollhouse Road Clovis, CA 93619	X	X	X					8/25/16			X	9/8/16	10/8/16
North Fork Rancheria of Mono Indians Judy Elaine Bethel-Fink, Chairperson P.O. Box 929 North Fork, CA 93643	X	X	X					8/25/16			X	8/30/16	9/29/16 & 11/28/16
Picayune Rancheria of Chukchansi Reggie Lewis, Chairperson 8080 Palm Ave, Suite 207 Fresno, CA, 93711	X	X	X					8/25/16			X	8/29/16	9/30/16 & 11/29/16
Santa Rosa Rancheria Tachi Yokut Tribe Rueben Barrios Sr., Chairperson P. O. Box 8 Lemoore, CA 93245	X	X	X					8/25/16			X	8/29/16	9/28/16 & 11/27/16
Santa Rosa Rancheria Tachi Yokut Tribe Hector Franco, Cultural Director P. O. Box 8 Lemoore, CA 93245	X	X	X					8/25/16			X	8/29/16	9/18/16 & 11/17/16
Santa Rosa Rancheria Tachi Yokut Tribe Shana Powers, Cultural Specialist P. O. Box 8 Lemoore, CA 93245	X	X	X					8/25/16			X	8/29/16	9/28/16 & 11/27/16
Southern Sierra Miwuk Nation Lois Martin, Chairperson P.O. Box 186 Mariposa, CA 95338	X	X	X					8/25/16			X	8/31/16	9/30/16 & 11/29/16
Table Mountain Rancheria Leanne Walker-Grant, Chairperson P.O. Box 410 Friant, CA, 93626	X	X	X					8/25/16			X	8/30/16	9/12/16 – letter received that says project is outside of their area of interest
Traditional Choinumni Tribe David Alvarez, Chairperson 2415 E. Houston Avenue Fresno, CA, 93720	X	X	X					8/25/16			X	9/3/16	10/3/16

SB 18 and AB 52 Consultation Notice – Hash Farms Development Project													
TRIBE CONTACTED	REQUEST TYPE		DOCUMENTS SENT					MAILED				CONSULTATION PERIOD	
	AB 52	SB 18	Map	Project Description	SLF Search	CHRIS	Other	Date	E-mail	FedEx	Certified US Mail	Return Receipt	Period Ends
Tubatulabals of Kern Valley Robert L. Gomez, Jr., Chairperson P. O. Box 226 Lake Isabella, CA 93240	X	X	X					8/25/16			X	9/13/16	10/13/16 & 12/12/16
Tule River Indian Tribe Neil Peyron, Chairperson P. O. Box 589 Porterville, CA 93258	X	X	X					8/25/16			X	8/31/16	9/30/16
Wuksachi Indian Tribe/Eshom Valley Band Kenneth Woodrow, Chairperson 1179 Rock Haven Ct. Salinas, CA 93906	X	X	X					8/25/16			X	8/29/16	9/28/16 & 11/27/16
Wuksachi Tribe John Sartuche 1028 East "K" Street Visalia, CA 93292	X	X	X					8/25/16			X	returned to County undelivered	---
CONSULTATION REQUEST LETTERS (CONCURRENT WITH NOP)													
Gabrieleno Band of Mission Indians – Kizh Nation Andrew Salas, Chariperson P.O. Box 393 Covina, CA 91723	X	X	X				NOP	9/6/16			X	9/8/16	10/8/16
Gabrieleno / Tongva San Gabriel Band of Mission Indians Anthony Morales, Chairperson P.O. Box 693 San Gabriel, CA 91778	X	X	X				NOP	9/6/16			X	9/8/16	10/8/16 & 12/7/16
Gabrielino / Tongva Nation Sandonne Goad, Chairperson 106 ½ Judge John Aiso St. # 231 Los Angeles, CA 90012	X	X	X				NOP	9/6/16			X	9/9/16	10/9/16 & 12/8/16
Gabrielino Tongva Indians of California Tribal Council Robert F. Dorame, Chairperson P.O. Box 490 Bellflower, CA 90707	X	X	X				NOP	9/6/16			X	9/7/16	10/7/16
Gabrielino-Tongva Tribe Linda Candelaria, Co-Chairperson 1999 Avenue of the Stars, Ste. 1100 Los Angeles, CA 90067	X	X	X				NOP	9/6/16			X	9/9/16	10/9/16 & 12/8/16
Kitanemuk & Yowlumne Tejon Indians Delia Dominguez, Chairperson 115 Radio Street Bakersfield, CA, 93305	X	X	X				NOP	9/6/16			X	9/8/16	10/8/16 & 12/7/16

SB 18 and AB 52 Consultation Notice – Hash Farms Development Project													
TRIBE CONTACTED	REQUEST TYPE		DOCUMENTS SENT					MAILED				CONSULTATION PERIOD	
	AB 52	SB 18	Map	Project Description	SLF Search	CHRIS	Other	Date	E-mail	FedEx	Certified US Mail	Return Receipt	Period Ends
San Fernando Band of Mission Indians John Valenzuela, Chairperson P.O. Box 221838 Newhall, CA 91322	X	X	X				NOP	9/6/16			X	9/26/16	10/26/16 & 12/25/16
Santa Rosa Rancheria Tachi Yokut Tribe Rueben Barrios Sr., Chairperson P. O. Box 8 Lemoore, CA 93245	X	X	X				NOP	9/6/16			X	9/12/16	10/12/16 & 12/11/16
Table Mountain Rancheria Leanne Walker-Grant, Chairperson P.O. Box 410 Friant, CA, 93626	X	X	X				NOP	9/6/16			X	9/8/16	10/8/16 & 12/7/16
Tule River Indian Tribe Neil Peyron, Chairperson P. O. Box 589 Porterville, CA 93258	X	X	X				NOP	9/6/16			X	9/8/16	10/8/16
CONSULTATION FOLLOW UP – CHRIS RESULTS (TRIBES ON SLF LIST & TRIBES REQUESTING CONSULT)													
Kitanemuk & Yowlumne Tejon Indians Delia Dominguez, Chairperson 115 Radio Street Bakersfield, CA, 93305	X		X	X	Results only	Results only							
Santa Rosa Rancheria Tachi Yokut Tribe Rueben Barrios Sr., Chairperson c/o Cultural Department P. O. Box 8 Lemoore, CA 93245	X		X	X	Results only	Results only						RMA met with tribal representatives on March 3, 2017 to discuss various projects including the Hash Project in Kingsburg.	
Santa Rosa Rancheria Tachi Yokut Tribe Cultural Department Hector Franco, Director P. O. Box 8 Lemoore, CA 93245	X		X	X	Results only	Results only							
Santa Rosa Rancheria Tachi Yokut Tribe Cultural Department Shana Powers, Cultural Specialist P. O. Box 8 Lemoore, CA 93245	X		X	X	Results only	Results only							
Torres Martinez Desert Cahuilla Indians Michael Mirelez, Cultural Resource Coordinator P. O. Box 1160 Thermal, CA 92274	X		X	X	Results only	Results only							

SB 18 and AB 52 Consultation Notice – Hash Farms Development Project													
TRIBE CONTACTED	REQUEST TYPE		DOCUMENTS SENT					MAILED				CONSULTATION PERIOD	
	AB 52	SB 18	Map	Project Description	SLF Search	CHRIS	Other	Date	E-mail	FedEx	Certified US Mail	Return Receipt	Period Ends
Tule River Indian Tribe Neil Peyron, Chairperson P. O. Box 589 Porterville, CA 93258	X		X	X	Results only	Results only							
Tule River Indian Tribe Tribal Archaeological Department Joseph Garfield, Tribal Archaeologist P. O. Box 589 Porterville, CA 93258	X		X	X	Results only	Results only							
Tule River Indian Tribe Environmental Department Kerri Vera, Director P. O. Box 589 Porterville, CA 93258	X		X	X	Results only	Results only							
Wuksachi Indian Tribe/Eshom Valley Band Kenneth Woodrow, Chairperson 1179 Rock Haven Ct. Salinas, CA 93906	X		X	X	Results only	Results only							

APPENDIX D

TECHNICAL MEMORANDUM

WATER SUPPLY & WATER QUALITY

TECHNICAL MEMORANDUM
WATER SUPPLY & WATER QUALITY

Hash Farms Development Project

PREPARED FOR:

Tulare County Resources Management Agency
5961 South Mooney Blvd.
Visalia, CA 93277

APPLICANT:

Steve Hash Farms
P.O. Box 551270
Lake Tahoe, CA 96155

PREPARED BY:

Crawford & Bowen Planning, Inc.
113 N. Church Street, Suite 302
Visalia, CA 93291
Contact: Travis Crawford, AICP

November 2017

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1.0 Introduction and Project Description

The purpose of this Technical Memorandum is to disclose and analyze information related to water supply and water quality for a proposed residential development adjacent to the City of Kingsburg in Tulare County, California. This document has been prepared to supplement a CEQA document for the Project. The Project is being proposed by Steve Hash Farms (Applicant) for a 200 unit subdivision and related features on a 54-acre site that is zoned A-1 (Agriculture). Impact determination, as well as regulatory information in the context of CEQA, will be provided in the Project CEQA document.

The City of Kingsburg, Tulare County LAFCO, Fresno County, and Fresno County LAFCO are responsible agencies. Tulare County will be the proposed Lead Agency regarding this subdivision. The County of Tulare will only process the portion of the subdivision within Tulare County. However, the Lead Agency will produce the CEQA document for the project as a whole.

PROJECT LOCATION AND SETTING

The proposed Project will be located at the northwest corner of Kern Street and Road 16, immediately southeast of the City of Kingsburg city limits. The site is within the Kingsburg Urban Development Boundary. The proposed Project is located on APNs: 028-140-007, 012, 013, 018, and 022, Section 26, Township 16S, Range 22E M.D.B. & M. Major roadways in the area include SR 201 to the north and SR 99 to the west. Historically, grapes, plums, nectarines, and peaches have been grown on the proposed Project site, for at least the past five years. Surrounding properties include residential, a school, and agricultural uses.

DESCRIPTION OF PROPOSED PROJECT

The proposed Project will subdivide seven existing parcels into 160 single family lots, ten multi-family lots (up to 40 units), parks, and a remainder lot encompassing a total of approximately 54.07 acres (Project). Approximately 48 acres lies within the Tulare County Kingsburg Urban Development Boundary (UDB), whereas 2.6 acres resides in the City of Kingsburg and 2.4 acres is in Fresno County.

Water and Wastewater services will be provided by the City of Kingsburg through an inter-territorial agreement. Roads, water and wastewater lines will be constructed by the Project. The Project proponent will be required to work with the County to form a Homeowners Association or provide a financial mechanism to provide long term maintenance for the parks, stormwater basin, road and other infrastructure. The Project will seek to provide a seamless transition between existing City of Kingsburg residential neighborhoods and will provide other improvements (roadways, infrastructure, etc.) that is equivalent or better than City of Kingsburg development standards.

The Project is proposing to rezone the site from A-1 (Agriculture) to R-1 (Single Family Residential) within Tulare County and from R-1-6 to R-1-7 and R-1-6 PD in the City of Kingsburg. No General Plan Amendment is required to allow the proposed Project.

Figure 1
Proposed Site Plan

2.0 Physical Setting

GROUNDWATER HYDROLOGY

Tulare County has unconfined groundwater throughout the entire County, and confined groundwater in its western portion underlying the Kings, Kaweah and Tule Sub-basins. Areas near the Kings, Kaweah and Tule Rivers contain highly permeable soils with opportunities for natural and artificial recharge.[1] Tulare County is primarily underlain by three groundwater sub-basins within the San Joaquin Valley basin. These sub-basins are Kings, Kaweah and Tule.

The proposed Project lies over the Kings sub-basin. The Kings sub-basin underlies 96,000 acres of Fresno, Kings, and Tulare Counties, and is roughly bounded on its southern end by the Kings River Watershed boundary.[2] In the Kings sub-basin, groundwater flows from areas underlying Fresno County into aquifers underlying the Kings River area. Well yields in the Kings sub-basin average 500-1,500 gpm, with a maximum of 3,000 gpm, and an average depth of 210 feet.[3]

The Kings sub-basin is a "Type C" or low level of knowledge, basin, indicating that there is not enough data to estimate its groundwater extraction or a groundwater budget. Estimates of specific groundwater yields for the basin range from 0.2 percent to 36 percent.[4]

3.0 Project Water Demands

Water use on site will be primarily from single-family homes, a multi-family component and landscaping. Water use assumptions are as follows:

- 160 single family residential lots and 40 multi-family units
- 54.07 acres:
  - 47.8 for residential lots,
  - 2.54 landscaped open space/parks,
  - Remainder of acreage for roadways, etc.

[1] Tulare County General Plan EIR, Pg. 3.6-22.
[2] Ibid.
[3] Ibid.
[4] Ibid. Pg. 3.6-24

Project Water Demands Based on Kingsburg UWMP

To calculate projected water use, the Kingsburg UWMP assumes 330 gallons [of water] per day per person and 2.82 persons per household (page 3-2 of the *Kingsburg Urban Water Management Plan*). This equates to 186,120 gallons [of water] per day (200 X 2.82 X 330) or 67,933,800 gallons per year, or approximately 209 acre feet [of water] per year. In addition, the 2.52 acres of landscaped open space/parks would use approximately 10 acre feet [of water] per year for a total of 219 acre feet [of water] per year. According to the California Department of Water Resources *California Single Family Water Use Efficiency Study*, approximately 53% of residential water use is used for outdoor landscape irrigation. Using this figure, if drought tolerant landscaping reduces water use 75%, then the daily per capita water use would be reduced by approximately 131 gallons per day for a total of approximately 199 gallons per day per person (330 X 53% = 174.9 reduced by 75% = 43.7 added to 330 X 47% = 198.8 gallons per day). This equates to 112,236 gallons per day or 40,966,140 gallons per year, or approximately 126 acre feet per year (plus the 10 for parks/exterior landscaping). Total water use is estimated to be 136 acre feet of water per year assuming a 75% reduction in outdoor water use using the Kingsburg UWMP assumptions.

Water Demands Based on Tulare County General Plan

The Tulare County General Plan assumes 3.5 acre feet [of water] per acre per year for single family residential units (page 11 of the General Plan *Phase I Water Supply Evaluation)*. Based on 47.8 acres, this equates to approximately 168 acre feet [of water] per year. Using the same assumption of 53% of total use is for outdoor landscape irrigation, a reduction of 75% of outdoor irrigation would result in total water use of 101 acre feet per year. In addition, the 2.54 acres of landscaped open space/parks would use approximately 10 acre feet per year. Total is 111 acre feet of water per year assuming a 75% reduction in outdoor water use.

Estimated Water Use Using Kingsburg UWMP Assumptions

Estimated water use using Kingsburg UWMP	**With 50% outdoor reduction**	**With 75% outdoor reduction**	**Existing site water use***
209 acre/feet/year	154 acre/feet/year	136 acre/feet/year	121 acre/feet/year

* only takes into account the 38 acres currently in ag production, not the historical production of the entire 57 acres

Estimated Water Use Using Tulare County General Plan Assumptions

Estimated water use using County GP	**With 50% outdoor reduction**	**With 75% outdoor reduction**	**Existing site water use***
168 acre/feet/year	124 acre/feet/year	101 acre/feet/year	121 acre/feet/year

* only takes into account the 38 acres currently in ag production, not the historical production of the entire 57 acres

Existing Water Use

Water Use Comparison

The information below provides a comparison of existing (baseline) conditions versus potential water use based on full buildout of the proposed project. Existing agricultural water use is based on crop information contained in Tulare County's *Phase I Water Supply Evaluation.* The site has historically been farmed, but most recently, only 38 acres of the entire site has been farmed as follows:

- Grapes – 14 acres X 2.5 ac/ft = 35 ac/ft
- Plums – 14 acres X 3.6 ac/ft = 50.4 ac/ft
- Nectarines – 6 acres X 3.6 ac/ft = 21.6 ac/ft
- Peaches – 4 acres X 3.6 ac/ft = 14.4 ac/ft

Total: 121.4 ac/ft

It is estimated that current farming of the 38 acres on site requires approximately 121 acre feet per year which is slightly less than Project water demands as calculated using the assumptions in Kingsburg's UWMP and slightly more than the Project water demands as calculated using the assumptions in the Tulare County General Plan.

4.0 Water Supply

The Project site has historically used a combination of well water and surface water for agricultural purposes. Use of this water will cease once the proposed Project is implemented. The Project will be required to tie into the City of Kingsburg's water system. The Project Applicant has secured a "Will-Serve" letter from the water purveyor (See Appendix XX).

5.0 Water Quality

Groundwater Quality

Constituents found in urban runoff may degrade both surface water quality and eventually groundwater quality. Development of urban uses on the proposed project site would result in alteration in the existing site conditions and the introduction of urban pollutant sources. Urban runoff typically contains oils, grease, fuel, antifreeze, byproducts of combustion (such as lead, cadmium, nickel, and other metals) and other household pollutants. Precipitation early in the rain season displaces these pollutants into storm water resulting in high pollutant concentrations in initial wet weather runoff. This initial runoff with peak pollutant levels can be referred to as the "first flush" of storm events.

The amount of runoff generated by the proposed project would be greater than the runoff occurring under existing conditions due to a significant increase in impervious surfaces. There would be a corresponding increase in urban runoff pollutants and "first flush" roadway contaminants such as heavy metals, oil, grease, as well as an increase in nutrients (i.e., fertilizers), and other chemicals from landscaped areas. These constituents will result in water quality impacts that have the potential to be significant.

The proposed project will be served by an onsite storm water system which is subject to the requirements of the NPDES Storm Water Permit adopted by the SWRCB. This permit requires that discharges of pollutants from areas of new development be reduced to the maximum extent practicable. Compliance with this standard requires that control measures be incorporated into the design of new development to reduce pollution discharges in site runoff over the life of the project.

The CVRWQCB is responsible for administering NPDES permit requirements, such as the use of construction and operational BMPs, to ensure that projects are in compliance with water quality standards as set forth in the CWA. The SWRCB through the creation of a Storm Water Quality Task Force has published the California Storm Water Best Management Practice Construction Handbook, which identifies a listing of acceptable BMPs to be used in meeting water standards as outlined by the CWA.

6.0 Conclusion

The intent of this Technical Memorandum is to provide technical information for analysis in the Project EIR. Conclusions of significance are provided in the Project EIR.

APPENDIX E

TRAFFIC STUDY

Project No: 524-03

TRAFFIC STUDY

Hash Farms
Proposed Residential Development

Kingsburg, CA

Prepared for:

Crawford & Bowen Planning, Inc.

January 2017

Prepared by:

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Ian J. Parks, RCE 58155

REGISTERED PROFESSIONAL ENGINEER
IAN JEFFREY PARKS
No. 58155
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CIVIL
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INTRODUCTION

The purpose of this study is to evaluate the potential traffic impact of a proposed 46 acre residential development located in the southeastern area of the City of Kingsburg in Tulare County. The development will include 185 single-family and 28 multifamily dwelling units. A vicinity map is presented in Figure 1 and a location map is presented in Figure 2.

A. Study Area

The study area extends from Road 16 in the east, to State Route 99 in the west, and State Route 201 in the North, to Kern Street in the south.

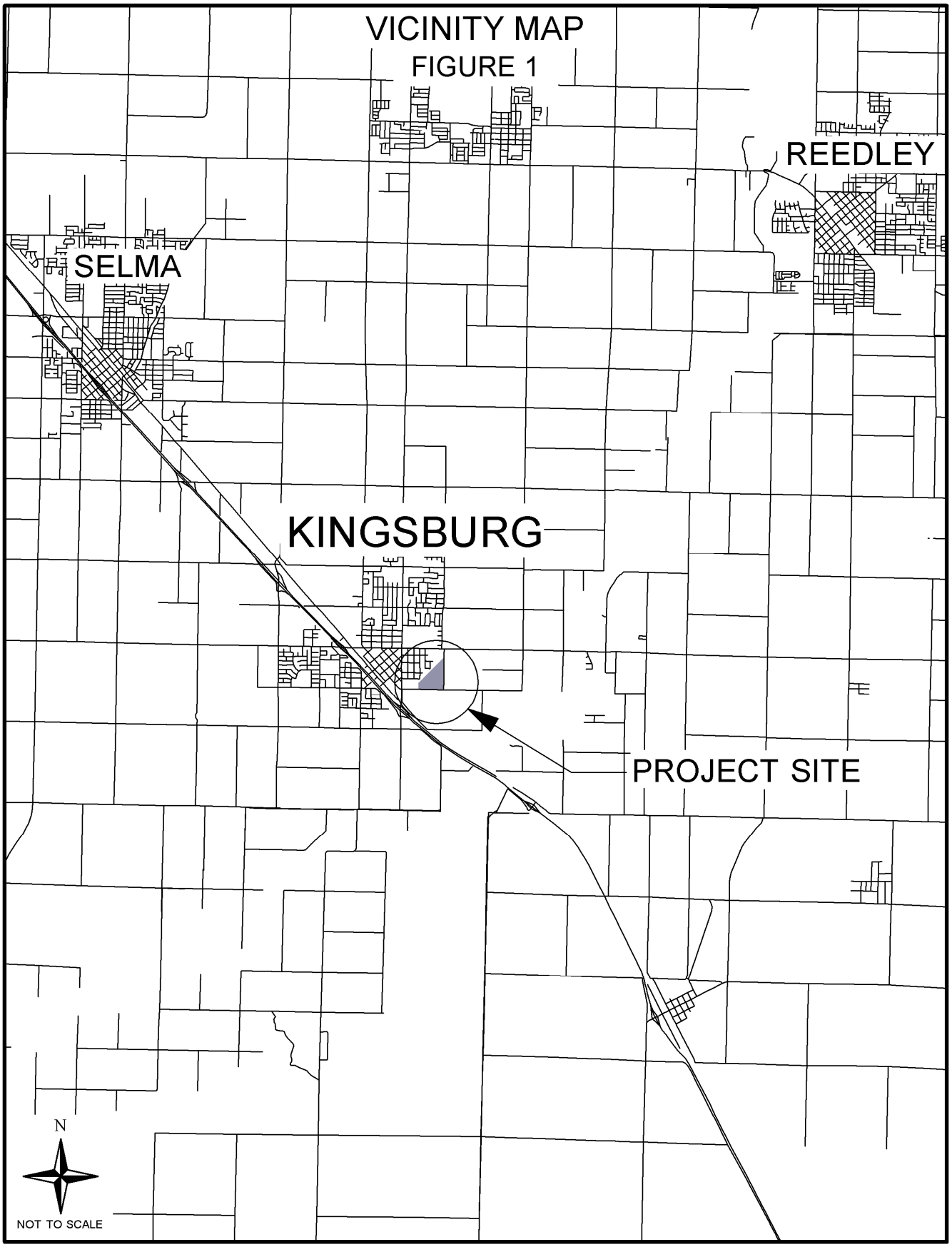
A total of 7 intersections are included in the study, 7 of which are stop controlled, and 1 that is signalized. The scope of the study was developed in association with the City of Kingsburg, the County of Tulare, and Caltrans. The scope is based on the guidelines contained in the "Guide for the Preparation of Traffic Impact Studies." The site lies on the western boarder of Tulare County, adjacent to the City of Kingsburg.

B. Existing Site Uses and Site Access

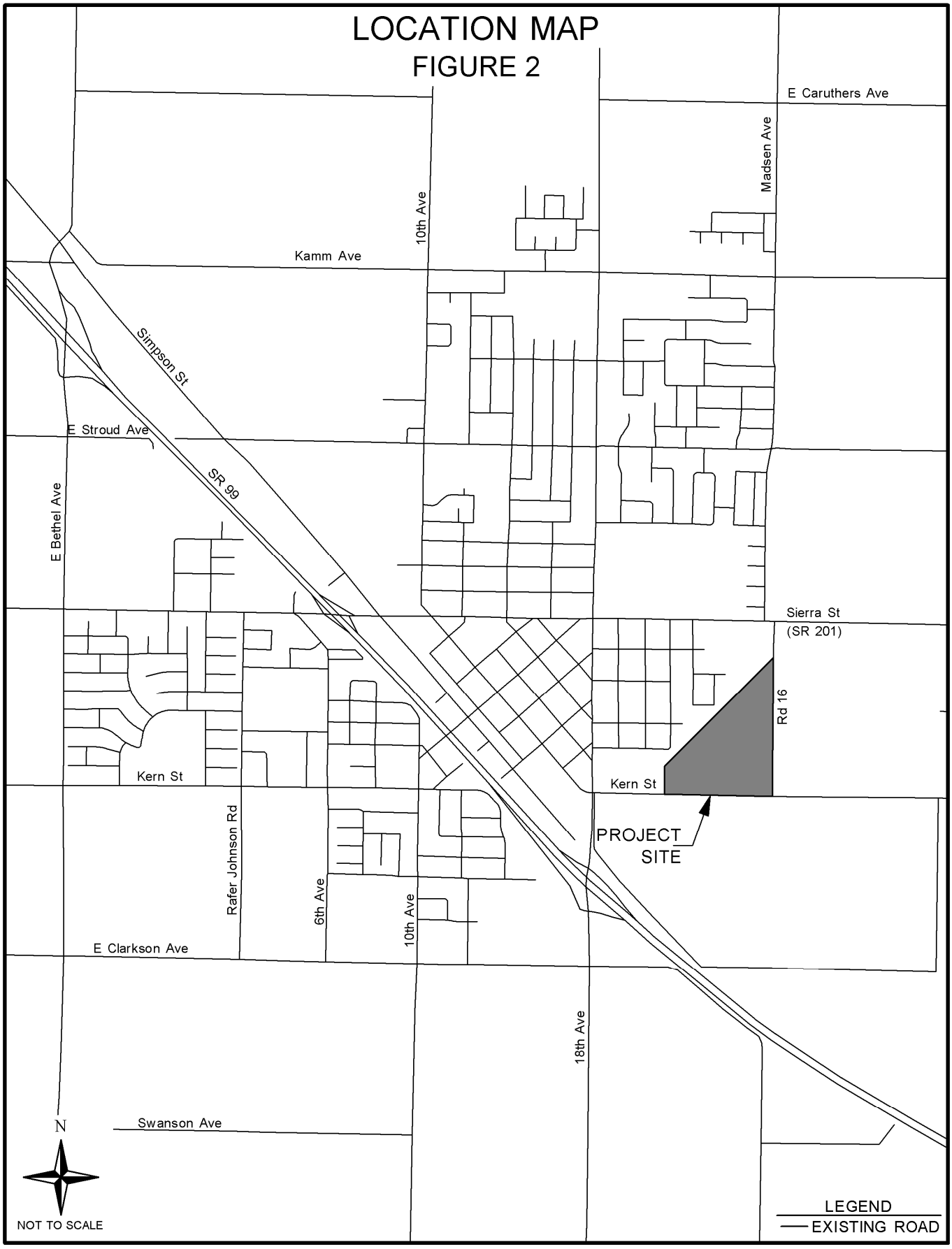
The site is currently being used for agricultural purposes. Site access is proposed along Road 16 to the east and Kern Street to the south.

C. Existing Uses in Vicinity of the Site

Existing land uses in the vicinity of the proposed development include agricultural land uses to the east and south, and residential development to the west and north. Kingsburg High School is also located northwest of the site, and Lincoln Elementary School is located immediately to the west of the site along Kern Street.


VICINITY MAP
FIGURE 1
REEDLEY
SELMA
KINGSBURG
PROJECT SITE
N
NOT TO SCALE

LOCATION MAP
FIGURE 2



D. Existing Streets and Intersections

Kern Street (Ave 396) is an east-west roadway that provides access to industrial and agricultural land uses. It is also the southern boundary of the project site and provides one of the project's access points. In the area of the project, Kern Street exists as a two-lane roadway with graded shoulders.

Madsen Avenue is a north-south roadway that provides access to agricultural and residential land uses. In the project area, Madsen Avenue exists as a two-lane roadway with graded shoulders.

Road 16 is a north-south roadway that provides access to agricultural and limited residential land uses. It is also the eastern boundary of the project site and provides one of the project's access points. In the project area, Road 16 exists as a two-lane roadway with graded shoulders.

State Route 201 (Sierra Street) is an east-west route in the central valley of California that connects State Route 99 in the City of Kingsburg to State Route 245. In the project area, it transitions from a 2-lane facility, to a 4-lane fully developed facility with a center 2-way left turn lane. State Route 201 provides access to residential and commercial land uses across the City of Kingsburg as well as Kingsburg High School.

State Route 99 is a major north-south route through the central valley of California, extending from Interstate 5 south of Bakersfield to Sacramento. State Route 99 operates as a 4-lane freeway through the City of Kingsburg and has interchanges at 18th Avenue and Sierra Street (SR 201) in the vicinity of the project.

18th Avenue is a north-south roadway that provides access to residential areas, Kingsburg High School, Lincoln Elementary School, and State Route 99. In the project area, 18th Avenue exists as a 2-lane roadway with curb and gutter adjacent to developments.

PROJECT TRIP GENERATION AND DESIGN HOUR VOLUMES

The trip generation and design hour volumes shown in Table 1 were calculated using the Institute of Transportation Engineers (ITE) Trip Generation, 9th Edition, as well as data provided in the project proposal. The AM/PM rate equations, and directional splits for ITE Land Use Code 210 (Single-Family detached Housing) and Code 220 (Apartment) were used to estimate the trip generation for the proposed project, for peak hour of adjacent street traffic. The peak hour of adjacent street traffic was determined to be from 7:30 AM to 8:30 AM and 4:30 PM to 5:30 PM.

Table 1
Project Trip Generation

General Information			Daily Trips		AM Peak Hour Trips			PM Peak Hour Trips		
ITE Code	Development Type	Variable	ADT RATE	ADT	Rate	In % Split/ Trips	Out % Split/ Trips	Rate	In % Split/ Trips	Out % Split/ Trips
210	Single-Family detached Housing	185 Dwelling Units	eq	1850	eq	25% 35	75% 104	eq	63% 115	37% 68
220	Apartment	28 Dwelling Units	eq	293	eq	20% 3	80% 14	eq	65% 21	35% 12
Total				2,143		38	118		136	80

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The project trip distribution was based on the most logically traveled routes for traffic accessing the project and a review of the potential draw from population centers within the region as well as the types of land uses involved. For purposes of this study, it was assumed that a majority of project traffic will travel north and south along State Route 99. These assumptions were used to distribute project traffic as shown in Figure 4 for the roadway system within the study scope.

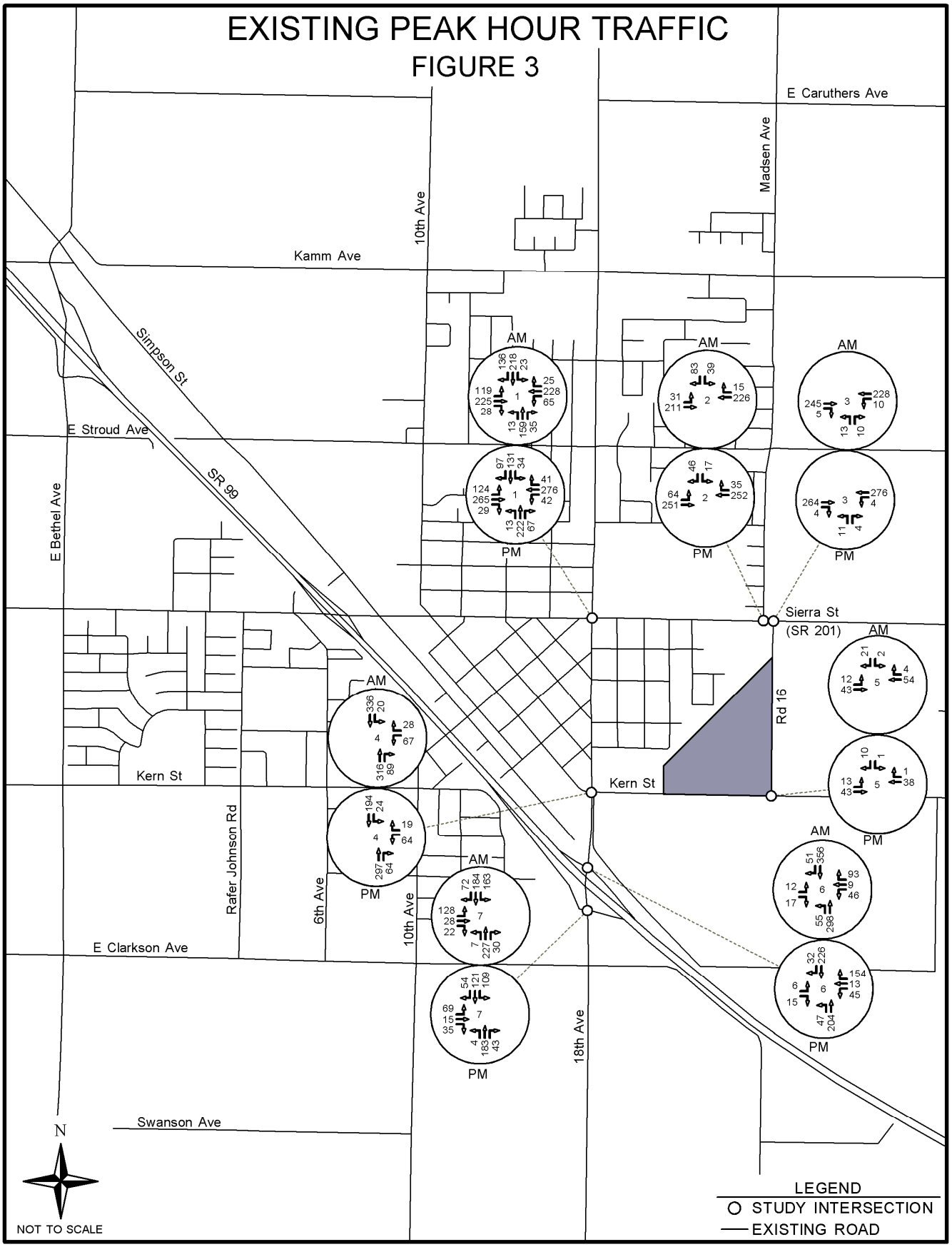
EXISTING AND FUTURE TRAFFIC

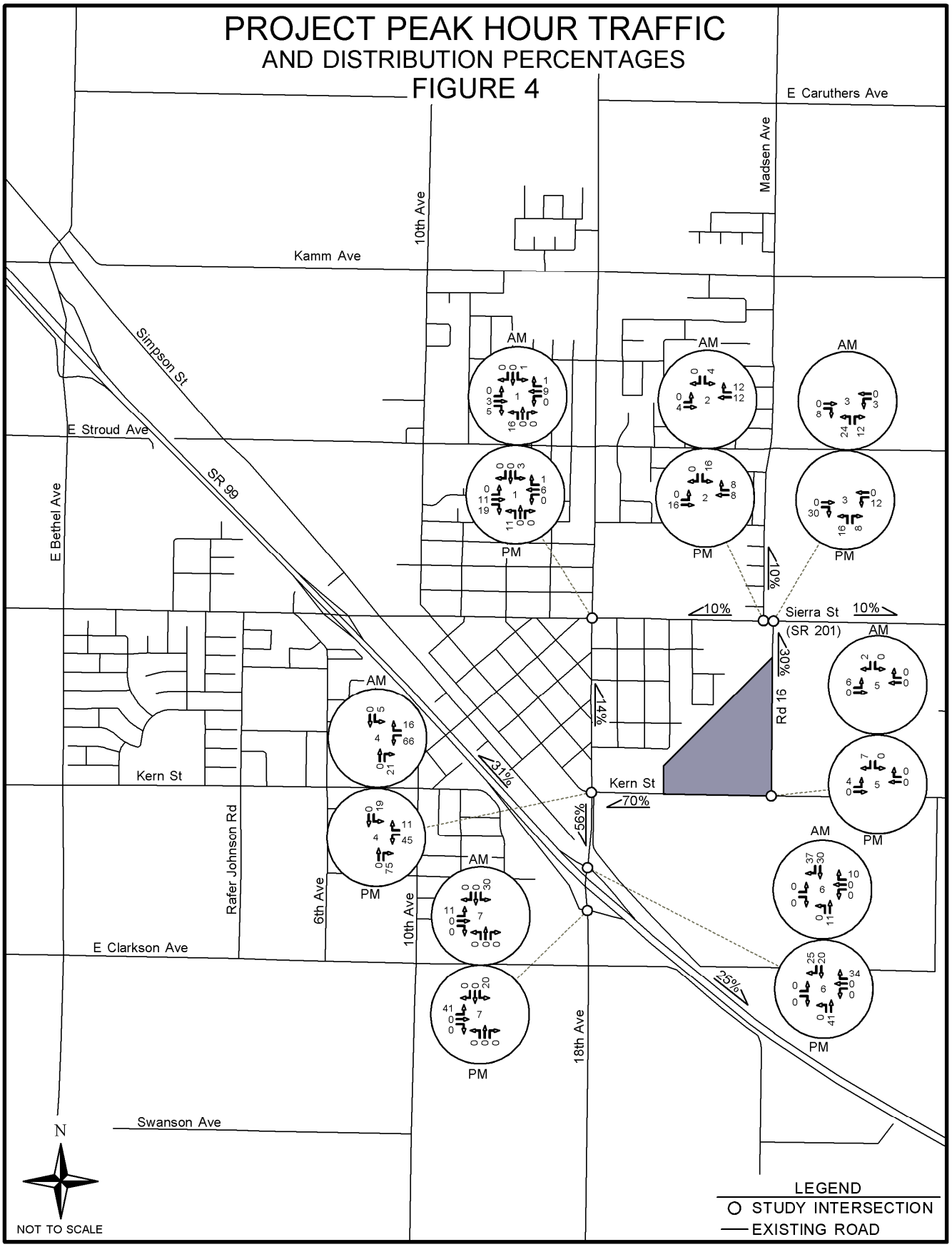
Existing weekday peak hour turning movement volumes were field measured at the following intersections in September 2014 (the City of Kingsburg approved the use of the 2014 count data):

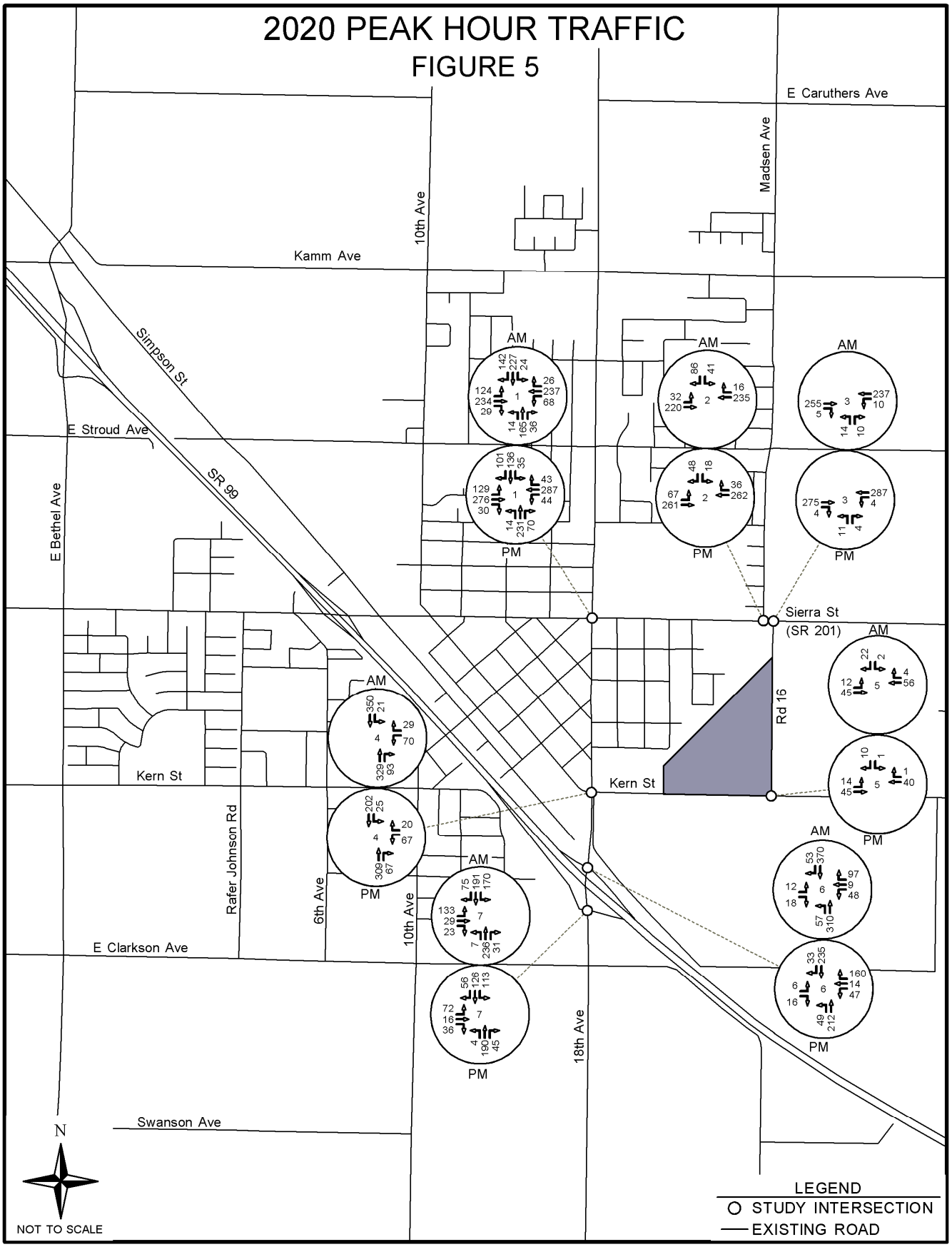
- Sierra Street (SR 201) & 18th Avenue
- Sierra Street (SR 201) & Madsen Avenue
- Sierra Street (SR 201) & Rd 16
- Kern Street (Ave 396) & 18th Avenue
- Kern Street (Ave 396) & Rd 16
- SR 99 NB On/Off Ramps & 18th Avenue
- SR 99 SB On/Off Ramps & 18th Avenue

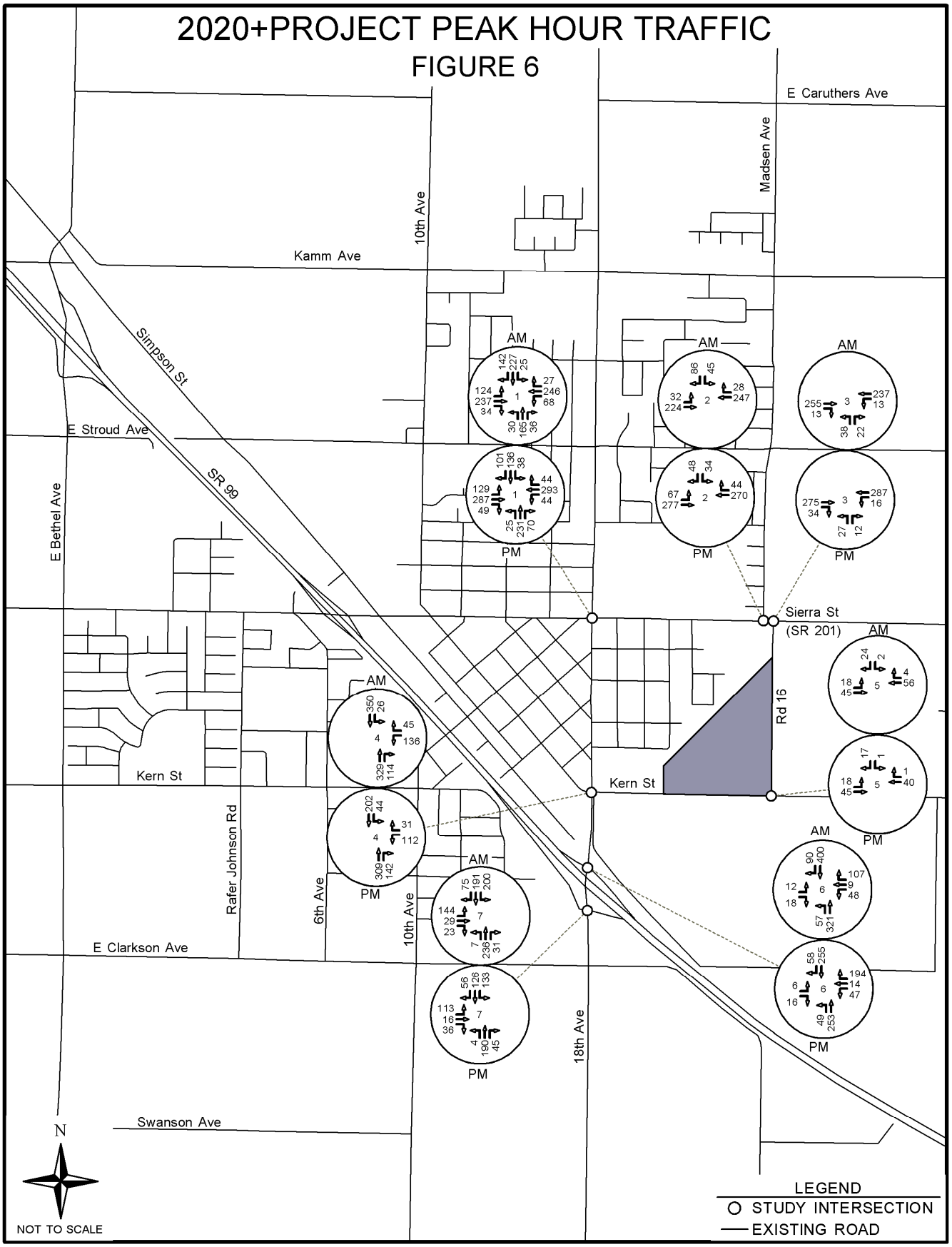
Existing peak hour turn movement volumes where field measured during the hours of 7:30 AM to 8:30 AM and 4:30 PM to 5:30 PM to coincide with the peak hour of adjacent street traffic.

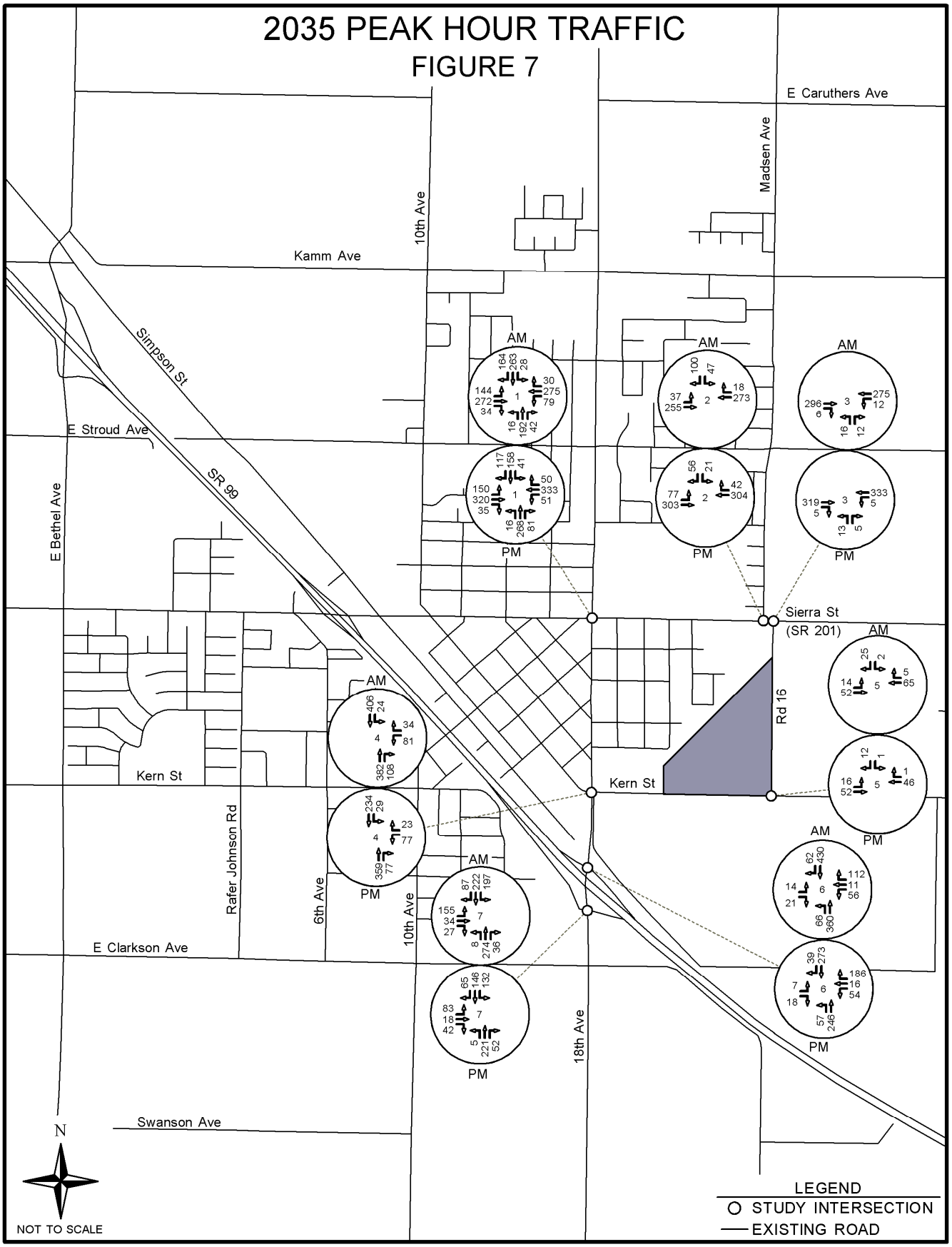
In order to determine future traffic volumes, an average annual growth rate of 1% was applied to existing traffic volumes for the 2020 assumed build year and the 2035 future year analyses. This rate was discussed and approved by the County of Tulare Planning Department. Investigation was also done in order to determine if any other proposed projects would impact the roadways within the scope of this study. No other known projects where found in the area. Future Peak Hour volumes are shown in Figures 5 through 8.

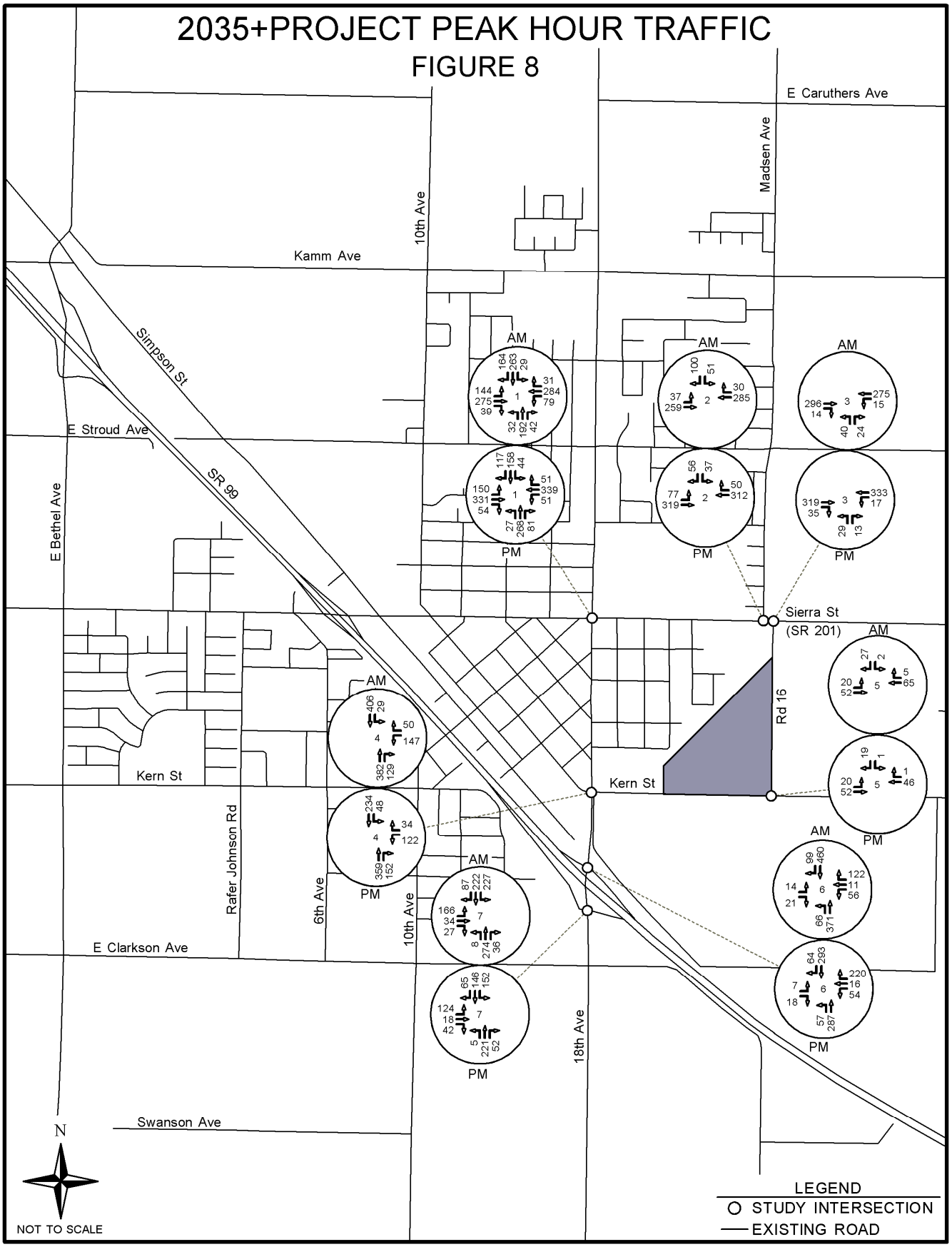

EXISTING PEAK HOUR TRAFFIC
FIGURE 3
E Caruthers Ave
Madsen Ave
10th Ave
Kamm Ave
Simpson St
E Stroud Ave
SR 99
E Bethel Ave
Sierra St
(SR 201)
Rd 16
Kern St
Rafer Johnson Rd
6th Ave
10th Ave
18th Ave
E Clarkson Ave
Swanson Ave
AM
PM
N
NOT TO SCALE
LEGEND
STUDY INTERSECTION
EXISTING ROAD


PROJECT PEAK HOUR TRAFFIC
AND DISTRIBUTION PERCENTAGES
FIGURE 4
E Caruthers Ave
Madsen Ave
10th Ave
Kamm Ave
Simpson St
E Stroud Ave
SR 99
E Bethel Ave
Sierra St
(SR 201)
Rd 16
Kern St
Rafer Johnson Rd
6th Ave
10th Ave
E Clarkson Ave
18th Ave
Swanson Ave
AM
PM
10%
14%
30%
31%
56%
70%
25%
N
NOT TO SCALE
LEGEND
STUDY INTERSECTION
EXISTING ROAD


2020 PEAK HOUR TRAFFIC
FIGURE 5
E Caruthers Ave
Madsen Ave
10th Ave
Kamm Ave
Simpson St
E Stroud Ave
SR 99
E Bethel Ave
Sierra St
(SR 201)
Rd 16
Kern St
Rafer Johnson Rd
6th Ave
E Clarkson Ave
18th Ave
Swanson Ave
AM
PM
N
NOT TO SCALE
LEGEND
STUDY INTERSECTION
EXISTING ROAD


2020+PROJECT PEAK HOUR TRAFFIC
FIGURE 6
E Caruthers Ave
Madsen Ave
10th Ave
Kamm Ave
Simpson St
E Stroud Ave
SR 99
E Bethel Ave
Sierra St
(SR 201)
Rd 16
Kern St
Rafer Johnson Rd
6th Ave
E Clarkson Ave
18th Ave
Swanson Ave
AM
PM
N
NOT TO SCALE
LEGEND
STUDY INTERSECTION
EXISTING ROAD


2035 PEAK HOUR TRAFFIC
FIGURE 7
E Caruthers Ave
Madsen Ave
10th Ave
Kamm Ave
Simpson St
E Stroud Ave
SR 99
E Bethel Ave
Sierra St
(SR 201)
Rd 16
Kern St
Rafer Johnson Rd
6th Ave
E Clarkson Ave
18th Ave
Swanson Ave
AM
PM
N
NOT TO SCALE
LEGEND
STUDY INTERSECTION
EXISTING ROAD


2035+PROJECT PEAK HOUR TRAFFIC
FIGURE 8
E Caruthers Ave
Madsen Ave
10th Ave
Kamm Ave
Simpson St
E Stroud Ave
SR 99
E Bethel Ave
Sierra St
(SR 201)
Rd 16
Kern St
Rafer Johnson Rd
6th Ave
10th Ave
18th Ave
E Clarkson Ave
Swanson Ave
AM
PM
N
NOT TO SCALE
LEGEND
STUDY INTERSECTION
EXISTING ROAD

INTERSECTION ANALYSIS

A capacity analysis of the study intersections was conducted using Synchro 9 software from Trafficware. This software utilizes the capacity analysis methodology in the Transportation Research Board's Highway Capacity Manual. The analysis was performed for the following AM and PM Peak Hour traffic scenarios:

- Existing
- Build Year (2020)
- Build Year + Project (2020)
- Future (2035)
- Future (2035) + Project

Criteria for intersection level of service (LOS) are shown in the tables below.

LEVEL OF SERVICE CRITERIA
UNSIGNALIZED INTERSECTION

Average Control Delay (sec/veh)	Level of Service	Expected Delay to Minor Street Traffic
≤ 10	A	Little or no delay
> 10 and ≤ 15	B	Short traffic delays
> 15 and ≤ 25	C	Average traffic delays
> 25 and ≤ 35	D	Long traffic delays
> 35 and ≤ 50	E	Very long traffic delays
> 50	F	Extreme delays

LEVEL OF SERVICE CRITERIA
SIGNALIZED INTERSECTIONS

Volume/Capacity	Control Delay (sec/veh)	Level of Service
< 0.60	≤ 10	A
0.61 - 0.70	> 10 and ≤ 20	B
0.71 - 0.80	> 20 and ≤ 35	C
0.81 - 0.90	> 35 and ≤ 55	D
0.91 - 1.00	> 55 and ≤ 80	E
> 1.0	> 80	F

The City of Kingsburg Traffic Impact Study Guidelines states that the peak hour level of service for intersections shall be no lower than LOS "D" for the existing and future scenarios. Level of service for the study intersections is presented in Tables 3a, 3b, 4a, and 4b.

Table 3a
Unsignalized Intersection Level of Service
AM Peak Hour

#	Intersection	Movement	Existing	Build Year 2020	Build Yr+Proj 2020	2035	2035+ Project	2035+ Project w/Mit[1]
2	Madsen Ave & Sierra St (SR-201)	SB	B	B	B	B	B	-
3	Road 16 & Sierra St (SR-201)	NB	B	B	B	B	B	-
4	18th Ave & Kern St (Ave 396)	EB WB	A C	A C	A E	A D	A F	B
5	Road 16 & Kern St (Ave 396)	SB	A	A	A	A	A	-
6	18th Ave & SR 99 NB Off Ramp	EB WB	C C	C C	C C	C C	D C	-
7	18th Ave & SR 99 SB Off Ramp	EB	E	E	F	F	F	B

[1]See Table 7 for mitigation details

Table 3b
Unsignalized Intersection Level of Service
PM Peak Hour

#	Intersection	Movement	Existing	Build Year 2020	Build Yr+Proj 2020	2035	2035+ Project	2035+ Project w/Mit[1]
2	Madsen Ave & Sierra St (SR-201)	SB	B	B	B	B	C	-
3	Road 16 & Sierra St (SR-201)	NB	B	B	B	B	B	-
4	18th Ave & Kern St (Ave 396)	EB WB	A C	A C	A C	A C	A D	B[2]
5	Road 16 & Kern St (Ave 396)	SB	A	A	A	A	A	-
6	18th Ave & SR 99 NB Off Ramp	EB WB	B B	B B	B B	B B	C C	-
7	18th Ave & SR 99 SB Off Ramp	EB	B	B	C	C	C	B[2]

[1]See Table 7 for mitigation details
[2]Mitigation due to AM level of service.

Table 4a
Signalized Intersection Level of Service
AM Peak Hour

#	Intersection	Existing	Build Year 2020	Build Yr+Proj 2020	2035	2035+ Project
1	18th Ave & Sierra St (SR-201)	C	C	C	C	C

Table 4b
Signalized Intersection Level of Service
PM Peak Hour

#	Intersection	Existing	Build Year 2020	Build Yr+Proj 2020	2035	2035+ Project
1	18th Ave & Sierra St (SR-201)	C	C	C	C	C

ROADWAY ANALYSIS

A capacity analysis of the study roadways was conducted using HCS software from McTrans. This software utilizes the capacity analysis methodology in the Transportation Research Board's Highway Capacity Manual. The City of Kingsburg Traffic Impact Study Guidelines states that the peak hour level of service for roadways shall be no lower than LOS "D" for urban areas for the existing and future scenarios. The analysis was performed for the following AM and PM traffic scenarios:

- Existing
- Build Year (2020)
- Build Year + Project (2020)
- Future (2035)
- Future (2035) + Project

Table 5
ROADWAY LEVEL OF SERVICE

Street	Existing Directional LOS		Build Year 2020 Directional LOS		2020+Project Directional LOS		2035 Directional LOS		2035+Project Directional LOS	
	E/S AM/PM	W/N AM/PM	E/S AM/PM	W/N AM/PM	E/S AM/PM	W/N AM/PM	E/S AM/PM	W/N AM/PM	E/S AM/PM	W/N AM/PM
18th Ave: Kern St (Ave 396) - SR 99	B/C	C/C	C/B	C/C	C/C	D/D	D/C	D/C	D/C	D/D
18th Ave: Sierra st - Kern St (Ave 396)	C/B	C/C	C/B	C/C	C/B	C/C	C/B	C/C	C/B	C/C
18th Ave: SR 99 Ramp - SR 99 Ramp	C/B	C/C	C/B	C/C	C/C	D/C	C/C	D/C	C/C	D/C
Kern St (Ave 396): 18th Ave - Rd 16	A/A	A/A	A/A	A/A	B/B	B/B	B/A	B/A	B/B	B/B
Road 16: Sierra St - Kern St (Ave 396)	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A
Sierra St: 18th Ave - Rd 16	C/C	C/C	C/C	C/C	C/C	C/C	C/C	C/C	C/C	C/D

TRAFFIC SIGNAL WARRANT ANALYSIS

Peak hour signal warrants were evaluated for each of the unsignalized intersections within the study based on the California Manual on Uniform Traffic Control Devices (MUTCD). Peak hour signal warrants assess delay to traffic on the minor street approaches when entering or crossing a major street. Signal warrant analysis results for AM and PM peak hours are shown in Tables 6a and 6b.

It is important to note that a signal warrant defines the minimum condition under which signalization of an intersection might be warranted. Meeting this threshold does not suggest traffic signals are required, but rather, that other traffic factors and conditions be considered in order to determine whether signals are truly justified.

It is also noted that signal warrants do not necessarily correlate with level of service. An intersection may satisfy a signal warrant condition and operate at or above an acceptable level of service, or operate below an acceptable level of service and not meet signal warrant criteria.

Table 6a
AM Traffic Signal Warrants

		Existing			Build Year 2020			2020+Project			2035			2035+Project		
#	Intersection	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
2	Madsen Ave at Sierra St (SR-201)	483	122	NO	503	127	NO	531	131	NO	583	147	NO	611	151	NO
3	Road 16 at Sierra St (SR-201)	488	23	NO	507	24	NO	518	60	NO	589	28	NO	600	64	NO
4	18th Ave at Kern St (Ave 396)	761	95	NO	793	99	NO	819	181	YES	920	115	NO	946	197	YES
5	Road 16 at Kern St (Ave 396)	113	23	NO	117	24	NO	123	26	NO	136	27	NO	142	29	NO
6	18th Ave at SR 99 NB Off Ramp	760	148	NO	790	154	NO	868	164	YES	918	179	YES	996	189	YES
7	18th Ave at SR 99 SB Off Ramp	683	178	NO	710	185	NO	740	196	YES	824	216	YES	854	227	YES

Table 6b
PM Traffic Signal Warrants

		Existing			Build Year 2020			2020+Project			2035			2035+Project		
#	Intersection	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met	Major Street Total Approach Vol	Minor Street High Approach Vol	Warrant Met
2	Madsen Ave at Sierra St (SR-201)	602	63	NO	626	66	NO	658	82	NO	726	77	NO	758	93	NO
3	Road 16 at Sierra St (SR-201)	548	15	NO	570	15	NO	612	39	NO	662	18	NO	704	42	NO
4	18th Ave at Kern St (Ave 396)	579	83	NO	603	87	NO	697	143	NO	699	100	NO	793	156	NO
5	Road 16 at Kern St (Ave 396)	95	11	NO	100	11	NO	104	18	NO	115	13	NO	119	20	NO
6	18th Ave at SR 99 NB Off Ramp	509	212	NO	529	221	NO	615	255	YES	615	256	YES	701	290	YES
7	18th Ave at SR 99 SB Off Ramp	514	119	NO	534	124	NO	554	165	NO	621	143	NO	641	184	NO

MITIGATION

Table 7 lists the intersection improvements needed by the year 2035 in order to maintain an acceptable operational level of service for the street system within the project scope.

Table 7
Future Intersection Improvements and Local Mitigation

#	Intersection	Total Improvements Required by 2035	Project % Share for Local Mitigation
4	18th Ave & Kern St (Ave 396)	Install Signal Add 1 Westbound Left Turn	37.63%
7	18th Ave & SR 99 SB Off Ramp	Install Signal*	18.64%

*As an alternate improvement option, Caltrans should also explore the possibility of constructing a roundabout.

SUMMARY AND CONCLUSIONS

This study has evaluated the potential traffic impact of a proposed 46 acre residential development located in the southeastern area of the City of Kingsburg in Tulare County. The development will include 185 single-family and 28 multifamily dwelling units.

Level of Service Analysis

Of the 7 intersections within the scope of this study, one operates below an acceptable level of service during peak hours in the existing year prior to the addition of project traffic (18th Avenue & State Route 99 SB Off Ramp – AM only). As shown in Table 3, intersection signalization will reduce the impact to a less then significant level; however Caltrans should also explore the possibility of a roundabout as an alternate improvement measure.

By the build year 2020, one additional intersection is anticipated to operate below an acceptable level of service during the AM peak hour (18th Avenue & Kern Street). As shown in Table 3, intersection signalization will reduce the impact to a less then significant level.

All other intersections operate at acceptable levels of service during peak hours through the future year with the addition of project traffic.

Roadway Capacity

All roadways within the project scope operate, in the current and future years, at or above LOS D and are anticipated to do so with the addition of project traffic.

Conclusion

Based on the City of Kingsburg's standards for determining whether project traffic has a significant impact on intersections and roadways, the intersection identified in Table 7 will require mitigation in order to reduce the impacts for the listed facilities to less-than-significant levels in the year 2035.

REFERENCES

1. 2013 Annual Traffic Census, TCAG
2. Highway Capacity Manual, Transportation Research Board
3. Tulare County General Plan, approved 2011
4. Manual on Uniform Traffic Control Devices for Streets and Highways, 2012 Edition, Federal Highway Administration (FHA)
5. Trip Generation, 9th Edition, Institute of Transportation Engineers (ITE)

APPENDIX

Intersection 1
18th Ave & Sierra St (SR-201)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	265	29	42	276	41	13	222	67	34	131	97
Future Volume (veh/h)	124	265	29	42	276	41	13	222	67	34	131	97
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1810	1750	1667	1810	1750	1750	1810	1750	1667	1810	1667
Adj Flow Rate, veh/h	135	288	32	46	300	45	14	241	73	37	142	105
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	174	828	92	66	690	104	50	411	121	292	571	444
Arrive On Green	0.11	0.52	0.51	0.04	0.45	0.44	0.32	0.32	0.31	0.32	0.32	0.32
Sat Flow, veh/h	1587	1599	178	1587	1537	231	33	1303	382	949	1810	1405
Grp Volume(v), veh/h	135	0	320	46	0	345	328	0	0	37	142	105
Grp Sat Flow(s),veh/h/ln	1587	0	1777	1587	0	1767	1718	0	0	949	1810	1405
Q Serve(g_s), s	7.9	0.0	10.1	2.7	0.0	12.7	0.0	0.0	0.0	0.0	5.5	5.2
Cycle Q Clear(g_c), s	7.9	0.0	10.1	2.7	0.0	12.7	15.1	0.0	0.0	6.2	5.5	5.2
Prop In Lane	1.00		0.10	1.00		0.13	0.04		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	174	0	920	66	0	794	582	0	0	292	571	444
V/C Ratio(X)	0.78	0.00	0.35	0.70	0.00	0.43	0.56	0.00	0.00	0.13	0.25	0.24
Avail Cap(c_a), veh/h	302	0	920	135	0	794	582	0	0	292	571	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.2	0.0	13.5	45.0	0.0	17.9	27.5	0.0	0.0	24.4	24.1	24.0
Incr Delay (d2), s/veh	7.2	0.0	1.0	12.7	0.0	1.7	3.9	0.0	0.0	0.9	1.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	5.2	1.4	0.0	6.5	7.8	0.0	0.0	0.8	2.9	2.2
LnGrp Delay(d),s/veh	48.3	0.0	14.5	57.6	0.0	19.7	31.4	0.0	0.0	25.3	25.2	25.3
LnGrp LOS	D		B	E		B	C			C	C	C
Approach Vol, veh/h		455			391			328			284	
Approach Delay, s/veh		24.6			24.1			31.4			25.2	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		34.0	7.8	53.2		34.0	14.3	46.7
Change Period (Y+Rc), s		4.9	4.5	4.6		4.9	4.5	4.6
Max Green Setting (Gmax), s		29.1	7.5	44.4		29.1	17.5	34.4
Max Q Clear Time (g_c+I1), s		17.1	4.7	12.1		8.2	9.9	14.7
Green Ext Time (p_c), s		2.2	0.0	2.9		2.6	0.2	2.7

Intersection Summary	
HCM 2010 Ctrl Delay	26.1
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	129	276	30	44	287	43	14	231	70	35	136	101
Future Volume (veh/h)	129	276	30	44	287	43	14	231	70	35	136	101
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1810	1750	1667	1810	1750	1750	1810	1750	1667	1810	1667
Adj Flow Rate, veh/h	140	300	33	48	312	47	15	251	76	38	148	110
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	179	792	87	68	653	98	51	438	129	307	610	474
Arrive On Green	0.11	0.49	0.49	0.04	0.43	0.42	0.34	0.34	0.33	0.34	0.34	0.34
Sat Flow, veh/h	1587	1601	176	1587	1536	231	34	1301	382	938	1810	1406
Grp Volume(v), veh/h	140	0	333	48	0	359	342	0	0	38	148	110
Grp Sat Flow(s),veh/h/ln	1587	0	1777	1587	0	1767	1717	0	0	938	1810	1406
Q Serve(g_s), s	8.2	0.0	11.1	2.8	0.0	13.9	0.0	0.0	0.0	0.0	5.6	5.3
Cycle Q Clear(g_c), s	8.2	0.0	11.1	2.8	0.0	13.9	15.4	0.0	0.0	6.3	5.6	5.3
Prop In Lane	1.00		0.10	1.00		0.13	0.04		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	179	0	880	68	0	751	618	0	0	307	610	474
V/C Ratio(X)	0.78	0.00	0.38	0.70	0.00	0.48	0.55	0.00	0.00	0.12	0.24	0.23
Avail Cap(c_a), veh/h	286	0	880	135	0	751	618	0	0	307	610	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.0	0.0	14.9	44.9	0.0	19.7	26.1	0.0	0.0	23.0	22.8	22.7
Incr Delay (d2), s/veh	7.2	0.0	1.2	12.3	0.0	2.2	3.5	0.0	0.0	0.8	0.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	0.0	5.7	1.5	0.0	7.2	8.0	0.0	0.0	0.8	3.0	2.2
LnGrp Delay(d),s/veh	48.2	0.0	16.2	57.2	0.0	21.9	29.6	0.0	0.0	23.8	23.7	23.8
LnGrp LOS	D		B	E		C	C			C	C	C
Approach Vol, veh/h		473			407			342			296	
Approach Delay, s/veh		25.7			26.1			29.6			23.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		36.0	8.0	51.0		36.0	14.6	44.4
Change Period (Y+Rc), s		4.9	4.5	4.6		4.9	4.5	4.6
Max Green Setting (Gmax), s		31.1	7.5	42.4		31.1	16.5	33.4
Max Q Clear Time (g_c+I1), s		17.4	4.8	13.1		8.3	10.2	15.9
Green Ext Time (p_c), s		2.4	0.0	3.0		2.8	0.2	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	129	287	49	44	293	44	25	231	70	38	136	101
Future Volume (veh/h)	129	287	49	44	293	44	25	231	70	38	136	101
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1810	1750	1667	1810	1750	1750	1810	1750	1667	1810	1667
Adj Flow Rate, veh/h	140	312	53	48	318	48	27	251	76	41	148	110
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	267	746	127	68	566	85	65	424	123	303	610	474
Arrive On Green	0.17	0.49	0.49	0.04	0.37	0.36	0.34	0.34	0.33	0.34	0.34	0.34
Sat Flow, veh/h	1587	1507	256	1587	1535	232	73	1257	364	938	1810	1406
Grp Volume(v), veh/h	140	0	365	48	0	366	354	0	0	41	148	110
Grp Sat Flow(s),veh/h/ln	1587	0	1763	1587	0	1767	1694	0	0	938	1810	1406
Q Serve(g_s), s	7.6	0.0	12.5	2.8	0.0	15.7	2.7	0.0	0.0	0.0	5.6	5.3
Cycle Q Clear(g_c), s	7.6	0.0	12.5	2.8	0.0	15.7	16.3	0.0	0.0	6.8	5.6	5.3
Prop In Lane	1.00		0.15	1.00		0.13	0.08		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	267	0	872	68	0	651	611	0	0	303	610	474
V/C Ratio(X)	0.52	0.00	0.42	0.70	0.00	0.56	0.58	0.00	0.00	0.14	0.24	0.23
Avail Cap(c_a), veh/h	269	0	872	135	0	651	611	0	0	303	610	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.0	0.0	15.3	44.9	0.0	23.9	26.3	0.0	0.0	23.1	22.8	22.7
Incr Delay (d2), s/veh	1.8	0.0	1.5	12.3	0.0	3.5	4.0	0.0	0.0	0.9	0.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.0	6.4	1.5	0.0	8.3	8.4	0.0	0.0	0.9	3.0	2.2
LnGrp Delay(d),s/veh	37.8	0.0	16.8	57.2	0.0	27.4	30.3	0.0	0.0	24.1	23.7	23.8
LnGrp LOS	D		B	E		C	C			C	C	C
Approach Vol, veh/h		505			414			354			299	
Approach Delay, s/veh		22.6			30.9			30.3			23.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		36.0	8.0	51.0		36.0	20.0	39.0
Change Period (Y+Rc), s		4.9	4.5	4.6		4.9	4.6	* 4.6
Max Green Setting (Gmax), s		31.1	7.5	42.4		31.1	15.5	* 34
Max Q Clear Time (g_c+I1), s		18.3	4.8	14.5		8.8	9.6	17.7
Green Ext Time (p_c), s		2.4	0.0	2.2		2.9	1.1	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	26.7
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	320	35	51	333	50	16	268	81	41	158	117
Future Volume (veh/h)	150	320	35	51	333	50	16	268	81	41	158	117
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1810	1750	1667	1810	1750	1750	1810	1750	1667	1810	1667
Adj Flow Rate, veh/h	163	348	38	55	362	54	17	291	88	45	172	127
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	203	784	86	77	630	94	51	437	128	270	610	474
Arrive On Green	0.13	0.49	0.48	0.05	0.41	0.40	0.34	0.34	0.33	0.34	0.34	0.34
Sat Flow, veh/h	1587	1603	175	1587	1538	229	35	1298	381	895	1810	1406
Grp Volume(v), veh/h	163	0	386	55	0	416	396	0	0	45	172	127
Grp Sat Flow(s),veh/h/ln	1587	0	1778	1587	0	1767	1714	0	0	895	1810	1406
Q Serve(g_s), s	9.5	0.0	13.5	3.2	0.0	17.3	2.2	0.0	0.0	0.0	6.6	6.3
Cycle Q Clear(g_c), s	9.5	0.0	13.5	3.2	0.0	17.3	18.7	0.0	0.0	9.3	6.6	6.3
Prop In Lane	1.00		0.10	1.00		0.13	0.04		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	203	0	869	77	0	725	617	0	0	270	610	474
V/C Ratio(X)	0.80	0.00	0.44	0.71	0.00	0.57	0.64	0.00	0.00	0.17	0.28	0.27
Avail Cap(c_a), veh/h	286	0	869	135	0	725	617	0	0	270	610	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.3	0.0	15.9	44.5	0.0	21.7	27.1	0.0	0.0	24.0	23.1	23.0
Incr Delay (d2), s/veh	10.5	0.0	1.6	11.4	0.0	3.3	5.1	0.0	0.0	1.3	1.2	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	0.0	6.9	1.7	0.0	9.1	9.8	0.0	0.0	1.0	3.5	2.6
LnGrp Delay(d),s/veh	50.8	0.0	17.5	55.9	0.0	25.0	32.2	0.0	0.0	25.3	24.2	24.3
LnGrp LOS	D		B	E		C	C			C	C	C
Approach Vol, veh/h		549			471			396			344	
Approach Delay, s/veh		27.4			28.6			32.2			24.4	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		36.0	8.5	50.5		36.0	16.1	42.9
Change Period (Y+Rc), s		4.9	4.5	4.6		4.9	4.5	4.6
Max Green Setting (Gmax), s		31.1	7.5	42.4		31.1	16.5	33.4
Max Q Clear Time (g_c+I1), s		20.7	5.2	15.5		11.3	11.5	19.3
Green Ext Time (p_c), s		2.5	0.0	3.6		3.3	0.2	3.1

Intersection Summary	
HCM 2010 Ctrl Delay	28.2
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	331	54	51	339	51	27	268	81	44	158	117
Future Volume (veh/h)	150	331	54	51	339	51	27	268	81	44	158	117
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1810	1750	1667	1810	1750	1750	1810	1750	1667	1810	1667
Adj Flow Rate, veh/h	163	360	59	55	368	55	29	291	88	48	172	127
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	267	741	122	77	566	85	64	423	123	265	610	474
Arrive On Green	0.17	0.49	0.48	0.05	0.37	0.36	0.34	0.34	0.33	0.34	0.34	0.34
Sat Flow, veh/h	1587	1516	248	1587	1537	230	70	1257	365	895	1810	1406
Grp Volume(v), veh/h	163	0	419	55	0	423	408	0	0	48	172	127
Grp Sat Flow(s),veh/h/ln	1587	0	1764	1587	0	1767	1692	0	0	895	1810	1406
Q Serve(g_s), s	9.0	0.0	15.1	3.2	0.0	18.9	6.7	0.0	0.0	0.0	6.6	6.3
Cycle Q Clear(g_c), s	9.0	0.0	15.1	3.2	0.0	18.9	19.7	0.0	0.0	9.8	6.6	6.3
Prop In Lane	1.00		0.14	1.00		0.13	0.07		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	267	0	863	77	0	651	610	0	0	265	610	474
V/C Ratio(X)	0.61	0.00	0.49	0.71	0.00	0.65	0.67	0.00	0.00	0.18	0.28	0.27
Avail Cap(c_a), veh/h	269	0	863	135	0	651	610	0	0	265	610	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.6	0.0	16.3	44.5	0.0	24.9	27.4	0.0	0.0	24.1	23.1	23.0
Incr Delay (d2), s/veh	3.9	0.0	2.0	11.4	0.0	5.0	5.7	0.0	0.0	1.5	1.2	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	0.0	7.8	1.7	0.0	10.1	10.3	0.0	0.0	1.1	3.5	2.6
LnGrp Delay(d),s/veh	40.5	0.0	18.2	55.9	0.0	29.9	33.1	0.0	0.0	25.6	24.2	24.3
LnGrp LOS	D		B	E		C	C			C	C	C
Approach Vol, veh/h		582			478			408			347	
Approach Delay, s/veh		24.5			32.9			33.1			24.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		36.0	8.5	50.5		36.0	20.0	39.0
Change Period (Y+Rc), s		4.9	4.5	4.6		4.9	4.6	* 4.6
Max Green Setting (Gmax), s		31.1	7.5	42.4		31.1	15.5	* 34
Max Q Clear Time (g_c+I1), s		21.7	5.2	17.1		11.8	11.0	20.9
Green Ext Time (p_c), s		2.5	0.0	2.5		3.3	1.1	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	28.6
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	225	28	65	228	25	13	159	35	23	218	136
Future Volume (veh/h)	119	225	28	65	228	25	13	159	35	23	218	136
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1810	1750	1667	1810	1750	1750	1810	1750	1667	1810	1667
Adj Flow Rate, veh/h	129	245	30	71	248	27	14	173	38	25	237	148
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	168	802	98	99	743	81	55	421	88	354	552	429
Arrive On Green	0.11	0.51	0.50	0.06	0.46	0.46	0.31	0.31	0.30	0.31	0.31	0.31
Sat Flow, veh/h	1587	1581	194	1587	1603	175	47	1378	290	1041	1810	1405
Grp Volume(v), veh/h	129	0	275	71	0	275	225	0	0	25	237	148
Grp Sat Flow(s),veh/h/ln	1587	0	1774	1587	0	1778	1715	0	0	1041	1810	1405
Q Serve(g_s), s	7.5	0.0	8.6	4.2	0.0	9.3	0.0	0.0	0.0	0.0	9.9	7.8
Cycle Q Clear(g_c), s	7.5	0.0	8.6	4.2	0.0	9.3	9.7	0.0	0.0	2.6	9.9	7.8
Prop In Lane	1.00		0.11	1.00		0.10	0.06		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	168	0	900	99	0	824	564	0	0	354	552	429
V/C Ratio(X)	0.77	0.00	0.31	0.72	0.00	0.33	0.40	0.00	0.00	0.07	0.43	0.35
Avail Cap(c_a), veh/h	336	0	900	236	0	824	564	0	0	354	552	429
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.3	0.0	13.7	43.7	0.0	16.2	26.4	0.0	0.0	23.8	26.4	25.6
Incr Delay (d2), s/veh	7.1	0.0	0.9	9.4	0.0	1.1	2.1	0.0	0.0	0.4	2.4	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	4.4	2.1	0.0	4.8	5.0	0.0	0.0	0.5	5.3	3.3
LnGrp Delay(d),s/veh	48.5	0.0	14.5	53.2	0.0	17.3	28.5	0.0	0.0	24.2	28.8	27.8
LnGrp LOS	D		B	D		B	C			C	C	C
Approach Vol, veh/h		404			346			225			410	
Approach Delay, s/veh		25.4			24.6			28.5			28.2	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		33.0	9.8	52.2		33.0	14.0	48.0
Change Period (Y+Rc), s		4.9	4.5	4.6		4.9	4.5	4.6
Max Green Setting (Gmax), s		28.1	13.5	39.4		28.1	19.5	33.4
Max Q Clear Time (g_c+I1), s		11.7	6.2	10.6		11.9	9.5	11.3
Green Ext Time (p_c), s		2.5	0.1	2.3		2.5	0.3	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	26.5
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	234	29	68	237	26	14	165	36	24	227	142
Future Volume (veh/h)	124	234	29	68	237	26	14	165	36	24	227	142
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1810	1750	1667	1810	1750	1750	1810	1750	1667	1810	1667
Adj Flow Rate, veh/h	135	254	32	74	258	28	15	179	39	26	247	154
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	175	795	100	102	737	80	56	420	87	348	552	429
Arrive On Green	0.11	0.51	0.50	0.06	0.46	0.45	0.31	0.31	0.30	0.31	0.31	0.31
Sat Flow, veh/h	1587	1575	198	1587	1604	174	50	1375	287	1035	1810	1405
Grp Volume(v), veh/h	135	0	286	74	0	286	233	0	0	26	247	154
Grp Sat Flow(s),veh/h/ln	1587	0	1773	1587	0	1778	1712	0	0	1035	1810	1405
Q Serve(g_s), s	7.9	0.0	9.1	4.3	0.0	9.9	0.0	0.0	0.0	0.0	10.4	8.1
Cycle Q Clear(g_c), s	7.9	0.0	9.1	4.3	0.0	9.9	10.1	0.0	0.0	2.8	10.4	8.1
Prop In Lane	1.00		0.11	1.00		0.10	0.06		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	175	0	896	102	0	817	563	0	0	348	552	429
V/C Ratio(X)	0.77	0.00	0.32	0.72	0.00	0.35	0.41	0.00	0.00	0.07	0.45	0.36
Avail Cap(c_a), veh/h	336	0	896	219	0	817	563	0	0	348	552	429
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.1	0.0	13.9	43.6	0.0	16.6	26.5	0.0	0.0	23.9	26.6	25.7
Incr Delay (d2), s/veh	7.1	0.0	0.9	9.3	0.0	1.2	2.2	0.0	0.0	0.4	2.6	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	4.6	2.2	0.0	5.1	5.2	0.0	0.0	0.5	5.6	3.4
LnGrp Delay(d),s/veh	48.2	0.0	14.8	52.9	0.0	17.7	28.7	0.0	0.0	24.3	29.2	28.1
LnGrp LOS	D		B	D		B	C			C	C	C
Approach Vol, veh/h		421			360			233			427	
Approach Delay, s/veh		25.5			25.0			28.7			28.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		33.0	10.0	52.0		33.0	14.4	47.6
Change Period (Y+Rc), s		4.9	4.5	4.6		4.9	4.5	4.6
Max Green Setting (Gmax), s		28.1	12.5	40.4		28.1	19.5	33.4
Max Q Clear Time (g_c+I1), s		12.1	6.3	11.1		12.4	9.9	11.9
Green Ext Time (p_c), s		2.6	0.1	2.4		2.6	0.3	2.3

Intersection Summary	
HCM 2010 Ctrl Delay	26.8
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	237	34	68	246	27	30	165	36	25	227	142
Future Volume (veh/h)	124	237	34	68	246	27	30	165	36	25	227	142
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1810	1750	1667	1810	1750	1750	1810	1750	1667	1810	1667
Adj Flow Rate, veh/h	135	258	37	74	267	29	33	179	39	27	247	154
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	174	765	110	102	720	78	84	398	81	357	571	444
Arrive On Green	0.11	0.49	0.49	0.06	0.45	0.44	0.32	0.32	0.31	0.32	0.32	0.32
Sat Flow, veh/h	1587	1547	222	1587	1603	174	130	1260	256	1035	1810	1405
Grp Volume(v), veh/h	135	0	295	74	0	296	251	0	0	27	247	154
Grp Sat Flow(s),veh/h/ln	1587	0	1769	1587	0	1778	1645	0	0	1035	1810	1405
Q Serve(g_s), s	7.9	0.0	9.6	4.3	0.0	10.5	0.0	0.0	0.0	0.0	10.3	8.0
Cycle Q Clear(g_c), s	7.9	0.0	9.6	4.3	0.0	10.5	10.8	0.0	0.0	2.9	10.3	8.0
Prop In Lane	1.00		0.13	1.00		0.10	0.13		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	174	0	875	102	0	798	562	0	0	357	571	444
V/C Ratio(X)	0.77	0.00	0.34	0.73	0.00	0.37	0.45	0.00	0.00	0.08	0.43	0.35
Avail Cap(c_a), veh/h	319	0	875	202	0	798	562	0	0	357	571	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.1	0.0	14.6	43.6	0.0	17.3	26.0	0.0	0.0	23.2	25.8	25.0
Incr Delay (d2), s/veh	7.1	0.0	1.0	9.3	0.0	1.3	2.6	0.0	0.0	0.4	2.4	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	0.0	4.9	2.2	0.0	5.4	5.6	0.0	0.0	0.5	5.5	3.3
LnGrp Delay(d),s/veh	48.3	0.0	15.6	53.0	0.0	18.6	28.5	0.0	0.0	23.6	28.1	27.1
LnGrp LOS	D		B	D		B	C			C	C	C
Approach Vol, veh/h		430			370			251			428	
Approach Delay, s/veh		25.9			25.5			28.5			27.5	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		34.0	10.0	51.0		34.0	14.3	46.7
Change Period (Y+Rc), s		4.9	4.5	4.6		4.9	4.5	4.6
Max Green Setting (Gmax), s		29.1	11.5	40.4		29.1	18.5	33.4
Max Q Clear Time (g_c+I1), s		12.8	6.3	11.6		12.3	9.9	12.5
Green Ext Time (p_c), s		2.7	0.1	2.5		2.8	0.3	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	26.7
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	272	34	79	275	30	16	192	42	28	263	164
Future Volume (veh/h)	144	272	34	79	275	30	16	192	42	28	263	164
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1810	1750	1667	1810	1750	1750	1810	1750	1667	1810	1667
Adj Flow Rate, veh/h	157	296	37	86	299	33	17	209	46	30	286	178
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	198	782	98	117	712	79	56	417	88	322	552	429
Arrive On Green	0.12	0.50	0.49	0.07	0.44	0.44	0.31	0.31	0.30	0.31	0.31	0.31
Sat Flow, veh/h	1587	1576	197	1587	1601	177	51	1366	288	1001	1810	1405
Grp Volume(v), veh/h	157	0	333	86	0	332	272	0	0	30	286	178
Grp Sat Flow(s),veh/h/ln	1587	0	1774	1587	0	1777	1705	0	0	1001	1810	1405
Q Serve(g_s), s	9.1	0.0	11.1	5.0	0.0	12.1	0.0	0.0	0.0	0.0	12.4	9.6
Cycle Q Clear(g_c), s	9.1	0.0	11.1	5.0	0.0	12.1	12.1	0.0	0.0	3.9	12.4	9.6
Prop In Lane	1.00		0.11	1.00		0.10	0.06		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	198	0	879	117	0	790	561	0	0	322	552	429
V/C Ratio(X)	0.79	0.00	0.38	0.74	0.00	0.42	0.49	0.00	0.00	0.09	0.52	0.42
Avail Cap(c_a), veh/h	336	0	879	219	0	790	561	0	0	322	552	429
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	0.0	14.9	43.1	0.0	18.0	27.2	0.0	0.0	24.3	27.2	26.3
Incr Delay (d2), s/veh	6.9	0.0	1.2	8.6	0.0	1.6	3.0	0.0	0.0	0.6	3.4	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	5.7	2.5	0.0	6.3	6.3	0.0	0.0	0.6	6.7	4.1
LnGrp Delay(d),s/veh	47.3	0.0	16.1	51.7	0.0	19.7	30.2	0.0	0.0	24.9	30.7	29.2
LnGrp LOS	D		B	D		B	C			C	C	C
Approach Vol, veh/h		490			418			272			494	
Approach Delay, s/veh		26.1			26.3			30.2			29.8	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		33.0	10.9	51.1		33.0	15.8	46.2
Change Period (Y+Rc), s		4.9	4.5	4.6		4.9	4.5	4.6
Max Green Setting (Gmax), s		28.1	12.5	40.4		28.1	19.5	33.4
Max Q Clear Time (g_c+I1), s		14.1	7.0	13.1		14.4	11.1	14.1
Green Ext Time (p_c), s		2.9	0.1	2.9		2.9	0.3	2.7

Intersection Summary	
HCM 2010 Ctrl Delay	27.9
HCM 2010 LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	275	39	79	284	31	32	192	42	29	263	164
Future Volume (veh/h)	144	275	39	79	284	31	32	192	42	29	263	164
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1810	1750	1667	1810	1750	1750	1810	1750	1667	1810	1667
Adj Flow Rate, veh/h	157	299	42	86	309	34	35	209	46	32	286	178
Adj No. of Lanes	1	1	0	1	1	0	0	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	198	753	106	117	695	77	78	381	79	312	571	444
Arrive On Green	0.12	0.49	0.48	0.07	0.43	0.43	0.32	0.32	0.31	0.32	0.32	0.32
Sat Flow, veh/h	1587	1552	218	1587	1601	176	112	1206	249	1001	1810	1405
Grp Volume(v), veh/h	157	0	341	86	0	343	290	0	0	32	286	178
Grp Sat Flow(s),veh/h/ln	1587	0	1770	1587	0	1777	1568	0	0	1001	1810	1405
Q Serve(g_s), s	9.1	0.0	11.7	5.0	0.0	12.9	2.6	0.0	0.0	0.0	12.2	9.4
Cycle Q Clear(g_c), s	9.1	0.0	11.7	5.0	0.0	12.9	14.8	0.0	0.0	4.5	12.2	9.4
Prop In Lane	1.00		0.12	1.00		0.10	0.12		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	198	0	859	117	0	772	537	0	0	312	571	444
V/C Ratio(X)	0.79	0.00	0.40	0.74	0.00	0.44	0.54	0.00	0.00	0.10	0.50	0.40
Avail Cap(c_a), veh/h	319	0	859	202	0	772	537	0	0	312	571	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	0.0	15.6	43.1	0.0	18.9	26.9	0.0	0.0	23.8	26.4	25.5
Incr Delay (d2), s/veh	7.0	0.0	1.4	8.7	0.0	1.9	3.9	0.0	0.0	0.7	3.1	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	6.0	2.5	0.0	6.7	6.9	0.0	0.0	0.7	6.6	4.0
LnGrp Delay(d),s/veh	47.4	0.0	17.0	51.8	0.0	20.7	30.8	0.0	0.0	24.5	29.5	28.2
LnGrp LOS	D		B	D		C	C			C	C	C
Approach Vol, veh/h		498			429			290			496	
Approach Delay, s/veh		26.6			26.9			30.8			28.7	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4		6	7	8
Phs Duration (G+Y+Rc), s		34.0	10.9	50.1		34.0	15.7	45.3
Change Period (Y+Rc), s		4.9	4.5	4.6		4.9	4.5	4.6
Max Green Setting (Gmax), s		29.1	11.5	40.4		29.1	18.5	33.4
Max Q Clear Time (g_c+I1), s		16.8	7.0	13.7		14.2	11.1	14.9
Green Ext Time (p_c), s		2.9	0.1	3.0		3.1	0.3	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	28.0
HCM 2010 LOS	C

Intersection 2
Madsen Ave & Sierra St (SR-201)

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	64	251	252	35	17	46
Future Vol, veh/h	64	251	252	35	17	46
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	70	273	274	38	18	50

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	317	0	-	0	710	303
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	412	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1226	-	-	-	396	730
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	662	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1221	-	-	-	370	724
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	621	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1221	-	-	-	575
HCM Lane V/C Ratio	0.057	-	-	-	0.119
HCM Control Delay (s)	8.1	-	-	-	12.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	67	261	262	36	18	48
Future Vol, veh/h	67	261	262	36	18	48
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	73	284	285	39	20	52

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	329	0	-	0	738	314
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	429	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1214	-	-	-	381	719
Stage 1	-	-	-	-	738	-
Stage 2	-	-	-	-	650	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1209	-	-	-	355	713
Mov Cap-2 Maneuver	-	-	-	-	355	-
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	608	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1209	-	-	-	559
HCM Lane V/C Ratio	0.06	-	-	-	0.128
HCM Control Delay (s)	8.2	-	-	-	12.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	67	277	270	44	34	48
Future Vol, veh/h	67	277	270	44	34	48
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	73	301	293	48	37	52

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	346	0	-	0	769	327
Stage 1	-	-	-	-	322	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1196	-	-	-	365	707
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	638	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1191	-	-	-	340	701
Mov Cap-2 Maneuver	-	-	-	-	340	-
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	596	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	14
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1191	-	-	-	487
HCM Lane V/C Ratio	0.061	-	-	-	0.183
HCM Control Delay (s)	8.2	-	-	-	14
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	77	303	304	42	21	56
Future Vol, veh/h	77	303	304	42	21	56
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	84	329	330	46	23	61

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	381	0	-	0	855	363
Stage 1	-	-	-	-	358	-
Stage 2	-	-	-	-	497	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1161	-	-	-	325	675
Stage 1	-	-	-	-	701	-
Stage 2	-	-	-	-	605	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1156	-	-	-	299	669
Mov Cap-2 Maneuver	-	-	-	-	299	-
Stage 1	-	-	-	-	698	-
Stage 2	-	-	-	-	559	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1156	-	-	-	500
HCM Lane V/C Ratio	0.072	-	-	-	0.167
HCM Control Delay (s)	8.4	-	-	-	13.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.6

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	77	319	312	50	37	56
Future Vol, veh/h	77	319	312	50	37	56
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	84	347	339	54	40	61

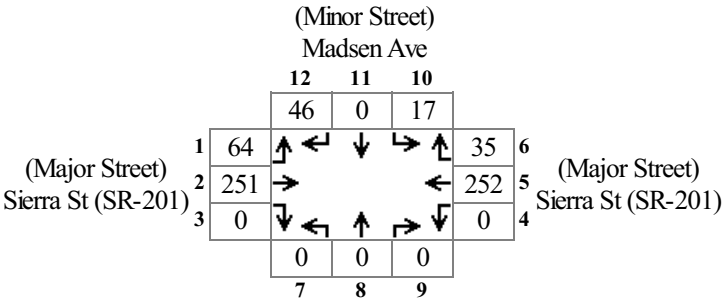
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	398	0	-	0	885	376
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	514	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1144	-	-	-	312	664
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	594	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1139	-	-	-	287	658
Mov Cap-2 Maneuver	-	-	-	-	287	-
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	548	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	15.8
HCM LOS			C

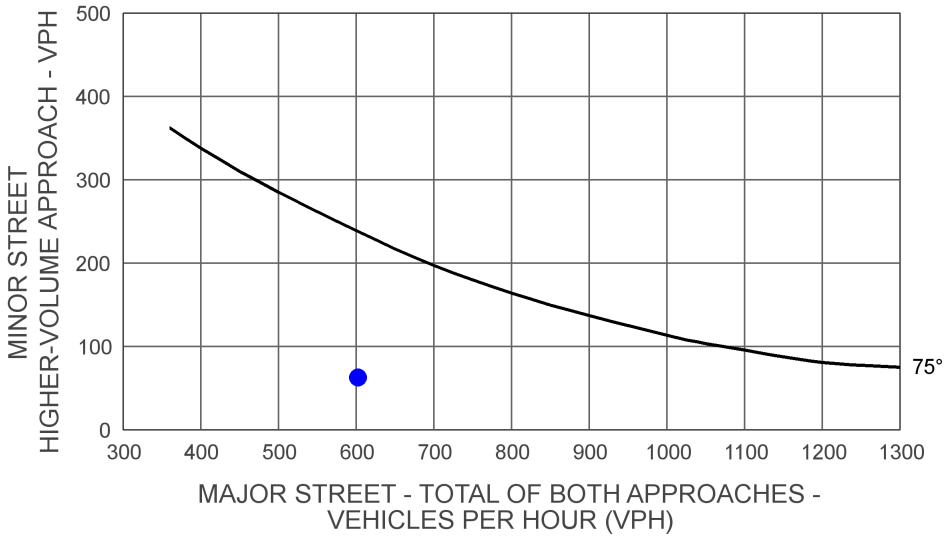
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1139	-	-	-	435
HCM Lane V/C Ratio	0.073	-	-	-	0.232
HCM Control Delay (s)	8.4	-	-	-	15.8
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.9

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing
Intersection #: 2

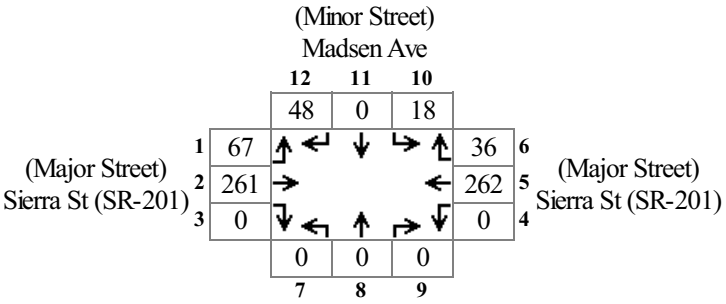


Major Total: 602
Minor High Volume: 63

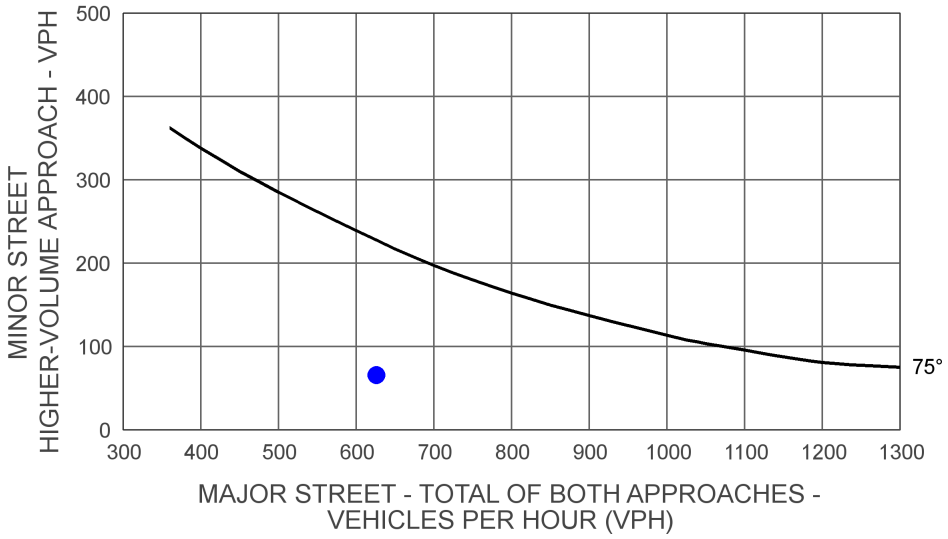


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 2

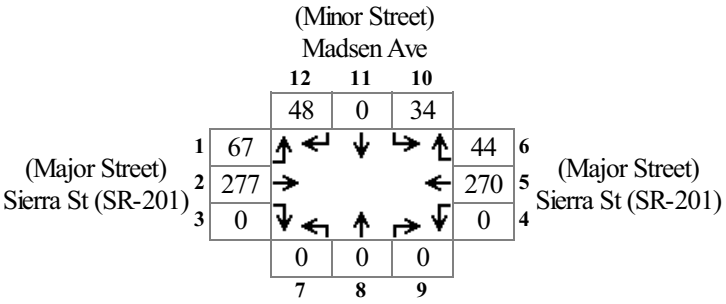


Major Total: 626
Minor High Volume: 66

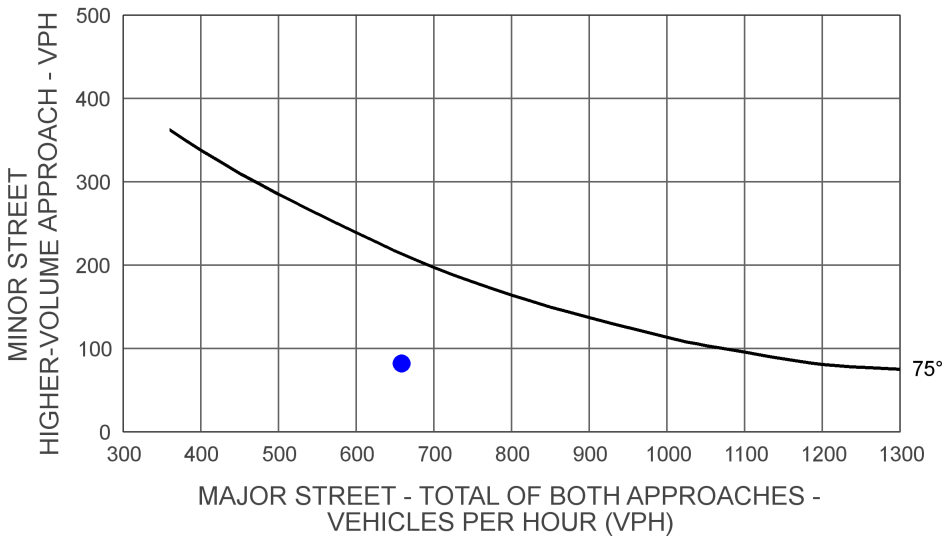


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 2

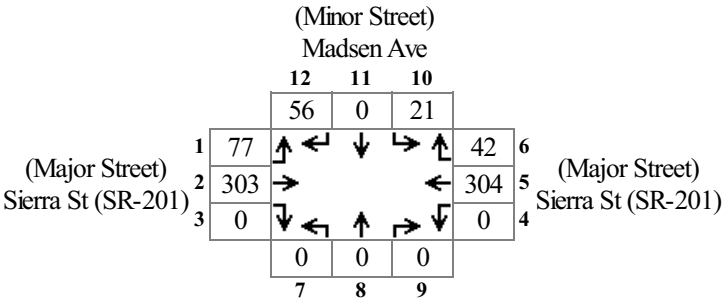


Major Total: 658
Minor High Volume: 82

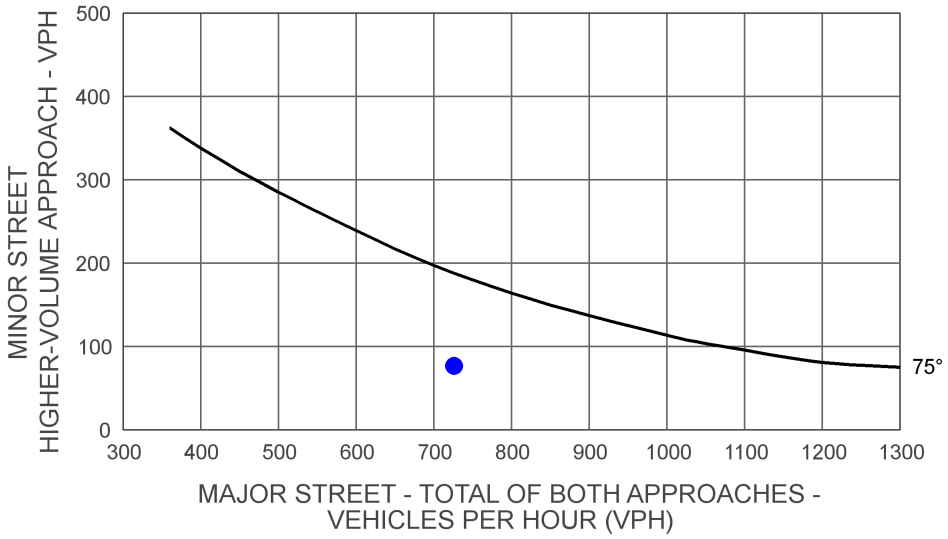


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 2

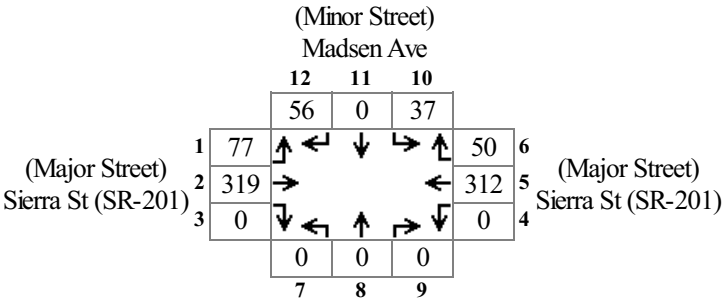


Major Total: 726
Minor High Volume: 77

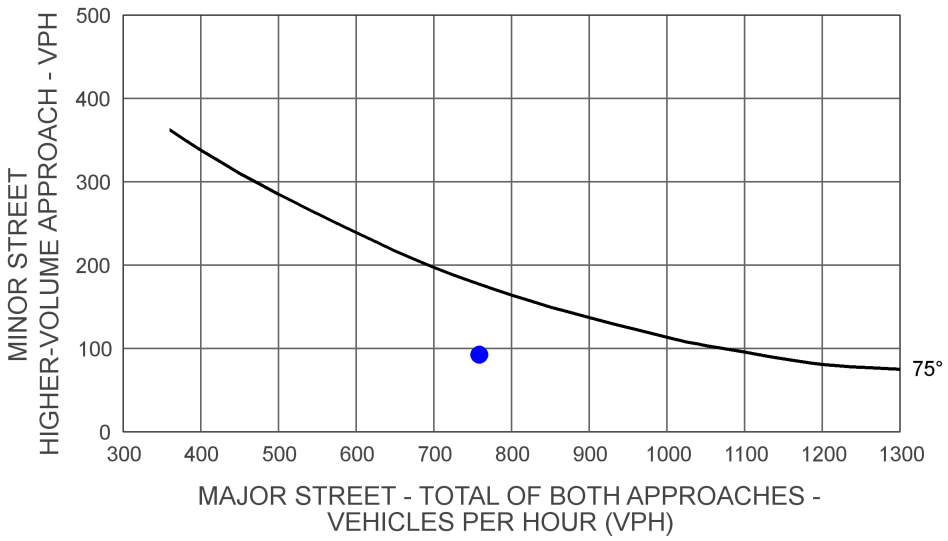


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 2



Major Total: 758
Minor High Volume: 93



Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	31	211	226	15	39	83
Future Vol, veh/h	31	211	226	15	39	83
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	34	229	246	16	42	90

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	267	0	-	0	556	264
Stage 1	-	-	-	-	259	-
Stage 2	-	-	-	-	297	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1280	-	-	-	487	767
Stage 1	-	-	-	-	777	-
Stage 2	-	-	-	-	747	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1275	-	-	-	470	761
Mov Cap-2 Maneuver	-	-	-	-	470	-
Stage 1	-	-	-	-	774	-
Stage 2	-	-	-	-	724	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1275	-	-	-	635
HCM Lane V/C Ratio	0.026	-	-	-	0.209
HCM Control Delay (s)	7.9	-	-	-	12.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	32	220	235	16	41	86
Future Vol, veh/h	32	220	235	16	41	86
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	35	239	255	17	45	93

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	278	0	-	0	578	274
Stage 1	-	-	-	-	269	-
Stage 2	-	-	-	-	309	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1268	-	-	-	473	758
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	738	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1263	-	-	-	456	752
Mov Cap-2 Maneuver	-	-	-	-	456	-
Stage 1	-	-	-	-	766	-
Stage 2	-	-	-	-	715	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	12.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1263	-	-	-	622
HCM Lane V/C Ratio	0.028	-	-	-	0.222
HCM Control Delay (s)	7.9	-	-	-	12.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	32	224	247	28	45	86
Future Vol, veh/h	32	224	247	28	45	86
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	35	243	268	30	49	93

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	304	0	-	0	602	294
Stage 1	-	-	-	-	289	-
Stage 2	-	-	-	-	313	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1240	-	-	-	458	738
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	735	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1235	-	-	-	441	732
Mov Cap-2 Maneuver	-	-	-	-	441	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	711	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1235	-	-	-	597
HCM Lane V/C Ratio	0.028	-	-	-	0.239
HCM Control Delay (s)	8	-	-	-	12.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	37	255	273	18	47	100
Future Vol, veh/h	37	255	273	18	47	100
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	40	277	297	20	51	109

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	321	0	-	0	670	317
Stage 1	-	-	-	-	312	-
Stage 2	-	-	-	-	358	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1222	-	-	-	418	717
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	701	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1217	-	-	-	401	711
Mov Cap-2 Maneuver	-	-	-	-	401	-
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	675	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1217	-	-	-	570
HCM Lane V/C Ratio	0.033	-	-	-	0.28
HCM Control Delay (s)	8.1	-	-	-	13.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.1

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	37	259	285	30	51	100
Future Vol, veh/h	37	259	285	30	51	100
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	40	282	310	33	55	109

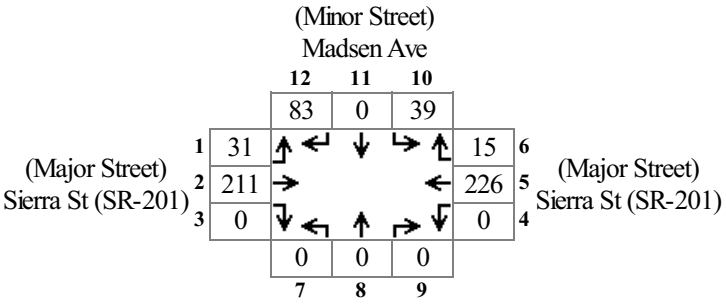
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	347	0	-	0	693	336
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	362	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1195	-	-	-	405	699
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	698	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1190	-	-	-	388	693
Mov Cap-2 Maneuver	-	-	-	-	388	-
Stage 1	-	-	-	-	718	-
Stage 2	-	-	-	-	672	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	14.4
HCM LOS			B

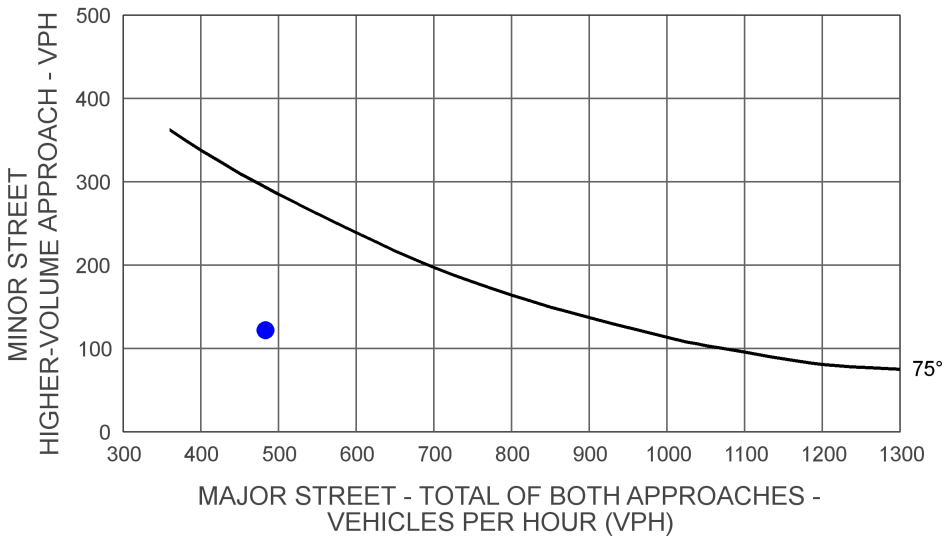
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1190	-	-	-	548
HCM Lane V/C Ratio	0.034	-	-	-	0.3
HCM Control Delay (s)	8.1	-	-	-	14.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.2

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing
Intersection #: 2

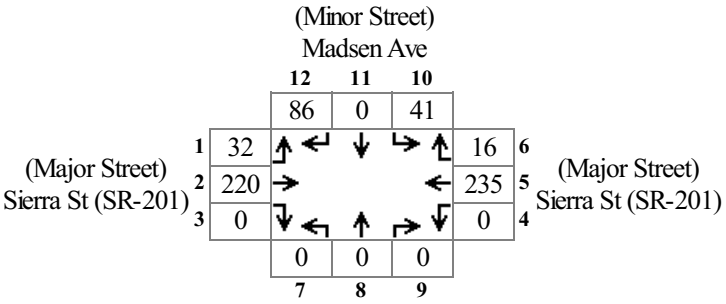


Major Total: 483
Minor High Volume: 122

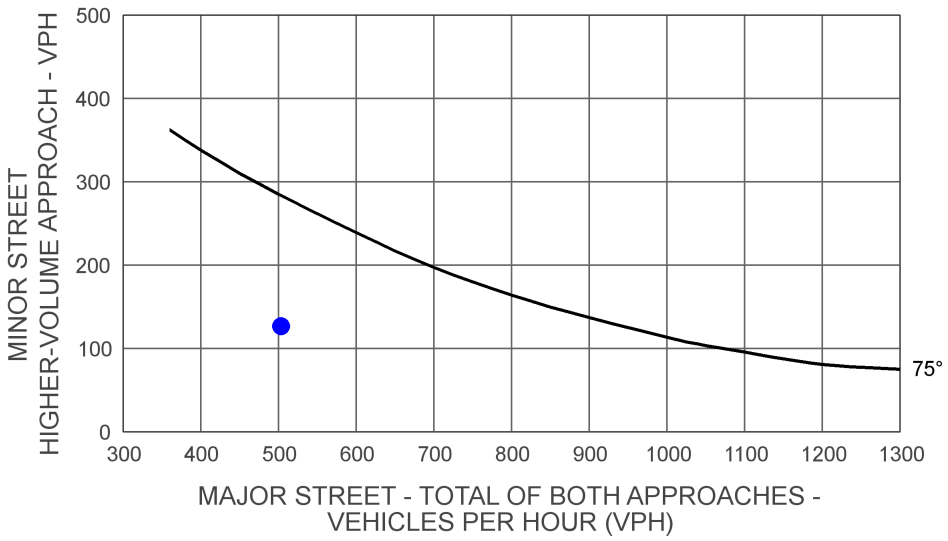


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 2

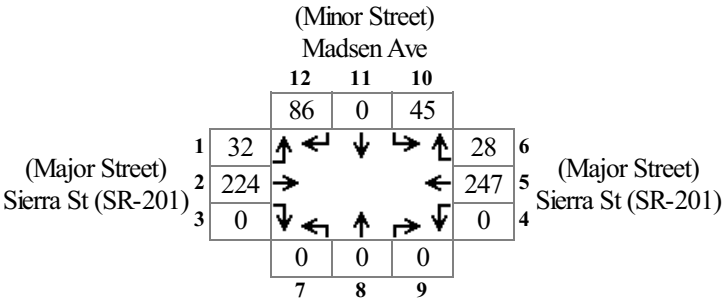


Major Total: 503
Minor High Volume: 127

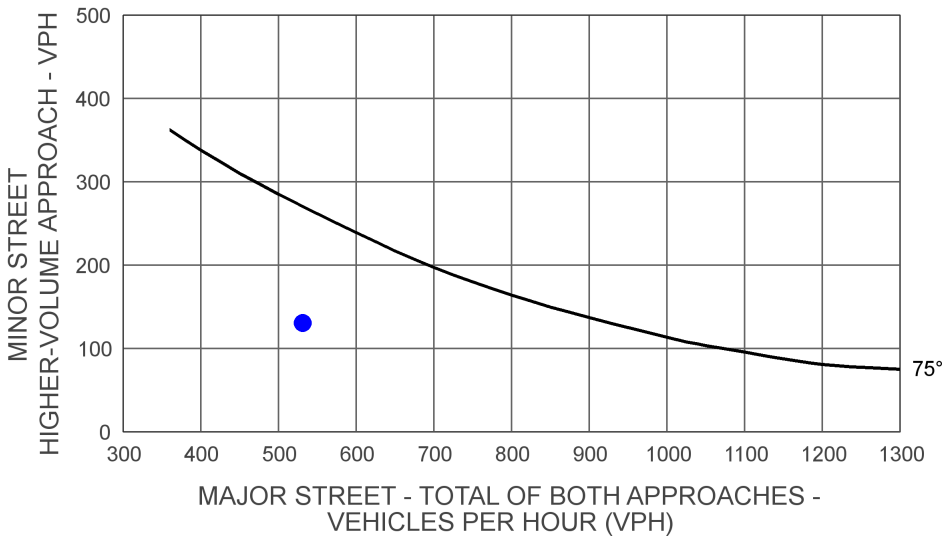


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future+Project
Intersection #: 2

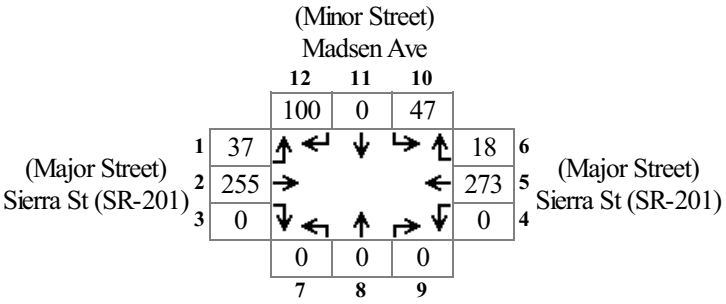


Major Total: 531
Minor High Volume: 131

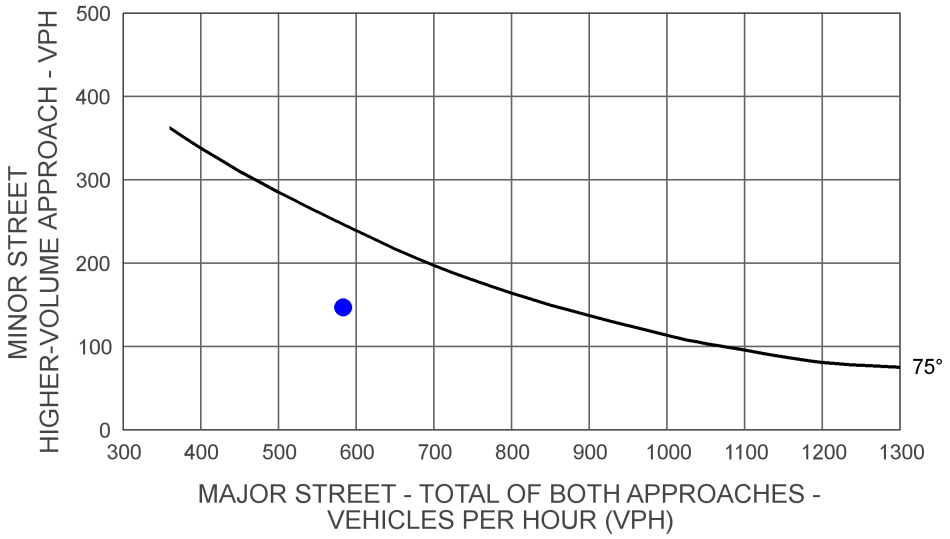


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 2

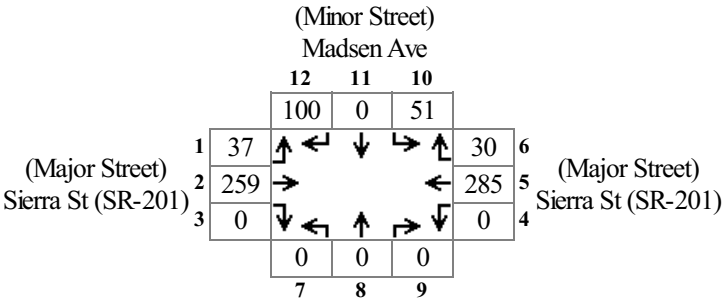


Major Total: 583
Minor High Volume: 147

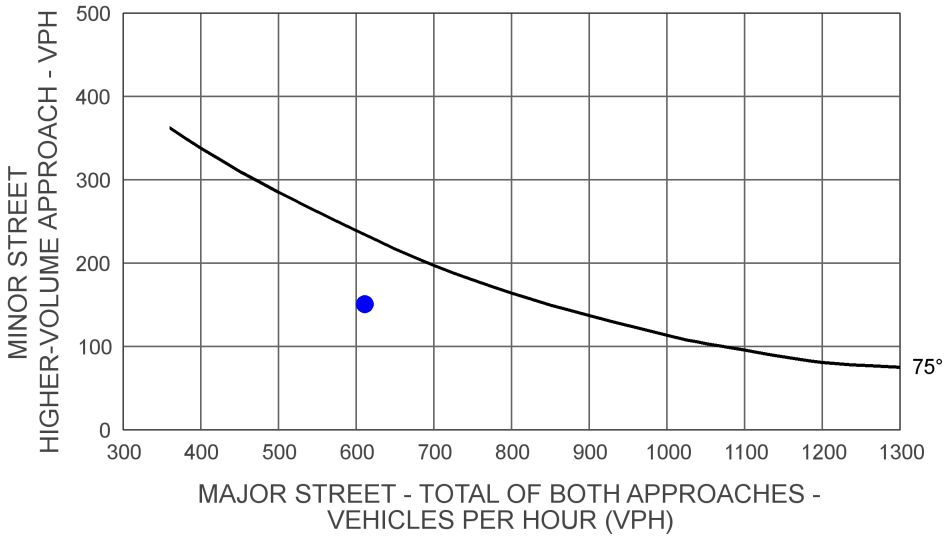


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future+Project
Intersection #: 2



Major Total: 611
Minor High Volume: 151



Intersection 3
Rd 16 & Sierra St (SR-201)

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	264	4	4	276	11	4
Future Vol, veh/h	264	4	4	276	11	4
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	287	4	4	300	12	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	296	0	603	299
Stage 1	-	-	-	-	294	-
Stage 2	-	-	-	-	309	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1248	-	457	733
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	738	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1243	-	452	727
Mov Cap-2 Maneuver	-	-	-	-	452	-
Stage 1	-	-	-	-	746	-
Stage 2	-	-	-	-	733	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	503	-	-	1243	-
HCM Lane V/C Ratio	0.032	-	-	0.003	-
HCM Control Delay (s)	12.4	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	275	4	4	287	11	4
Future Vol, veh/h	275	4	4	287	11	4
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	299	4	4	312	12	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	308	0	627	311
Stage 1	-	-	-	-	306	-
Stage 2	-	-	-	-	321	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1236	-	443	722
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	729	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1231	-	438	716
Mov Cap-2 Maneuver	-	-	-	-	438	-
Stage 1	-	-	-	-	737	-
Stage 2	-	-	-	-	724	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	489	-	-	1231	-
HCM Lane V/C Ratio	0.033	-	-	0.004	-
HCM Control Delay (s)	12.6	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	275	34	16	287	27	12
Future Vol, veh/h	275	34	16	287	27	12
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	299	37	17	312	29	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	341	0	669	327
Stage 1	-	-	-	-	322	-
Stage 2	-	-	-	-	347	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1202	-	418	707
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	709	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1197	-	409	701
Mov Cap-2 Maneuver	-	-	-	-	409	-
Stage 1	-	-	-	-	725	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	13.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	469	-	-	1197	-
HCM Lane V/C Ratio	0.09	-	-	0.015	-
HCM Control Delay (s)	13.4	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	319	5	5	333	13	5
Future Vol, veh/h	319	5	5	333	13	5
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	347	5	5	362	14	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	357	0	727	359
Stage 1	-	-	-	-	354	-
Stage 2	-	-	-	-	373	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1185	-	387	679
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	690	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1180	-	382	673
Mov Cap-2 Maneuver	-	-	-	-	382	-
Stage 1	-	-	-	-	701	-
Stage 2	-	-	-	-	684	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	434	-	-	1180	-
HCM Lane V/C Ratio	0.045	-	-	0.005	-
HCM Control Delay (s)	13.7	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	319	35	17	333	29	13
Future Vol, veh/h	319	35	17	333	29	13
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	347	38	18	362	32	14

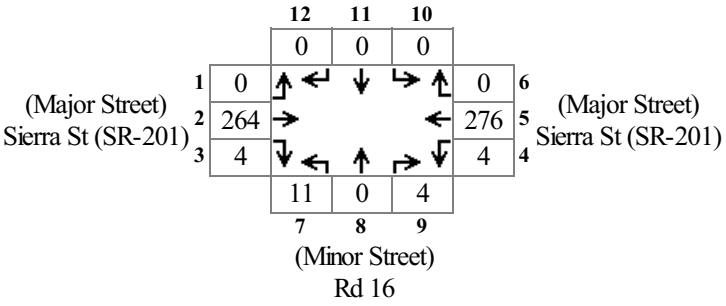
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	390	0	770	376
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	399	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1152	-	365	664
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	671	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1147	-	356	658
Mov Cap-2 Maneuver	-	-	-	-	356	-
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	658	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	14.7
HCM LOS			B

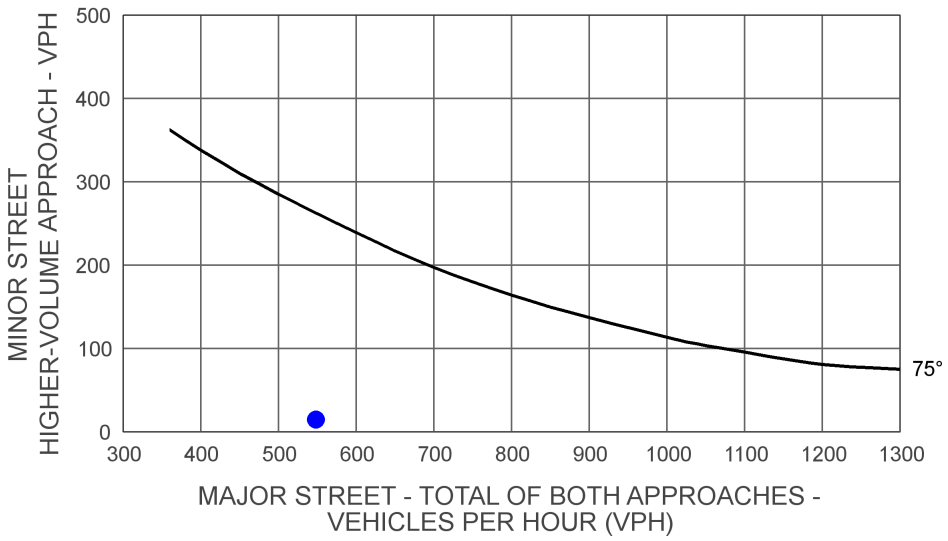
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	415	-	-	1147	-
HCM Lane V/C Ratio	0.11	-	-	0.016	-
HCM Control Delay (s)	14.7	-	-	8.2	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing
Intersection #: 3

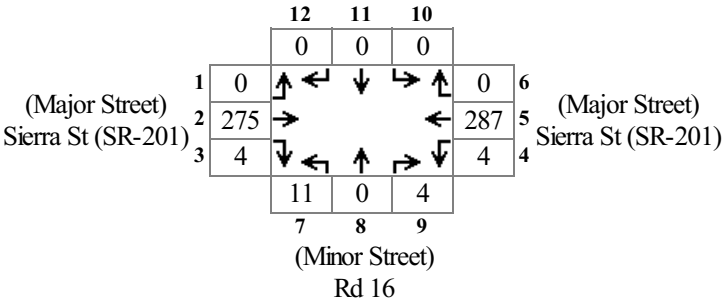


Major Total: 548
Minor High Volume: 15

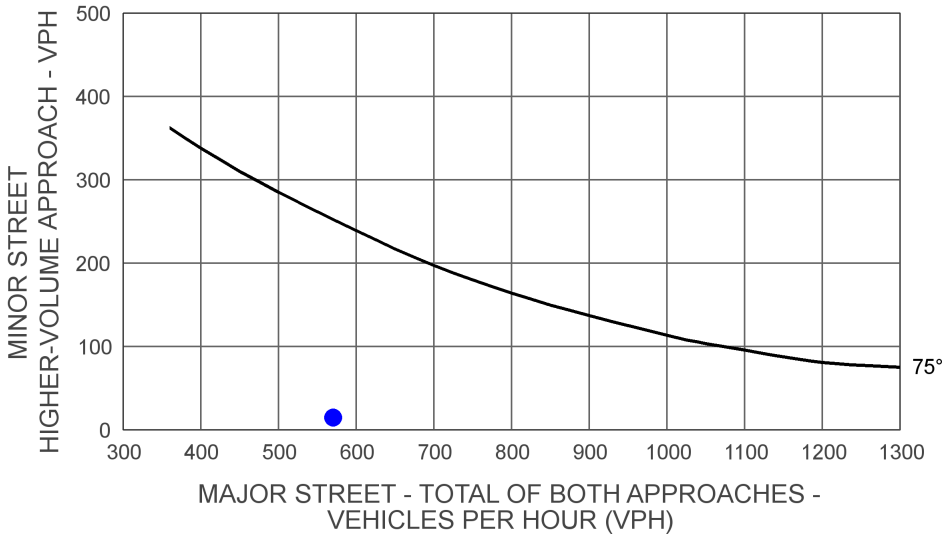


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 3

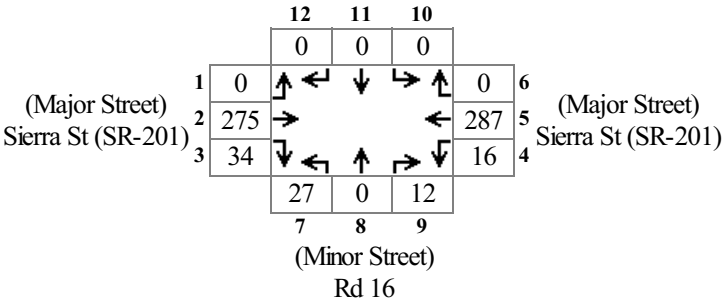


Major Total: 570
Minor High Volume: 15

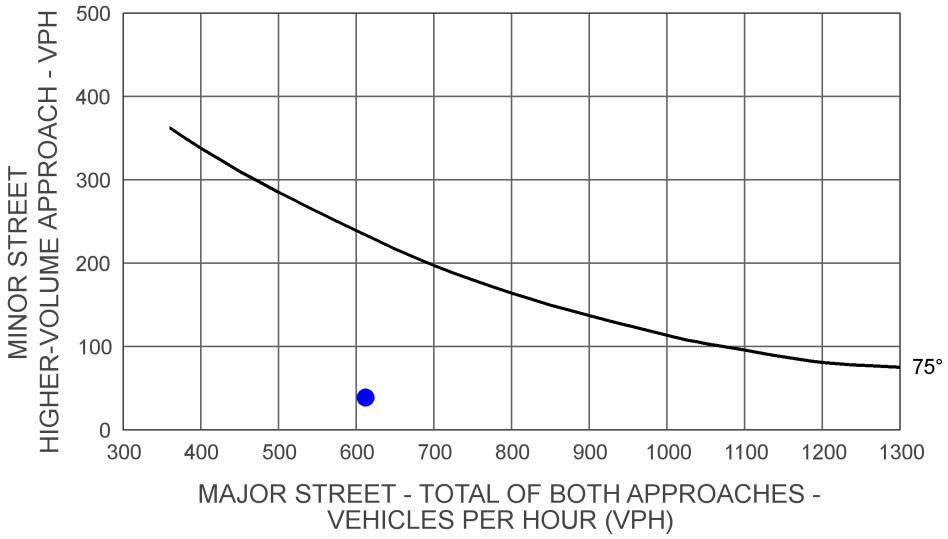


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 3

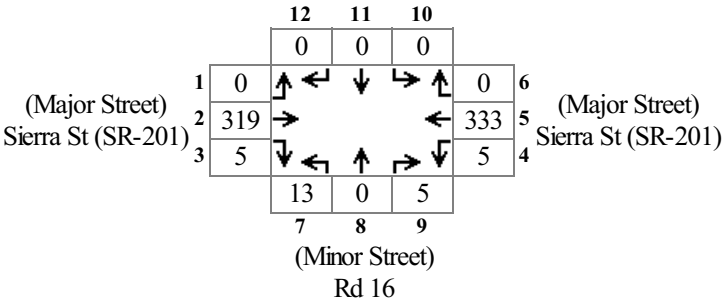


Major Total: 612
Minor High Volume: 39

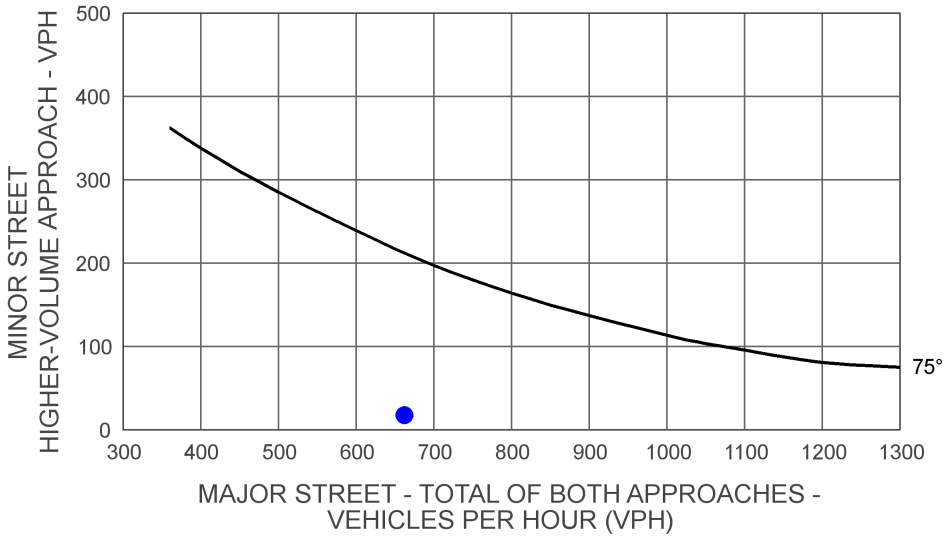


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 3

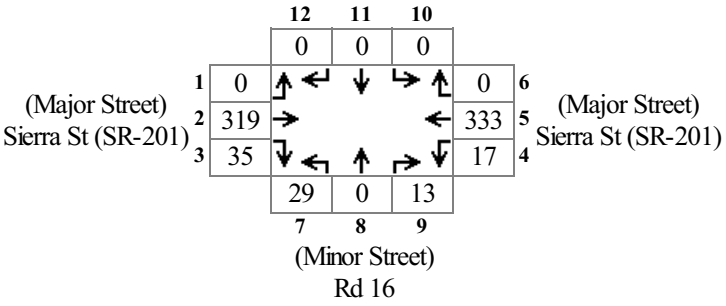


Major Total: 662
Minor High Volume: 18

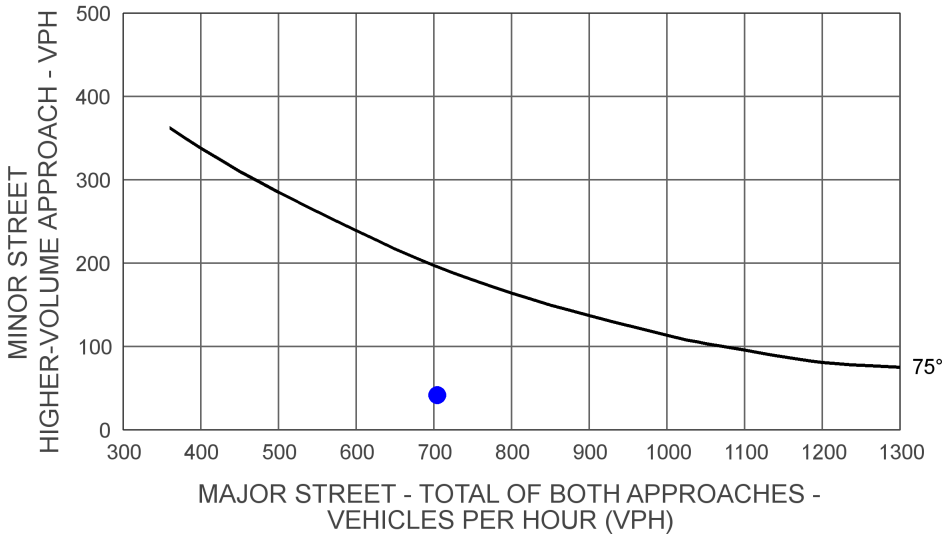


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 3



Major Total: 704
Minor High Volume: 42



Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	245	5	10	228	13	10
Future Vol, veh/h	245	5	10	228	13	10
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	266	5	11	248	14	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	277	0	544	279
Stage 1	-	-	-	-	274	-
Stage 2	-	-	-	-	270	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1269	-	495	753
Stage 1	-	-	-	-	765	-
Stage 2	-	-	-	-	768	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1264	-	487	747
Mov Cap-2 Maneuver	-	-	-	-	487	-
Stage 1	-	-	-	-	762	-
Stage 2	-	-	-	-	758	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	574	-	-	1264	-
HCM Lane V/C Ratio	0.044	-	-	0.009	-
HCM Control Delay (s)	11.6	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	255	5	10	237	14	10
Future Vol, veh/h	255	5	10	237	14	10
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	277	5	11	258	15	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	288	0	564	290
Stage 1	-	-	-	-	285	-
Stage 2	-	-	-	-	279	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1257	-	482	742
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	761	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1252	-	474	736
Mov Cap-2 Maneuver	-	-	-	-	474	-
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	751	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	557	-	-	1252	-
HCM Lane V/C Ratio	0.047	-	-	0.009	-
HCM Control Delay (s)	11.8	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	255	13	13	237	38	22
Future Vol, veh/h	255	13	13	237	38	22
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	277	14	14	258	41	24

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	296	0	575	294
Stage 1	-	-	-	-	289	-
Stage 2	-	-	-	-	286	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1248	-	475	738
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	756	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1243	-	466	732
Mov Cap-2 Maneuver	-	-	-	-	466	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	744	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	538	-	-	1243	-
HCM Lane V/C Ratio	0.121	-	-	0.011	-
HCM Control Delay (s)	12.6	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection	
Int Delay, s/veh	0.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	296	6	12	275	16	12
Future Vol, veh/h	296	6	12	275	16	12
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	322	7	13	299	17	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	333	0	655	335
Stage 1	-	-	-	-	330	-
Stage 2	-	-	-	-	325	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1210	-	426	700
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	726	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1205	-	418	694
Mov Cap-2 Maneuver	-	-	-	-	418	-
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	715	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	12.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	504	-	-	1205	-
HCM Lane V/C Ratio	0.06	-	-	0.011	-
HCM Control Delay (s)	12.6	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Traffic Vol, veh/h	296	14	15	275	40	24
Future Vol, veh/h	296	14	15	275	40	24
Conflicting Peds, #/hr	0	5	5	0	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	322	15	16	299	43	26

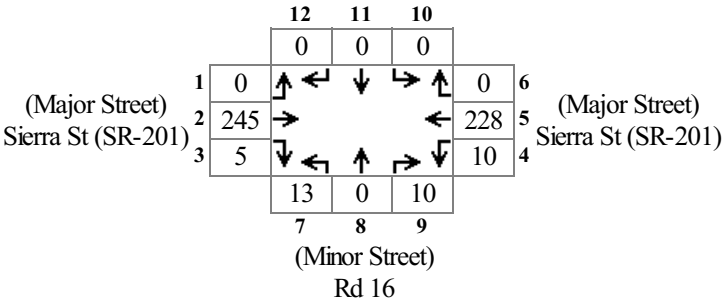
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	342	0	666	339
Stage 1	-	-	-	-	334	-
Stage 2	-	-	-	-	332	-
Critical Hdwy	-	-	4.15	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.245	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1200	-	420	696
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	720	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1195	-	411	690
Mov Cap-2 Maneuver	-	-	-	-	411	-
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	707	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	13.7
HCM LOS			B

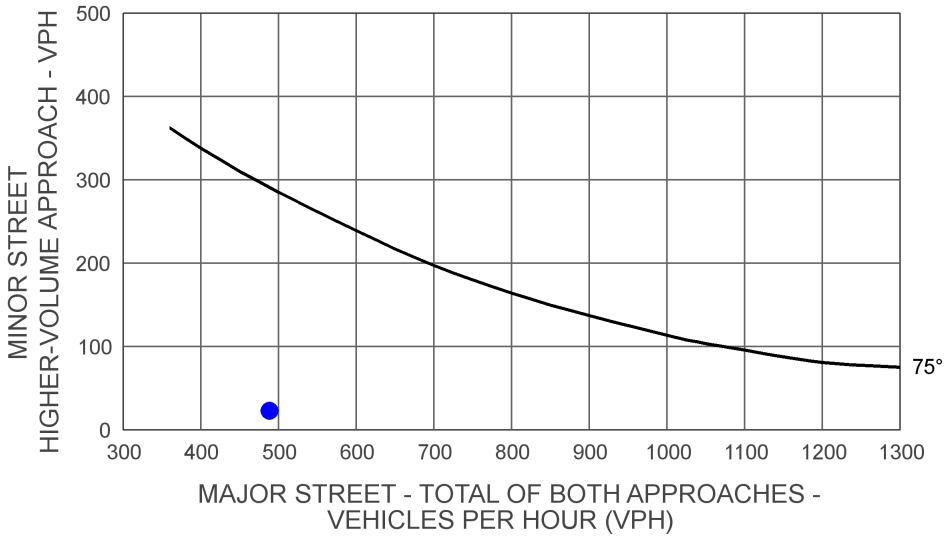
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	484	-	-	1195	-
HCM Lane V/C Ratio	0.144	-	-	0.014	-
HCM Control Delay (s)	13.7	-	-	8.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing
Intersection #: 3

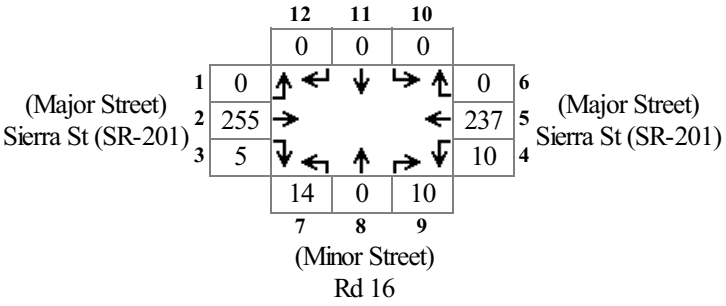


Major Total: 488
Minor High Volume: 23

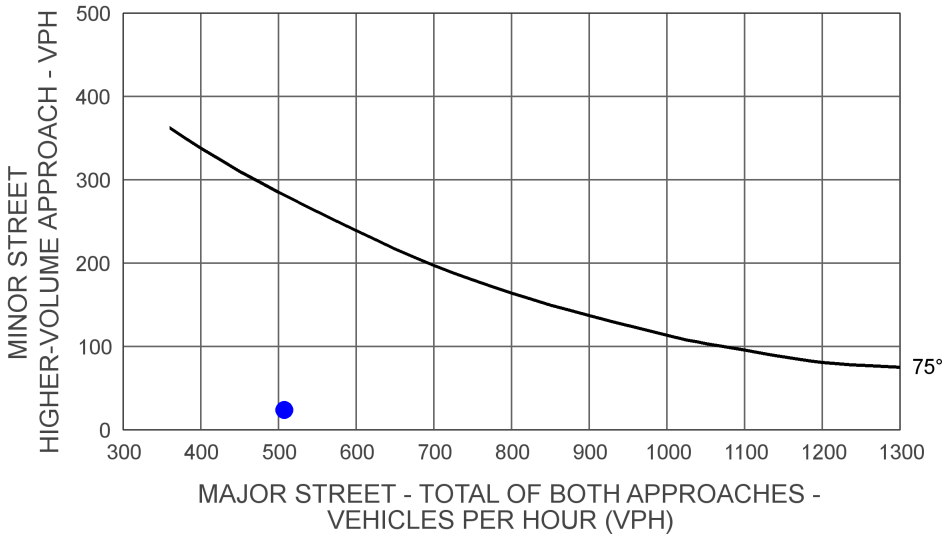


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 3

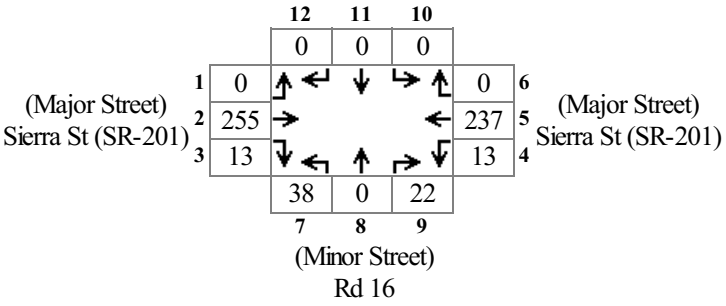


Major Total: 507
Minor High Volume: 24

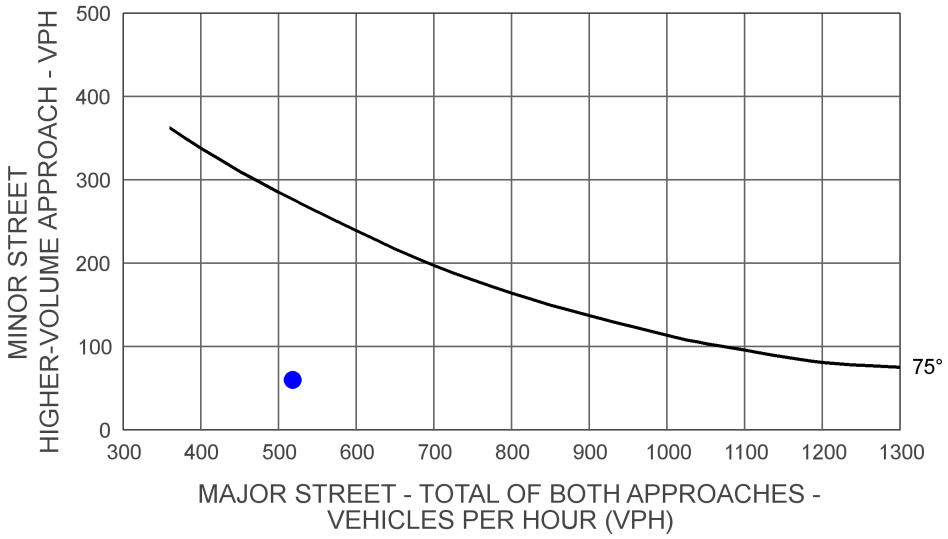


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future+Project
Intersection #: 3

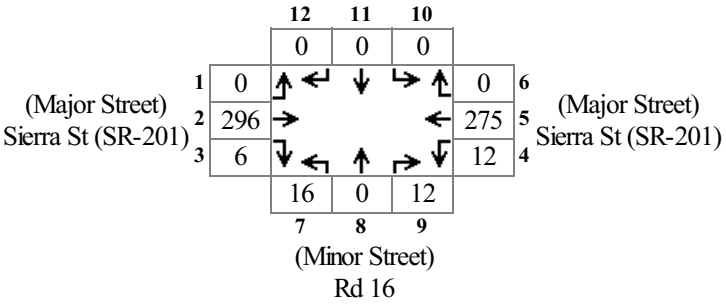


Major Total: 518
Minor High Volume: 60

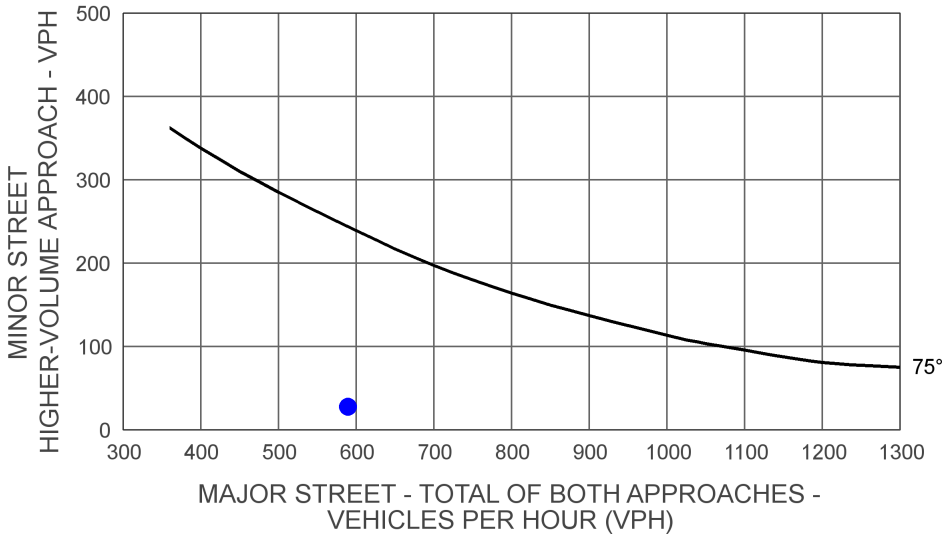


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 3

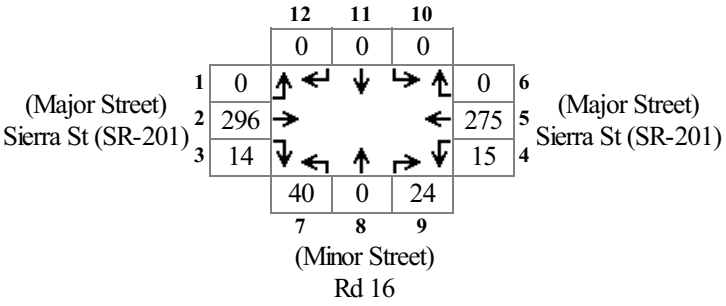


Major Total: 589
Minor High Volume: 28

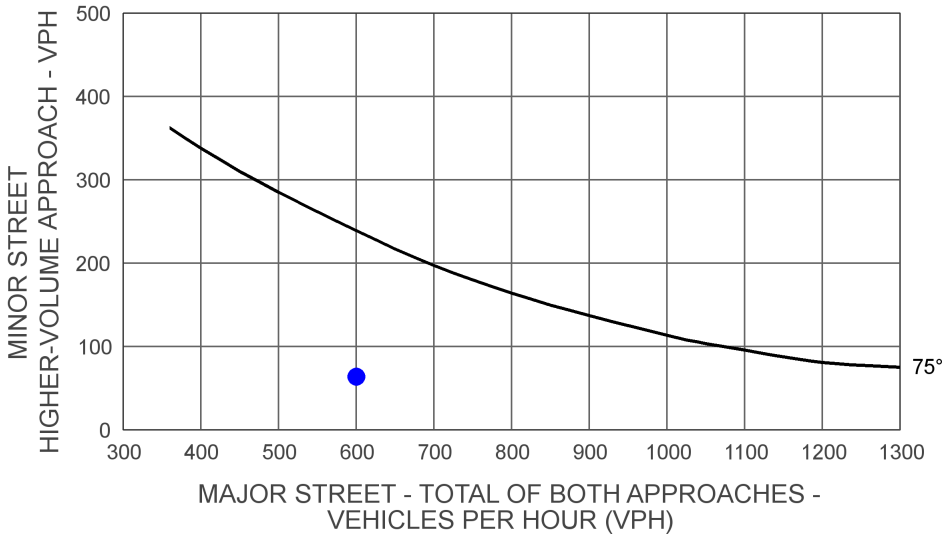


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future+Project
Intersection #: 3



Major Total: 600
Minor High Volume: 64



Intersection 4
18th Ave & Ave 396

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	64	0	19	0	297	64	24	194	0
Future Vol, veh/h	0	0	0	64	0	19	0	297	64	24	194	0
Conflicting Peds, #/hr	0	0	0	5	0	5	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	48	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	70	0	21	0	323	70	26	211	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	636	660	216	626	626	368	211	0	0	397	0	0
Stage 1	263	263	-	363	363	-	-	-	-	-	-	-
Stage 2	373	397	-	263	263	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	386	379	816	392	397	671	1342	-	-	1145	-	-
Stage 1	736	685	-	650	619	-	-	-	-	-	-	-
Stage 2	642	598	-	736	685	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	366	369	813	382	386	665	1336	-	-	1140	-	-
Mov Cap-2 Maneuver	366	369	-	382	386	-	-	-	-	-	-	-
Stage 1	736	669	-	647	616	-	-	-	-	-	-	-
Stage 2	619	596	-	716	669	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	15.8	0	0.9
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1336	-	-	-	423	1140	-	-
HCM Lane V/C Ratio	-	-	-	-	0.213	0.023	-	-
HCM Control Delay (s)	0	-	-	0	15.8	8.2	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.8	0.1	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	67	0	20	0	309	67	25	202	0
Future Vol, veh/h	0	0	0	67	0	20	0	309	67	25	202	0
Conflicting Peds, #/hr	0	0	0	5	0	5	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	48	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	73	0	22	0	336	73	27	220	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	662	688	225	651	651	382	220	0	0	414	0	0
Stage 1	274	274	-	377	377	-	-	-	-	-	-	-
Stage 2	388	414	-	274	274	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	371	365	807	378	384	659	1332	-	-	1129	-	-
Stage 1	726	678	-	638	611	-	-	-	-	-	-	-
Stage 2	630	588	-	726	678	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	351	355	804	368	373	654	1326	-	-	1124	-	-
Mov Cap-2 Maneuver	351	355	-	368	373	-	-	-	-	-	-	-
Stage 1	726	662	-	635	608	-	-	-	-	-	-	-
Stage 2	607	586	-	706	662	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	16.4	0	0.9
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1326	-	-	-	409	1124	-	-
HCM Lane V/C Ratio	-	-	-	-	0.231	0.024	-	-
HCM Control Delay (s)	0	-	-	0	16.4	8.3	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	0.9	0.1	-	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	112	0	31	0	309	142	44	202	0
Future Vol, veh/h	0	0	0	112	0	31	0	309	142	44	202	0
Conflicting Peds, #/hr	0	0	0	5	0	5	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	48	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	122	0	34	0	336	154	48	220	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	750	810	225	733	733	423	220	0	0	495	0	0
Stage 1	315	315	-	418	418	-	-	-	-	-	-	-
Stage 2	435	495	-	315	315	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	324	311	807	332	344	624	1332	-	-	1053	-	-
Stage 1	690	650	-	607	585	-	-	-	-	-	-	-
Stage 2	594	541	-	690	650	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	294	296	804	318	327	619	1326	-	-	1049	-	-
Mov Cap-2 Maneuver	294	296	-	318	327	-	-	-	-	-	-	-
Stage 1	690	620	-	604	583	-	-	-	-	-	-	-
Stage 2	559	539	-	656	620	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	22.8	0	1.5
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1326	-	-	-	355	1049	-	-
HCM Lane V/C Ratio	-	-	-	-	0.438	0.046	-	-
HCM Control Delay (s)	0	-	-	0	22.8	8.6	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	2.2	0.1	-	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	77	0	23	0	359	77	29	234	0
Future Vol, veh/h	0	0	0	77	0	23	0	359	77	29	234	0
Conflicting Peds, #/hr	0	0	0	5	0	5	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	48	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	84	0	25	0	390	84	32	254	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	767	796	259	754	754	442	254	0	0	479	0	0
Stage 1	317	317	-	437	437	-	-	-	-	-	-	-
Stage 2	450	479	-	317	317	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	315	316	772	322	335	609	1294	-	-	1068	-	-
Stage 1	688	649	-	592	574	-	-	-	-	-	-	-
Stage 2	583	550	-	688	649	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	294	305	769	312	324	604	1289	-	-	1064	-	-
Mov Cap-2 Maneuver	294	305	-	312	324	-	-	-	-	-	-	-
Stage 1	688	629	-	590	572	-	-	-	-	-	-	-
Stage 2	557	548	-	665	629	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	19.8	0	0.9
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1289	-	-	-	351	1064	-	-
HCM Lane V/C Ratio	-	-	-	-	0.31	0.03	-	-
HCM Control Delay (s)	0	-	-	0	19.8	8.5	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	1.3	0.1	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	122	0	34	0	359	152	48	234	0
Future Vol, veh/h	0	0	0	122	0	34	0	359	152	48	234	0
Conflicting Peds, #/hr	0	0	0	5	0	5	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	48	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	133	0	37	0	390	165	52	254	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	855	919	259	837	837	483	254	0	0	560	0	0
Stage 1	359	359	-	478	478	-	-	-	-	-	-	-
Stage 2	496	560	-	359	359	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	275	268	772	283	299	577	1294	-	-	996	-	-
Stage 1	653	622	-	563	551	-	-	-	-	-	-	-
Stage 2	550	506	-	653	622	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	246	253	769	269	282	572	1289	-	-	992	-	-
Mov Cap-2 Maneuver	246	253	-	269	282	-	-	-	-	-	-	-
Stage 1	653	589	-	561	549	-	-	-	-	-	-	-
Stage 2	512	504	-	616	589	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	30.8	0	1.5
HCM LOS	A	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1289	-	-	-	304	992	-	-
HCM Lane V/C Ratio	-	-	-	-	0.558	0.053	-	-
HCM Control Delay (s)	0	-	-	0	30.8	8.8	-	-
HCM Lane LOS	A	-	-	A	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	3.2	0.2	-	-

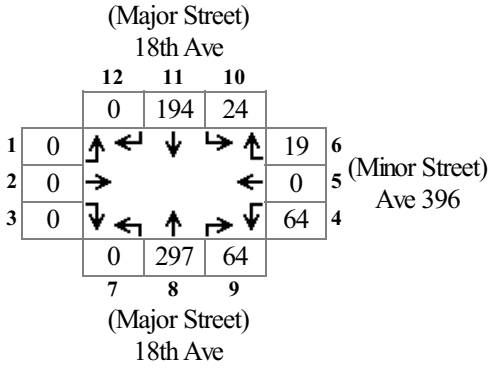
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	122	0	34	0	359	152	48	234	0
Future Volume (veh/h)	0	0	0	122	0	34	0	359	152	48	234	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1810	1900	1667	1810	1750	1810	1810	1750	1667	1810	1900
Adj Flow Rate, veh/h	0	0	0	133	0	37	0	390	165	52	254	0
Adj No. of Lanes	0	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	0	212	0	264	0	176	2	854	361	71	1440	0
Arrive On Green	0.00	0.00	0.00	0.12	0.00	0.11	0.00	0.71	0.70	0.09	1.00	0.00
Sat Flow, veh/h	0	1810	0	1587	0	1504	1723	1207	511	1587	1810	0
Grp Volume(v), veh/h	0	0	0	133	0	37	0	0	555	52	254	0
Grp Sat Flow(s),veh/h/ln	0	1810	0	1587	0	1504	1723	0	1717	1587	1810	0
Q Serve(g_s), s	0.0	0.0	0.0	7.4	0.0	2.1	0.0	0.0	12.9	2.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	7.4	0.0	2.1	0.0	0.0	12.9	2.9	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.30	1.00		0.00
Lane Grp Cap(c), veh/h	0	212	0	264	0	176	2	0	1215	71	1440	0
V/C Ratio(X)	0.00	0.00	0.00	0.50	0.00	0.21	0.00	0.00	0.46	0.73	0.18	0.00
Avail Cap(c_a), veh/h	0	600	0	458	0	360	84	0	1215	104	1440	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.95	0.98	0.98	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	39.1	0.0	37.0	0.0	0.0	5.9	41.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.5	0.0	0.6	0.0	0.0	1.2	13.3	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	3.4	0.0	0.9	0.0	0.0	6.4	1.5	0.1	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	40.6	0.0	37.6	0.0	0.0	7.0	54.6	0.3	0.0
LnGrp LOS				D		D			A	D	A	
Approach Vol, veh/h		0			170			555			306	
Approach Delay, s/veh		0.0			40.0			7.0			9.5	
Approach LOS					D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	69.1		14.8	0.0	77.2	0.0	14.8
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	43.0		30.0	4.0	44.5	4.0	21.5
Max Q Clear Time (g_c+I1), s	4.9	14.9		0.0	0.0	2.0	0.0	9.4
Green Ext Time (p_c), s	0.0	3.8		0.0	0.0	4.0	0.0	0.4

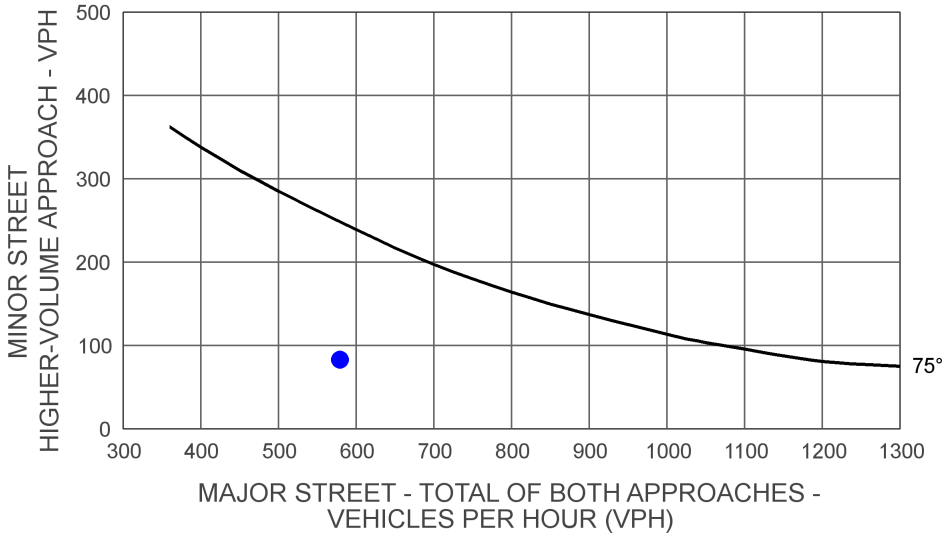
Intersection Summary	
HCM 2010 Ctrl Delay	13.2
HCM 2010 LOS	B

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing
Intersection #: 4

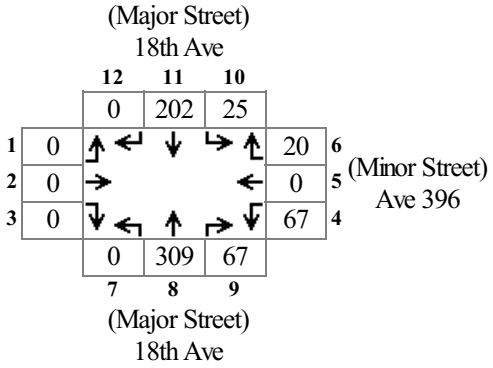


Major Total: 579
Minor High Volume: 83

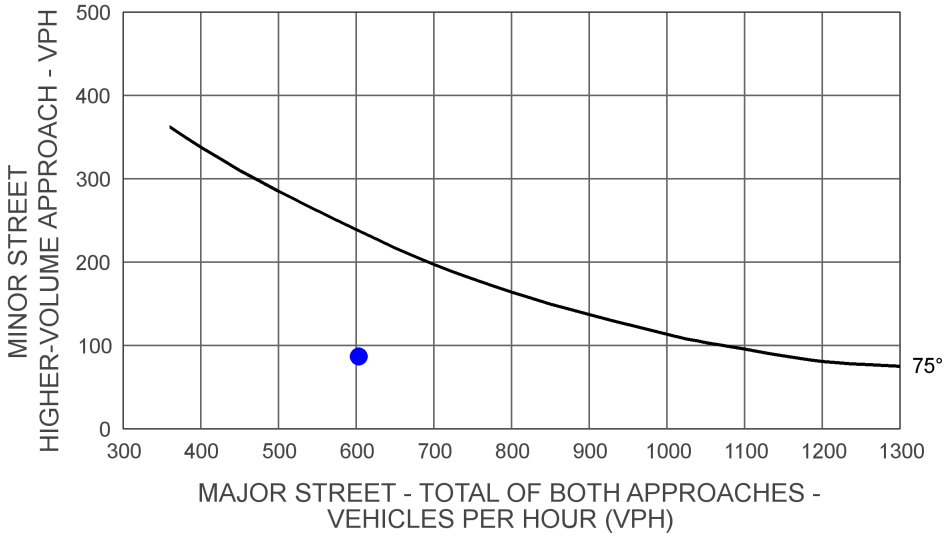


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 4

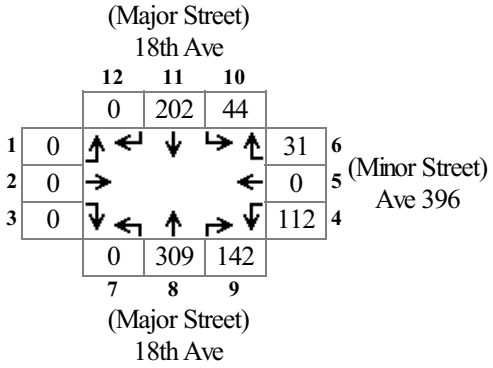


Major Total: 603
Minor High Volume: 87

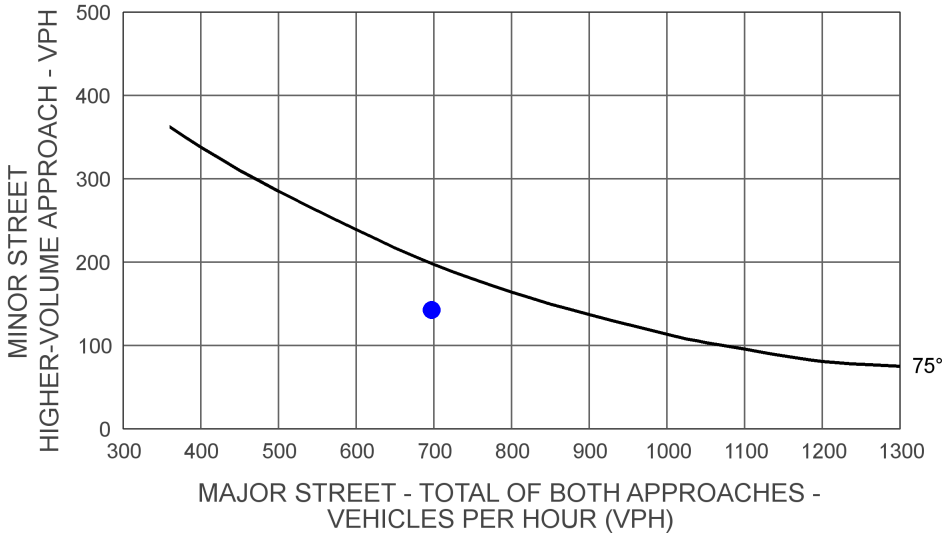


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 4

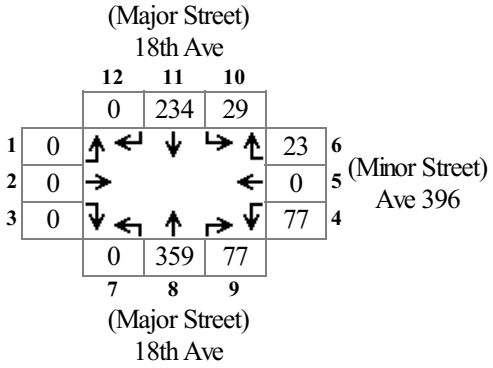


Major Total: 697
Minor High Volume: 143

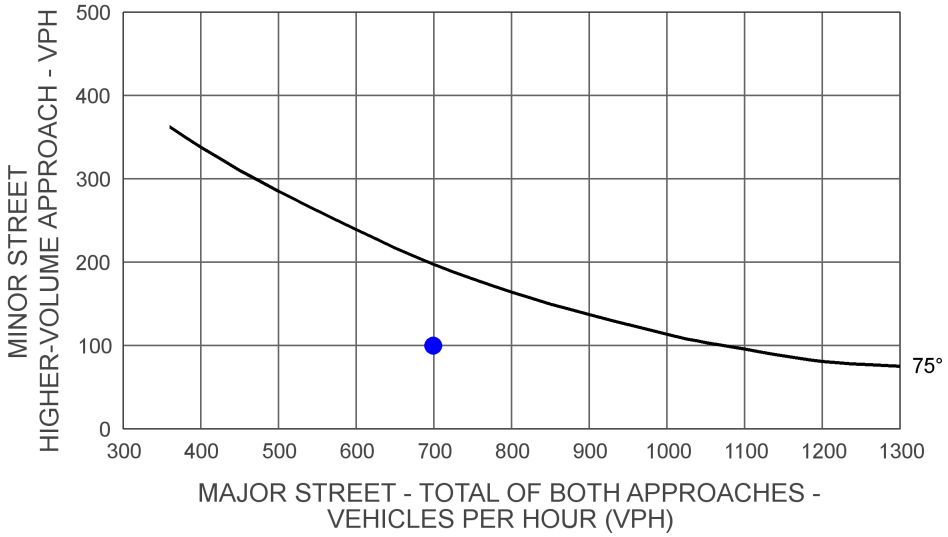


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 4

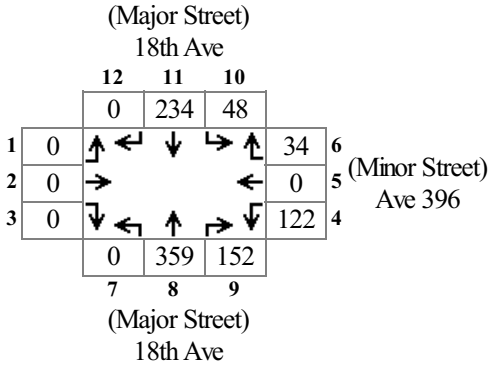


Major Total: 699
Minor High Volume: 100

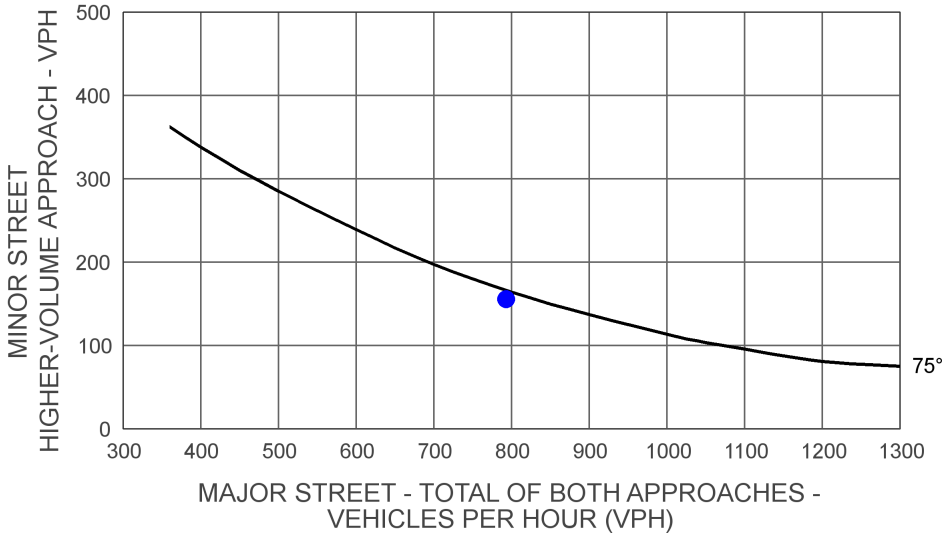


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 4



Major Total: 793
Minor High Volume: 156



Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	67	0	28	0	316	89	20	336	0
Future Vol, veh/h	0	0	0	67	0	28	0	316	89	20	336	0
Conflicting Peds, #/hr	0	0	0	5	0	5	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	48	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	73	0	30	0	343	97	22	365	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	821	854	370	806	806	402	365	0	0	445	0	0
Stage 1	409	409	-	397	397	-	-	-	-	-	-	-
Stage 2	412	445	-	409	409	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	290	293	669	297	312	642	1177	-	-	1099	-	-
Stage 1	613	591	-	623	598	-	-	-	-	-	-	-
Stage 2	611	570	-	613	591	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	271	286	666	290	304	637	1172	-	-	1094	-	-
Mov Cap-2 Maneuver	271	286	-	290	304	-	-	-	-	-	-	-
Stage 1	613	579	-	620	596	-	-	-	-	-	-	-
Stage 2	579	568	-	598	579	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	19.8	0	0.5
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1172	-	-	-	345	1094	-	-
HCM Lane V/C Ratio	-	-	-	-	0.299	0.02	-	-
HCM Control Delay (s)	0	-	-	0	19.8	8.4	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	1.2	0.1	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	70	0	29	0	329	93	21	350	0
Future Vol, veh/h	0	0	0	70	0	29	0	329	93	21	350	0
Conflicting Peds, #/hr	0	0	0	5	0	5	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	48	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	76	0	32	0	358	101	23	380	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	855	890	385	839	839	418	380	0	0	464	0	0
Stage 1	426	426	-	413	413	-	-	-	-	-	-	-
Stage 2	429	464	-	426	426	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	275	279	656	282	299	629	1162	-	-	1082	-	-
Stage 1	601	581	-	610	588	-	-	-	-	-	-	-
Stage 2	598	558	-	601	581	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	256	272	653	275	291	624	1157	-	-	1077	-	-
Mov Cap-2 Maneuver	256	272	-	275	291	-	-	-	-	-	-	-
Stage 1	601	569	-	607	586	-	-	-	-	-	-	-
Stage 2	565	556	-	586	569	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	21.2	0	0.5
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1157	-	-	-	329	1077	-	-
HCM Lane V/C Ratio	-	-	-	-	0.327	0.021	-	-
HCM Control Delay (s)	0	-	-	0	21.2	8.4	-	-
HCM Lane LOS	A	-	-	A	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	1.4	0.1	-	-

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	136	0	45	0	329	114	26	350	0
Future Vol, veh/h	0	0	0	136	0	45	0	329	114	26	350	0
Conflicting Peds, #/hr	0	0	0	5	0	5	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	48	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	148	0	49	0	358	124	28	380	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	886	924	385	862	862	430	380	0	0	487	0	0
Stage 1	437	437	-	425	425	-	-	-	-	-	-	-
Stage 2	449	487	-	437	437	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	262	266	656	272	290	619	1162	-	-	1061	-	-
Stage 1	592	574	-	601	581	-	-	-	-	-	-	-
Stage 2	584	545	-	592	574	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	235	258	653	264	281	614	1157	-	-	1057	-	-
Mov Cap-2 Maneuver	235	258	-	264	281	-	-	-	-	-	-	-
Stage 1	592	559	-	598	579	-	-	-	-	-	-	-
Stage 2	535	543	-	574	559	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	35.2	0	0.6
HCM LOS	A	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1157	-	-	-	308	1057	-	-
HCM Lane V/C Ratio	-	-	-	-	0.639	0.027	-	-
HCM Control Delay (s)	0	-	-	0	35.2	8.5	-	-
HCM Lane LOS	A	-	-	A	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	4.1	0.1	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	81	0	34	0	382	108	24	406	0
Future Vol, veh/h	0	0	0	81	0	34	0	382	108	24	406	0
Conflicting Peds, #/hr	0	0	0	5	0	5	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	48	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	88	0	37	0	415	117	26	441	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	990	1031	446	972	972	484	441	0	0	538	0	0
Stage 1	493	493	-	479	479	-	-	-	-	-	-	-
Stage 2	497	538	-	493	493	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	223	230	606	229	250	577	1103	-	-	1015	-	-
Stage 1	552	542	-	562	550	-	-	-	-	-	-	-
Stage 2	549	517	-	552	542	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	204	223	603	223	243	572	1098	-	-	1011	-	-
Mov Cap-2 Maneuver	204	223	-	223	243	-	-	-	-	-	-	-
Stage 1	552	528	-	560	548	-	-	-	-	-	-	-
Stage 2	511	515	-	536	528	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	29	0	0.5
HCM LOS	A	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1098	-	-	-	272	1011	-	-
HCM Lane V/C Ratio	-	-	-	-	0.46	0.026	-	-
HCM Control Delay (s)	0	-	-	0	29	8.7	-	-
HCM Lane LOS	A	-	-	A	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	2.3	0.1	-	-

Intersection	
Int Delay, s/veh	11.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	147	0	50	0	382	129	29	406	0
Future Vol, veh/h	0	0	0	147	0	50	0	382	129	29	406	0
Conflicting Peds, #/hr	0	0	0	5	0	5	0	0	5	5	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	0	-	-	48	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	0	0	0	160	0	54	0	415	140	32	441	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1022	1064	446	994	994	495	441	0	0	560	0	0
Stage 1	504	504	-	490	490	-	-	-	-	-	-	-
Stage 2	518	560	-	504	504	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	212	220	606	221	242	569	1103	-	-	996	-	-
Stage 1	545	536	-	554	544	-	-	-	-	-	-	-
Stage 2	535	506	-	545	536	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	186	212	603	214	233	564	1098	-	-	992	-	-
Mov Cap-2 Maneuver	186	212	-	214	233	-	-	-	-	-	-	-
Stage 1	545	519	-	552	542	-	-	-	-	-	-	-
Stage 2	481	504	-	525	519	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	65.2	0	0.6
HCM LOS	A	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1098	-	-	-	254	992	-	-
HCM Lane V/C Ratio	-	-	-	-	0.843	0.032	-	-
HCM Control Delay (s)	0	-	-	0	65.2	8.7	-	-
HCM Lane LOS	A	-	-	A	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	6.8	0.1	-	-

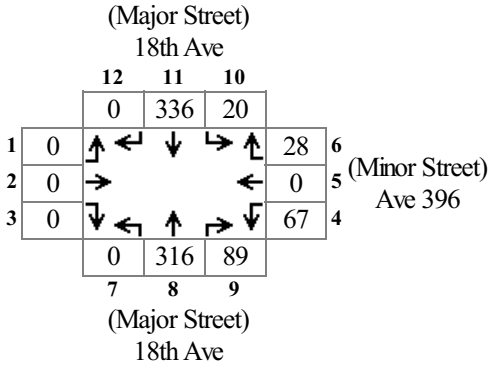
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	147	0	50	0	382	129	29	406	0
Future Volume (veh/h)	0	0	0	147	0	50	0	382	129	29	406	0
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1810	1900	1667	1810	1750	1810	1810	1750	1667	1810	1900
Adj Flow Rate, veh/h	0	0	0	160	0	54	0	415	140	32	441	0
Adj No. of Lanes	0	1	0	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5	5	5	5	5	5	5	5	5	5
Cap, veh/h	0	243	0	291	0	203	2	913	308	47	1409	0
Arrive On Green	0.00	0.00	0.00	0.13	0.00	0.13	0.00	0.71	0.70	0.06	1.00	0.00
Sat Flow, veh/h	0	1810	0	1587	0	1508	1723	1294	437	1587	1810	0
Grp Volume(v), veh/h	0	0	0	160	0	54	0	0	555	32	441	0
Grp Sat Flow(s),veh/h/ln	0	1810	0	1587	0	1508	1723	0	1731	1587	1810	0
Q Serve(g_s), s	0.0	0.0	0.0	8.9	0.0	3.0	0.0	0.0	12.8	1.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	0.0	8.9	0.0	3.0	0.0	0.0	12.8	1.8	0.0	0.0
Prop In Lane	0.00		0.00	1.00		1.00	1.00		0.25	1.00		0.00
Lane Grp Cap(c), veh/h	0	243	0	291	0	203	2	0	1221	47	1409	0
V/C Ratio(X)	0.00	0.00	0.00	0.55	0.00	0.27	0.00	0.00	0.45	0.68	0.31	0.00
Avail Cap(c_a), veh/h	0	600	0	458	0	361	84	0	1221	104	1409	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.90	0.95	0.95	0.00
Uniform Delay (d), s/veh	0.0	0.0	0.0	38.3	0.0	36.0	0.0	0.0	5.9	42.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	1.6	0.0	0.7	0.0	0.0	1.1	15.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	0.0	4.0	0.0	1.3	0.0	0.0	6.4	1.0	0.2	0.0
LnGrp Delay(d),s/veh	0.0	0.0	0.0	40.0	0.0	36.7	0.0	0.0	7.0	57.9	0.6	0.0
LnGrp LOS				D		D			A	E	A	
Approach Vol, veh/h		0			214			555			473	
Approach Delay, s/veh		0.0			39.1			7.0			4.4	
Approach LOS					D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.7	68.9		16.4	0.0	75.6	0.0	16.4
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	43.0		30.0	4.0	44.5	4.0	21.5
Max Q Clear Time (g_c+I1), s	3.8	14.8		0.0	0.0	2.0	0.0	10.9
Green Ext Time (p_c), s	0.0	4.9		0.0	0.0	5.1	0.0	0.6

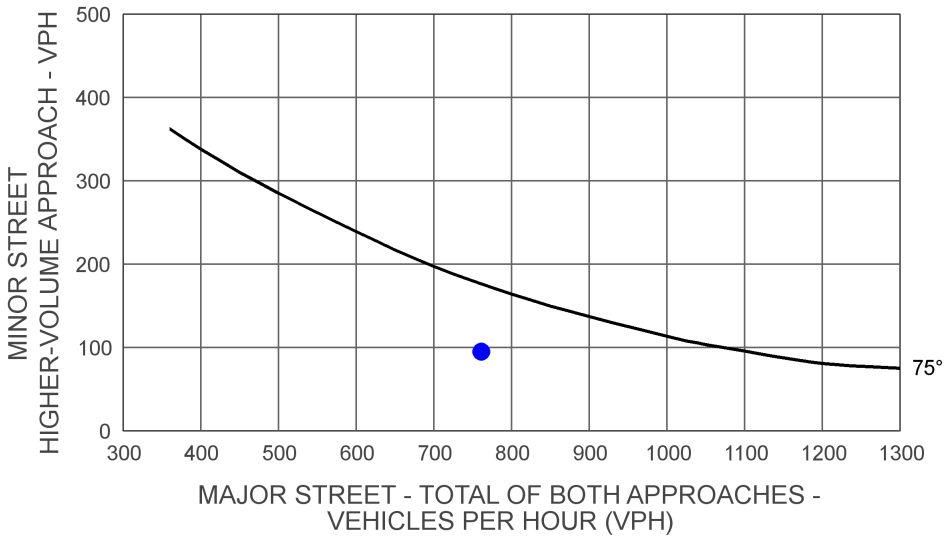
Intersection Summary	
HCM 2010 Ctrl Delay	11.6
HCM 2010 LOS	B

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing
Intersection #: 4

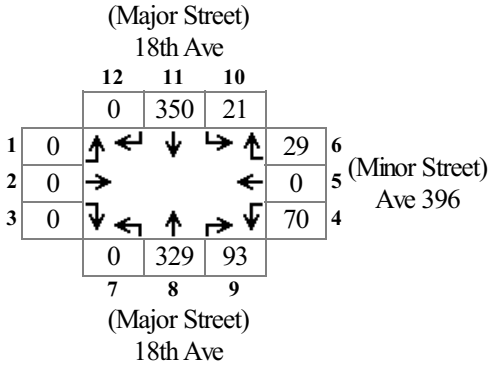


Major Total: 761
Minor High Volume: 95

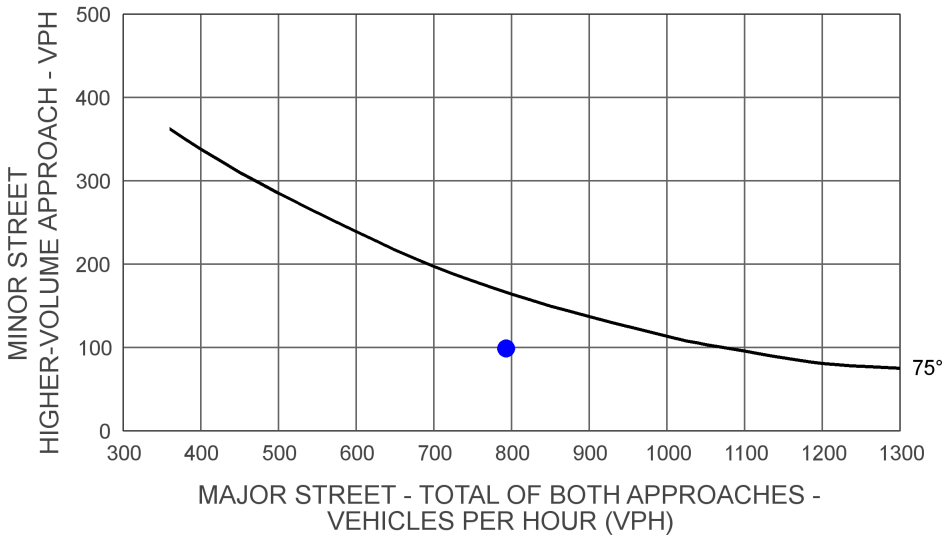


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 4

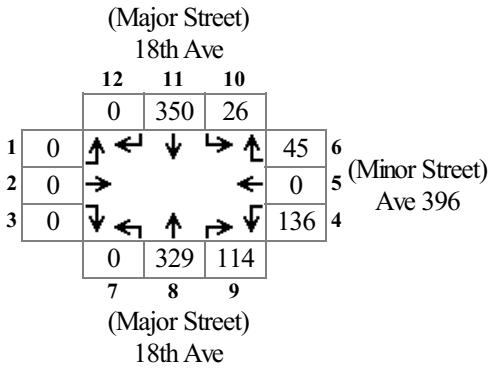


Major Total: 793
Minor High Volume: 99

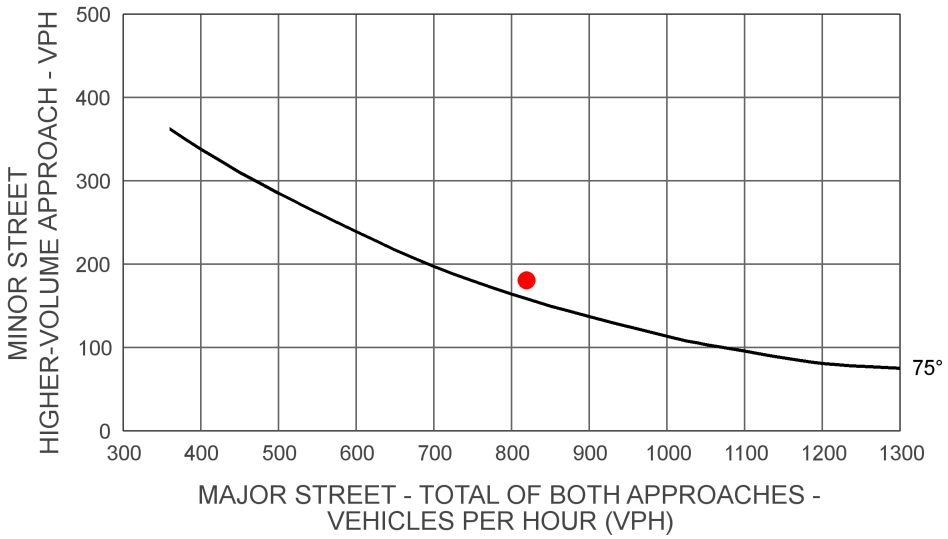


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: AM Future+Project
Intersection #: 4

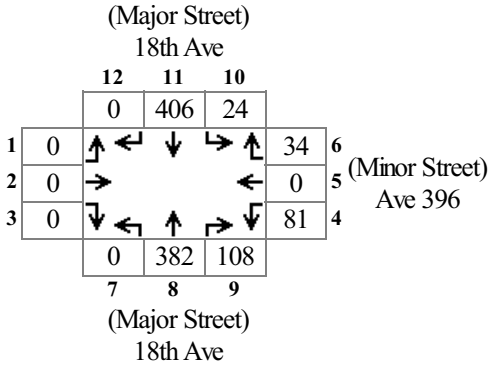


Major Total: 819
Minor High Volume: 181

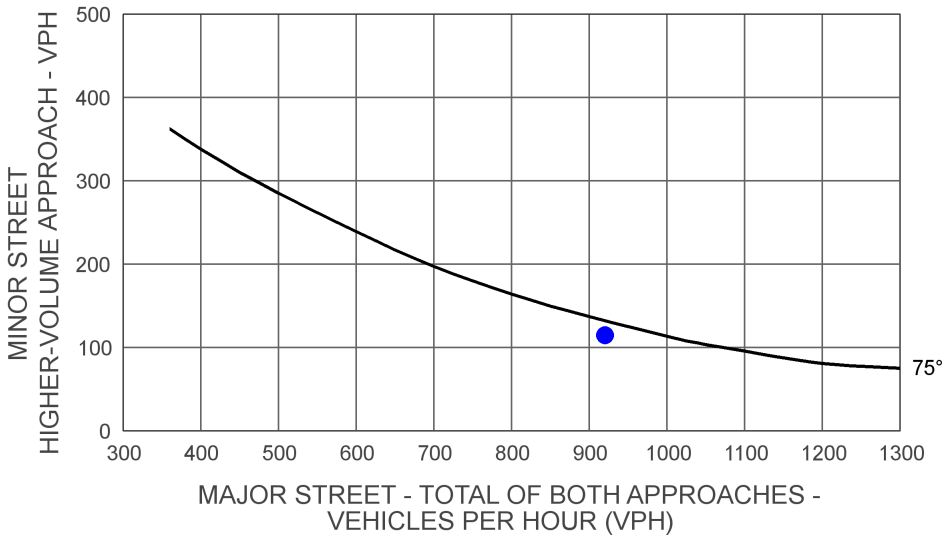


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 4

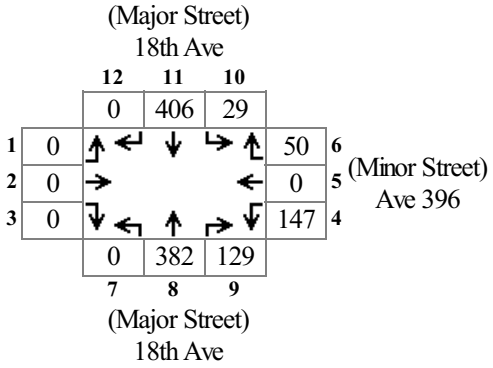


Major Total: 920
Minor High Volume: 115

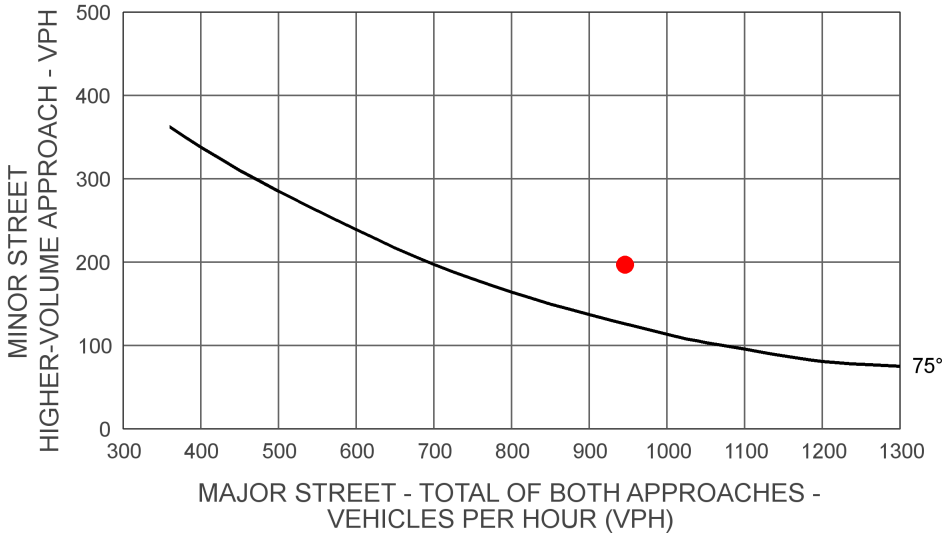


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: AM Future+Project
Intersection #: 4



Major Total: 946
Minor High Volume: 197



Intersection 5
Road 16 & Ave 396

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	13	43	38	1	1	10
Future Vol, veh/h	13	43	38	1	1	10
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	14	47	41	1	1	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	47	0	-	0	122	52
Stage 1	-	-	-	-	47	-
Stage 2	-	-	-	-	75	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1541	-	-	-	866	1007
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1535	-	-	-	851	999
Mov Cap-2 Maneuver	-	-	-	-	851	-
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	928	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1535	-	-	-	983
HCM Lane V/C Ratio	0.009	-	-	-	0.012
HCM Control Delay (s)	7.4	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	14	45	40	1	1	10
Future Vol, veh/h	14	45	40	1	1	10
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	15	49	43	1	1	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	50	0	-	0	128	54
Stage 1	-	-	-	-	49	-
Stage 2	-	-	-	-	79	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1537	-	-	-	859	1005
Stage 1	-	-	-	-	966	-
Stage 2	-	-	-	-	937	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1531	-	-	-	843	997
Mov Cap-2 Maneuver	-	-	-	-	843	-
Stage 1	-	-	-	-	962	-
Stage 2	-	-	-	-	924	-

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1531	-	-	-	981
HCM Lane V/C Ratio	0.01	-	-	-	0.012
HCM Control Delay (s)	7.4	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	18	45	40	1	1	17
Future Vol, veh/h	18	45	40	1	1	17
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	20	49	43	1	1	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	50	0	-	0	137	54
Stage 1	-	-	-	-	49	-
Stage 2	-	-	-	-	88	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1537	-	-	-	849	1005
Stage 1	-	-	-	-	966	-
Stage 2	-	-	-	-	928	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1531	-	-	-	831	997
Mov Cap-2 Maneuver	-	-	-	-	831	-
Stage 1	-	-	-	-	962	-
Stage 2	-	-	-	-	912	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1531	-	-	-	986
HCM Lane V/C Ratio	0.013	-	-	-	0.02
HCM Control Delay (s)	7.4	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	16	52	46	1	1	12
Future Vol, veh/h	16	52	46	1	1	12
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	17	57	50	1	1	13

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	56	0	-	0	147	61
Stage 1	-	-	-	-	56	-
Stage 2	-	-	-	-	91	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1530	-	-	-	838	996
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	925	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1524	-	-	-	821	988
Mov Cap-2 Maneuver	-	-	-	-	821	-
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	910	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1524	-	-	-	973
HCM Lane V/C Ratio	0.011	-	-	-	0.015
HCM Control Delay (s)	7.4	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	20	52	46	1	1	19
Future Vol, veh/h	20	52	46	1	1	19
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	22	57	50	1	1	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	56	0	-	0	156	61
Stage 1	-	-	-	-	56	-
Stage 2	-	-	-	-	100	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1530	-	-	-	828	996
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	917	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1524	-	-	-	809	988
Mov Cap-2 Maneuver	-	-	-	-	809	-
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	899	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1524	-	-	-	977
HCM Lane V/C Ratio	0.014	-	-	-	0.022
HCM Control Delay (s)	7.4	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	20	52	46	1	1	19
Future Vol, veh/h	20	52	46	1	1	19
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	22	57	50	1	1	21

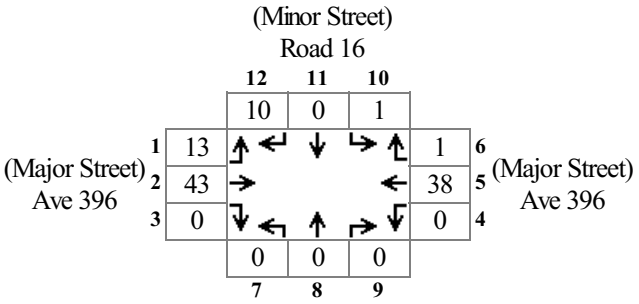
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	56	0	-	0	156	61
Stage 1	-	-	-	-	56	-
Stage 2	-	-	-	-	100	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1530	-	-	-	828	996
Stage 1	-	-	-	-	959	-
Stage 2	-	-	-	-	917	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1524	-	-	-	809	988
Mov Cap-2 Maneuver	-	-	-	-	809	-
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	899	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	8.8
HCM LOS			A

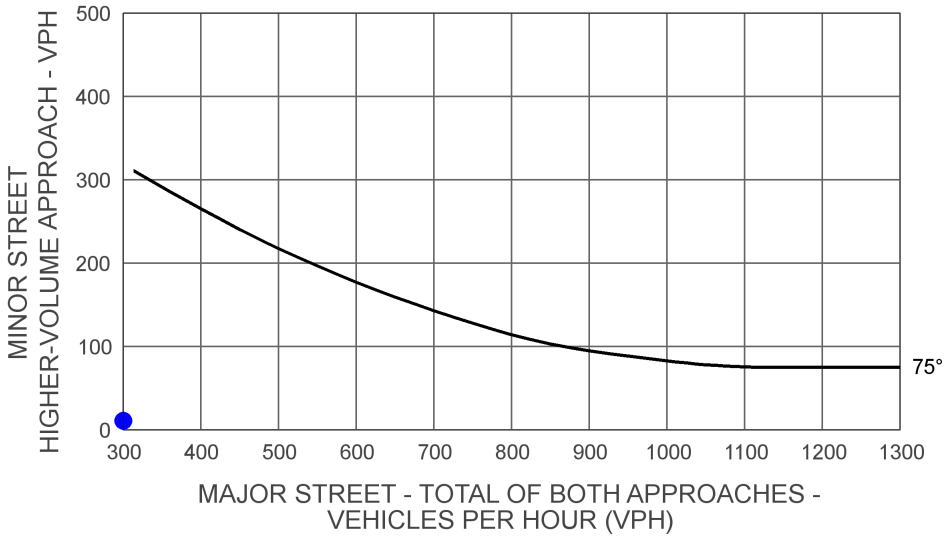
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1524	-	-	-	977
HCM Lane V/C Ratio	0.014	-	-	-	0.022
HCM Control Delay (s)	7.4	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing
Intersection #: 5

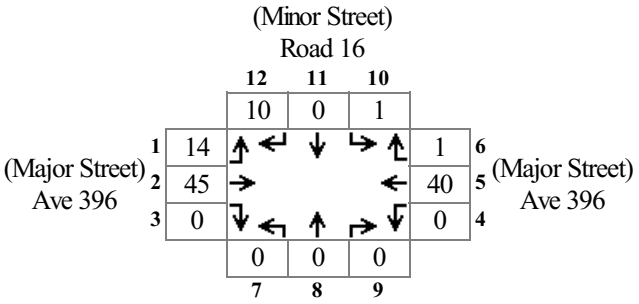


Major Total: 95
Minor High Volume: 11

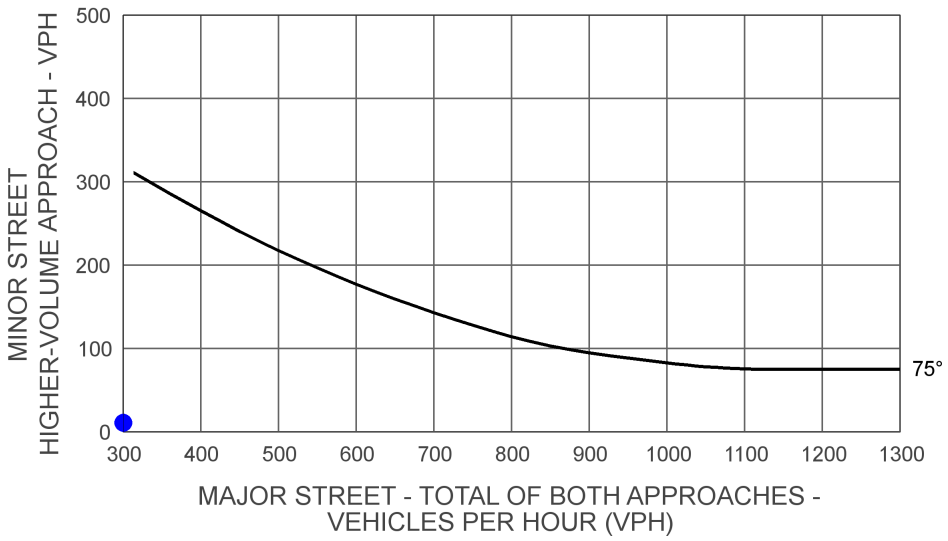


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 5

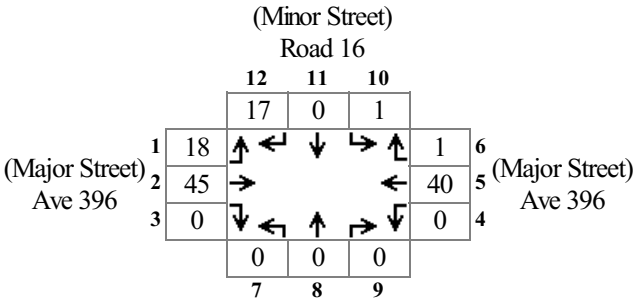


Major Total: 100
Minor High Volume: 11

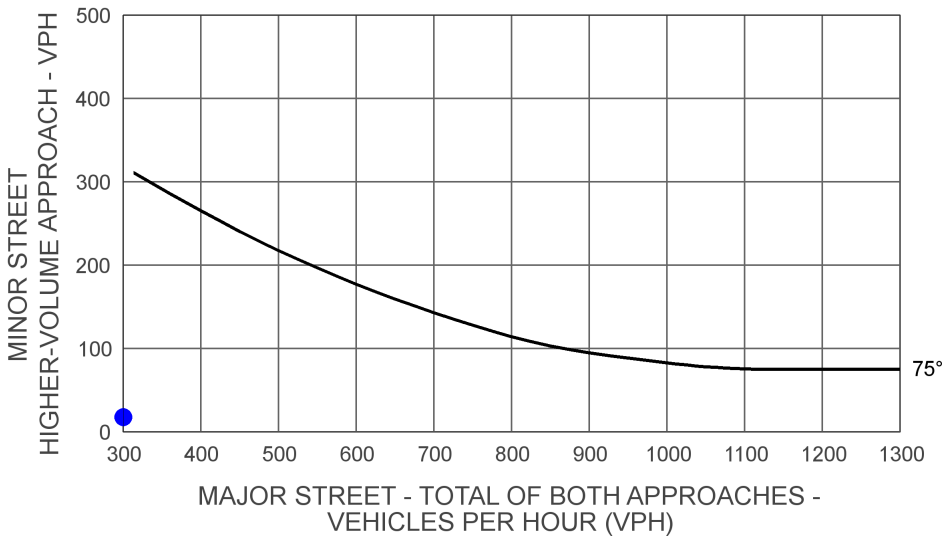


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 5

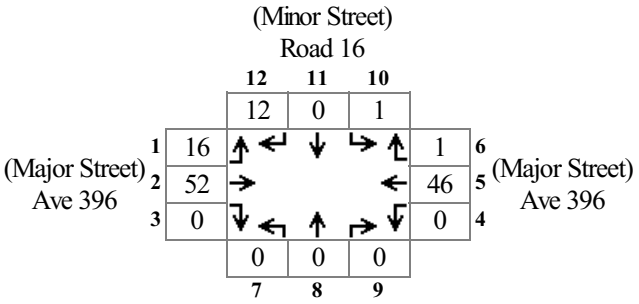


Major Total: 104
Minor High Volume: 18

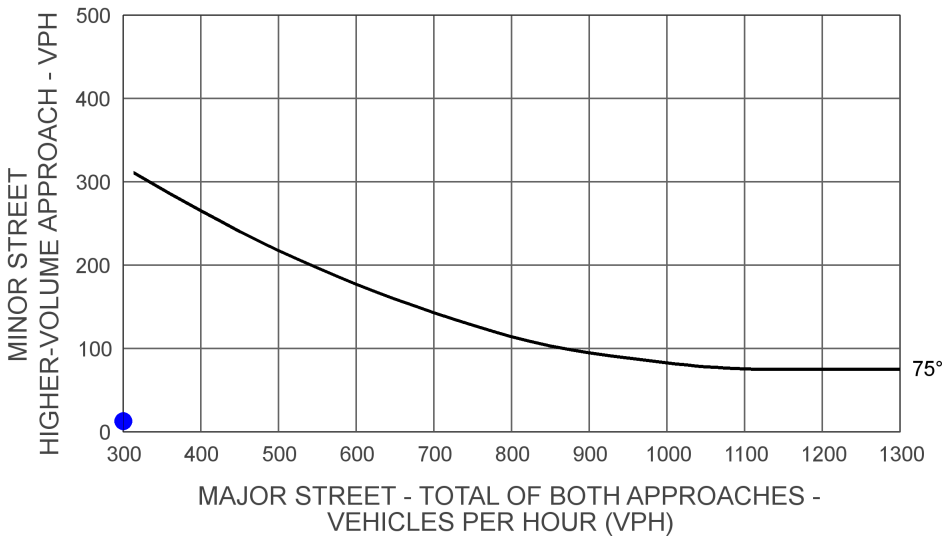


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 5

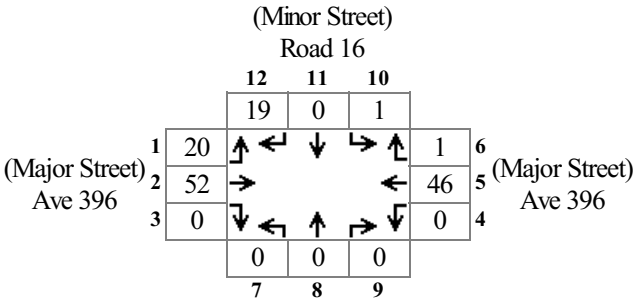


Major Total: 115
Minor High Volume: 13

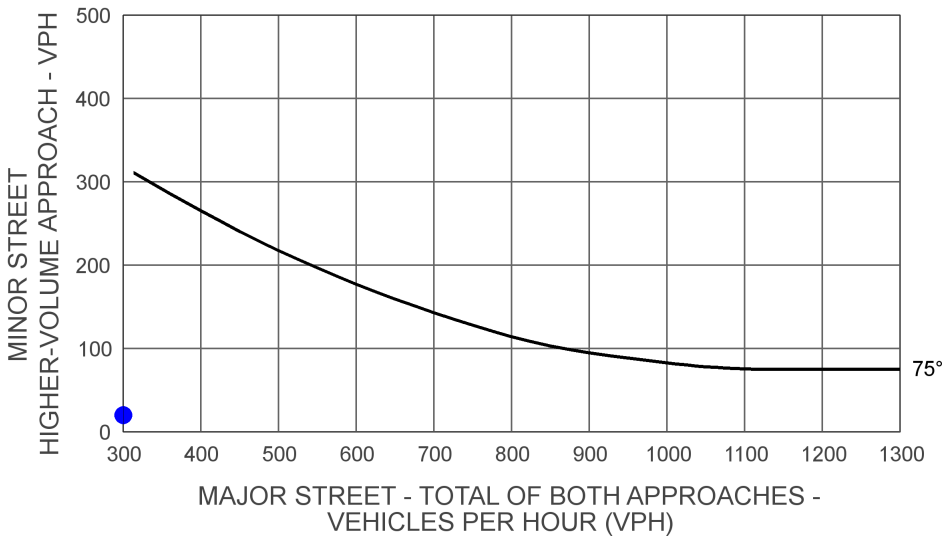


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 5



Major Total: 119
Minor High Volume: 20



Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	12	43	54	4	2	21
Future Vol, veh/h	12	43	54	4	2	21
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	13	47	59	4	2	23

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	68	0	-	0	139	71
Stage 1	-	-	-	-	66	-
Stage 2	-	-	-	-	73	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1514	-	-	-	847	983
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	942	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1508	-	-	-	832	975
Mov Cap-2 Maneuver	-	-	-	-	832	-
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	930	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1508	-	-	-	961
HCM Lane V/C Ratio	0.009	-	-	-	0.026
HCM Control Delay (s)	7.4	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	12	45	56	4	2	22
Future Vol, veh/h	12	45	56	4	2	22
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	13	49	61	4	2	24

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	70	0	-	0	143	73
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	75	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1512	-	-	-	843	981
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1506	-	-	-	828	973
Mov Cap-2 Maneuver	-	-	-	-	828	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	928	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1506	-	-	-	959
HCM Lane V/C Ratio	0.009	-	-	-	0.027
HCM Control Delay (s)	7.4	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	18	45	56	4	2	24
Future Vol, veh/h	18	45	56	4	2	24
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	20	49	61	4	2	26

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	70	0	-	0	156	73
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	88	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1512	-	-	-	828	981
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	928	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1506	-	-	-	810	973
Mov Cap-2 Maneuver	-	-	-	-	810	-
Stage 1	-	-	-	-	943	-
Stage 2	-	-	-	-	911	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1506	-	-	-	958
HCM Lane V/C Ratio	0.013	-	-	-	0.029
HCM Control Delay (s)	7.4	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	14	52	65	5	2	25
Future Vol, veh/h	14	52	65	5	2	25
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	15	57	71	5	2	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	81	0	-	0	165	83
Stage 1	-	-	-	-	78	-
Stage 2	-	-	-	-	87	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1498	-	-	-	819	968
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	929	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1492	-	-	-	804	960
Mov Cap-2 Maneuver	-	-	-	-	804	-
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	916	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1492	-	-	-	946
HCM Lane V/C Ratio	0.01	-	-	-	0.031
HCM Control Delay (s)	7.4	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	20	52	65	5	2	27
Future Vol, veh/h	20	52	65	5	2	27
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	22	57	71	5	2	29

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	81	0	-	0	178	83
Stage 1	-	-	-	-	78	-
Stage 2	-	-	-	-	100	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1498	-	-	-	805	968
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	917	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1492	-	-	-	786	960
Mov Cap-2 Maneuver	-	-	-	-	786	-
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	899	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1492	-	-	-	946
HCM Lane V/C Ratio	0.015	-	-	-	0.033
HCM Control Delay (s)	7.4	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	20	52	65	5	2	27
Future Vol, veh/h	20	52	65	5	2	27
Conflicting Peds, #/hr	5	0	0	5	5	5
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5
Mvmt Flow	22	57	71	5	2	29

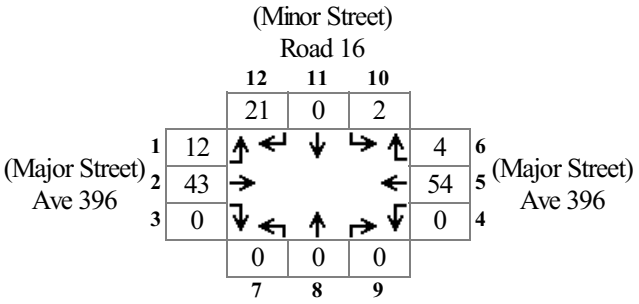
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	81	0	-	0	178	83
Stage 1	-	-	-	-	78	-
Stage 2	-	-	-	-	100	-
Critical Hdwy	4.15	-	-	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	2.245	-	-	-	3.545	3.345
Pot Cap-1 Maneuver	1498	-	-	-	805	968
Stage 1	-	-	-	-	938	-
Stage 2	-	-	-	-	917	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1492	-	-	-	786	960
Mov Cap-2 Maneuver	-	-	-	-	786	-
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	899	-

Approach	EB	WB	SB
HCM Control Delay, s	2.1	0	8.9
HCM LOS			A

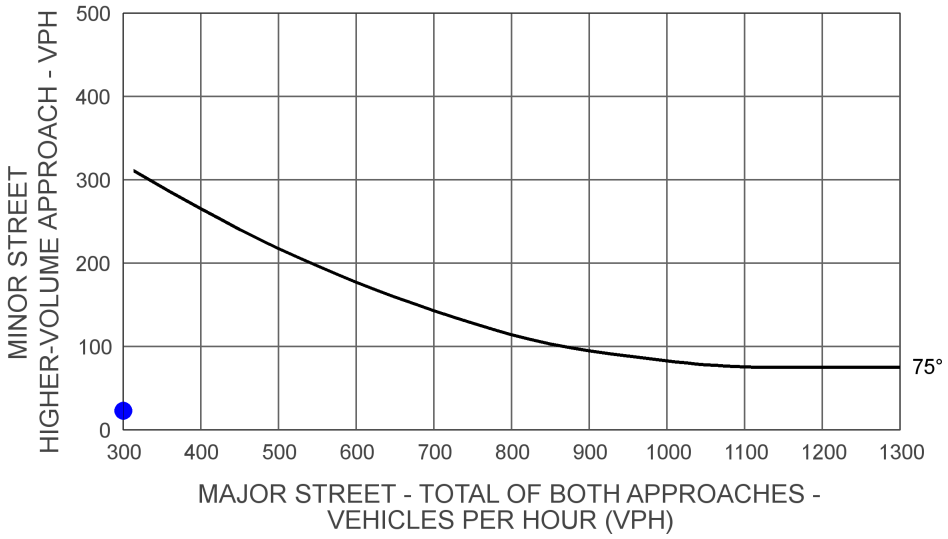
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1492	-	-	-	946
HCM Lane V/C Ratio	0.015	-	-	-	0.033
HCM Control Delay (s)	7.4	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing
Intersection #: 5

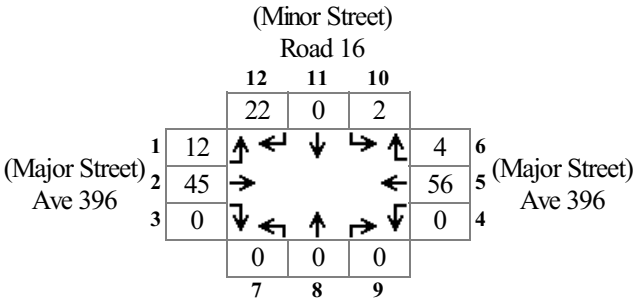


Major Total: 113
Minor High Volume: 23

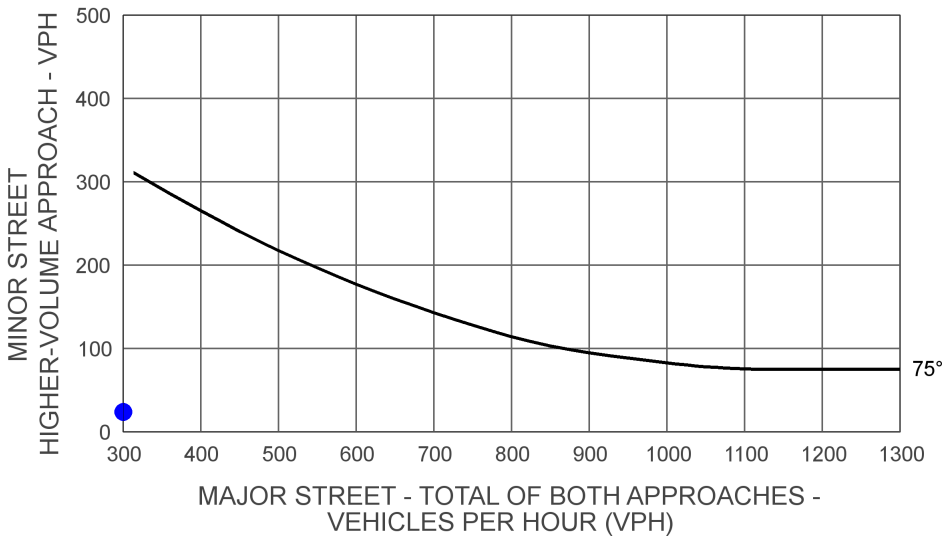


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 5

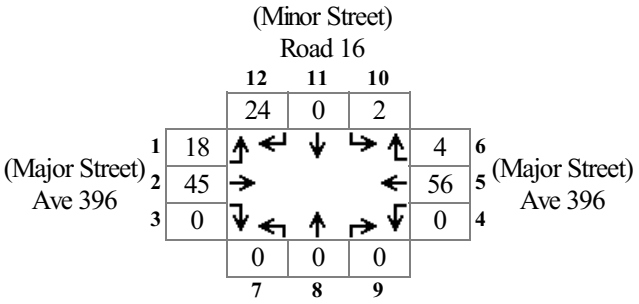


Major Total: 117
Minor High Volume: 24

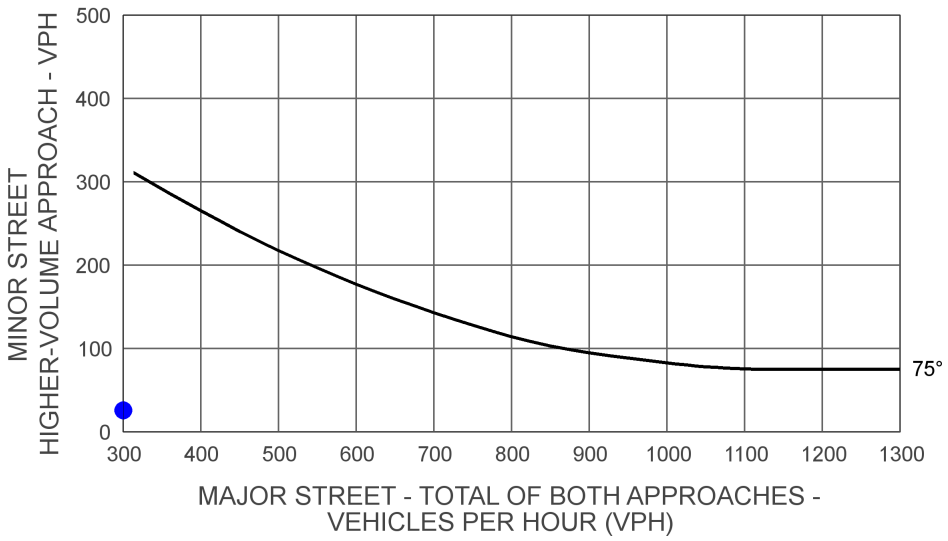


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future+Project
Intersection #: 5

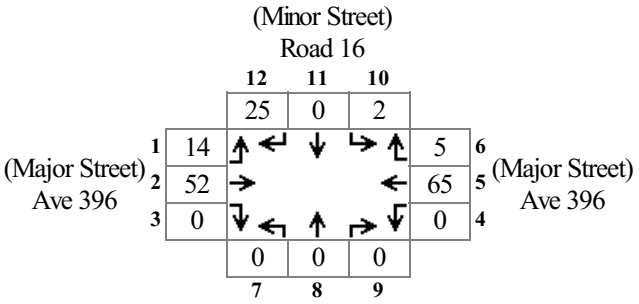


Major Total: 123
Minor High Volume: 26

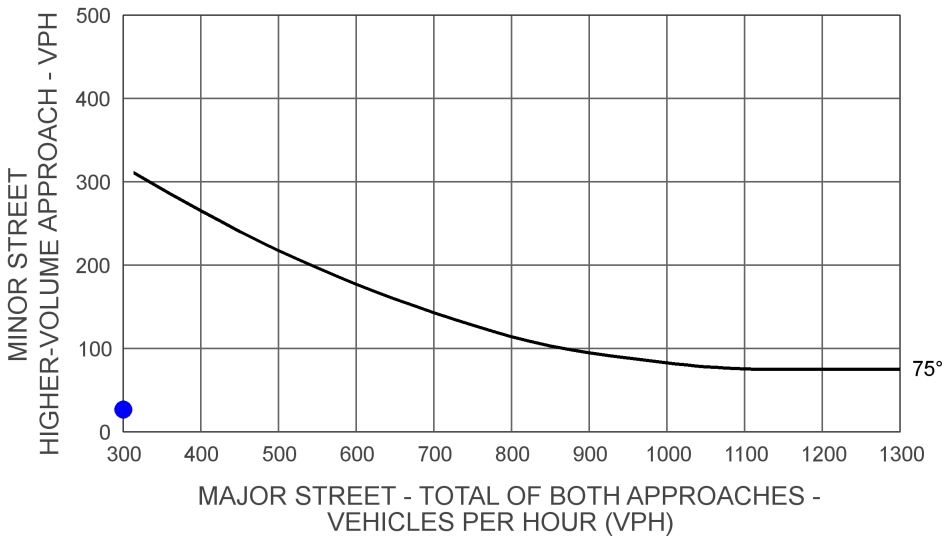


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 5

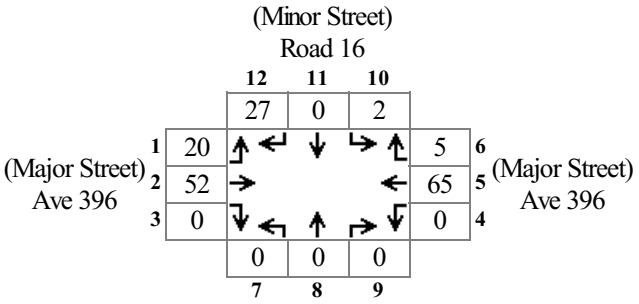


Major Total: 136
Minor High Volume: 27

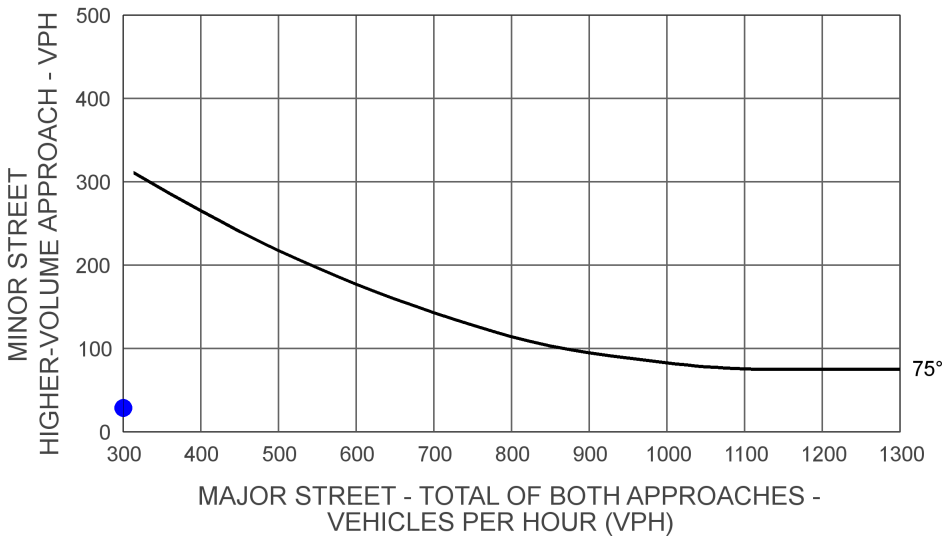


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future+Project
Intersection #: 5



Major Total: 142
Minor High Volume: 29



Intersection 6
18th Ave & SR 99 NB Off Ramp/SR 99 NB On Ramp

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	6	0	15	45	13	154	47	204	0	0	226	32
Future Vol, veh/h	6	0	15	45	13	154	47	204	0	0	226	32
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	7	0	16	49	14	167	51	222	0	0	246	35

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	688	597	273	605	614	232	285	0	0	227	0	0
Stage 1	268	268	-	329	329	-	-	-	-	-	-	-
Stage 2	420	329	-	276	285	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	357	412	759	405	403	800	1260	-	-	1324	-	-
Stage 1	731	682	-	678	641	-	-	-	-	-	-	-
Stage 2	605	641	-	724	670	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	262	390	753	379	381	793	1255	-	-	1318	-	-
Mov Cap-2 Maneuver	262	390	-	379	381	-	-	-	-	-	-	-
Stage 1	694	679	-	644	609	-	-	-	-	-	-	-
Stage 2	443	609	-	705	667	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.7	12.4	1.5	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1255	-	-	490	379	731	1318	-	-
HCM Lane V/C Ratio	0.041	-	-	0.047	0.129	0.248	-	-	-
HCM Control Delay (s)	8	0	-	12.7	15.9	11.5	0	-	-
HCM Lane LOS	A	A	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.4	1	0	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	6	0	16	47	14	160	49	212	0	0	235	33
Future Vol, veh/h	6	0	16	47	14	160	49	212	0	0	235	33
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	7	0	17	51	15	174	53	230	0	0	255	36

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	715	620	283	629	638	240	296	0	0	235	0	0
Stage 1	278	278	-	342	342	-	-	-	-	-	-	-
Stage 2	437	342	-	287	296	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	342	400	749	391	391	792	1248	-	-	1315	-	-
Stage 1	722	675	-	667	633	-	-	-	-	-	-	-
Stage 2	592	633	-	714	663	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	246	377	743	364	369	785	1243	-	-	1310	-	-
Mov Cap-2 Maneuver	246	377	-	364	369	-	-	-	-	-	-	-
Stage 1	684	672	-	632	599	-	-	-	-	-	-	-
Stage 2	425	599	-	694	660	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.9	12.8	1.5	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1243	-	-	479	364	720	1310	-	-
HCM Lane V/C Ratio	0.043	-	-	0.05	0.14	0.263	-	-	-
HCM Control Delay (s)	8	0	-	12.9	16.5	11.8	0	-	-
HCM Lane LOS	A	A	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.5	1.1	0	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	6	0	16	47	14	194	49	253	0	0	255	58
Future Vol, veh/h	6	0	16	47	14	194	49	253	0	0	255	58
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	7	0	17	51	15	211	53	275	0	0	277	63

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	814	701	319	709	732	285	345	0	0	280	0	0
Stage 1	314	314	-	387	387	-	-	-	-	-	-	-
Stage 2	500	387	-	322	345	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	293	359	715	345	345	747	1197	-	-	1266	-	-
Stage 1	690	651	-	631	604	-	-	-	-	-	-	-
Stage 2	547	604	-	684	631	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	193	338	709	320	324	741	1192	-	-	1261	-	-
Mov Cap-2 Maneuver	193	338	-	320	324	-	-	-	-	-	-	-
Stage 1	651	648	-	596	570	-	-	-	-	-	-	-
Stage 2	360	570	-	664	628	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.3	13.9	1.3	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1192	-	-	410	320	682	1261	-	-
HCM Lane V/C Ratio	0.045	-	-	0.058	0.16	0.332	-	-	-
HCM Control Delay (s)	8.2	0	-	14.3	18.4	12.9	0	-	-
HCM Lane LOS	A	A	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.6	1.5	0	-	-

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	7	0	18	54	16	186	57	246	0	0	273	39
Future Vol, veh/h	7	0	18	54	16	186	57	246	0	0	273	39
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	8	0	20	59	17	202	62	267	0	0	297	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	829	719	328	729	740	277	344	0	0	272	0	0
Stage 1	323	323	-	396	396	-	-	-	-	-	-	-
Stage 2	506	396	-	333	344	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	286	351	706	335	341	755	1198	-	-	1274	-	-
Stage 1	683	645	-	623	599	-	-	-	-	-	-	-
Stage 2	543	599	-	674	631	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	189	327	700	308	318	749	1193	-	-	1269	-	-
Mov Cap-2 Maneuver	189	327	-	308	318	-	-	-	-	-	-	-
Stage 1	639	642	-	583	560	-	-	-	-	-	-	-
Stage 2	359	560	-	652	628	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.7	14.3	1.5	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1193	-	-	398	308	676	1269	-	-
HCM Lane V/C Ratio	0.052	-	-	0.068	0.191	0.325	-	-	-
HCM Control Delay (s)	8.2	0	-	14.7	19.4	12.9	0	-	-
HCM Lane LOS	A	A	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0.7	1.4	0	-	-

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	7	0	18	54	16	220	57	287	0	0	293	64
Future Vol, veh/h	7	0	18	54	16	220	57	287	0	0	293	64
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	8	0	20	59	17	239	62	312	0	0	318	70

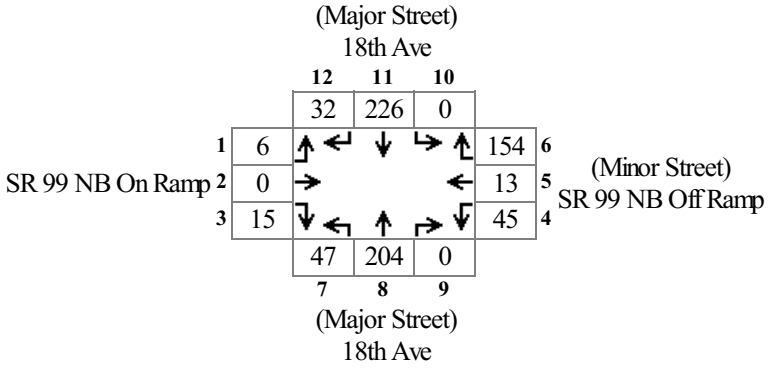
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	927	799	363	809	834	322	393	0	0	317	0	0
Stage 1	358	358	-	441	441	-	-	-	-	-	-	-
Stage 2	569	441	-	368	393	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	246	315	675	295	301	712	1149	-	-	1226	-	-
Stage 1	654	622	-	589	572	-	-	-	-	-	-	-
Stage 2	502	572	-	646	601	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	146	292	669	270	279	706	1144	-	-	1221	-	-
Mov Cap-2 Maneuver	146	292	-	270	279	-	-	-	-	-	-	-
Stage 1	608	619	-	548	532	-	-	-	-	-	-	-
Stage 2	299	532	-	624	598	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	15.7	1.4	0
HCM LOS	C	C		

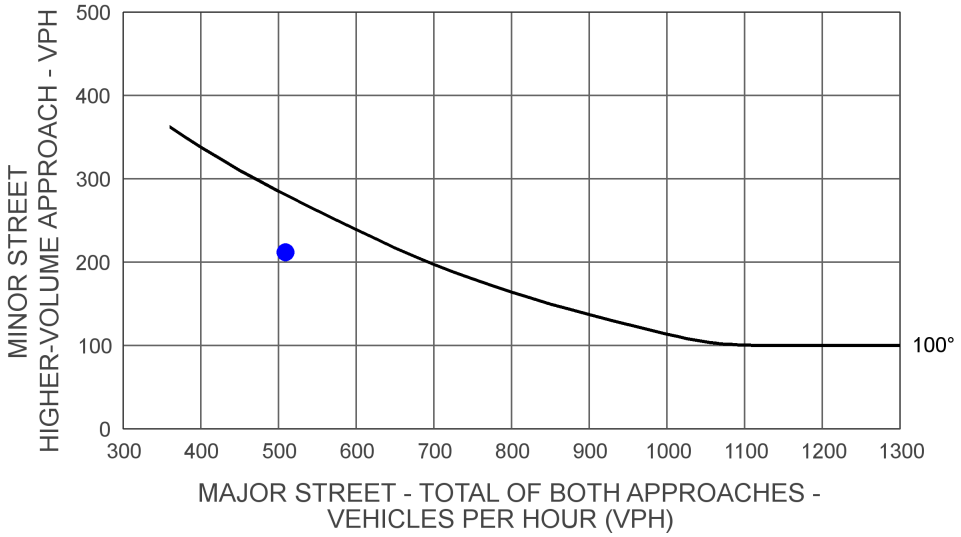
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1144	-	-	334	270	640	1221	-	-
HCM Lane V/C Ratio	0.054	-	-	0.081	0.217	0.401	-	-	-
HCM Control Delay (s)	8.3	0	-	16.7	22	14.3	0	-	-
HCM Lane LOS	A	A	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	0.8	1.9	0	-	-

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing
Intersection #: 6

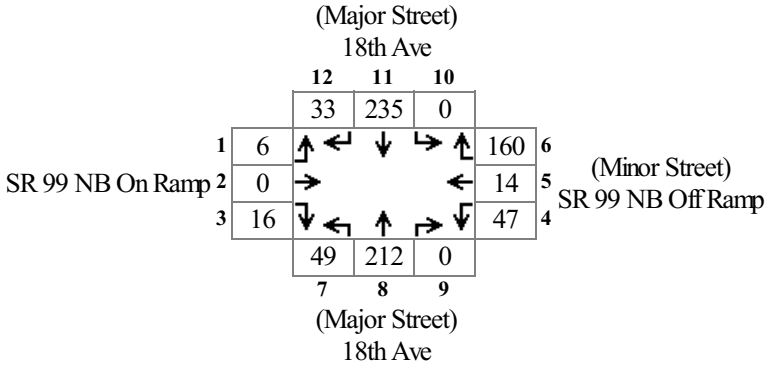


Major Total: 509
Minor High Volume: 212

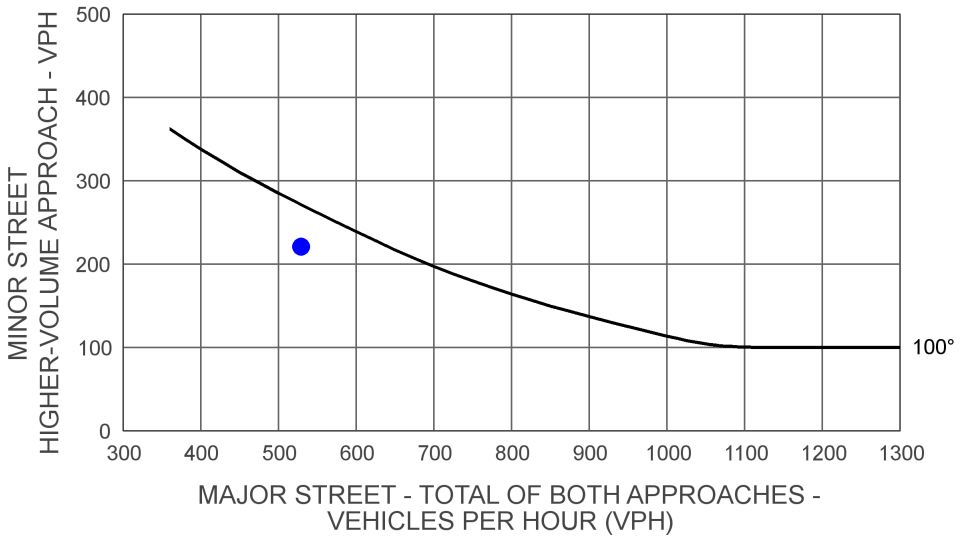


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 6

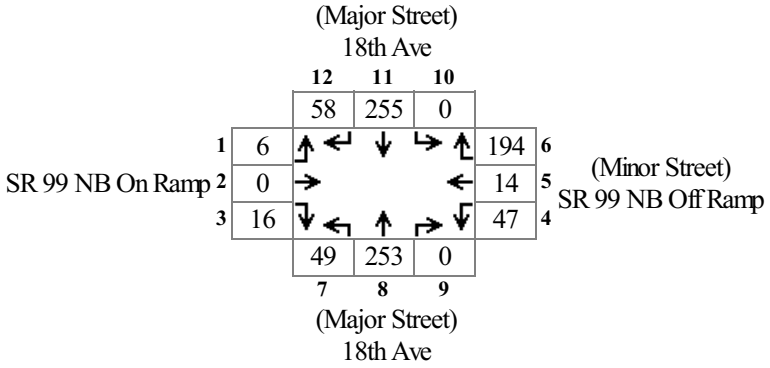


Major Total: 529
Minor High Volume: 221

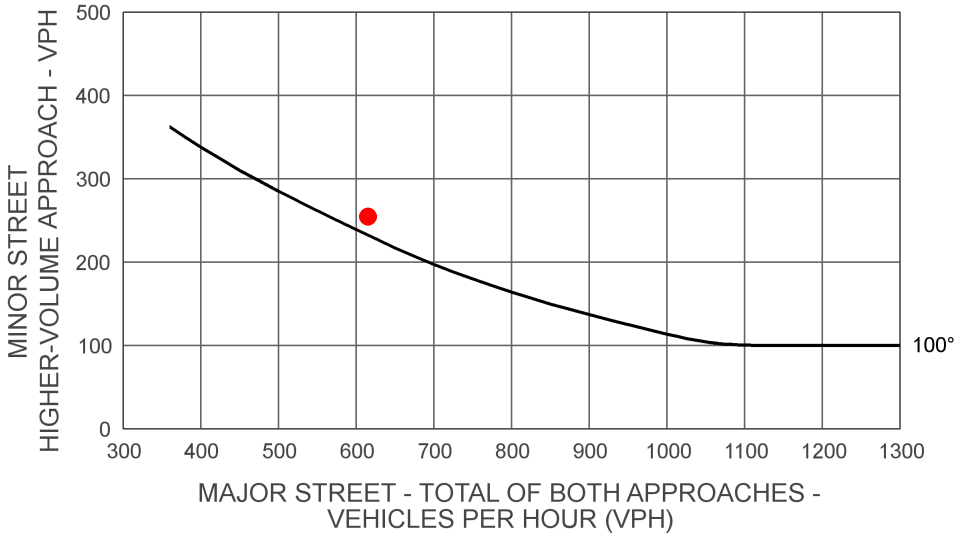


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: PM Future+Project
Intersection #: 6

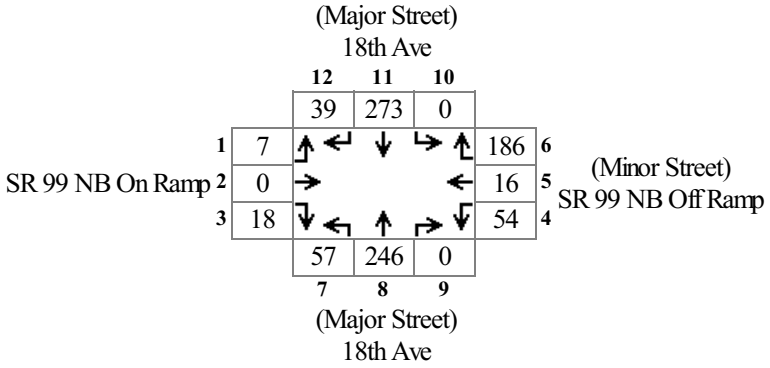


Major Total: 615
Minor High Volume: 255

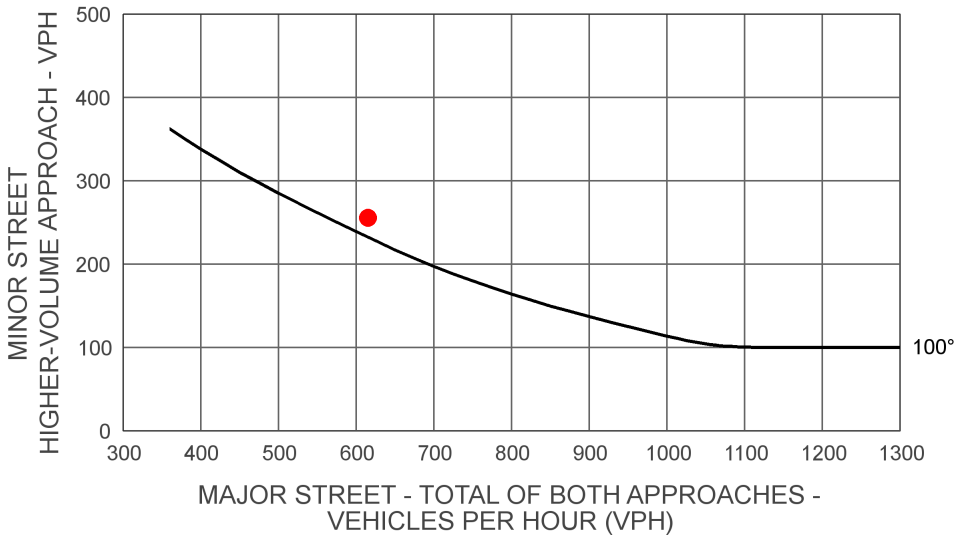


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: PM Future
Intersection #: 6

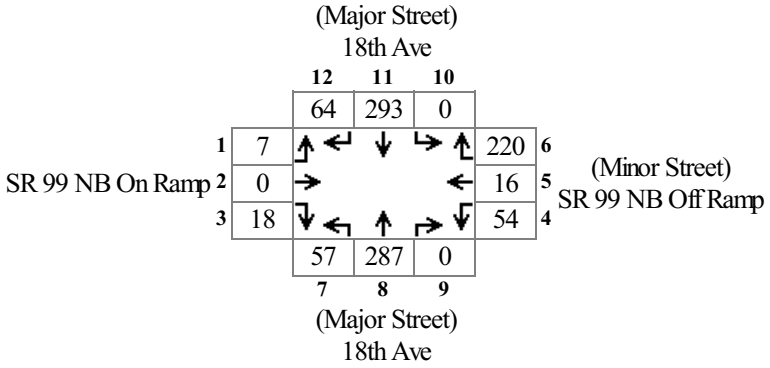


Major Total: 615
Minor High Volume: 256

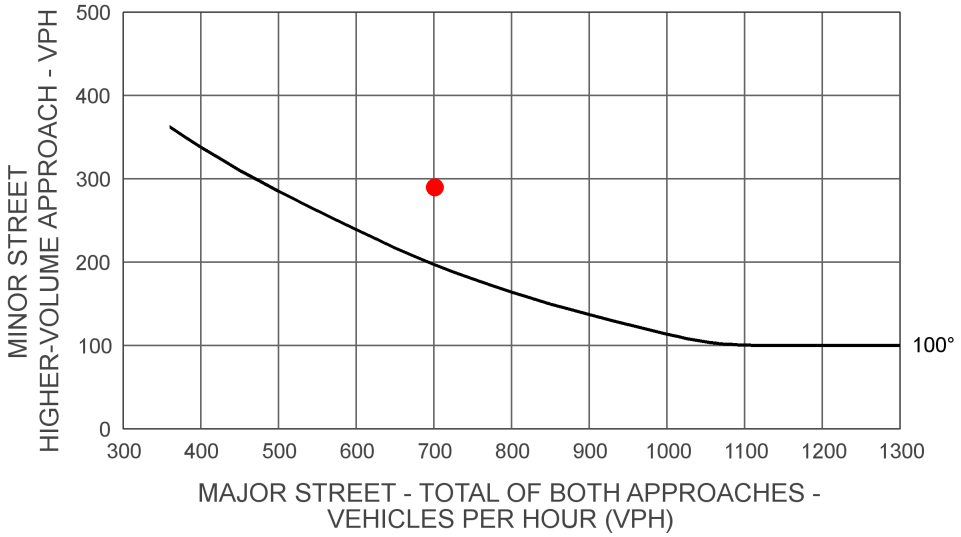


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: PM Future+Project
Intersection #: 6



Major Total: 701
Minor High Volume: 290



Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	12	0	17	46	9	93	55	298	0	0	356	51
Future Vol, veh/h	12	0	17	46	9	93	55	298	0	0	356	51
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	13	0	18	50	10	101	60	324	0	0	387	55

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	924	868	425	877	895	334	447	0	0	329	0	0
Stage 1	420	420	-	448	448	-	-	-	-	-	-	-
Stage 2	504	448	-	429	447	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	247	287	623	266	277	701	1098	-	-	1214	-	-
Stage 1	605	584	-	584	568	-	-	-	-	-	-	-
Stage 2	545	568	-	598	568	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	193	266	618	243	256	695	1093	-	-	1209	-	-
Mov Cap-2 Maneuver	193	266	-	243	256	-	-	-	-	-	-	-
Stage 1	562	582	-	543	528	-	-	-	-	-	-	-
Stage 2	425	528	-	578	566	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.3	15.8	1.3	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1093	-	-	323	243	604	1209	-	-
HCM Lane V/C Ratio	0.055	-	-	0.098	0.206	0.184	-	-	-
HCM Control Delay (s)	8.5	0	-	17.3	23.6	12.3	0	-	-
HCM Lane LOS	A	A	-	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	0.8	0.7	0	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	12	0	18	48	9	97	57	310	0	0	370	53
Future Vol, veh/h	12	0	18	48	9	97	57	310	0	0	370	53
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	13	0	20	52	10	105	62	337	0	0	402	58

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	959	902	441	912	931	347	465	0	0	342	0	0
Stage 1	436	436	-	466	466	-	-	-	-	-	-	-
Stage 2	523	466	-	446	465	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	234	274	610	252	264	689	1081	-	-	1200	-	-
Stage 1	593	575	-	571	557	-	-	-	-	-	-	-
Stage 2	532	557	-	586	558	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	180	252	605	229	243	683	1076	-	-	1195	-	-
Mov Cap-2 Maneuver	180	252	-	229	243	-	-	-	-	-	-	-
Stage 1	549	573	-	528	515	-	-	-	-	-	-	-
Stage 2	408	515	-	565	556	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.9	16.5	1.3	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1076	-	-	311	229	592	1195	-	-
HCM Lane V/C Ratio	0.058	-	-	0.105	0.228	0.195	-	-	-
HCM Control Delay (s)	8.6	0	-	17.9	25.3	12.5	0	-	-
HCM Lane LOS	A	A	-	C	D	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	0.9	0.7	0	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	12	0	18	48	9	107	57	321	0	0	400	90
Future Vol, veh/h	12	0	18	48	9	107	57	321	0	0	400	90
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	13	0	20	52	10	116	62	349	0	0	435	98

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1030	967	494	976	1016	359	538	0	0	354	0	0
Stage 1	489	489	-	478	478	-	-	-	-	-	-	-
Stage 2	541	478	-	498	538	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	209	251	569	227	235	679	1015	-	-	1188	-	-
Stage 1	555	544	-	563	551	-	-	-	-	-	-	-
Stage 2	520	551	-	549	517	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	156	230	564	205	215	673	1011	-	-	1183	-	-
Mov Cap-2 Maneuver	156	230	-	205	215	-	-	-	-	-	-	-
Stage 1	511	542	-	518	507	-	-	-	-	-	-	-
Stage 2	388	507	-	528	515	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.8	17.5	1.3	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1011	-	-	276	205	578	1183	-	-
HCM Lane V/C Ratio	0.061	-	-	0.118	0.255	0.218	-	-	-
HCM Control Delay (s)	8.8	0	-	19.8	28.5	13	0	-	-
HCM Lane LOS	A	A	-	C	D	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.4	1	0.8	0	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	14	0	21	56	11	112	66	360	0	0	430	62
Future Vol, veh/h	14	0	21	56	11	112	66	360	0	0	430	62
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	15	0	23	61	12	122	72	391	0	0	467	67

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1113	1046	511	1058	1080	401	540	0	0	396	0	0
Stage 1	506	506	-	540	540	-	-	-	-	-	-	-
Stage 2	607	540	-	518	540	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	183	226	557	200	215	643	1013	-	-	1146	-	-
Stage 1	543	535	-	520	516	-	-	-	-	-	-	-
Stage 2	478	516	-	535	516	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	130	204	552	177	194	638	1009	-	-	1141	-	-
Mov Cap-2 Maneuver	130	204	-	177	194	-	-	-	-	-	-	-
Stage 1	492	533	-	471	467	-	-	-	-	-	-	-
Stage 2	341	467	-	511	514	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.8	20.8	1.4	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1009	-	-	240	177	530	1141	-	-
HCM Lane V/C Ratio	0.071	-	-	0.159	0.344	0.252	-	-	-
HCM Control Delay (s)	8.8	0	-	22.8	35.6	14.1	0	-	-
HCM Lane LOS	A	A	-	C	E	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.6	1.4	1	0	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	14	0	21	56	11	122	66	371	0	0	460	99
Future Vol, veh/h	14	0	21	56	11	122	66	371	0	0	460	99
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	15	0	23	61	12	133	72	403	0	0	500	108

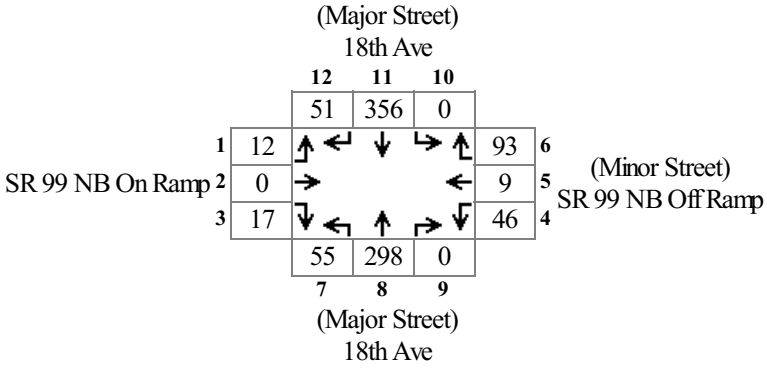
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1183	1111	564	1122	1165	413	613	0	0	408	0	0
Stage 1	559	559	-	552	552	-	-	-	-	-	-	-
Stage 2	624	552	-	570	613	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	164	206	519	181	192	633	952	-	-	1135	-	-
Stage 1	508	506	-	513	510	-	-	-	-	-	-	-
Stage 2	468	510	-	501	479	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	112	184	515	159	172	628	948	-	-	1130	-	-
Mov Cap-2 Maneuver	112	184	-	159	172	-	-	-	-	-	-	-
Stage 1	456	504	-	461	458	-	-	-	-	-	-	-
Stage 2	323	458	-	477	477	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.8	22.5	1.4	0
HCM LOS	D	C		

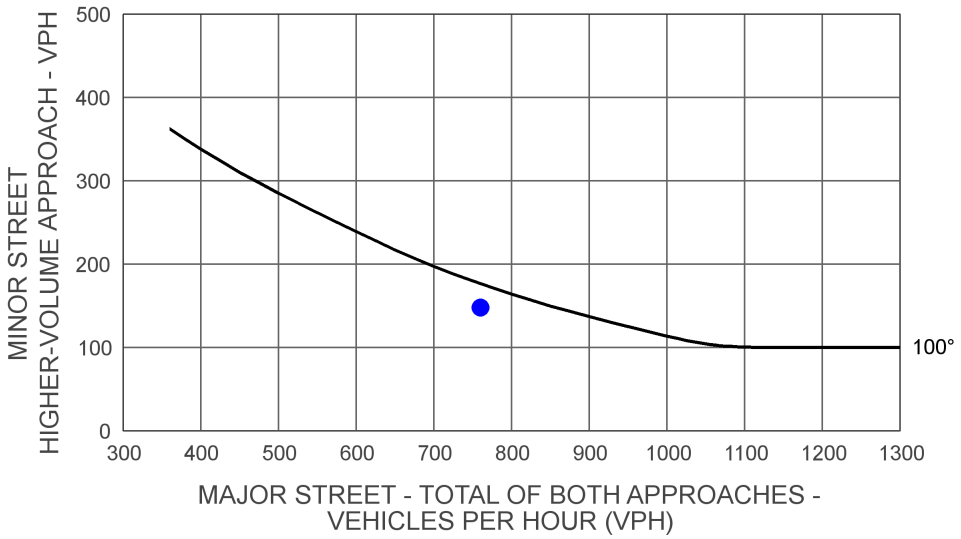
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	948	-	-	211	159	515	1130	-	-
HCM Lane V/C Ratio	0.076	-	-	0.18	0.383	0.281	-	-	-
HCM Control Delay (s)	9.1	0	-	25.8	41	14.7	0	-	-
HCM Lane LOS	A	A	-	D	E	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.6	1.6	1.1	0	-	-

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing
Intersection #: 6

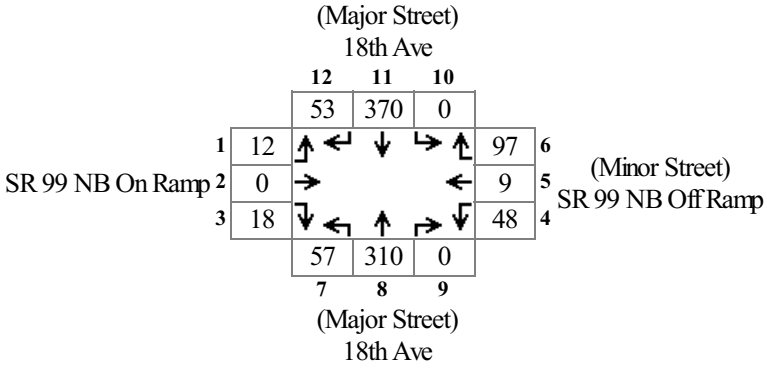


Major Total: 760
Minor High Volume: 148

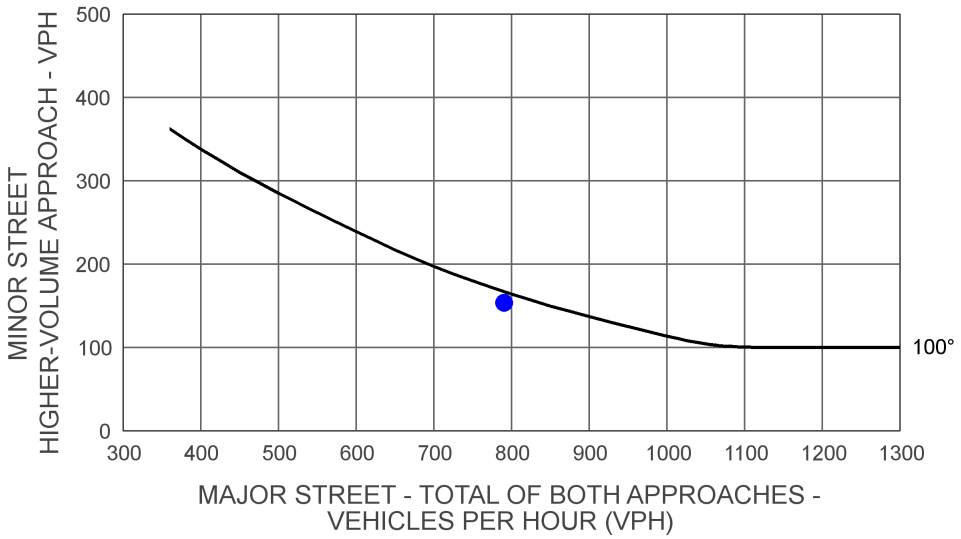


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 6

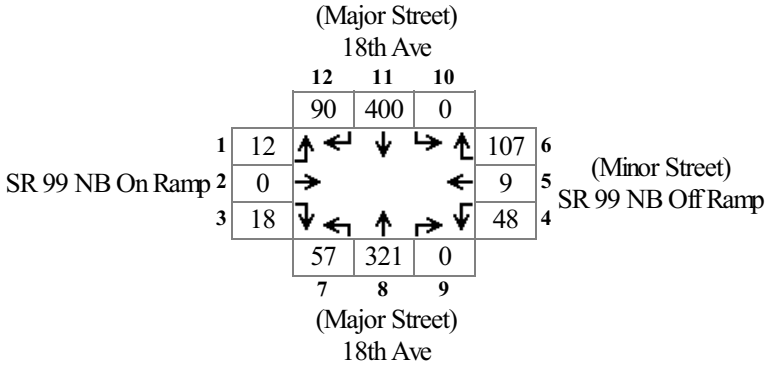


Major Total: 790
Minor High Volume: 154

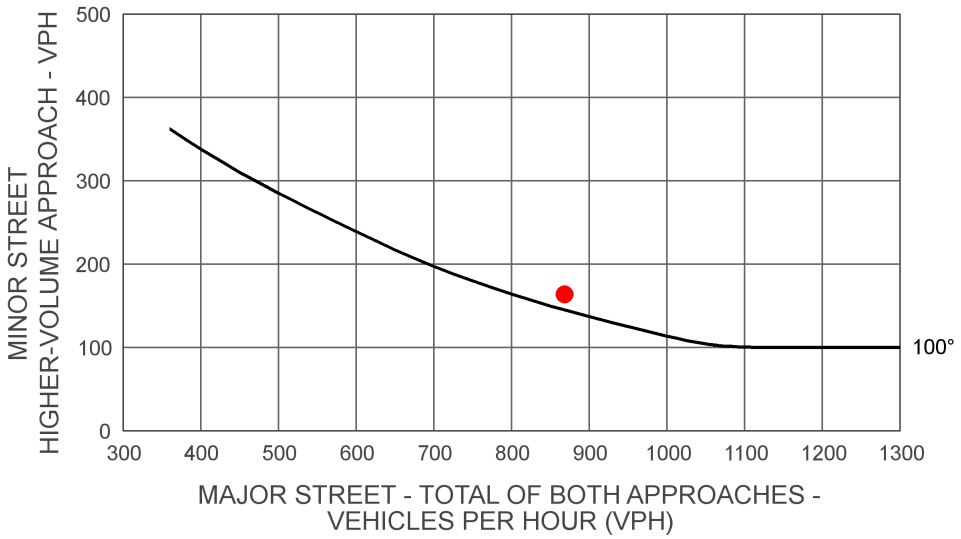


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: AM Future+Project
Intersection #: 6

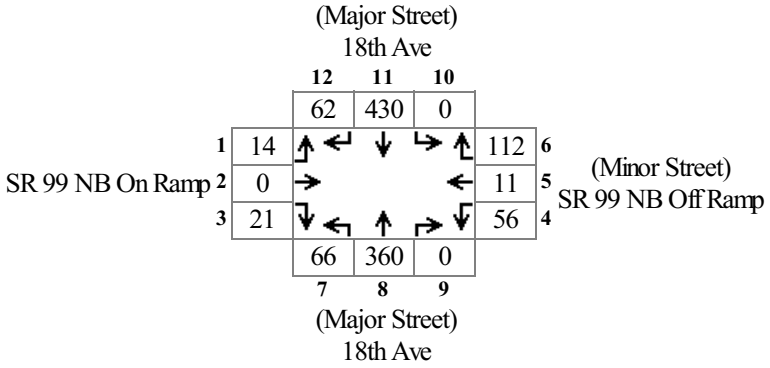


Major Total: 868
Minor High Volume: 164

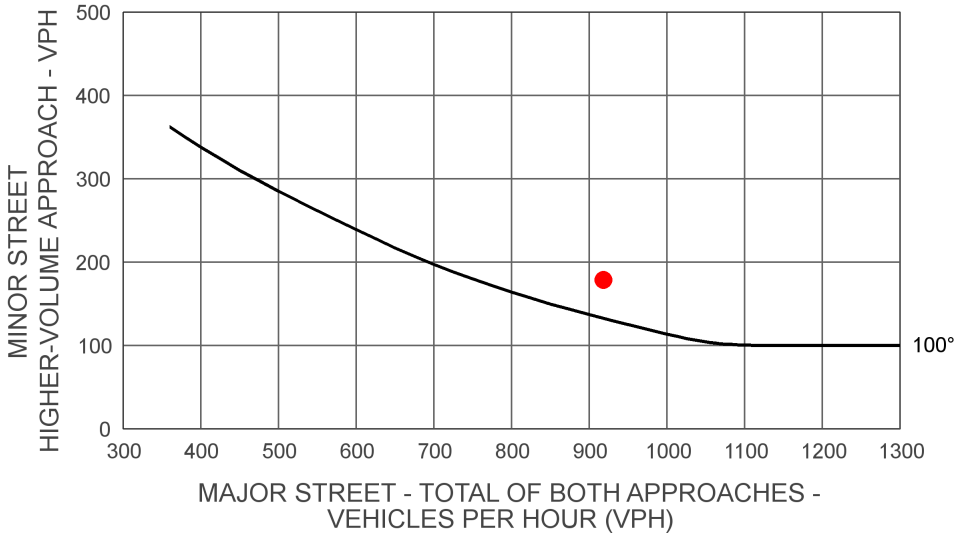


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: AM Future
Intersection #: 6

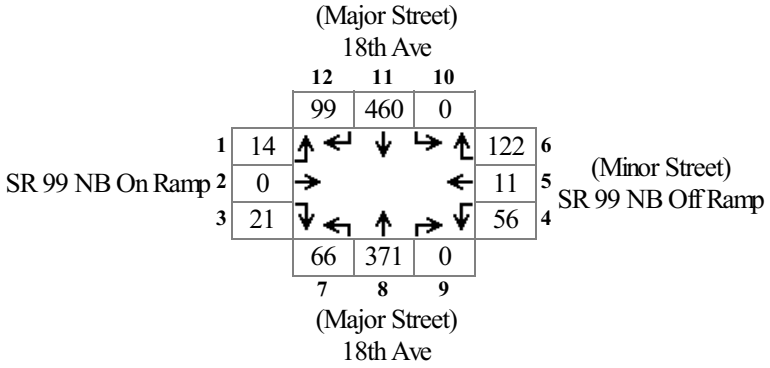


Major Total: 918
Minor High Volume: 179

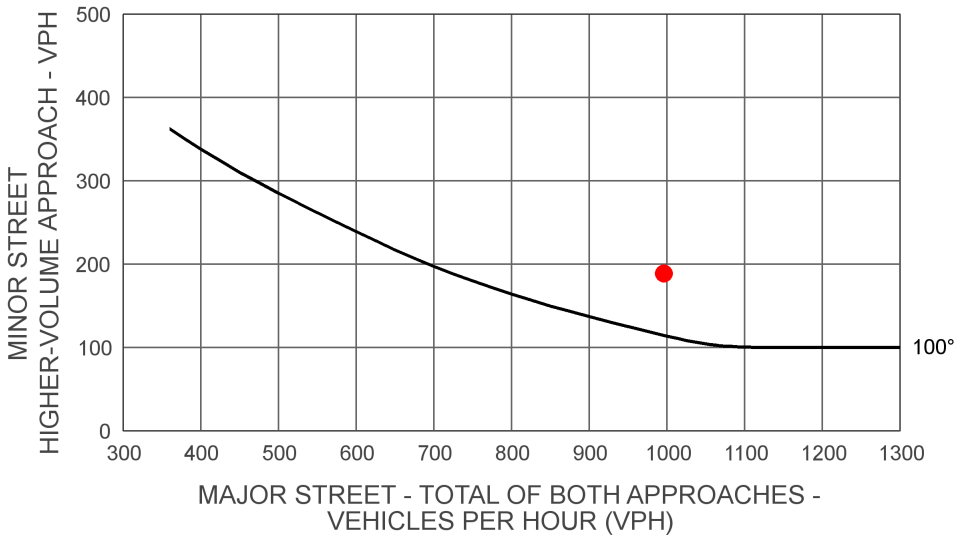


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: AM Future+Project
Intersection #: 6



Major Total: 996
Minor High Volume: 189



Intersection 7
18th Ave & SR 99 SB Off Ramp/SR 99 SB On Ramp

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	69	15	35	0	0	0	4	183	43	109	121	54
Future Vol, veh/h	69	15	35	0	0	0	4	183	43	109	121	54
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	20	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	75	16	38	0	0	0	4	199	47	118	132	59

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	611	611	171	195	0	0	199	0	0
Stage 1	403	403	-	-	-	-	-	-	-
Stage 2	208	208	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	452	405	865	1360	-	-	1356	-	-
Stage 1	668	595	-	-	-	-	-	-	-
Stage 2	820	724	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	403	0	858	1354	-	-	1350	-	-
Mov Cap-2 Maneuver	403	0	-	-	-	-	-	-	-
Stage 1	600	0	-	-	-	-	-	-	-
Stage 2	814	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	0.1	3
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1354	-	-	403	858	1350	-	-
HCM Lane V/C Ratio	0.003	-	-	0.227	0.044	0.088	-	-
HCM Control Delay (s)	7.7	0	-	16.5	9.4	7.9	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.9	0.1	0.3	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	72	16	36	0	0	0	4	190	45	113	126	56
Future Vol, veh/h	72	16	36	0	0	0	4	190	45	113	126	56
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	20	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	78	17	39	0	0	0	4	207	49	123	137	61

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	633	633	177	203	0	0	207	0	0
Stage 1	418	418	-	-	-	-	-	-	-
Stage 2	215	215	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	439	393	858	1351	-	-	1346	-	-
Stage 1	658	585	-	-	-	-	-	-	-
Stage 2	814	719	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	389	0	851	1345	-	-	1340	-	-
Mov Cap-2 Maneuver	389	0	-	-	-	-	-	-	-
Stage 1	587	0	-	-	-	-	-	-	-
Stage 2	808	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.9	0.1	3
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1345	-	-	389	851	1340	-	-
HCM Lane V/C Ratio	0.003	-	-	0.246	0.046	0.092	-	-
HCM Control Delay (s)	7.7	0	-	17.2	9.4	8	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1	0.1	0.3	-	-

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	113	16	36	0	0	0	4	190	45	133	126	56
Future Vol, veh/h	113	16	36	0	0	0	4	190	45	133	126	56
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	20	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	123	17	39	0	0	0	4	207	49	145	137	61

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	677	677	177	203	0	0	207	0	0
Stage 1	462	462	-	-	-	-	-	-	-
Stage 2	215	215	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	414	371	858	1351	-	-	1346	-	-
Stage 1	628	560	-	-	-	-	-	-	-
Stage 2	814	719	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	359	0	851	1345	-	-	1340	-	-
Mov Cap-2 Maneuver	359	0	-	-	-	-	-	-	-
Stage 1	548	0	-	-	-	-	-	-	-
Stage 2	808	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.7	0.1	3.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1345	-	-	359	851	1340	-	-
HCM Lane V/C Ratio	0.003	-	-	0.391	0.046	0.108	-	-
HCM Control Delay (s)	7.7	0	-	21.3	9.4	8	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.8	0.1	0.4	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	83	18	42	0	0	0	5	221	52	132	146	65
Future Vol, veh/h	83	18	42	0	0	0	5	221	52	132	146	65
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	20	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	90	20	46	0	0	0	5	240	57	143	159	71

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	737	737	204	234	0	0	240	0	0
Stage 1	486	486	-	-	-	-	-	-	-
Stage 2	251	251	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	381	342	829	1316	-	-	1309	-	-
Stage 1	612	546	-	-	-	-	-	-	-
Stage 2	784	694	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	328	0	822	1311	-	-	1304	-	-
Mov Cap-2 Maneuver	328	0	-	-	-	-	-	-	-
Stage 1	532	0	-	-	-	-	-	-	-
Stage 2	777	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.9	0.1	3.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1311	-	-	328	822	1304	-	-
HCM Lane V/C Ratio	0.004	-	-	0.335	0.056	0.11	-	-
HCM Control Delay (s)	7.8	0	-	21.4	9.6	8.1	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.4	0.2	0.4	-	-

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	124	18	42	0	0	0	5	221	52	152	146	65
Future Vol, veh/h	124	18	42	0	0	0	5	221	52	152	146	65
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	20	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	135	20	46	0	0	0	5	240	57	165	159	71

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	780	780	204	234	0	0	240	0	0
Stage 1	529	529	-	-	-	-	-	-	-
Stage 2	251	251	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	360	323	829	1316	-	-	1309	-	-
Stage 1	585	522	-	-	-	-	-	-	-
Stage 2	784	694	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	303	0	822	1311	-	-	1304	-	-
Mov Cap-2 Maneuver	303	0	-	-	-	-	-	-	-
Stage 1	498	0	-	-	-	-	-	-	-
Stage 2	777	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.3	0.1	3.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1311	-	-	303	822	1304	-	-
HCM Lane V/C Ratio	0.004	-	-	0.509	0.056	0.127	-	-
HCM Control Delay (s)	7.8	0	-	28.6	9.6	8.2	0	-
HCM Lane LOS	A	A	-	D	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	2.7	0.2	0.4	-	-

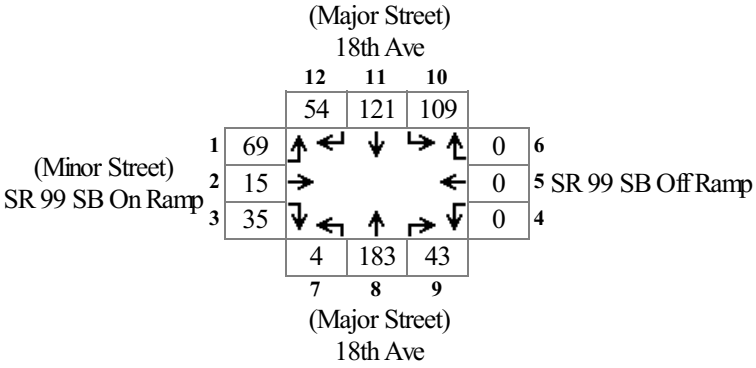
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	124	18	42	0	0	0	5	221	52	152	146	65
Future Volume (veh/h)	124	18	42	0	0	0	5	221	52	152	146	65
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1750	1810	1667				1750	1810	1750	1750	1810	1750
Adj Flow Rate, veh/h	135	20	46				5	240	0	165	159	71
Adj No. of Lanes	0	1	1				0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5				5	5	5	5	5	5
Cap, veh/h	175	26	153				0	1456	0	502	475	203
Arrive On Green	0.12	0.12	0.11				0.00	0.80	0.00	0.80	0.80	0.80
Sat Flow, veh/h	1510	224	1385				0	1810	0	561	591	252
Grp Volume(v), veh/h	155	0	46				0	240	0	395	0	0
Grp Sat Flow(s),veh/h/ln	1734	0	1385				0	1810	0	1404	0	0
Q Serve(g_s), s	8.7	0.0	3.1				0.0	3.0	0.0	3.7	0.0	0.0
Cycle Q Clear(g_c), s	8.7	0.0	3.1				0.0	3.0	0.0	6.7	0.0	0.0
Prop In Lane	0.87		1.00				0.00		0.00	0.42		0.18
Lane Grp Cap(c), veh/h	200	0	153				0	1456	0	1181	0	0
V/C Ratio(X)	0.77	0.00	0.30				0.00	0.16	0.00	0.33	0.00	0.00
Avail Cap(c_a), veh/h	321	0	249				0	1456	0	1181	0	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.96	0.00	0.00
Uniform Delay (d), s/veh	42.9	0.0	40.9				0.0	2.2	0.0	2.5	0.0	0.0
Incr Delay (d2), s/veh	6.2	0.0	1.1				0.0	0.2	0.0	0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	2.4				0.0	1.6	0.0	3.0	0.0	0.0
LnGrp Delay(d),s/veh	49.2	0.0	42.0				0.0	2.4	0.0	3.3	0.0	0.0
LnGrp LOS	D		D					A		A		
Approach Vol, veh/h		201						240			395	
Approach Delay, s/veh		47.5						2.4			3.3	
Approach LOS		D						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		84.4		15.6	0.0	84.4		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		73.0		18.0	4.0	64.5		
Max Q Clear Time (g_c+I1), s		5.0		10.7	0.0	8.7		
Green Ext Time (p_c), s		3.1		0.4	0.0	3.1		

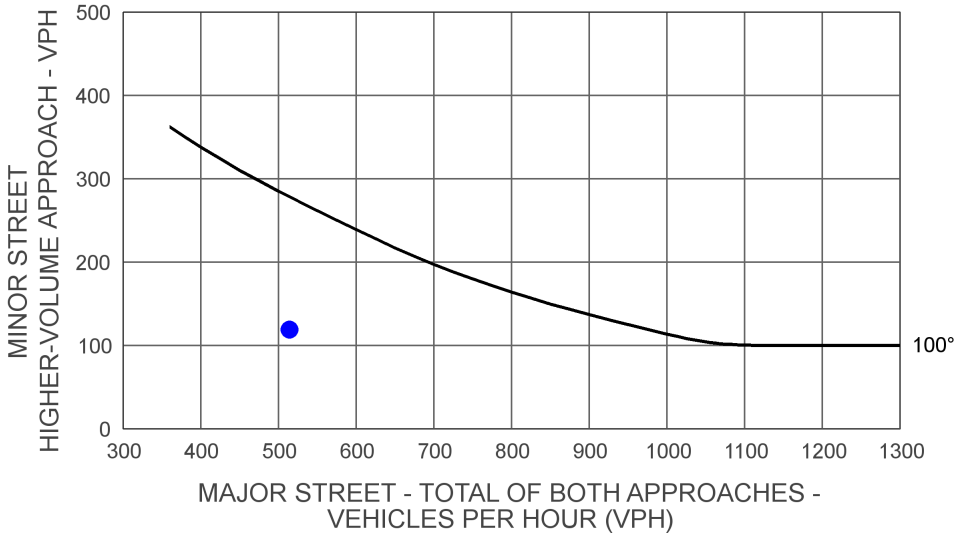
Intersection Summary	
HCM 2010 Ctrl Delay	13.7
HCM 2010 LOS	B

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Existing
Intersection #: 7

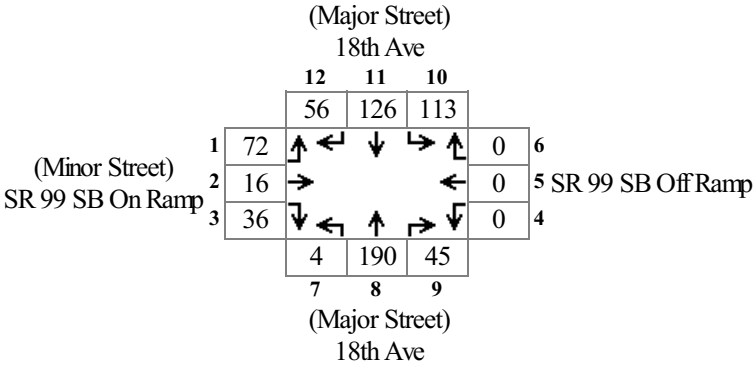


Major Total: 514
Minor High Volume: 119

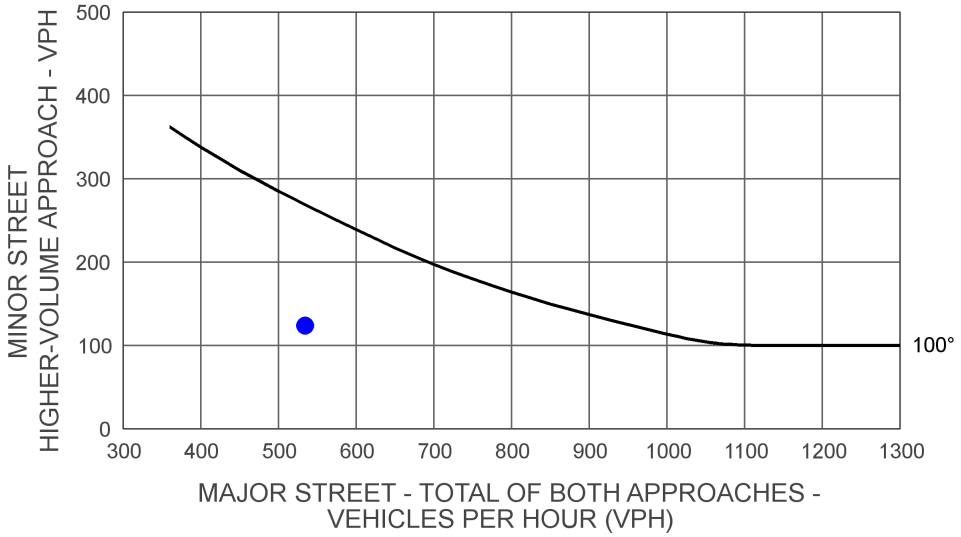


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 7

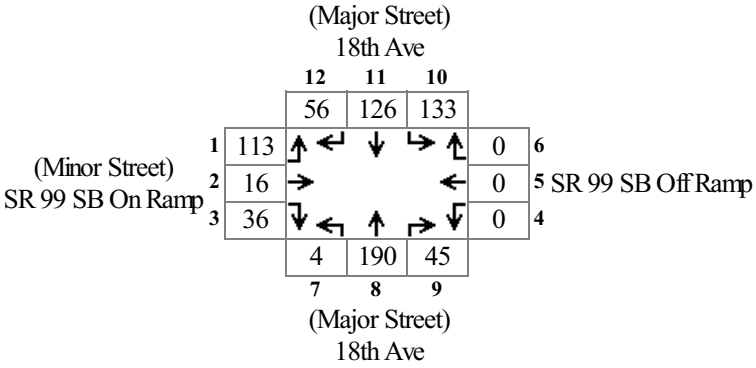


Major Total: 534
Minor High Volume: 124

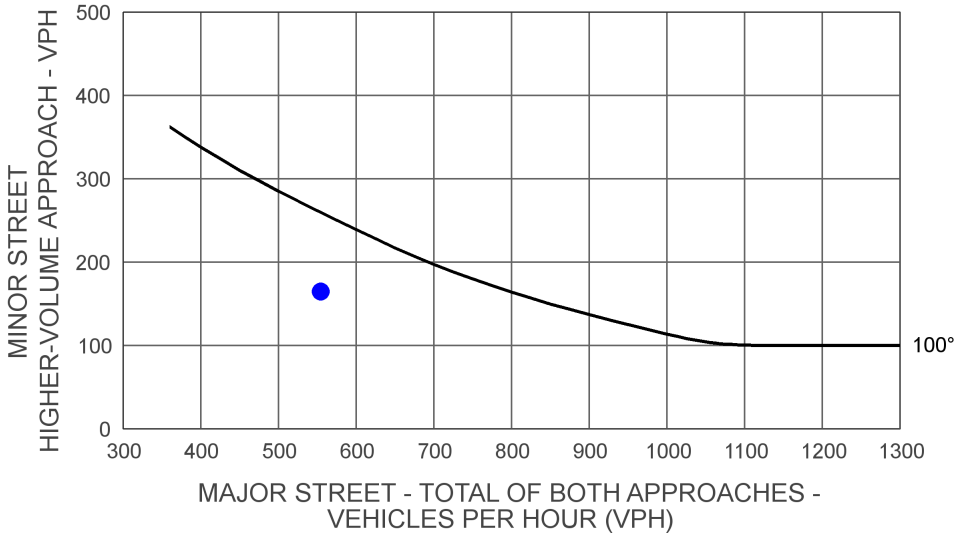


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 7

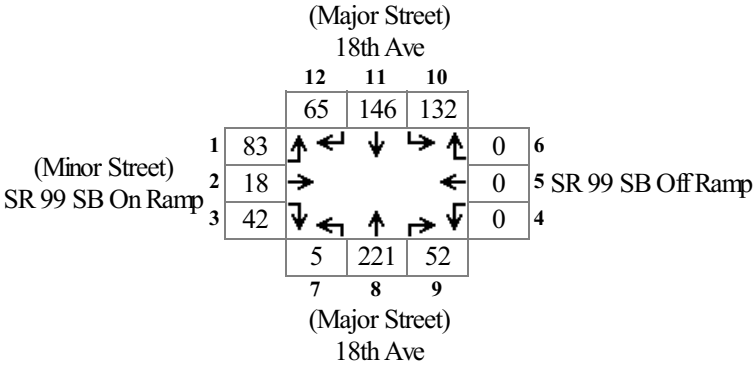


Major Total: 554
Minor High Volume: 165

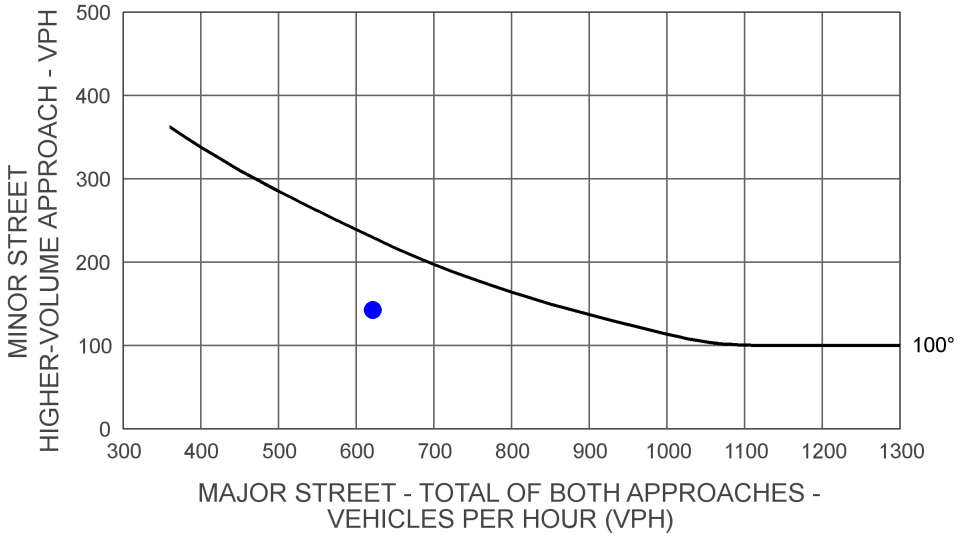


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future
Intersection #: 7

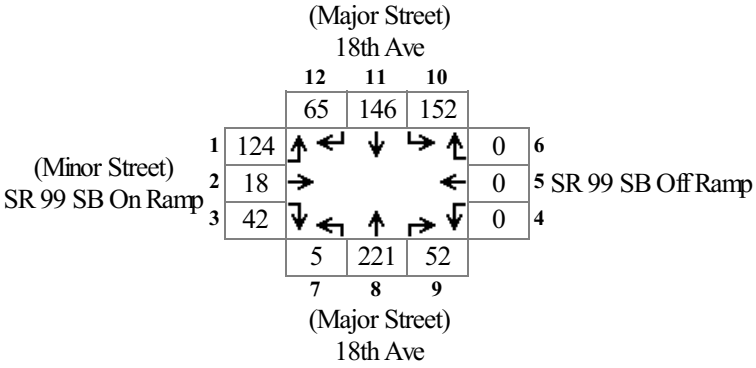


Major Total: 621
Minor High Volume: 143

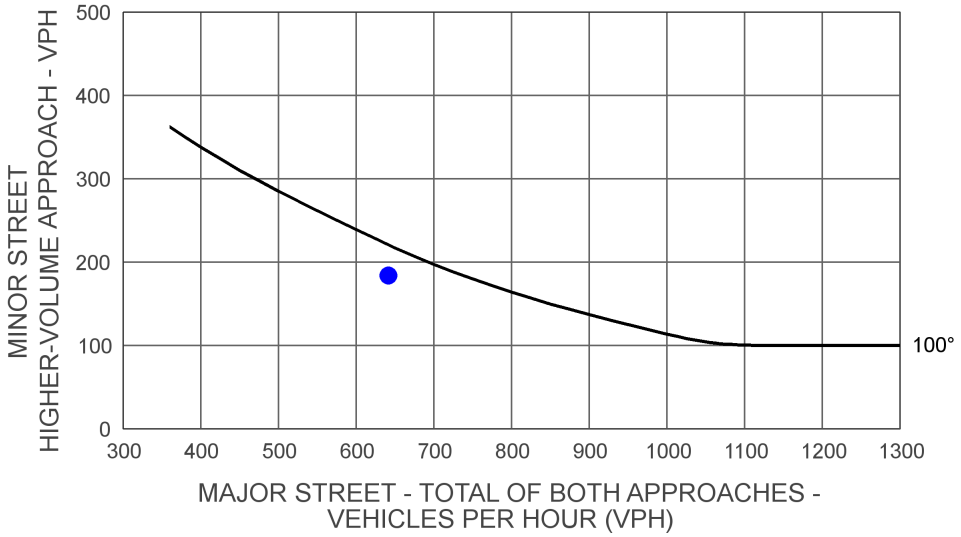


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: PM Future+Project
Intersection #: 7



Major Total: 641
Minor High Volume: 184



Intersection	
Int Delay, s/veh	9.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	128	28	22	0	0	0	7	227	30	163	184	72
Future Vol, veh/h	128	28	22	0	0	0	7	227	30	163	184	72
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	20	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	139	30	24	0	0	0	8	247	33	177	200	78

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	860	860	249	283	0	0	247	0	0
Stage 1	598	598	-	-	-	-	-	-	-
Stage 2	262	262	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	322	290	782	1262	-	-	1302	-	-
Stage 1	543	486	-	-	-	-	-	-	-
Stage 2	775	686	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	265	0	775	1257	-	-	1297	-	-
Mov Cap-2 Maneuver	265	0	-	-	-	-	-	-	-
Stage 1	453	0	-	-	-	-	-	-	-
Stage 2	766	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	36.2	0.2	3.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1257	-	-	265	775	1297	-	-
HCM Lane V/C Ratio	0.006	-	-	0.64	0.031	0.137	-	-
HCM Control Delay (s)	7.9	0	-	39.9	9.8	8.2	0	-
HCM Lane LOS	A	A	-	E	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	4	0.1	0.5	-	-

Intersection	
Int Delay, s/veh	10.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	133	29	23	0	0	0	7	236	31	170	191	75
Future Vol, veh/h	133	29	23	0	0	0	7	236	31	170	191	75
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	20	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	145	32	25	0	0	0	8	257	34	185	208	82

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	895	895	258	294	0	0	257	0	0
Stage 1	623	623	-	-	-	-	-	-	-
Stage 2	272	272	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	307	277	773	1251	-	-	1290	-	-
Stage 1	529	474	-	-	-	-	-	-	-
Stage 2	767	679	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	250	0	767	1246	-	-	1285	-	-
Mov Cap-2 Maneuver	250	0	-	-	-	-	-	-	-
Stage 1	436	0	-	-	-	-	-	-	-
Stage 2	758	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	43	0.2	3.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1246	-	-	250	767	1285	-	-
HCM Lane V/C Ratio	0.006	-	-	0.704	0.033	0.144	-	-
HCM Control Delay (s)	7.9	0	-	47.7	9.9	8.3	0	-
HCM Lane LOS	A	A	-	E	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	4.7	0.1	0.5	-	-

Intersection	
Int Delay, s/veh	15.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	144	29	23	0	0	0	7	236	31	200	191	75
Future Vol, veh/h	144	29	23	0	0	0	7	236	31	200	191	75
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	20	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	157	32	25	0	0	0	8	257	34	217	208	82

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	960	960	258	294	0	0	257	0	0
Stage 1	688	688	-	-	-	-	-	-	-
Stage 2	272	272	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	281	254	773	1251	-	-	1290	-	-
Stage 1	493	442	-	-	-	-	-	-	-
Stage 2	767	679	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	220	0	767	1246	-	-	1285	-	-
Mov Cap-2 Maneuver	220	0	-	-	-	-	-	-	-
Stage 1	391	0	-	-	-	-	-	-	-
Stage 2	758	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	66.9	0.2	3.6
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1246	-	-	220	767	1285	-	-
HCM Lane V/C Ratio	0.006	-	-	0.855	0.033	0.169	-	-
HCM Control Delay (s)	7.9	0	-	74.5	9.9	8.4	0	-
HCM Lane LOS	A	A	-	F	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	6.6	0.1	0.6	-	-

Intersection	
Int Delay, s/veh	25.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	155	34	27	0	0	0	8	274	36	197	222	87
Future Vol, veh/h	155	34	27	0	0	0	8	274	36	197	222	87
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	20	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	168	37	29	0	0	0	9	298	39	214	241	95

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1037	1037	299	341	0	0	298	0	0
Stage 1	722	722	-	-	-	-	-	-	-
Stage 2	315	315	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	253	228	733	1202	-	-	1246	-	-
Stage 1	476	427	-	-	-	-	-	-	-
Stage 2	733	650	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	195	0	727	1197	-	-	1241	-	-
Mov Cap-2 Maneuver	195	0	-	-	-	-	-	-	-
Stage 1	372	0	-	-	-	-	-	-	-
Stage 2	723	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	114.9	0.2	3.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1197	-	-	195	727	1241	-	-
HCM Lane V/C Ratio	0.007	-	-	1.054	0.04	0.173	-	-
HCM Control Delay (s)	8	0	-	129.8	10.2	8.5	0	-
HCM Lane LOS	A	A	-	F	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	9.5	0.1	0.6	-	-

Intersection	
Int Delay, s/veh	41.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	166	34	27	0	0	0	8	274	36	227	222	87
Future Vol, veh/h	166	34	27	0	0	0	8	274	36	227	222	87
Conflicting Peds, #/hr	5	0	5	5	0	5	5	0	5	5	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Yield	-	-	None
Storage Length	-	-	20	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	180	37	29	0	0	0	9	298	39	247	241	95

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1102	1102	299	341	0	0	298	0	0
Stage 1	787	787	-	-	-	-	-	-	-
Stage 2	315	315	-	-	-	-	-	-	-
Critical Hdwy	6.45	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	5.45	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.45	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	231	209	733	1202	-	-	1246	-	-
Stage 1	443	398	-	-	-	-	-	-	-
Stage 2	733	650	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	~ 171	0	727	1197	-	-	1241	-	-
Mov Cap-2 Maneuver	~ 171	0	-	-	-	-	-	-	-
Stage 1	332	0	-	-	-	-	-	-	-
Stage 2	723	0	-	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	188.6	0.2	3.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	SBL	SBT	SBR
Capacity (veh/h)	1197	-	-	171	727	1241	-	-
HCM Lane V/C Ratio	0.007	-	-	1.271	0.04	0.199	-	-
HCM Control Delay (s)	8	0	-	212.7	10.2	8.6	0	-
HCM Lane LOS	A	A	-	F	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	12.4	0.1	0.7	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

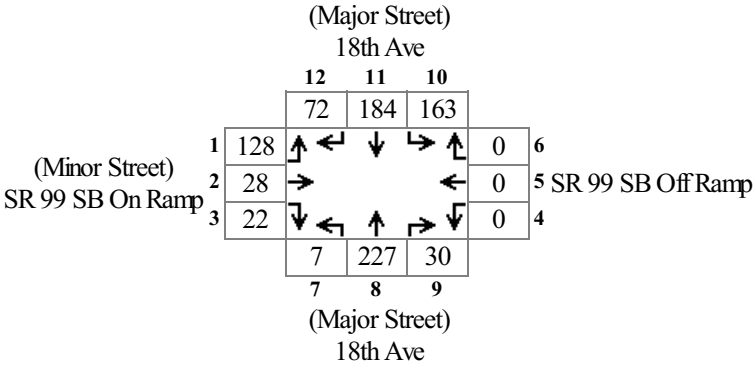
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	34	27	0	0	0	8	274	36	227	222	87
Future Volume (veh/h)	166	34	27	0	0	0	8	274	36	227	222	87
Number	7	4	14				5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1750	1810	1667				1750	1810	1750	1750	1810	1750
Adj Flow Rate, veh/h	180	37	29				9	298	0	247	241	95
Adj No. of Lanes	0	1	1				0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	5	5	5				5	5	5	5	5	5
Cap, veh/h	216	44	201				0	1394	0	483	455	173
Arrive On Green	0.15	0.15	0.14				0.00	0.77	0.00	0.77	0.77	0.77
Sat Flow, veh/h	1441	296	1392				0	1810	0	561	590	224
Grp Volume(v), veh/h	217	0	29				0	298	0	583	0	0
Grp Sat Flow(s),veh/h/ln	1737	0	1392				0	1810	0	1375	0	0
Q Serve(g_s), s	12.1	0.0	1.8				0.0	4.5	0.0	10.5	0.0	0.0
Cycle Q Clear(g_c), s	12.1	0.0	1.8				0.0	4.5	0.0	15.0	0.0	0.0
Prop In Lane	0.83		1.00				0.00		0.00	0.42		0.16
Lane Grp Cap(c), veh/h	260	0	201				0	1394	0	1111	0	0
V/C Ratio(X)	0.84	0.00	0.14				0.00	0.21	0.00	0.52	0.00	0.00
Avail Cap(c_a), veh/h	321	0	251				0	1394	0	1111	0	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.87	0.00	0.00
Uniform Delay (d), s/veh	41.3	0.0	37.4				0.0	3.2	0.0	4.2	0.0	0.0
Incr Delay (d2), s/veh	14.4	0.0	0.3				0.0	0.4	0.0	1.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	0.0	1.5				0.0	2.4	0.0	6.5	0.0	0.0
LnGrp Delay(d),s/veh	55.7	0.0	37.7				0.0	3.5	0.0	5.8	0.0	0.0
LnGrp LOS	E		D					A		A		
Approach Vol, veh/h		246						298			583	
Approach Delay, s/veh		53.6						3.5			5.8	
Approach LOS		D						A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		81.0		19.0	0.0	81.0		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		73.0		18.0	4.0	64.5		
Max Q Clear Time (g_c+I1), s		6.5		14.1	0.0	17.0		
Green Ext Time (p_c), s		5.0		0.3	0.0	4.9		

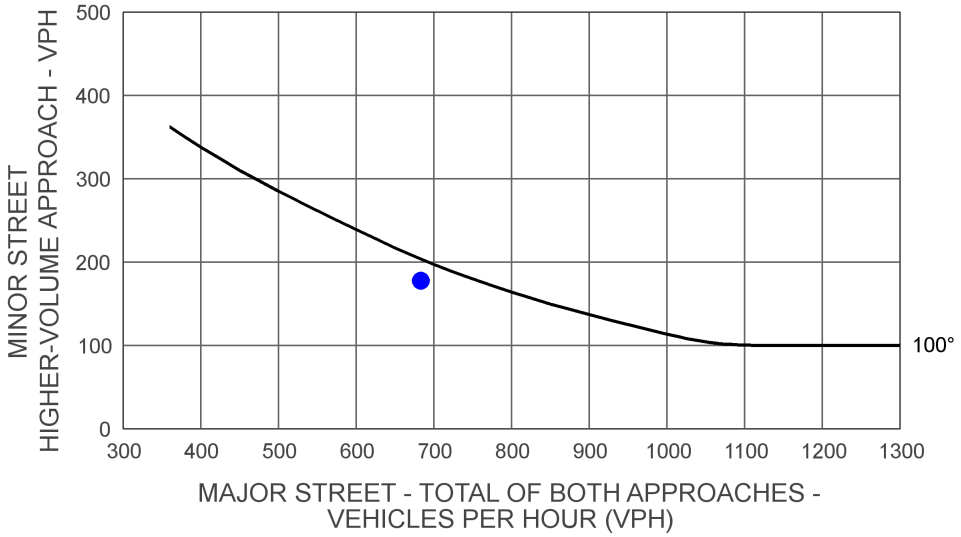
Intersection Summary	
HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B

Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Existing
Intersection #: 7

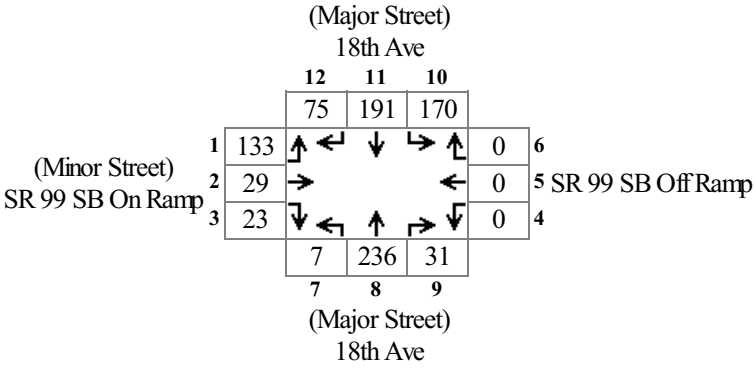


Major Total: 683
Minor High Volume: 178

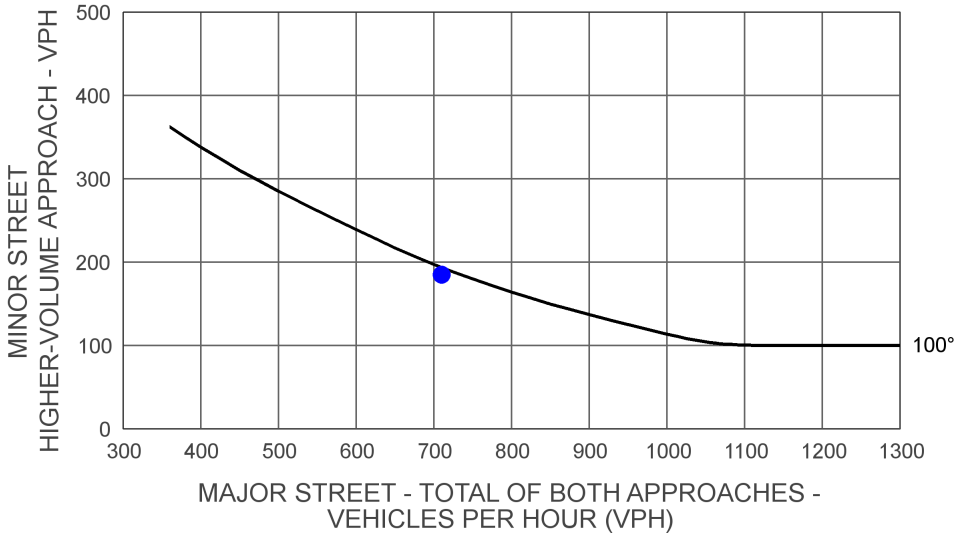


Rural Peak Hour Signal Warrant
Intersection Does Not Meet Signal Warrant

Scenario: AM Future
Intersection #: 7

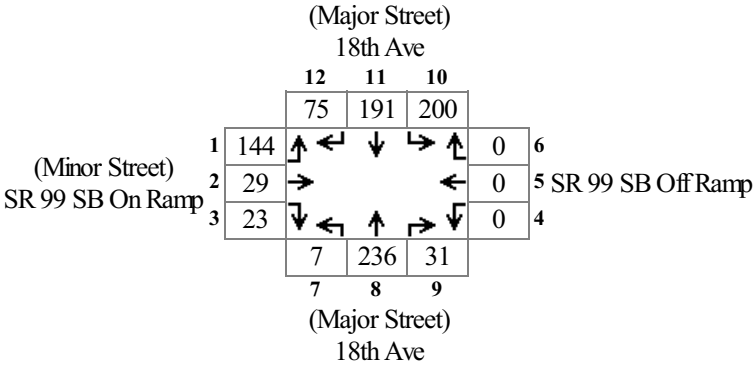


Major Total: 710
Minor High Volume: 185

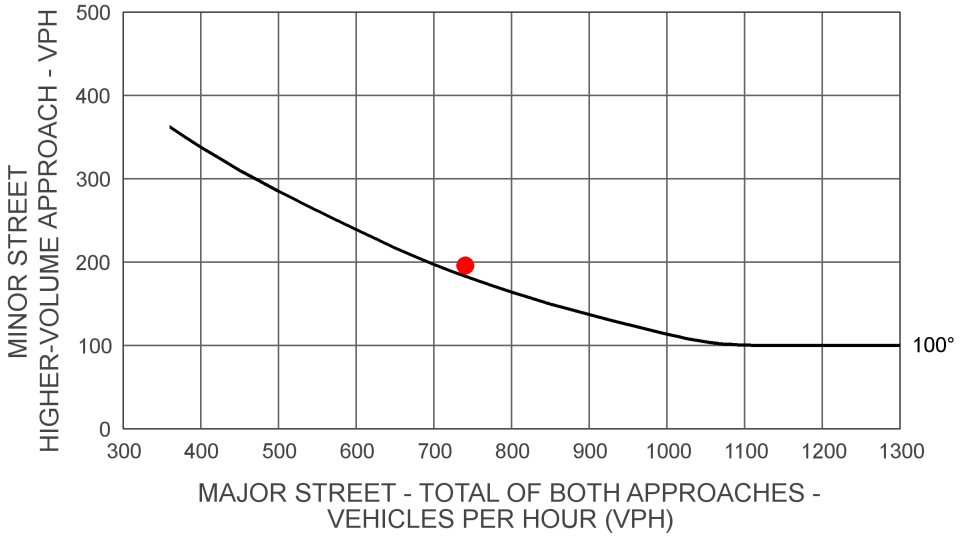


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: AM Future+Project
Intersection #: 7

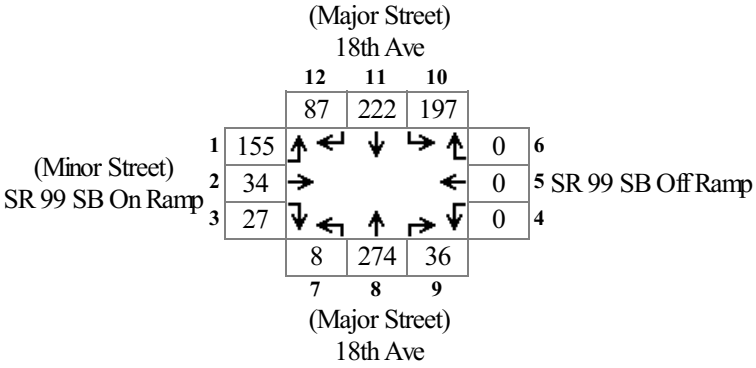


Major Total: 740
Minor High Volume: 196

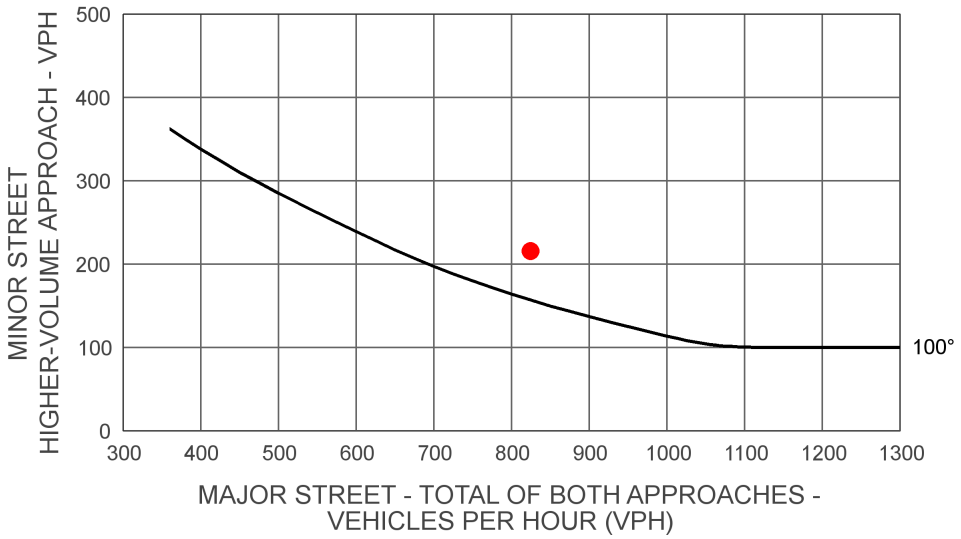


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: AM Future
Intersection #: 7

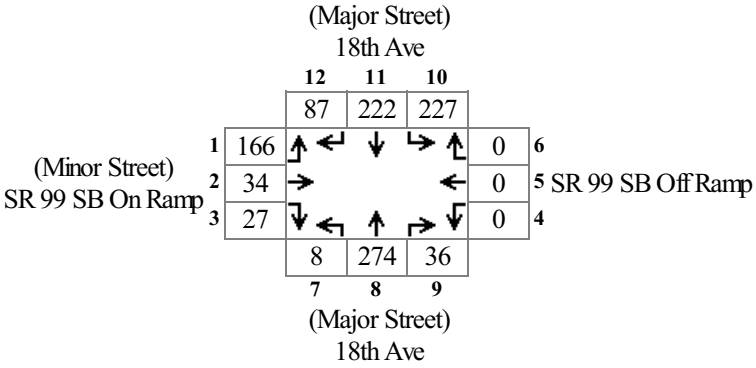


Major Total: 824
Minor High Volume: 216

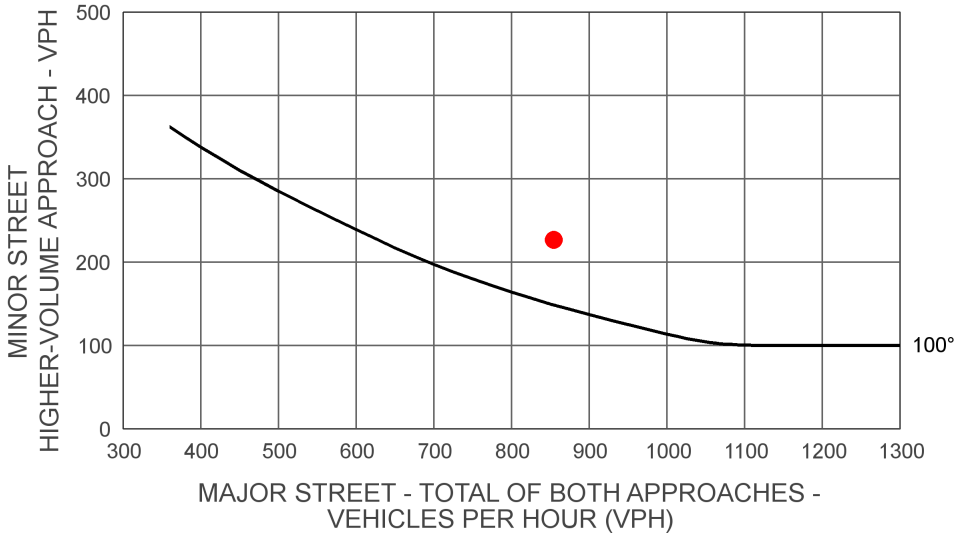


Rural Peak Hour Signal Warrant
Intersection Meets Signal Warrant

Scenario: AM Future+Project
Intersection #: 7



Major Total: 854
Minor High Volume: 227



HCS Analysis

EAST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	109	veh/h
Opposing direction volume, Vo	95	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.954		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	124	pc/h	109	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	55.5	mi/h
Percent Free Flow Speed, PFFS	95.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	119	pc/h	104	pc/h
Base percent time-spent-following,(note-4) BPTSFd	13.6	%		
Adjustment for no-passing zones, fnp	30.8			
Percent time-spent-following, PTSFd	30.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.5	mi/h
Percent time-spent-following, PTSFd (from above)	30.0	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	118.5
Effective width of outside lane, We	32.19
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.60
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	109	veh/h
Opposing direction volume, Vo	95	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.954		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	124	pc/h	109	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	55.5	mi/h
Percent Free Flow Speed, PFFS	95.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	119	pc/h	104	pc/h
Base percent time-spent-following,(note-4) BPTSFd	13.6	%		
Adjustment for no-passing zones, fnp	30.8			
Percent time-spent-following, PTSFd	30.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.5	mi/h
Percent time-spent-following, PTSFd (from above)	30.0	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	118.5
Effective width of outside lane, We	32.19
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.60
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 403 veh/h
Opposing direction volume, Vo 407 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	446	pc/h	451	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	49.8	mi/h
Percent Free Flow Speed, PFFS	85.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	438	pc/h	442	pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.0	%		
Adjustment for no-passing zones, fnp	31.8			
Percent time-spent-following, PTSFd	61.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.26	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.8	mi/h
Percent time-spent-following, PTSFd (from above)	61.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	438.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.57
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	344	veh/h
Opposing direction volume, Vo	356	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	381	pc/h	394	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	50.6	mi/h
Percent Free Flow Speed, PFFS	87.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	376	pc/h	389	pc/h
Base percent time-spent-following,(note-4) BPTSFd	41.3	%		
Adjustment for no-passing zones, fnp	34.2			
Percent time-spent-following, PTSFd	58.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.22	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.6	mi/h
Percent time-spent-following, PTSFd (from above)	58.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	373.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.49
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2016
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 355 veh/h
Opposing direction volume, Vo 419 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	393	pc/h	461	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	50.1	mi/h
Percent Free Flow Speed, PFFS	86.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	388	pc/h	455	pc/h
Base percent time-spent-following,(note-4) BPTSFd	42.9	%		
Adjustment for no-passing zones, fnp	30.6			
Percent time-spent-following, PTSFd	57.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.1	mi/h
Percent time-spent-following, PTSFd (from above)	57.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	385.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.50
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	407	veh/h
Opposing direction volume, Vo	403	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	451	pc/h	446	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	49.8	mi/h
Percent Free Flow Speed, PFFS	85.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	442	pc/h	438	pc/h
Base percent time-spent-following,(note-4) BPTSFd	46.4	%		
Adjustment for no-passing zones, fnp	31.8			
Percent time-spent-following, PTSFd	62.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.27	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.8	mi/h
Percent time-spent-following, PTSFd (from above)	62.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	442.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.57
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	356	veh/h
Opposing direction volume, Vo	344	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	394	pc/h	381	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	50.6	mi/h
Percent Free Flow Speed, PFFS	87.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	389	pc/h	376	pc/h
Base percent time-spent-following,(note-4) BPTSFd	41.4	%		
Adjustment for no-passing zones, fnp	34.2			
Percent time-spent-following, PTSFd	58.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.6	mi/h
Percent time-spent-following, PTSFd (from above)	58.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	387.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.51
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2016
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	419	veh/h
Opposing direction volume, Vo	355	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	461	pc/h	393	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	50.0	mi/h
Percent Free Flow Speed, PFFS	86.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	455	pc/h	388	pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.1	%		
Adjustment for no-passing zones, fnp	30.6			
Percent time-spent-following, PTSFd	63.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.27	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.0	mi/h
Percent time-spent-following, PTSFd (from above)	63.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	455.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.59
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	95	veh/h
Opposing direction volume, Vo	109	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.954	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	109	pc/h	124	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	55.3	mi/h
Percent Free Flow Speed, PFFS	95.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	104	pc/h	119	pc/h
Base percent time-spent-following,(note-4) BPTSFd	12.1	%		
Adjustment for no-passing zones, fnp	30.8			
Percent time-spent-following, PTSFd	26.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1622	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1622	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.3	mi/h
Percent time-spent-following, PTSFd (from above)	26.5	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	103.3
Effective width of outside lane, We	33.45
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.12
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	95	veh/h
Opposing direction volume, Vo	109	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.954	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	109	pc/h	124	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	55.3	mi/h
Percent Free Flow Speed, PFFS	95.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	104	pc/h	119	pc/h
Base percent time-spent-following,(note-4) BPTSFd	12.1	%		
Adjustment for no-passing zones, fnp	30.8			
Percent time-spent-following, PTSFd	26.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1622	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1622	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.3	mi/h
Percent time-spent-following, PTSFd (from above)	26.5	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	103.3
Effective width of outside lane, We	33.45
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.12
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	135	veh/h
Opposing direction volume, Vo	177	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.960		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	153	pc/h	198	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	53.6	mi/h
Percent Free Flow Speed, PFFS	92.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	148	pc/h	194	pc/h
Base percent time-spent-following,(note-4) BPTSFd	16.6	%		
Adjustment for no-passing zones, fnp	35.5			
Percent time-spent-following, PTSFd	32.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.09	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1651	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1651	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.6	mi/h
Percent time-spent-following, PTSFd (from above)	32.0	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	146.7
Effective width of outside lane, We	29.85
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	1.44
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	18	veh/h
Opposing direction volume, Vo	6	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	21	pc/h	7	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.2	mi/h
Percent Free Flow Speed, PFFS	98.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	20	pc/h	7	pc/h
Base percent time-spent-following,(note-4) BPTSFd	2.5	%		
Adjustment for no-passing zones, fnp	27.6			
Percent time-spent-following, PTSFd	22.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.2	mi/h
Percent time-spent-following, PTSFd (from above)	22.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	19.6
Effective width of outside lane, We	40.38
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-3.27
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	361	veh/h
Opposing direction volume, Vo	360	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	400	pc/h	398	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	50.4	mi/h
Percent Free Flow Speed, PFFS	87.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	395	pc/h	394	pc/h
Base percent time-spent-following,(note-4) BPTSFd	42.4	%		
Adjustment for no-passing zones, fnp	34.0			
Percent time-spent-following, PTSFd	59.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.24	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.4	mi/h
Percent time-spent-following, PTSFd (from above)	59.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	392.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.51
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 473 veh/h
Opposing direction volume, Vo 424 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	520	pc/h	466	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	49.1	mi/h
Percent Free Flow Speed, PFFS	84.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	514	pc/h	461	pc/h
Base percent time-spent-following,(note-4) BPTSFd	51.3	%		
Adjustment for no-passing zones, fnp	28.6			
Percent time-spent-following, PTSFd	66.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.31	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.1	mi/h
Percent time-spent-following, PTSFd (from above)	66.4	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	514.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.65
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	177	veh/h
Opposing direction volume, Vo	135	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.960	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	198	pc/h	153	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	54.1	mi/h
Percent Free Flow Speed, PFFS	93.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	194	pc/h	148	pc/h
Base percent time-spent-following,(note-4) BPTSFd	21.0	%		
Adjustment for no-passing zones, fnp	35.5			
Percent time-spent-following, PTSFd	41.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.12	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1632	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1632	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	54.1	mi/h
Percent time-spent-following, PTSFd (from above)	41.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	192.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.15
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 6 veh/h
Opposing direction volume, Vo 18 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	7	pc/h	21	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.2	mi/h
Percent Free Flow Speed, PFFS	98.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	7	pc/h	20	pc/h
Base percent time-spent-following,(note-4) BPTSFd	0.9	%		
Adjustment for no-passing zones, fnp	27.6			
Percent time-spent-following, PTSFd	8.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.00	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.2	mi/h
Percent time-spent-following, PTSFd (from above)	8.1	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	6.5
Effective width of outside lane, We	41.46
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-4.24
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	177	veh/h
Opposing direction volume, Vo	135	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.960	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	198	pc/h	153	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	54.1	mi/h
Percent Free Flow Speed, PFFS	93.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	194	pc/h	148	pc/h
Base percent time-spent-following,(note-4) BPTSFd	21.0	%		
Adjustment for no-passing zones, fnp	35.5			
Percent time-spent-following, PTSFd	41.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.12	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1632	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1632	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	54.1	mi/h
Percent time-spent-following, PTSFd (from above)	41.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	192.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.15
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	135	veh/h
Opposing direction volume, Vo	177	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.960		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	153	pc/h	198	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	53.6	mi/h
Percent Free Flow Speed, PFFS	92.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	148	pc/h	194	pc/h
Base percent time-spent-following,(note-4) BPTSFd	16.6	%		
Adjustment for no-passing zones, fnp	35.5			
Percent time-spent-following, PTSFd	32.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.09	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1651	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1651	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.6	mi/h
Percent time-spent-following, PTSFd (from above)	32.0	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	146.7
Effective width of outside lane, We	29.85
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	1.44
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	360	veh/h
Opposing direction volume, Vo	361	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	398	pc/h	400	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	50.4	mi/h
Percent Free Flow Speed, PFFS	87.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	394	pc/h	395	pc/h
Base percent time-spent-following,(note-4) BPTSFd	42.3	%		
Adjustment for no-passing zones, fnp	34.0			
Percent time-spent-following, PTSFd	59.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.4	mi/h
Percent time-spent-following, PTSFd (from above)	59.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	391.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.51
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	424	veh/h
Opposing direction volume, Vo	473	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	466	pc/h	520	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	49.2	mi/h
Percent Free Flow Speed, PFFS	84.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	461	pc/h	514	pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.8	%		
Adjustment for no-passing zones, fnp	28.6			
Percent time-spent-following, PTSFd	62.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.27	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.2	mi/h
Percent time-spent-following, PTSFd (from above)	62.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	460.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.59
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 436 veh/h
Opposing direction volume, Vo 367 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	480	pc/h	406	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	49.8	mi/h
Percent Free Flow Speed, PFFS	85.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	474	pc/h	401	pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.7	%		
Adjustment for no-passing zones, fnp	29.9			
Percent time-spent-following, PTSFd	63.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.8	mi/h
Percent time-spent-following, PTSFd (from above)	63.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	473.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.61
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	114	veh/h
Opposing direction volume, Vo	99	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.954		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	130	pc/h	113	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSd	55.3	mi/h
Percent Free Flow Speed, PFFS	95.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	125	pc/h	108	pc/h
Base percent time-spent-following,(note-4) BPTSFd	14.2	%		
Adjustment for no-passing zones, fnp	31.3			
Percent time-spent-following, PTSFd	31.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.08	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.3	mi/h
Percent time-spent-following, PTSFd (from above)	31.0	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	123.9
Effective width of outside lane, We	31.74
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.77
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	24	veh/h
Opposing direction volume, Vo	16	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	27	pc/h	18	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.0	mi/h
Percent Free Flow Speed, PFFS	98.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	26	pc/h	17	pc/h
Base percent time-spent-following,(note-4) BPTSFd	3.3	%		
Adjustment for no-passing zones, fnp	30.6			
Percent time-spent-following, PTSFd	21.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.02	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.0	mi/h
Percent time-spent-following, PTSFd (from above)	21.8	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	26.1
Effective width of outside lane, We	39.84
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-2.92
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	358	veh/h
Opposing direction volume, Vo	371	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	396	pc/h	411	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	50.4	mi/h
Percent Free Flow Speed, PFFS	86.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	391	pc/h	403	pc/h
Base percent time-spent-following,(note-4) BPTSFd	41.7	%		
Adjustment for no-passing zones, fnp	33.4			
Percent time-spent-following, PTSFd	58.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.4	mi/h
Percent time-spent-following, PTSFd (from above)	58.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	389.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.51
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Sierra St
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	331	veh/h
Opposing direction volume, Vo	294	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	366	pc/h	327	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	51.1	mi/h
Percent Free Flow Speed, PFFS	88.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	362	pc/h	321	pc/h
Base percent time-spent-following,(note-4) BPTSFd	38.8	%		
Adjustment for no-passing zones, fnp	35.5			
Percent time-spent-following, PTSFd	57.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.22	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.1	mi/h
Percent time-spent-following, PTSFd (from above)	57.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-		mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-		mi
Adj. factor for the effect of passing lane on average speed, fpl	-		
Average travel speed including passing lane, ATSpl	-		
Percent free flow speed including passing lane, PFFSpl	-	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-		mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-		mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-		
Percent time-spent-following including passing lane, PTSFpl	-		%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl		E	
Peak 15-min total travel time, TT15	-		veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	359.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.47
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	420	veh/h
Opposing direction volume, Vo	422	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	462	pc/h	464	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	49.6	mi/h
Percent Free Flow Speed, PFFS	85.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	457	pc/h	459	pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.6	%		
Adjustment for no-passing zones, fnp	31.1			
Percent time-spent-following, PTSFd	63.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.27	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.6	mi/h
Percent time-spent-following, PTSFd (from above)	63.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	456.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.59
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	99	veh/h
Opposing direction volume, Vo	114	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.954	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	113	pc/h	130	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSd	55.2	mi/h
Percent Free Flow Speed, PFFS	95.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	108	pc/h	125	pc/h
Base percent time-spent-following,(note-4) BPTSFd	12.5	%		
Adjustment for no-passing zones, fnp	31.3			
Percent time-spent-following, PTSFd	27.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1622	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1622	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.2	mi/h
Percent time-spent-following, PTSFd (from above)	27.0	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	107.6
Effective width of outside lane, We	33.09
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.26
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	371	veh/h
Opposing direction volume, Vo	358	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	411	pc/h	396	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	50.4	mi/h
Percent Free Flow Speed, PFFS	86.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	403	pc/h	391	pc/h
Base percent time-spent-following,(note-4) BPTSFd	43.2	%		
Adjustment for no-passing zones, fnp	33.4			
Percent time-spent-following, PTSFd	60.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.24	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.4	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	403.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.53
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST Sierra St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Sierra ST
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	294	veh/h
Opposing direction volume, Vo	331	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	327	pc/h	366	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	51.2	mi/h
Percent Free Flow Speed, PFFS	88.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	321	pc/h	362	pc/h
Base percent time-spent-following,(note-4) BPTSFd	35.3	%		
Adjustment for no-passing zones, fnp	35.5			
Percent time-spent-following, PTSFd	52.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.19	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.2	mi/h
Percent time-spent-following, PTSFd (from above)	52.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	319.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.41
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	422	veh/h
Opposing direction volume, Vo	420	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	464	pc/h	462	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	49.6	mi/h
Percent Free Flow Speed, PFFS	85.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	459	pc/h	457	pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.9	%		
Adjustment for no-passing zones, fnp	31.1			
Percent time-spent-following, PTSFd	63.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.27	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.6	mi/h
Percent time-spent-following, PTSFd (from above)	63.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	458.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.59
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 367 veh/h
Opposing direction volume, Vo 436 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	406	pc/h	480	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	49.9	mi/h
Percent Free Flow Speed, PFFS	86.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	401	pc/h	474	pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.2	%		
Adjustment for no-passing zones, fnp	29.9			
Percent time-spent-following, PTSFd	57.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.24	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.9	mi/h
Percent time-spent-following, PTSFd (from above)	57.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	398.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.52
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	16	veh/h
Opposing direction volume, Vo	24	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	18	pc/h	27	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.0	mi/h
Percent Free Flow Speed, PFFS	98.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	17	pc/h	26	pc/h
Base percent time-spent-following,(note-4) BPTSFd	2.2	%		
Adjustment for no-passing zones, fnp	30.6			
Percent time-spent-following, PTSFd	14.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.0	mi/h
Percent time-spent-following, PTSFd (from above)	14.3	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	17.4
Effective width of outside lane, We	40.56
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-3.42
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	374	veh/h
Opposing direction volume, Vo	376	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	414	pc/h	416	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	50.2	mi/h
Percent Free Flow Speed, PFFS	86.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	407	pc/h	409	pc/h
Base percent time-spent-following,(note-4) BPTSFd	42.7	%		
Adjustment for no-passing zones, fnp	33.4			
Percent time-spent-following, PTSFd	59.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.24	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.2	mi/h
Percent time-spent-following, PTSFd (from above)	59.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	406.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.53
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 378 veh/h
Opposing direction volume, Vo 466 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	418	pc/h	513	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	49.6	mi/h
Percent Free Flow Speed, PFFS	85.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	411	pc/h	507	pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.8	%		
Adjustment for no-passing zones, fnp	28.6			
Percent time-spent-following, PTSFd	58.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.25	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.6	mi/h
Percent time-spent-following, PTSFd (from above)	58.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	410.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.54
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	181	veh/h
Opposing direction volume, Vo	140	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.960	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	203	pc/h	159	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	53.9	mi/h
Percent Free Flow Speed, PFFS	92.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	198	pc/h	153	pc/h
Base percent time-spent-following,(note-4) BPTSFd	21.4	%		
Adjustment for no-passing zones, fnp	36.0			
Percent time-spent-following, PTSFd	41.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.12	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1632	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1632	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.9	mi/h
Percent time-spent-following, PTSFd (from above)	41.7	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	196.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.16
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	22	veh/h
Opposing direction volume, Vo	26	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	25	pc/h	30	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.0	mi/h
Percent Free Flow Speed, PFFS	98.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	24	pc/h	28	pc/h
Base percent time-spent-following,(note-4) BPTSFd	3.0	%		
Adjustment for no-passing zones, fnp	29.8			
Percent time-spent-following, PTSFd	16.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.0	mi/h
Percent time-spent-following, PTSFd (from above)	16.8	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	23.9
Effective width of outside lane, We	40.02
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-3.03
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	486	veh/h
Opposing direction volume, Vo	443	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	535	pc/h	487	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	48.9	mi/h
Percent Free Flow Speed, PFFS	84.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	528	pc/h	482	pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.5	%		
Adjustment for no-passing zones, fnp	28.0			
Percent time-spent-following, PTSFd	68.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.31	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	48.9	mi/h
Percent time-spent-following, PTSFd (from above)	68.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	528.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.66
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	466	veh/h
Opposing direction volume, Vo	378	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	513	pc/h	418	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	49.4	mi/h
Percent Free Flow Speed, PFFS	85.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	507	pc/h	411	pc/h
Base percent time-spent-following,(note-4) BPTSFd	50.8	%		
Adjustment for no-passing zones, fnp	28.6			
Percent time-spent-following, PTSFd	66.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.30	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.4	mi/h
Percent time-spent-following, PTSFd (from above)	66.6	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	506.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.64
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	26	veh/h
Opposing direction volume, Vo	22	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	30	pc/h	25	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.0	mi/h
Percent Free Flow Speed, PFFS	98.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	28	pc/h	24	pc/h
Base percent time-spent-following,(note-4) BPTSFd	3.5	%		
Adjustment for no-passing zones, fnp	29.8			
Percent time-spent-following, PTSFd	19.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.02	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.0	mi/h
Percent time-spent-following, PTSFd (from above)	19.5	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	28.3
Effective width of outside lane, We	39.66
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-2.81
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	140	veh/h
Opposing direction volume, Vo	181	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.960		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	159	pc/h	203	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	53.5	mi/h
Percent Free Flow Speed, PFFS	92.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	153	pc/h	198	pc/h
Base percent time-spent-following,(note-4) BPTSFd	17.1	%		
Adjustment for no-passing zones, fnp	36.0			
Percent time-spent-following, PTSFd	32.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.09	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1651	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1651	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.5	mi/h
Percent time-spent-following, PTSFd (from above)	32.8	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	152.2
Effective width of outside lane, We	29.40
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	1.59
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Sierra St
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	298	veh/h
Opposing direction volume, Vo	341	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	332	pc/h	377	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	51.1	mi/h
Percent Free Flow Speed, PFFS	88.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	326	pc/h	373	pc/h
Base percent time-spent-following,(note-4) BPTSFd	36.7	%		
Adjustment for no-passing zones, fnp	34.9			
Percent time-spent-following, PTSFd	53.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.20	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.1	mi/h
Percent time-spent-following, PTSFd (from above)	53.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	323.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.42
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Sierra St
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	341	veh/h
Opposing direction volume, Vo	298	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	377	pc/h	332	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	51.0	mi/h
Percent Free Flow Speed, PFFS	87.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	373	pc/h	326	pc/h
Base percent time-spent-following,(note-4) BPTSFd	39.5	%		
Adjustment for no-passing zones, fnp	34.9			
Percent time-spent-following, PTSFd	58.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.22	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.0	mi/h
Percent time-spent-following, PTSFd (from above)	58.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	370.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.48
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	443	veh/h
Opposing direction volume, Vo	486	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	487	pc/h	535	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	48.9	mi/h
Percent Free Flow Speed, PFFS	84.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	482	pc/h	528	pc/h
Base percent time-spent-following,(note-4) BPTSFd	50.5	%		
Adjustment for no-passing zones, fnp	28.0			
Percent time-spent-following, PTSFd	63.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.29	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	48.9	mi/h
Percent time-spent-following, PTSFd (from above)	63.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	481.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.62
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 376 veh/h
Opposing direction volume, Vo 374 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	416	pc/h	414	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	50.2	mi/h
Percent Free Flow Speed, PFFS	86.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	409	pc/h	407	pc/h
Base percent time-spent-following,(note-4) BPTSFd	42.9	%		
Adjustment for no-passing zones, fnp	33.4			
Percent time-spent-following, PTSFd	59.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.25	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.2	mi/h
Percent time-spent-following, PTSFd (from above)	59.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	408.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.53
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	507	veh/h
Opposing direction volume, Vo	426	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	554	pc/h	469	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	48.8	mi/h
Percent Free Flow Speed, PFFS	84.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	551	pc/h	463	pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.3	%		
Adjustment for no-passing zones, fnp	27.1			
Percent time-spent-following, PTSFd	68.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.33	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	48.8	mi/h
Percent time-spent-following, PTSFd (from above)	68.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	551.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.68
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	426	veh/h
Opposing direction volume, Vo	507	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.994	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	469	pc/h	554	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	49.0	mi/h
Percent Free Flow Speed, PFFS	84.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	463	pc/h	551	pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.2	%		
Adjustment for no-passing zones, fnp	27.1			
Percent time-spent-following, PTSFd	61.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1690	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1690	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.0	mi/h
Percent time-spent-following, PTSFd (from above)	61.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	463.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.60
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	486	veh/h
Opposing direction volume, Vo	492	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	535	pc/h	541	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	48.5	mi/h
Percent Free Flow Speed, PFFS	83.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	528	pc/h	535	pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.0	%		
Adjustment for no-passing zones, fnp	27.6			
Percent time-spent-following, PTSFd	66.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.31	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	48.5	mi/h
Percent time-spent-following, PTSFd (from above)	66.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	528.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.66
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	115	veh/h
Opposing direction volume, Vo	132	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.954		0.960	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	131	pc/h	149	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	54.7	mi/h
Percent Free Flow Speed, PFFS	94.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	126	pc/h	144	pc/h
Base percent time-spent-following,(note-4) BPTSFd	14.3	%		
Adjustment for no-passing zones, fnp	33.1			
Percent time-spent-following, PTSFd	29.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.08	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1632	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1632	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	54.7	mi/h
Percent time-spent-following, PTSFd (from above)	29.7	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	125.0
Effective width of outside lane, We	31.65
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.80
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	132	veh/h
Opposing direction volume, Vo	115	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.960		0.954	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	149	pc/h	131	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSd	54.9	mi/h
Percent Free Flow Speed, PFFS	94.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	144	pc/h	126	pc/h
Base percent time-spent-following,(note-4) BPTSFd	16.2	%		
Adjustment for no-passing zones, fnp	33.1			
Percent time-spent-following, PTSFd	33.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.09	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1622	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1622	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	54.9	mi/h
Percent time-spent-following, PTSFd (from above)	33.9	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	143.5
Effective width of outside lane, We	30.12
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	1.34
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	115	veh/h
Opposing direction volume, Vo	132	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.954		0.960	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	131	pc/h	149	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	54.7	mi/h
Percent Free Flow Speed, PFFS	94.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	126	pc/h	144	pc/h
Base percent time-spent-following,(note-4) BPTSFd	14.3	%		
Adjustment for no-passing zones, fnp	33.1			
Percent time-spent-following, PTSFd	29.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.08	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1632	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1632	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	54.7	mi/h
Percent time-spent-following, PTSFd (from above)	29.7	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	125.0
Effective width of outside lane, We	31.65
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.80
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	132	veh/h
Opposing direction volume, Vo	115	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.960		0.954	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	149	pc/h	131	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSd	54.9	mi/h
Percent Free Flow Speed, PFFS	94.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	144	pc/h	126	pc/h
Base percent time-spent-following,(note-4) BPTSFd	16.2	%		
Adjustment for no-passing zones, fnp	33.1			
Percent time-spent-following, PTSFd	33.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.09	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1622	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1622	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	54.9	mi/h
Percent time-spent-following, PTSFd (from above)	33.9	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	143.5
Effective width of outside lane, We	30.12
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	1.34
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 430 veh/h
Opposing direction volume, Vo 416 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	473	pc/h	458	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	49.5	mi/h
Percent Free Flow Speed, PFFS	85.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	467	pc/h	452	pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.7	%		
Adjustment for no-passing zones, fnp	30.7			
Percent time-spent-following, PTSFd	64.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.5	mi/h
Percent time-spent-following, PTSFd (from above)	64.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	467.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.60
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	416	veh/h
Opposing direction volume, Vo	430	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	458	pc/h	473	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	49.5	mi/h
Percent Free Flow Speed, PFFS	85.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	452	pc/h	467	pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.2	%		
Adjustment for no-passing zones, fnp	30.7			
Percent time-spent-following, PTSFd	63.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.27	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.5	mi/h
Percent time-spent-following, PTSFd (from above)	63.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	452.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.58
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	492	veh/h
Opposing direction volume, Vo	486	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	541	pc/h	535	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	48.5	mi/h
Percent Free Flow Speed, PFFS	83.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	535	pc/h	528	pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.8	%		
Adjustment for no-passing zones, fnp	27.6			
Percent time-spent-following, PTSFd	67.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.32	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	48.5	mi/h
Percent time-spent-following, PTSFd (from above)	67.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	534.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.67
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	507	veh/h
Opposing direction volume, Vo	558	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.994	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	554	pc/h	610	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSd	48.0	mi/h
Percent Free Flow Speed, PFFS	82.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	551	pc/h	607	pc/h
Base percent time-spent-following,(note-4) BPTSFd	54.9	%		
Adjustment for no-passing zones, fnp	24.9			
Percent time-spent-following, PTSFd	66.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.33	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1690	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1690	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	48.0	mi/h
Percent time-spent-following, PTSFd (from above)	66.7	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	551.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.68
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	537	veh/h
Opposing direction volume, Vo	437	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	587	pc/h	481	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	48.5	mi/h
Percent Free Flow Speed, PFFS	83.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	584	pc/h	475	pc/h
Base percent time-spent-following,(note-4) BPTSFd	55.9	%		
Adjustment for no-passing zones, fnp	26.0			
Percent time-spent-following, PTSFd	70.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.35	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	48.5	mi/h
Percent time-spent-following, PTSFd (from above)	70.2	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	583.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.71
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	435	veh/h
Opposing direction volume, Vo	432	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	479	pc/h	475	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	49.4	mi/h
Percent Free Flow Speed, PFFS	85.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	473	pc/h	470	pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.4	%		
Adjustment for no-passing zones, fnp	30.4			
Percent time-spent-following, PTSFd	64.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.4	mi/h
Percent time-spent-following, PTSFd (from above)	64.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	472.8
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.61
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	64	veh/h
Opposing direction volume, Vo	29	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	73	pc/h	33	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	56.6	mi/h
Percent Free Flow Speed, PFFS	97.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	70	pc/h	32	pc/h
Base percent time-spent-following,(note-4) BPTSFd	8.4	%		
Adjustment for no-passing zones, fnp	28.4			
Percent time-spent-following, PTSFd	27.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.04	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	56.6	mi/h
Percent time-spent-following, PTSFd (from above)	27.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	69.6
Effective width of outside lane, We	36.24
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-1.05
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	29	veh/h
Opposing direction volume, Vo	64	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	33	pc/h	73	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	56.6	mi/h
Percent Free Flow Speed, PFFS	97.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	32	pc/h	70	pc/h
Base percent time-spent-following,(note-4) BPTSFd	4.0	%		
Adjustment for no-passing zones, fnp	28.4			
Percent time-spent-following, PTSFd	12.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.02	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	56.6	mi/h
Percent time-spent-following, PTSFd (from above)	12.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	31.5
Effective width of outside lane, We	39.39
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-2.64
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	158	veh/h
Opposing direction volume, Vo	197	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.965		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	178	pc/h	221	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	53.2	mi/h
Percent Free Flow Speed, PFFS	91.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	173	pc/h	215	pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.8	%		
Adjustment for no-passing zones, fnp	37.8			
Percent time-spent-following, PTSFd	36.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1651	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1651	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.2	mi/h
Percent time-spent-following, PTSFd (from above)	36.7	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	171.7
Effective width of outside lane, We	27.78
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.12
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	197	veh/h
Opposing direction volume, Vo	158	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.965	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	221	pc/h	178	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	53.4	mi/h
Percent Free Flow Speed, PFFS	92.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	215	pc/h	173	pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.9	%		
Adjustment for no-passing zones, fnp	37.8			
Percent time-spent-following, PTSFd	43.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.13	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1641	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1641	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.4	mi/h
Percent time-spent-following, PTSFd (from above)	43.8	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	214.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.21
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	197	veh/h
Opposing direction volume, Vo	158	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.965	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	221	pc/h	178	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	53.4	mi/h
Percent Free Flow Speed, PFFS	92.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	215	pc/h	173	pc/h
Base percent time-spent-following,(note-4) BPTSFd	22.9	%		
Adjustment for no-passing zones, fnp	37.8			
Percent time-spent-following, PTSFd	43.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.13	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1641	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1641	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.4	mi/h
Percent time-spent-following, PTSFd (from above)	43.8	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	214.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.21
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	437	veh/h
Opposing direction volume, Vo	537	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.994	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	481	pc/h	587	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.0	mi/h
Average travel speed, ATSd	48.7	mi/h
Percent Free Flow Speed, PFFS	83.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	475	pc/h	584	pc/h
Base percent time-spent-following,(note-4) BPTSFd	50.3	%		
Adjustment for no-passing zones, fnp	26.0			
Percent time-spent-following, PTSFd	62.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1690	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1690	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	48.7	mi/h
Percent time-spent-following, PTSFd (from above)	62.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	475.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.61
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 558 veh/h
Opposing direction volume, Vo 507 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.994	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	610	pc/h	554	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	47.9	mi/h
Percent Free Flow Speed, PFFS	82.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	607	pc/h	551	pc/h
Base percent time-spent-following,(note-4) BPTSFd	57.7	%		
Adjustment for no-passing zones, fnp	24.9			
Percent time-spent-following, PTSFd	70.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.36	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1690	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1690	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	47.9	mi/h
Percent time-spent-following, PTSFd (from above)	70.8	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	606.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.73
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	432	veh/h
Opposing direction volume, Vo	435	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	475	pc/h	479	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	49.4	mi/h
Percent Free Flow Speed, PFFS	85.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	470	pc/h	473	pc/h
Base percent time-spent-following,(note-4) BPTSFd	49.2	%		
Adjustment for no-passing zones, fnp	30.4			
Percent time-spent-following, PTSFd	64.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.4	mi/h
Percent time-spent-following, PTSFd (from above)	64.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	469.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.60
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	AM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	158	veh/h
Opposing direction volume, Vo	197	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.965		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	178	pc/h	221	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	53.2	mi/h
Percent Free Flow Speed, PFFS	91.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	173	pc/h	215	pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.8	%		
Adjustment for no-passing zones, fnp	37.8			
Percent time-spent-following, PTSFd	36.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1651	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1651	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.2	mi/h
Percent time-spent-following, PTSFd (from above)	36.7	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	171.7
Effective width of outside lane, We	27.78
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.12
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	258	veh/h
Opposing direction volume, Vo	364	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	287	pc/h	403	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	51.3	mi/h
Percent Free Flow Speed, PFFS	88.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	282	pc/h	398	pc/h
Base percent time-spent-following,(note-4) BPTSFd	33.2	%		
Adjustment for no-passing zones, fnp	33.9			
Percent time-spent-following, PTSFd	47.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.17	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.3	mi/h
Percent time-spent-following, PTSFd (from above)	47.3	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	280.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.34
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	218	veh/h
Opposing direction volume, Vo	316	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	244	pc/h	352	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	51.9	mi/h
Percent Free Flow Speed, PFFS	89.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	238	pc/h	346	pc/h
Base percent time-spent-following,(note-4) BPTSFd	28.5	%		
Adjustment for no-passing zones, fnp	37.0			
Percent time-spent-following, PTSFd	43.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.14	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.9	mi/h
Percent time-spent-following, PTSFd (from above)	43.6	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-		mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-		mi
Adj. factor for the effect of passing lane on average speed, fpl	-		
Average travel speed including passing lane, ATSpl	-		
Percent free flow speed including passing lane, PFFSpl	0.0		%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-		mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-		mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-		
Percent time-spent-following including passing lane, PTSFpl	-		%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E		
Peak 15-min total travel time, TT15	-		veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	237.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.26
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2016
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 284 veh/h
Opposing direction volume, Vo 252 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	316	pc/h	280	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	51.8	mi/h
Percent Free Flow Speed, PFFS	89.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	311	pc/h	276	pc/h
Base percent time-spent-following,(note-4) BPTSFd	33.4	%		
Adjustment for no-passing zones, fnp	37.9			
Percent time-spent-following, PTSFd	53.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.19	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.8	mi/h
Percent time-spent-following, PTSFd (from above)	53.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	308.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.39
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	316	veh/h
Opposing direction volume, Vo	218	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	352	pc/h	244	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	51.7	mi/h
Percent Free Flow Speed, PFFS	89.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	346	pc/h	238	pc/h
Base percent time-spent-following,(note-4) BPTSFd	36.0	%		
Adjustment for no-passing zones, fnp	37.0			
Percent time-spent-following, PTSFd	57.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.21	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1651	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1651	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.7	mi/h
Percent time-spent-following, PTSFd (from above)	57.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	343.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.44
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	83	veh/h
Opposing direction volume, Vo	88	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	95	pc/h	101	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	55.8	mi/h
Percent Free Flow Speed, PFFS	96.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	91	pc/h	96	pc/h
Base percent time-spent-following,(note-4) BPTSFd	10.7	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	25.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.8	mi/h
Percent time-spent-following, PTSFd (from above)	25.0	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	90.2
Effective width of outside lane, We	34.53
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-0.32
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	83	veh/h
Opposing direction volume, Vo	88	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	95	pc/h	101	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	55.8	mi/h
Percent Free Flow Speed, PFFS	96.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	91	pc/h	96	pc/h
Base percent time-spent-following,(note-4) BPTSFd	10.7	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	25.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.8	mi/h
Percent time-spent-following, PTSFd (from above)	25.0	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	90.2
Effective width of outside lane, We	34.53
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-0.32
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2016
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 252 veh/h
Opposing direction volume, Vo 284 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	280	pc/h	316	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	51.9	mi/h
Percent Free Flow Speed, PFFS	89.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	276	pc/h	311	pc/h
Base percent time-spent-following,(note-4) BPTSFd	30.6	%		
Adjustment for no-passing zones, fnp	37.9			
Percent time-spent-following, PTSFd	48.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.16	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.9	mi/h
Percent time-spent-following, PTSFd (from above)	48.4	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	273.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.33
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	88	veh/h
Opposing direction volume, Vo	83	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	101	pc/h	95	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	55.9	mi/h
Percent Free Flow Speed, PFFS	96.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	96	pc/h	91	pc/h
Base percent time-spent-following,(note-4) BPTSFd	11.2	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	26.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.9	mi/h
Percent time-spent-following, PTSFd (from above)	26.3	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	95.7
Effective width of outside lane, We	34.08
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-0.13
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	12	veh/h
Opposing direction volume, Vo	21	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	14	pc/h	24	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.1	mi/h
Percent Free Flow Speed, PFFS	98.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	13	pc/h	23	pc/h
Base percent time-spent-following,(note-4) BPTSFd	1.7	%		
Adjustment for no-passing zones, fnp	29.7			
Percent time-spent-following, PTSFd	12.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.1	mi/h
Percent time-spent-following, PTSFd (from above)	12.4	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	13.0
Effective width of outside lane, We	40.92
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-3.71
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	21	veh/h
Opposing direction volume, Vo	12	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	24	pc/h	14	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.1	mi/h
Percent Free Flow Speed, PFFS	98.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	23	pc/h	13	pc/h
Base percent time-spent-following,(note-4) BPTSFd	2.9	%		
Adjustment for no-passing zones, fnp	29.7			
Percent time-spent-following, PTSFd	21.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.1	mi/h
Percent time-spent-following, PTSFd (from above)	21.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	22.8
Effective width of outside lane, We	40.11
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-3.09
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 364 veh/h
Opposing direction volume, Vo 258 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	403	pc/h	287	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	51.1	mi/h
Percent Free Flow Speed, PFFS	88.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	398	pc/h	282	pc/h
Base percent time-spent-following,(note-4) BPTSFd	39.8	%		
Adjustment for no-passing zones, fnp	33.9			
Percent time-spent-following, PTSFd	59.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.24	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.1	mi/h
Percent time-spent-following, PTSFd (from above)	59.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-		mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-		mi
Adj. factor for the effect of passing lane on average speed, fpl	-		
Average travel speed including passing lane, ATSpl	-		
Percent free flow speed including passing lane, PFFSpl	-	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-		mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-		mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-		
Percent time-spent-following including passing lane, PTSFpl	-		%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl		E	
Peak 15-min total travel time, TT15	-		veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	395.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.52
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2014
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	88	veh/h
Opposing direction volume, Vo	83	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	101	pc/h	95	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	55.9	mi/h
Percent Free Flow Speed, PFFS	96.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	96	pc/h	91	pc/h
Base percent time-spent-following,(note-4) BPTSFd	11.2	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	26.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.9	mi/h
Percent time-spent-following, PTSFd (from above)	26.3	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	95.7
Effective width of outside lane, We	34.08
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-0.13
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 261 veh/h
Opposing direction volume, Vo 298 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	290	pc/h	332	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	51.7	mi/h
Percent Free Flow Speed, PFFS	89.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	285	pc/h	326	pc/h
Base percent time-spent-following,(note-4) BPTSFd	32.3	%		
Adjustment for no-passing zones, fnp	37.4			
Percent time-spent-following, PTSFd	49.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.17	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.7	mi/h
Percent time-spent-following, PTSFd (from above)	49.7	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	283.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.35
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 15 veh/h
Opposing direction volume, Vo 11 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	17	pc/h	13	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.1	mi/h
Percent Free Flow Speed, PFFS	98.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	16	pc/h	12	pc/h
Base percent time-spent-following,(note-4) BPTSFd	2.1	%		
Adjustment for no-passing zones, fnp	30.3			
Percent time-spent-following, PTSFd	19.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.1	mi/h
Percent time-spent-following, PTSFd (from above)	19.4	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	16.3
Effective width of outside lane, We	40.65
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-3.49
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	329	veh/h
Opposing direction volume, Vo	227	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	364	pc/h	254	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	51.6	mi/h
Percent Free Flow Speed, PFFS	88.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	360	pc/h	248	pc/h
Base percent time-spent-following,(note-4) BPTSFd	36.7	%		
Adjustment for no-passing zones, fnp	36.7			
Percent time-spent-following, PTSFd	58.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.21	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1651	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1651	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.6	mi/h
Percent time-spent-following, PTSFd (from above)	58.4	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	357.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.47
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	227	veh/h
Opposing direction volume, Vo	329	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	254	pc/h	364	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	51.8	mi/h
Percent Free Flow Speed, PFFS	89.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	248	pc/h	360	pc/h
Base percent time-spent-following,(note-4) BPTSFd	29.0	%		
Adjustment for no-passing zones, fnp	36.7			
Percent time-spent-following, PTSFd	44.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.15	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.8	mi/h
Percent time-spent-following, PTSFd (from above)	44.0	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	246.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.28
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	87	veh/h
Opposing direction volume, Vo	92	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	100	pc/h	105	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.7	mi/h
Average travel speed, ATSd	55.7	mi/h
Percent Free Flow Speed, PFFS	96.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	95	pc/h	101	pc/h
Base percent time-spent-following,(note-4) BPTSFd	11.1	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	25.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.7	mi/h
Percent time-spent-following, PTSFd (from above)	25.4	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	94.6
Effective width of outside lane, We	34.17
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-0.16
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 298 veh/h
Opposing direction volume, Vo 261 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	332	pc/h	290	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	51.6	mi/h
Percent Free Flow Speed, PFFS	89.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	326	pc/h	285	pc/h
Base percent time-spent-following,(note-4) BPTSFd	34.3	%		
Adjustment for no-passing zones, fnp	37.4			
Percent time-spent-following, PTSFd	54.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.20	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.6	mi/h
Percent time-spent-following, PTSFd (from above)	54.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	323.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.42
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Sierra St
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 381 veh/h
Opposing direction volume, Vo 374 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	422	pc/h	414	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	50.2	mi/h
Percent Free Flow Speed, PFFS	86.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	414	pc/h	407	pc/h
Base percent time-spent-following,(note-4) BPTSFd	43.2	%		
Adjustment for no-passing zones, fnp	33.1			
Percent time-spent-following, PTSFd	59.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.25	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.2	mi/h
Percent time-spent-following, PTSFd (from above)	59.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	414.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.54
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	269	veh/h
Opposing direction volume, Vo	376	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	299	pc/h	416	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	51.1	mi/h
Percent Free Flow Speed, PFFS	88.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	294	pc/h	409	pc/h
Base percent time-spent-following,(note-4) BPTSFd	33.8	%		
Adjustment for no-passing zones, fnp	33.0			
Percent time-spent-following, PTSFd	47.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.18	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.1	mi/h
Percent time-spent-following, PTSFd (from above)	47.6	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	292.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.36
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Sierra St
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	374	veh/h
Opposing direction volume, Vo	381	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	414	pc/h	422	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	50.2	mi/h
Percent Free Flow Speed, PFFS	86.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	407	pc/h	414	pc/h
Base percent time-spent-following,(note-4) BPTSFd	43.8	%		
Adjustment for no-passing zones, fnp	33.1			
Percent time-spent-following, PTSFd	60.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.24	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.2	mi/h
Percent time-spent-following, PTSFd (from above)	60.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-		mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-		mi
Adj. factor for the effect of passing lane on average speed, fpl	-		
Average travel speed including passing lane, ATSpl	-		
Percent free flow speed including passing lane, PFFSpl	-	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-		mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-		mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-		
Percent time-spent-following including passing lane, PTSFpl	-		%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl		E	
Peak 15-min total travel time, TT15	-		veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	406.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.53
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 376 veh/h
Opposing direction volume, Vo 269 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	416	pc/h	299	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	50.9	mi/h
Percent Free Flow Speed, PFFS	87.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	409	pc/h	294	pc/h
Base percent time-spent-following,(note-4) BPTSFd	41.8	%		
Adjustment for no-passing zones, fnp	33.0			
Percent time-spent-following, PTSFd	61.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.24	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.9	mi/h
Percent time-spent-following, PTSFd (from above)	61.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	408.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.53
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	11	veh/h
Opposing direction volume, Vo	15	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	13	pc/h	17	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.1	mi/h
Percent Free Flow Speed, PFFS	98.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	12	pc/h	16	pc/h
Base percent time-spent-following,(note-4) BPTSFd	1.6	%		
Adjustment for no-passing zones, fnp	30.3			
Percent time-spent-following, PTSFd	14.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.1	mi/h
Percent time-spent-following, PTSFd (from above)	14.6	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	12.0
Effective width of outside lane, We	41.01
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-3.78
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	92	veh/h
Opposing direction volume, Vo	87	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	105	pc/h	100	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	55.8	mi/h
Percent Free Flow Speed, PFFS	96.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	101	pc/h	95	pc/h
Base percent time-spent-following,(note-4) BPTSFd	11.7	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	26.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.8	mi/h
Percent time-spent-following, PTSFd (from above)	26.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	100.0
Effective width of outside lane, We	33.72
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.01
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 19 veh/h
Opposing direction volume, Vo 18 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	22	pc/h	21	pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.0	mi/h
Percent Free Flow Speed, PFFS	98.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	21	pc/h	20	pc/h
Base percent time-spent-following,(note-4) BPTSFd	2.7	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	17.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.0	mi/h
Percent time-spent-following, PTSFd (from above)	17.8	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	20.7
Effective width of outside lane, We	40.29
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-3.21
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 302 veh/h
Opposing direction volume, Vo 318 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	336	pc/h	354	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	51.2	mi/h
Percent Free Flow Speed, PFFS	88.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	330	pc/h	348	pc/h
Base percent time-spent-following,(note-4) BPTSFd	36.6	%		
Adjustment for no-passing zones, fnp	36.1			
Percent time-spent-following, PTSFd	54.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.20	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.2	mi/h
Percent time-spent-following, PTSFd (from above)	54.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	328.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.42
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 18 veh/h
Opposing direction volume, Vo 19 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	21	pc/h	22	pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	57.0	mi/h
Percent Free Flow Speed, PFFS	98.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	20	pc/h	21	pc/h
Base percent time-spent-following,(note-4) BPTSFd	2.5	%		
Adjustment for no-passing zones, fnp	29.4			
Percent time-spent-following, PTSFd	16.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.01	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	57.0	mi/h
Percent time-spent-following, PTSFd (from above)	16.8	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	19.6
Effective width of outside lane, We	40.38
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-3.27
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	318	veh/h
Opposing direction volume, Vo	302	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	354	pc/h	336	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	51.2	mi/h
Percent Free Flow Speed, PFFS	88.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	348	pc/h	330	pc/h
Base percent time-spent-following,(note-4) BPTSFd	37.2	%		
Adjustment for no-passing zones, fnp	36.1			
Percent time-spent-following, PTSFd	55.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.21	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.2	mi/h
Percent time-spent-following, PTSFd (from above)	55.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	345.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.45
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	340	veh/h
Opposing direction volume, Vo	246	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	376	pc/h	274	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	51.4	mi/h
Percent Free Flow Speed, PFFS	88.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	372	pc/h	269	pc/h
Base percent time-spent-following,(note-4) BPTSFd	38.6	%		
Adjustment for no-passing zones, fnp	35.5			
Percent time-spent-following, PTSFd	59.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.22	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.4	mi/h
Percent time-spent-following, PTSFd (from above)	59.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	369.6
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.48
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	314	veh/h
Opposing direction volume, Vo	451	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	349	pc/h	496	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	50.2	mi/h
Percent Free Flow Speed, PFFS	86.6	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	343	pc/h	490	pc/h
Base percent time-spent-following,(note-4) BPTSFd	40.2	%		
Adjustment for no-passing zones, fnp	28.2			
Percent time-spent-following, PTSFd	51.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.21	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.2	mi/h
Percent time-spent-following, PTSFd (from above)	51.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	341.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.44
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	143	veh/h
Opposing direction volume, Vo	186	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.7		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.960		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	162	pc/h	208	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	53.4	mi/h
Percent Free Flow Speed, PFFS	92.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	156	pc/h	203	pc/h
Base percent time-spent-following,(note-4) BPTSFd	17.3	%		
Adjustment for no-passing zones, fnp	36.2			
Percent time-spent-following, PTSFd	33.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1651	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1651	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.4	mi/h
Percent time-spent-following, PTSFd (from above)	33.0	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	155.4
Effective width of outside lane, We	29.13
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	1.68
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Sierra St
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 381 veh/h
Opposing direction volume, Vo 395 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	422	pc/h	437	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	50.0	mi/h
Percent Free Flow Speed, PFFS	86.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	414	pc/h	429	pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.9	%		
Adjustment for no-passing zones, fnp	32.3			
Percent time-spent-following, PTSFd	60.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.25	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.0	mi/h
Percent time-spent-following, PTSFd (from above)	60.8	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	414.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.54
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	246	veh/h
Opposing direction volume, Vo	340	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	274	pc/h	376	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	51.6	mi/h
Percent Free Flow Speed, PFFS	88.9	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	269	pc/h	372	pc/h
Base percent time-spent-following,(note-4) BPTSFd	31.7	%		
Adjustment for no-passing zones, fnp	35.5			
Percent time-spent-following, PTSFd	46.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.16	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.6	mi/h
Percent time-spent-following, PTSFd (from above)	46.6	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	267.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.32
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	451	veh/h
Opposing direction volume, Vo	314	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	496	pc/h	349	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	50.0	mi/h
Percent Free Flow Speed, PFFS	86.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	490	pc/h	343	pc/h
Base percent time-spent-following,(note-4) BPTSFd	48.5	%		
Adjustment for no-passing zones, fnp	28.2			
Percent time-spent-following, PTSFd	65.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.29	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.0	mi/h
Percent time-spent-following, PTSFd (from above)	65.1	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	490.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.63
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Sierra St
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	395	veh/h
Opposing direction volume, Vo	381	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	437	pc/h	422	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	50.0	mi/h
Percent Free Flow Speed, PFFS	86.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	429	pc/h	414	pc/h
Base percent time-spent-following,(note-4) BPTSFd	45.3	%		
Adjustment for no-passing zones, fnp	32.3			
Percent time-spent-following, PTSFd	61.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.26	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.0	mi/h
Percent time-spent-following, PTSFd (from above)	61.7	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	429.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.56
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2020
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	186	veh/h
Opposing direction volume, Vo	143	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.7	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.960	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	208	pc/h	162	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	53.8	mi/h
Percent Free Flow Speed, PFFS	92.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	203	pc/h	156	pc/h
Base percent time-spent-following,(note-4) BPTSFd	21.8	%		
Adjustment for no-passing zones, fnp	36.2			
Percent time-spent-following, PTSFd	42.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.12	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1632	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1632	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.8	mi/h
Percent time-spent-following, PTSFd (from above)	42.3	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	202.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.18
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 303 veh/h
Opposing direction volume, Vo 345 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	337	pc/h	382	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	51.0	mi/h
Percent Free Flow Speed, PFFS	88.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	331	pc/h	377	pc/h
Base percent time-spent-following,(note-4) BPTSFd	36.9	%		
Adjustment for no-passing zones, fnp	34.7			
Percent time-spent-following, PTSFd	53.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.20	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.0	mi/h
Percent time-spent-following, PTSFd (from above)	53.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	329.3
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.42
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	312	veh/h
Opposing direction volume, Vo	439	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.2	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.988	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	347	pc/h	483	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.2	mi/h
Average travel speed, ATSd	50.3	mi/h
Percent Free Flow Speed, PFFS	86.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	341	pc/h	477	pc/h
Base percent time-spent-following,(note-4) BPTSFd	39.6	%		
Adjustment for no-passing zones, fnp	28.8			
Percent time-spent-following, PTSFd	51.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.20	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1680	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1680	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.3	mi/h
Percent time-spent-following, PTSFd (from above)	51.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	339.1
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.44
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	100	veh/h
Opposing direction volume, Vo	106	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.954	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	115	pc/h	121	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	55.3	mi/h
Percent Free Flow Speed, PFFS	95.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	109	pc/h	116	pc/h
Base percent time-spent-following,(note-4) BPTSFd	12.6	%		
Adjustment for no-passing zones, fnp	30.8			
Percent time-spent-following, PTSFd	27.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1622	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1622	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.3	mi/h
Percent time-spent-following, PTSFd (from above)	27.5	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	108.7
Effective width of outside lane, We	33.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.30
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 263 veh/h
Opposing direction volume, Vo 382 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	293	pc/h	423	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	51.1	mi/h
Percent Free Flow Speed, PFFS	88.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	288	pc/h	415	pc/h
Base percent time-spent-following,(note-4) BPTSFd	34.2	%		
Adjustment for no-passing zones, fnp	32.7			
Percent time-spent-following, PTSFd	47.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.17	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	51.1	mi/h
Percent time-spent-following, PTSFd (from above)	47.6	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	285.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.35
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 345 veh/h
Opposing direction volume, Vo 303 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	382	pc/h	337	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	50.9	mi/h
Percent Free Flow Speed, PFFS	87.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	377	pc/h	331	pc/h
Base percent time-spent-following,(note-4) BPTSFd	39.5	%		
Adjustment for no-passing zones, fnp	34.7			
Percent time-spent-following, PTSFd	58.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.22	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.9	mi/h
Percent time-spent-following, PTSFd (from above)	58.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	375.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.49
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	106	veh/h
Opposing direction volume, Vo	100	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.954		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	121	pc/h	115	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSd	55.4	mi/h
Percent Free Flow Speed, PFFS	95.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	116	pc/h	109	pc/h
Base percent time-spent-following,(note-4) BPTSFd	13.3	%		
Adjustment for no-passing zones, fnp	30.8			
Percent time-spent-following, PTSFd	29.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.4	mi/h
Percent time-spent-following, PTSFd (from above)	29.2	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	115.2
Effective width of outside lane, We	32.46
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.50
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	100	veh/h
Opposing direction volume, Vo	106	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.954	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	115	pc/h	121	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.9	mi/h
Average travel speed, ATSd	55.3	mi/h
Percent Free Flow Speed, PFFS	95.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	109	pc/h	116	pc/h
Base percent time-spent-following,(note-4) BPTSFd	12.6	%		
Adjustment for no-passing zones, fnp	30.8			
Percent time-spent-following, PTSFd	27.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1622	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1622	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.3	mi/h
Percent time-spent-following, PTSFd (from above)	27.5	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	108.7
Effective width of outside lane, We	33.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.30
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	439	veh/h
Opposing direction volume, Vo	312	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.2		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.988		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	483	pc/h	347	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	50.1	mi/h
Percent Free Flow Speed, PFFS	86.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	477	pc/h	341	pc/h
Base percent time-spent-following,(note-4) BPTSFd	47.8	%		
Adjustment for no-passing zones, fnp	28.8			
Percent time-spent-following, PTSFd	64.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.28	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.1	mi/h
Percent time-spent-following, PTSFd (from above)	64.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	477.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.61
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 382 veh/h
Opposing direction volume, Vo 263 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	423	pc/h	293	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.6	mi/h
Average travel speed, ATSd	50.9	mi/h
Percent Free Flow Speed, PFFS	87.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	415	pc/h	288	pc/h
Base percent time-spent-following,(note-4) BPTSFd	42.6	%		
Adjustment for no-passing zones, fnp	32.7			
Percent time-spent-following, PTSFd	61.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.25	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.9	mi/h
Percent time-spent-following, PTSFd (from above)	61.9	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	415.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.54
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	106	veh/h
Opposing direction volume, Vo	100	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.954		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	121	pc/h	115	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.8	mi/h
Average travel speed, ATSd	55.4	mi/h
Percent Free Flow Speed, PFFS	95.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	116	pc/h	109	pc/h
Base percent time-spent-following,(note-4) BPTSFd	13.3	%		
Adjustment for no-passing zones, fnp	30.8			
Percent time-spent-following, PTSFd	29.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	55.4	mi/h
Percent time-spent-following, PTSFd (from above)	29.2	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	115.2
Effective width of outside lane, We	32.46
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	0.50
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	514	veh/h
Opposing direction volume, Vo	357	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.994		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	562	pc/h	395	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	49.2	mi/h
Percent Free Flow Speed, PFFS	84.8	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	559	pc/h	390	pc/h
Base percent time-spent-following,(note-4) BPTSFd	53.5	%		
Adjustment for no-passing zones, fnp	26.3			
Percent time-spent-following, PTSFd	69.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	D	
Volume to capacity ratio, v/c	0.33	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.2	mi/h
Percent time-spent-following, PTSFd (from above)	69.0	
Level of service, LOSd (from above)	D	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	558.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.69
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	42	veh/h
Opposing direction volume, Vo	52	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	48	pc/h	60	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	56.5	mi/h
Percent Free Flow Speed, PFFS	97.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	46	pc/h	57	pc/h
Base percent time-spent-following,(note-4) BPTSFd	5.6	%		
Adjustment for no-passing zones, fnp	29.9			
Percent time-spent-following, PTSFd	19.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.03	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	56.5	mi/h
Percent time-spent-following, PTSFd (from above)	19.0	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	45.7
Effective width of outside lane, We	38.22
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-2.00
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 365 veh/h
Opposing direction volume, Vo 344 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	404	pc/h	381	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	50.5	mi/h
Percent Free Flow Speed, PFFS	87.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	399	pc/h	376	pc/h
Base percent time-spent-following,(note-4) BPTSFd	42.2	%		
Adjustment for no-passing zones, fnp	33.6			
Percent time-spent-following, PTSFd	59.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.24	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.5	mi/h
Percent time-spent-following, PTSFd (from above)	59.5	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	396.7
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.52
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH Rd 16 FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Rd 16
From/To	Sierra St/Kern St
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	52	veh/h
Opposing direction volume, Vo	42	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.949		0.949	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	60	pc/h	48	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	0.6	mi/h
Average travel speed, ATSd	56.5	mi/h
Percent Free Flow Speed, PFFS	97.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	57	pc/h	46	pc/h
Base percent time-spent-following,(note-4) BPTSFd	6.9	%		
Adjustment for no-passing zones, fnp	29.9			
Percent time-spent-following, PTSFd	23.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.04	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1613	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1613	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	56.5	mi/h
Percent time-spent-following, PTSFd (from above)	23.4	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	56.5
Effective width of outside lane, We	37.32
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	-1.55
Bicycle LOS	A

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	156	veh/h
Opposing direction volume, Vo	200	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.965		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	176	pc/h	224	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	53.2	mi/h
Percent Free Flow Speed, PFFS	91.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	171	pc/h	219	pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.6	%		
Adjustment for no-passing zones, fnp	37.6			
Percent time-spent-following, PTSFd	36.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1651	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1651	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.2	mi/h
Percent time-spent-following, PTSFd (from above)	36.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	169.6
Effective width of outside lane, We	27.96
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.06
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM SR 99 TO SR 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	SR 99/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	344	veh/h
Opposing direction volume, Vo	365	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	381	pc/h	404	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.4	mi/h
Average travel speed, ATSd	50.6	mi/h
Percent Free Flow Speed, PFFS	87.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	376	pc/h	399	pc/h
Base percent time-spent-following,(note-4) BPTSFd	40.8	%		
Adjustment for no-passing zones, fnp	33.6			
Percent time-spent-following, PTSFd	57.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.22	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.6	mi/h
Percent time-spent-following, PTSFd (from above)	57.1	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	373.9
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.49
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	200	veh/h
Opposing direction volume, Vo	156	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.965	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	224	pc/h	176	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	53.4	mi/h
Percent Free Flow Speed, PFFS	92.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	219	pc/h	171	pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.3	%		
Adjustment for no-passing zones, fnp	37.6			
Percent time-spent-following, PTSFd	44.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.13	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1641	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1641	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.4	mi/h
Percent time-spent-following, PTSFd (from above)	44.4	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	217.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.21
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	393	veh/h
Opposing direction volume, Vo	282	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.4	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.977	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	435	pc/h	314	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	50.7	mi/h
Percent Free Flow Speed, PFFS	87.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.0		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	1.000		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	427	pc/h	308	pc/h
Base percent time-spent-following,(note-4) BPTSFd	42.5	%		
Adjustment for no-passing zones, fnp	31.8			
Percent time-spent-following, PTSFd	61.0	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.26	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1661	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1661	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.7	mi/h
Percent time-spent-following, PTSFd (from above)	61.0	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	427.2
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.56
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

SOUTH 18th Ave FROM Sierra St TO Kern St.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Sierra St/Kern St (Ave 396)
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 282 veh/h
Opposing direction volume, Vo 393 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.4		1.3	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.977		0.982	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	314	pc/h	435	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.3	mi/h
Average travel speed, ATSd	50.9	mi/h
Percent Free Flow Speed, PFFS	87.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	308	pc/h	427	pc/h
Base percent time-spent-following,(note-4) BPTSFd	35.5	%		
Adjustment for no-passing zones, fnp	31.8			
Percent time-spent-following, PTSFd	48.8	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.18	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1669	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1669	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	50.9	mi/h
Percent time-spent-following, PTSFd (from above)	48.8	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	306.5
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.39
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

NORTH 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd 357 veh/h
Opposing direction volume, Vo 514 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.3		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.982		0.994	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	395	pc/h	562	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.1	mi/h
Average travel speed, ATSd	49.5	mi/h
Percent Free Flow Speed, PFFS	85.3	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.0	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		1.000	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	390	pc/h	559	pc/h
Base percent time-spent-following,(note-4) BPTSFd	44.8	%		
Adjustment for no-passing zones, fnp	26.3			
Percent time-spent-following, PTSFd	55.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.23	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1690	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1690	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	49.5	mi/h
Percent time-spent-following, PTSFd (from above)	55.6	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	388.0
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.51
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

EAST 18th Ave FROM Kern St TO Sr 99.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	18th Ave
From/To	Kern St (Ave 396)/SR 99
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	200	veh/h
Opposing direction volume, Vo	156	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.5		1.6	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.971		0.965	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	224	pc/h	176	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.5	mi/h
Average travel speed, ATSd	53.4	mi/h
Percent Free Flow Speed, PFFS	92.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	219	pc/h	171	pc/h
Base percent time-spent-following,(note-4) BPTSFd	23.3	%		
Adjustment for no-passing zones, fnp	37.6			
Percent time-spent-following, PTSFd	44.4	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.13	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1641	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1641	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.4	mi/h
Percent time-spent-following, PTSFd (from above)	44.4	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	217.4
Effective width of outside lane, We	24.00
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	3.21
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

WEST Kern St FROM 18th St TO Rd 16.txt

HCS 2010: Two-Lane Highways Release 6.65

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Mark Assi
Agency/Co.	R&S Civil Engineers
Date Performed	12/22/2016
Analysis Time Period	PM
Highway	Kern St (Ave 396)
From/To	18th Ave/Rd 16
Jurisdiction	Tulare County
Analysis Year	2035
Description	Kingsburg

Input Data

Highway class	Class 1		Peak hour factor, PHF	0.92	
Shoulder width	6.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.0	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Level		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	20	%
Up/down	-	%	Access point density	8	/mi

Analysis direction volume, Vd	156	veh/h
Opposing direction volume, Vo	200	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.6		1.5	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adj. factor,(note-5) fHV	0.965		0.971	
Grade adj. factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	176	pc/h	224	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	60.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	0.0	mi/h
Adj. for access point density,(note-3) fA	2.0	mi/h
Free-flow speed, FFSd	58.0	mi/h
Adjustment for no-passing zones, fnp	1.7	mi/h
Average travel speed, ATSd	53.2	mi/h
Percent Free Flow Speed, PFFS	91.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.1		1.1	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.994		0.994	
Grade adjustment factor,(note-1) fg	1.00		1.00	
Directional flow rate,(note-2) vi	171	pc/h	219	pc/h
Base percent time-spent-following,(note-4) BPTSFd	19.6	%		
Adjustment for no-passing zones, fnp	37.6			
Percent time-spent-following, PTSFd	36.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	0	veh-mi
Peak-hour vehicle-miles of travel, VMT60	0	veh-mi
Peak 15-min total travel time, TT15	0.0	veh-h
Capacity from ATS, CdATS	1651	veh/h
Capacity from PTSF, CdPTSF	1690	veh/h
Directional Capacity	1651	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.0	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	53.2	mi/h
Percent time-spent-following, PTSFd (from above)	36.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	E	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

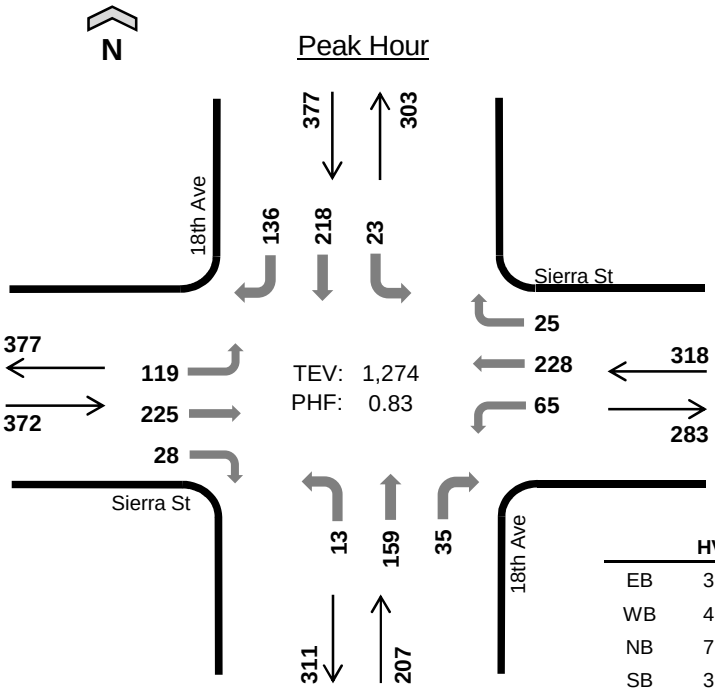
Posted speed limit, Sp	55
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	169.6
Effective width of outside lane, We	27.96
Effective speed factor, St	4.79
Bicycle LOS Score, BLOS	2.06
Bicycle LOS	B

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific dewngrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

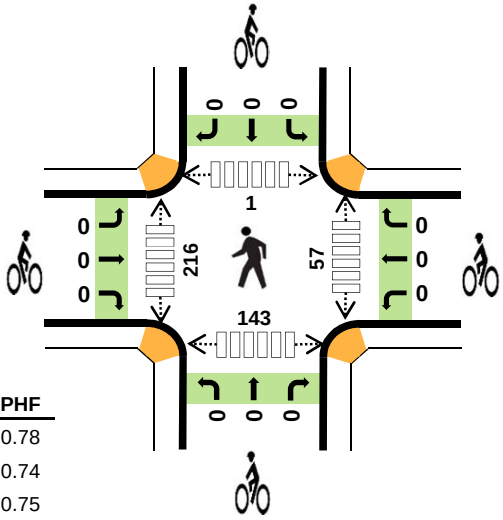
TURN MOVEMENT
COUNT DATA

18th Ave
Sierra St

Date: Thu, Sep 11, 2014
Count Period: 7:30 AM to 9:30 AM
Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	3.5%	0.78
WB	4.1%	0.74
NB	7.2%	0.75
SB	3.7%	0.79
TOTAL	4.3%	0.83



Two-Hour Count Summaries

Interval Start		Sierra St Eastbound			Sierra St Westbound			18th Ave Northbound			18th Ave Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM		**27**	**48**	**6**	**14**	**59**	**7**	**5**	**40**	**13**	**11**	**61**	**48**	**339**	
7:45 AM		**37**	**70**	**12**	**18**	**80**	**9**	**1**	**44**	**9**	**3**	**62**	**37**	**382**	
8:00 AM		**36**	**50**	**6**	**17**	**55**	**6**	**6**	**55**	**8**	**4**	**55**	**30**	**328**	
8:15 AM		**19**	**57**	**4**	**16**	**34**	**3**	**1**	**20**	**5**	**5**	**40**	**21**	**225**	**1,274**
8:30 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	935
8:45 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	553
9:00 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	225
9:15 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		119	225	28	65	228	25	13	159	35	23	218	136	1,274	
Peak Hour	**All**	**119**	**225**	**28**	**65**	**228**	**25**	**13**	**159**	**35**	**23**	**218**	**136**	**1,274**	
	HV	**2**	**11**	**0**	**1**	**10**	**2**	**1**	**11**	**3**	**0**	**13**	**1**	**55**	
	HV%	**2%**	**5%**	**0%**	**2%**	**4%**	**8%**	**8%**	**7%**	**9%**	**0%**	**6%**	**1%**	**4%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:30 AM	**4**	**3**	**3**	**2**	***12***	**0**	**0**	**0**	**0**	***0***	**24**	**44**	**1**	**14**	***83***
7:45 AM	**1**	**3**	**3**	**6**	***13***	**0**	**0**	**0**	**0**	***0***	**23**	**118**	**0**	**89**	***230***
8:00 AM	**4**	**2**	**7**	**2**	***15***	**0**	**0**	**0**	**0**	***0***	**9**	**46**	**0**	**36**	***91***
8:15 AM	**4**	**5**	**2**	**4**	***15***	**0**	**0**	**0**	**0**	***0***	**1**	**8**	**0**	**4**	***13***
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	13	13	15	14	*55*	0	0	0	0	*0*	57	216	1	143	*417*
Peak Hr	**13**	**13**	**15**	**14**	***55***	**0**	**0**	**0**	**0**	***0***	**57**	**216**	**1**	**143**	***417***

Two-Hour Count Summaries - Heavy Vehicles

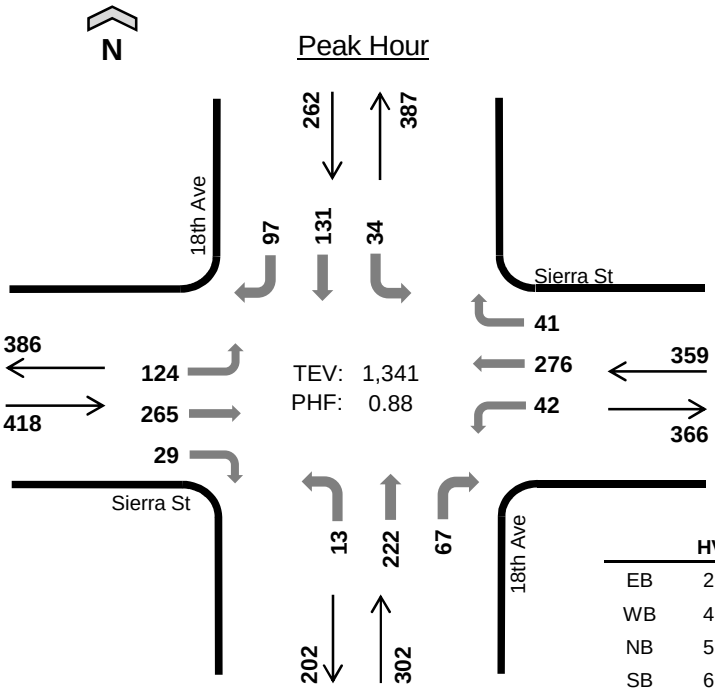
Interval Start	Sierra St			Sierra St			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**4**	**0**	**1**	**1**	**1**	**1**	**2**	**0**	**0**	**2**	**0**	**12**	
7:45 AM	**1**	**0**	**0**	**0**	**2**	**1**	**0**	**1**	**2**	**0**	**6**	**0**	**13**	
8:00 AM	**1**	**3**	**0**	**0**	**2**	**0**	**0**	**6**	**1**	**0**	**2**	**0**	**15**	
8:15 AM	**0**	**4**	**0**	**0**	**5**	**0**	**0**	**2**	**0**	**0**	**3**	**1**	**15**	**55**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	43
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	30
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	15
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	2	11	0	1	10	2	1	11	3	0	13	1	55	
Peak Hour	**2**	**11**	**0**	**1**	**10**	**2**	**1**	**11**	**3**	**0**	**13**	**1**	**55**	

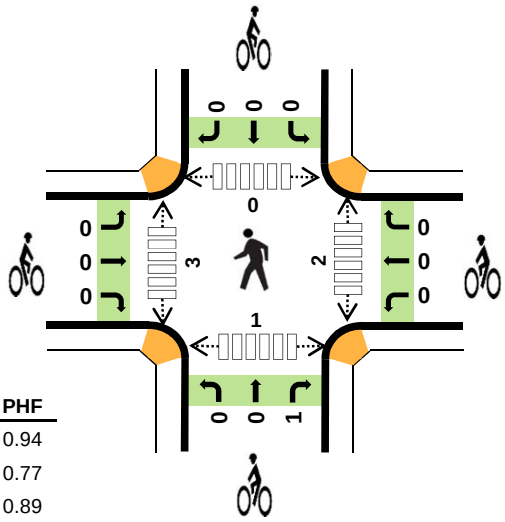
Two-Hour Count Summaries - Bikes

Interval Start	Sierra St			Sierra St			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

18th Ave
Sierra St

Date: Thu, Sep 11, 2014
Count Period: 4:30 PM to 6:30 PM
Peak Hour: 4:30 PM to 5:30 PM





	HV %:	PHF
EB	2.9%	0.94
WB	4.7%	0.77
NB	5.6%	0.89
SB	6.9%	0.94
TOTAL	4.8%	0.88

Two-Hour Count Summaries

Interval Start		Sierra St Eastbound			Sierra St Westbound			18th Ave Northbound			18th Ave Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM		**20**	**69**	**9**	**6**	**52**	**9**	**6**	**64**	**15**	**7**	**35**	**20**	**312**	
4:45 PM		**37**	**61**	**6**	**10**	**66**	**5**	**2**	**40**	**11**	**10**	**24**	**27**	**299**	
5:00 PM		**39**	**60**	**6**	**10**	**75**	**9**	**4**	**56**	**21**	**8**	**34**	**27**	**349**	
5:15 PM		**28**	**75**	**8**	**16**	**83**	**18**	**1**	**62**	**20**	**9**	**38**	**23**	**381**	**1,341**
5:30 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	1,029
5:45 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	730
6:00 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	381
6:15 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		124	265	29	42	276	41	13	222	67	34	131	97	1,341	
Peak Hour	**All**	**124**	**265**	**29**	**42**	**276**	**41**	**13**	**222**	**67**	**34**	**131**	**97**	**1,341**	
	HV	**0**	**12**	**0**	**4**	**13**	**0**	**0**	**14**	**3**	**1**	**15**	**2**	**64**	
	HV%	**0%**	**5%**	**0%**	**10%**	**5%**	**0%**	**0%**	**6%**	**4%**	**3%**	**11%**	**2%**	**5%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:30 PM	**3**	**6**	**8**	**4**	***21***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**3**	**4**	**1**	**2**	***10***	**0**	**0**	**0**	**0**	***0***	**1**	**1**	**0**	**1**	***3***
5:00 PM	**2**	**6**	**2**	**8**	***18***	**0**	**0**	**0**	**0**	***0***	**0**	**2**	**0**	**0**	***2***
5:15 PM	**4**	**1**	**6**	**4**	***15***	**0**	**0**	**1**	**0**	***1***	**1**	**0**	**0**	**0**	***1***
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	12	17	17	18	*64*	0	0	1	0	*1*	2	3	0	1	*6*
Peak Hr	**12**	**17**	**17**	**18**	***64***	**0**	**0**	**1**	**0**	***1***	**2**	**3**	**0**	**1**	***6***

Two-Hour Count Summaries - Heavy Vehicles

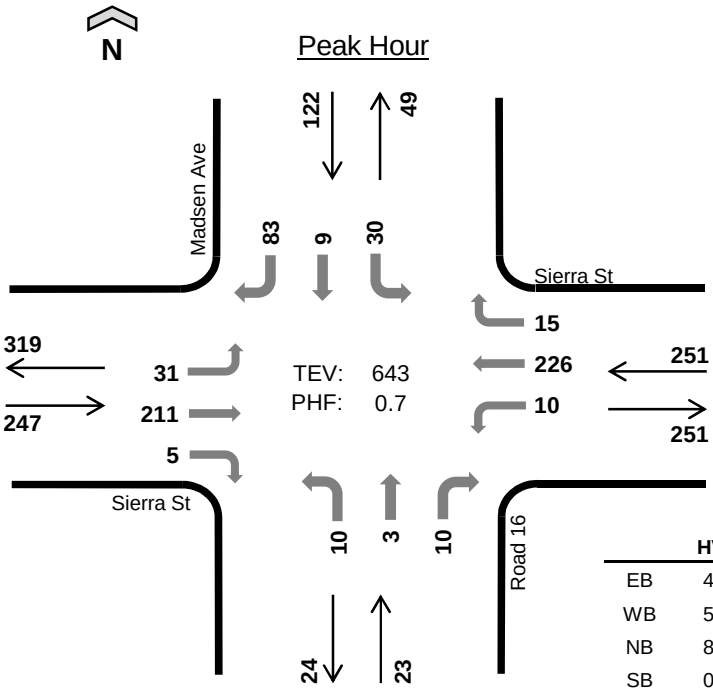
Interval Start	Sierra St			Sierra St			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**3**	**0**	**2**	**4**	**0**	**0**	**8**	**0**	**0**	**4**	**0**	**21**	
4:45 PM	**0**	**3**	**0**	**1**	**3**	**0**	**0**	**1**	**0**	**1**	**1**	**0**	**10**	
5:00 PM	**0**	**2**	**0**	**1**	**5**	**0**	**0**	**1**	**1**	**0**	**6**	**2**	**18**	
5:15 PM	**0**	**4**	**0**	**0**	**1**	**0**	**0**	**4**	**2**	**0**	**4**	**0**	**15**	**64**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	43
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	33
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	15
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	12	0	4	13	0	0	14	3	1	15	2	64	
Peak Hour	**0**	**12**	**0**	**4**	**13**	**0**	**0**	**14**	**3**	**1**	**15**	**2**	**64**	

Two-Hour Count Summaries - Bikes

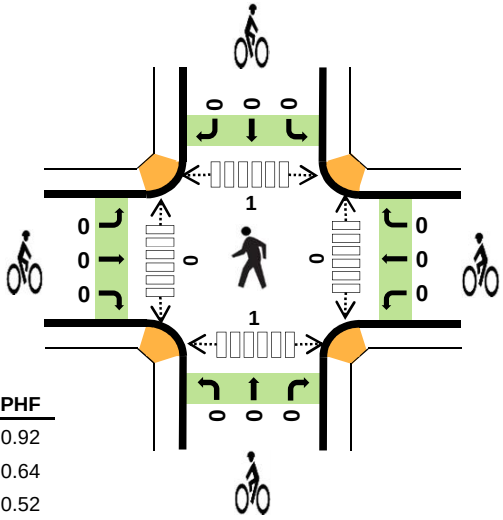
Interval Start	Sierra St			Sierra St			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	1	0	0	0	1	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	

Madsen Ave
Sierra St

Date: Thu, Sep 11, 2014
Count Period: 7:30 AM to 9:30 AM
Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	4.9%	0.92
WB	5.2%	0.64
NB	8.7%	0.52
SB	0.0%	0.55
TOTAL	4.2%	0.70



Two-Hour Count Summaries

Interval Start		Sierra St Eastbound			Sierra St Westbound			Road 16 Northbound			Madsen Ave Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM		**6**	**59**	**1**	**1**	**56**	**4**	**2**	**2**	**1**	**14**	**1**	**20**	**167**	
7:45 AM		**7**	**58**	**2**	**5**	**85**	**8**	**6**	**1**	**4**	**8**	**6**	**41**	**231**	
8:00 AM		**10**	**45**	**1**	**2**	**42**	**3**	**2**	**0**	**3**	**5**	**1**	**15**	**129**	
8:15 AM		**8**	**49**	**1**	**2**	**43**	**0**	**0**	**0**	**2**	**3**	**1**	**7**	**116**	**643**
8:30 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	476
8:45 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	245
9:00 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	116
9:15 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		31	211	5	10	226	15	10	3	10	30	9	83	643	
Peak Hour	**All**	**31**	**211**	**5**	**10**	**226**	**15**	**10**	**3**	**10**	**30**	**9**	**83**	**643**	
	HV	**0**	**12**	**0**	**2**	**11**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**27**	
	HV%	**0%**	**6%**	**0%**	**20%**	**5%**	**0%**	**0%**	**0%**	**20%**	**0%**	**0%**	**0%**	**4%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:30 AM	**4**	**2**	**0**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:45 AM	**2**	**3**	**1**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:00 AM	**4**	**2**	**0**	**0**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	**2**	**6**	**1**	**0**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**1**	***2***
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	12	13	2	0	*27*	0	0	0	0	*0*	0	0	1	1	*2*
Peak Hr	**12**	**13**	**2**	**0**	***27***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**1**	***2***

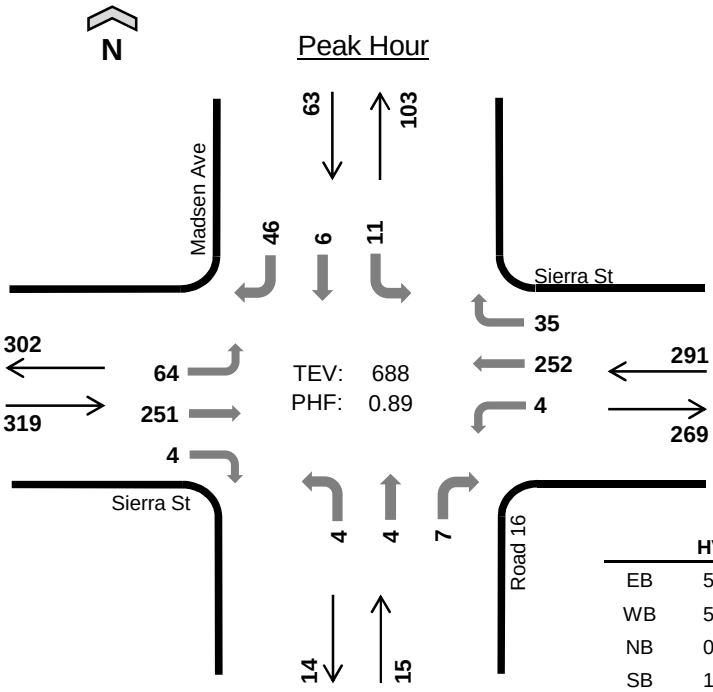
Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Sierra St			Sierra St			Road 16			Madsen Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**4**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	
7:45 AM	**0**	**2**	**0**	**0**	**3**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**6**	
8:00 AM	**0**	**4**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	
8:15 AM	**0**	**2**	**0**	**1**	**5**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**9**	**27**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	21
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	15
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	9
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	12	0	2	11	0	0	0	2	0	0	0	27	
Peak Hour	**0**	**12**	**0**	**2**	**11**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**27**	

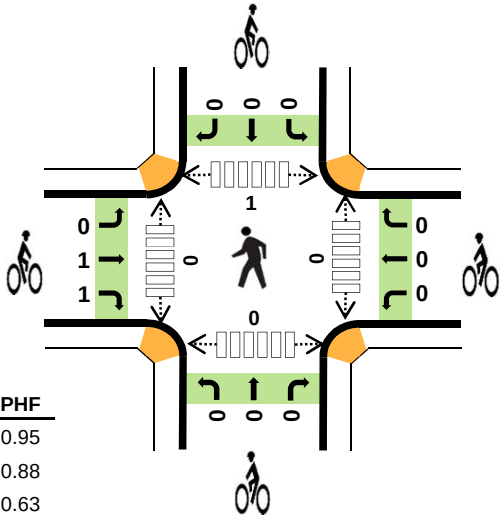
Two-Hour Count Summaries - Bikes

Interval Start	Sierra St			Sierra St			Road 16			Madsen Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

Madsen Ave
Sierra St



Date: Thu, Sep 11, 2014
Count Period: 4:30 PM to 6:30 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	5.3%	0.95
WB	5.5%	0.88
NB	0.0%	0.63
SB	1.6%	0.72
TOTAL	4.9%	0.89

Two-Hour Count Summaries

Interval Start		Sierra St Eastbound			Sierra St Westbound			Road 16 Northbound			Madsen Ave Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM		**15**	**61**	**0**	**1**	**45**	**9**	**1**	**1**	**1**	**5**	**0**	**8**	**147**	
4:45 PM		**15**	**62**	**2**	**2**	**71**	**7**	**0**	**0**	**2**	**2**	**1**	**10**	**174**	
5:00 PM		**20**	**60**	**0**	**0**	**63**	**10**	**0**	**3**	**3**	**1**	**1**	**13**	**174**	
5:15 PM		**14**	**68**	**2**	**1**	**73**	**9**	**3**	**0**	**1**	**3**	**4**	**15**	**193**	**688**
5:30 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	541
5:45 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	367
6:00 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	193
6:15 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		64	251	4	4	252	35	4	4	7	11	6	46	688	
Peak Hour	**All**	**64**	**251**	**4**	**4**	**252**	**35**	**4**	**4**	**7**	**11**	**6**	**46**	**688**	
	HV	**0**	**16**	**1**	**0**	**16**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**34**	
	HV%	**0%**	**6%**	**25%**	**0%**	**6%**	**0%**	**0%**	**0%**	**0%**	**0%**	**17%**	**0%**	**5%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:30 PM	**3**	**4**	**0**	**0**	***7***	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**5**	**3**	**0**	**0**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**2**	**6**	**0**	**0**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	**7**	**3**	**0**	**1**	***11***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**0**	***1***
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	17	16	0	1	*34*	2	0	0	0	*2*	0	0	1	0	*1*
Peak Hr	**17**	**16**	**0**	**1**	***34***	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**1**	**0**	***1***

Two-Hour Count Summaries - Heavy Vehicles

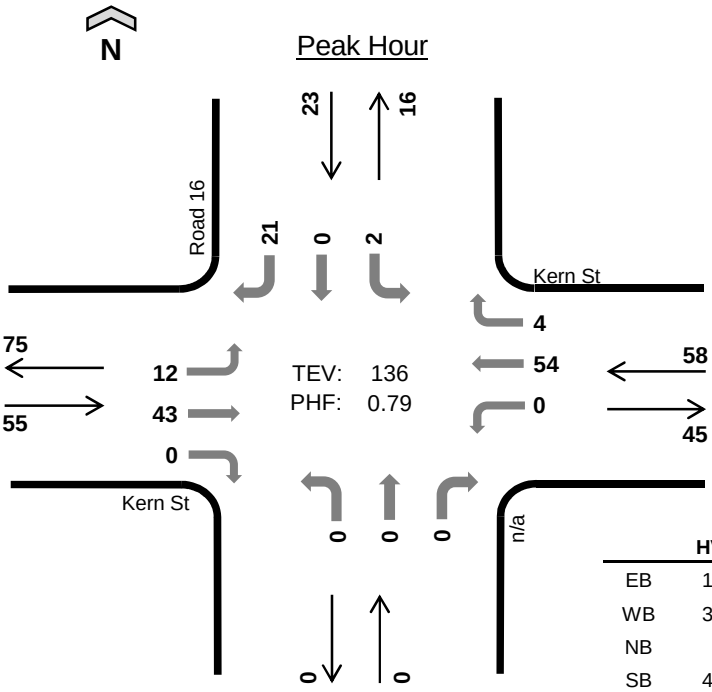
Interval Start	Sierra St			Sierra St			Road 16			Madsen Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**3**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	
4:45 PM	**0**	**4**	**1**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	
5:00 PM	**0**	**2**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	
5:15 PM	**0**	**7**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**11**	**34**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	27
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	19
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	11
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	16	1	0	16	0	0	0	0	0	1	0	34	
Peak Hour	**0**	**16**	**1**	**0**	**16**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**34**	

Two-Hour Count Summaries - Bikes

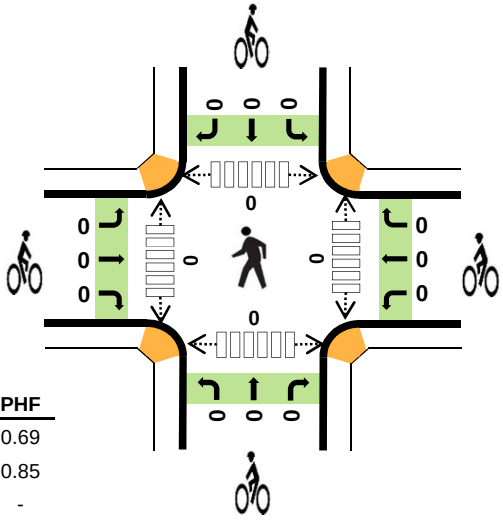
Interval Start	Sierra St			Sierra St			Road 16			Madsen Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	1	1	0	0	0	0	0	0	0	0	0	2	
Peak Hour	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	

Road 16
Kern St

Date: Thu, Sep 11, 2014
Count Period: 7:30 AM to 9:30 AM
Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	1.8%	0.69
WB	3.4%	0.85
NB	-	-
SB	4.3%	0.64
TOTAL	2.9%	0.79



Two-Hour Count Summaries

Interval Start		Kern St Eastbound			Kern St Westbound			n/a Northbound			Road 16 Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM		**2**	**18**	**0**	**0**	**13**	**1**	**0**	**0**	**0**	**0**	**0**	**9**	**43**	
7:45 AM		**6**	**9**	**0**	**0**	**9**	**3**	**0**	**0**	**0**	**0**	**0**	**8**	**35**	
8:00 AM		**3**	**11**	**0**	**0**	**17**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**33**	
8:15 AM		**1**	**5**	**0**	**0**	**15**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**25**	**136**
8:30 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	93
8:45 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	58
9:00 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	25
9:15 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		12	43	0	0	54	4	0	0	0	2	0	21	136	
Peak Hour	**All**	**12**	**43**	**0**	**0**	**54**	**4**	**0**	**0**	**0**	**2**	**0**	**21**	**136**	
	HV	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**4**	
	HV%	**8%**	**0%**	**-**	**-**	**4%**	**0%**	**-**	**-**	**-**	**50%**	**-**	**0%**	**3%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:30 AM	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:45 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:00 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	**0**	**1**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	1	2	0	1	*4*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**1**	**2**	**0**	**1**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

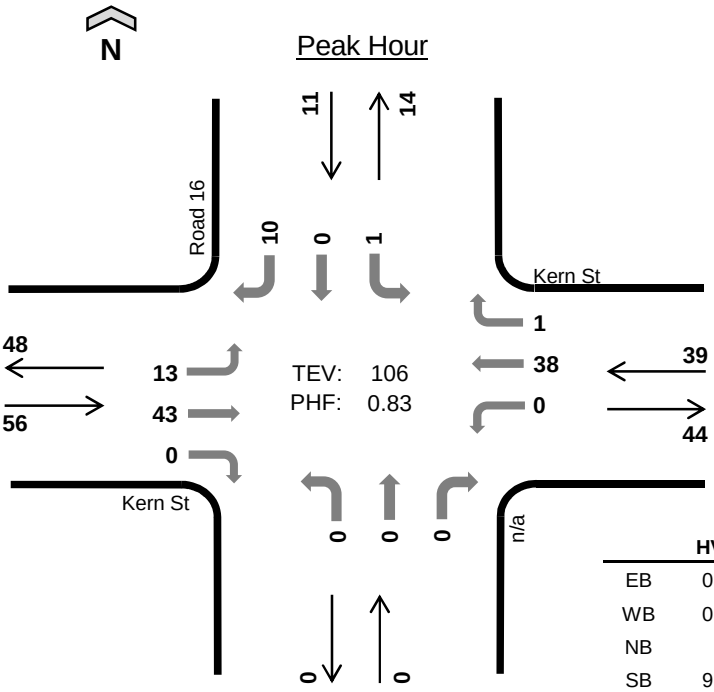
Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Kern St			Kern St			n/a			Road 16			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:00 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	
8:15 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**4**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	1	0	0	0	2	0	0	0	0	1	0	0	4	
Peak Hour	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**4**	

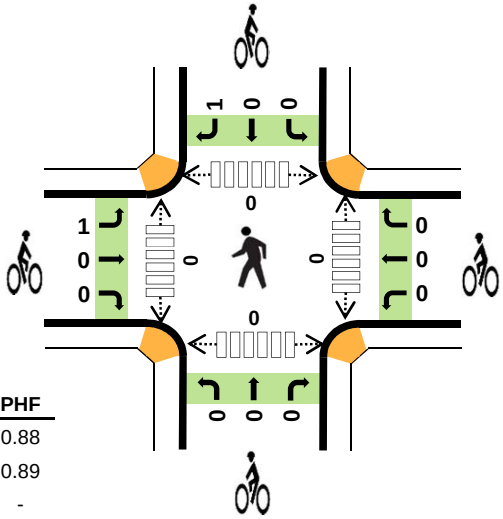
Two-Hour Count Summaries - Bikes

Interval Start	Kern St			Kern St			n/a			Road 16			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

Road 16
Kern St



Date: Thu, Sep 11, 2014
Count Period: 4:30 PM to 6:30 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	0.0%	0.88
WB	0.0%	0.89
NB	-	-
SB	9.1%	0.46
TOTAL	0.9%	0.83

Two-Hour Count Summaries

Interval Start		Kern St Eastbound			Kern St Westbound			n/a Northbound			Road 16 Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM		**5**	**9**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**23**	
4:45 PM		**1**	**10**	**0**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**22**	
5:00 PM		**5**	**11**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**29**	
5:15 PM		**2**	**13**	**0**	**0**	**10**	**1**	**0**	**0**	**0**	**1**	**0**	**5**	**32**	**106**
5:30 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	83
5:45 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	61
6:00 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	32
6:15 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		13	43	0	0	38	1	0	0	0	1	0	10	106	
Peak Hour	**All**	**13**	**43**	**0**	**0**	**38**	**1**	**0**	**0**	**0**	**1**	**0**	**10**	**106**	
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	
	HV%	**0%**	**0%**	**-**	**-**	**0%**	**0%**	**-**	**-**	**-**	**0%**	**-**	**10%**	**1%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**0**	**0**	**0**	**1**	***1***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***
5:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	0	0	0	1	*1*	1	0	0	1	*2*	0	0	0	0	*0*
Peak Hr	**0**	**0**	**0**	**1**	***1***	**1**	**0**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***

Two-Hour Count Summaries - Heavy Vehicles

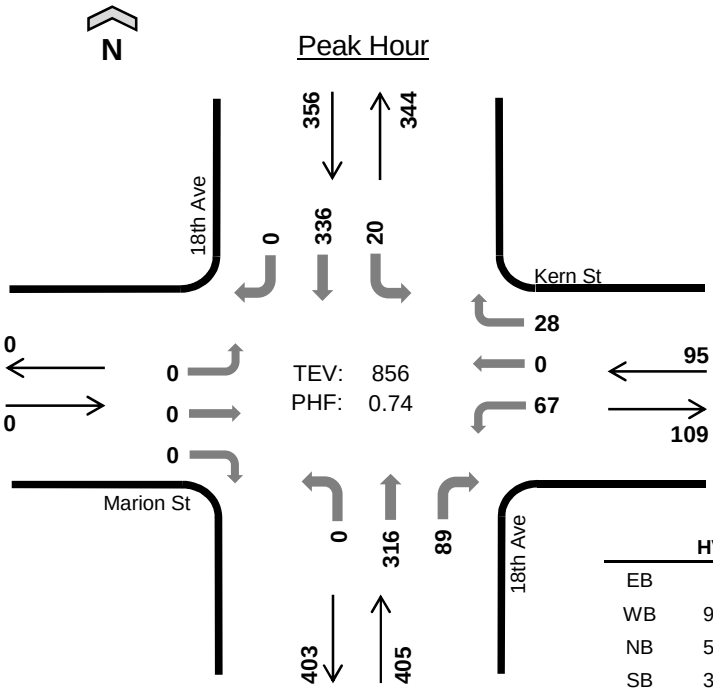
Interval Start	Kern St			Kern St			n/a			Road 16			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	1	1	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	

Two-Hour Count Summaries - Bikes

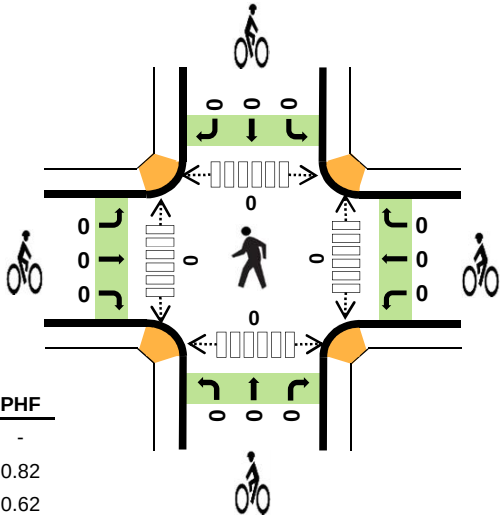
Interval Start	Kern St			Kern St			n/a			Road 16			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	
5:00 PM	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	1	0	0	0	0	0	0	0	0	0	0	1	2	
Peak Hour	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	

18th Ave
Kern St

Date: Thu, Sep 11, 2014
Count Period: 7:30 AM to 9:30 AM
Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	-	-
WB	9.5%	0.82
NB	5.2%	0.62
SB	3.9%	0.85
TOTAL	5.1%	0.74



Two-Hour Count Summaries

Interval Start		Marion St Eastbound			Kern St Westbound			18th Ave Northbound			18th Ave Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM		**0**	**0**	**0**	**21**	**0**	**8**	**0**	**87**	**25**	**5**	**92**	**0**	**238**	
7:45 AM		**0**	**0**	**0**	**15**	**0**	**8**	**0**	**129**	**34**	**9**	**96**	**0**	**291**	
8:00 AM		**0**	**0**	**0**	**17**	**0**	**7**	**0**	**67**	**20**	**3**	**86**	**0**	**200**	
8:15 AM		**0**	**0**	**0**	**14**	**0**	**5**	**0**	**33**	**10**	**3**	**62**	**0**	**127**	**856**
8:30 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	618
8:45 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	327
9:00 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	127
9:15 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		0	0	0	67	0	28	0	316	89	20	336	0	856	
Peak Hour	**All**	**0**	**0**	**0**	**67**	**0**	**28**	**0**	**316**	**89**	**20**	**336**	**0**	**856**	
	HV	**0**	**0**	**0**	**4**	**0**	**5**	**0**	**17**	**4**	**2**	**12**	**0**	**44**	
	HV%	**-**	**-**	**-**	**6%**	**-**	**18%**	**-**	**5%**	**4%**	**10%**	**4%**	**-**	**5%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:30 AM	**0**	**2**	**4**	**3**	***9***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:45 AM	**0**	**3**	**8**	**4**	***15***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:00 AM	**0**	**2**	**6**	**2**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	**0**	**2**	**3**	**5**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	0	9	21	14	*44*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**9**	**21**	**14**	***44***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Two-Hour Count Summaries - Heavy Vehicles

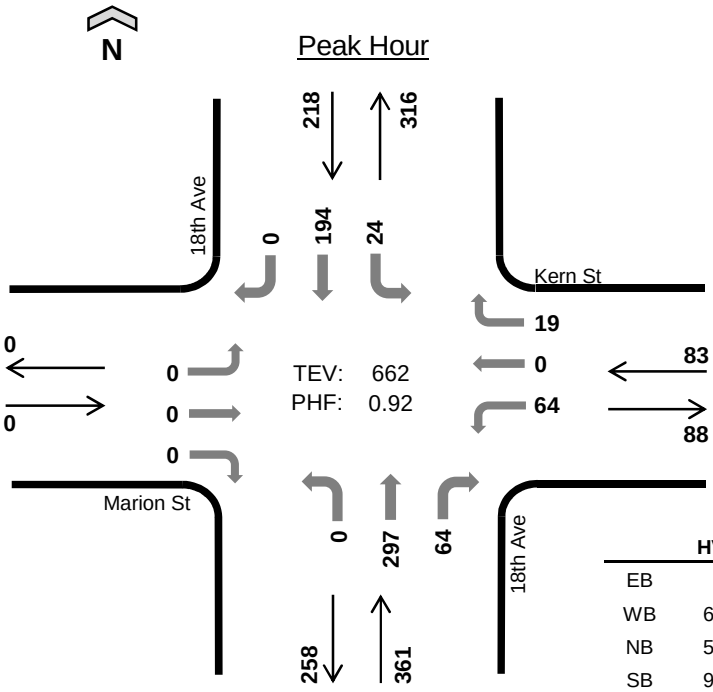
Interval Start	Marion St			Kern St			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**3**	**1**	**0**	**3**	**0**	**9**	
7:45 AM	**0**	**0**	**0**	**1**	**0**	**2**	**0**	**7**	**1**	**0**	**4**	**0**	**15**	
8:00 AM	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**4**	**2**	**0**	**2**	**0**	**10**	
8:15 AM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**3**	**0**	**2**	**3**	**0**	**10**	**44**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	35
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	20
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	10
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	4	0	5	0	17	4	2	12	0	44	
Peak Hour	**0**	**0**	**0**	**4**	**0**	**5**	**0**	**17**	**4**	**2**	**12**	**0**	**44**	

Two-Hour Count Summaries - Bikes

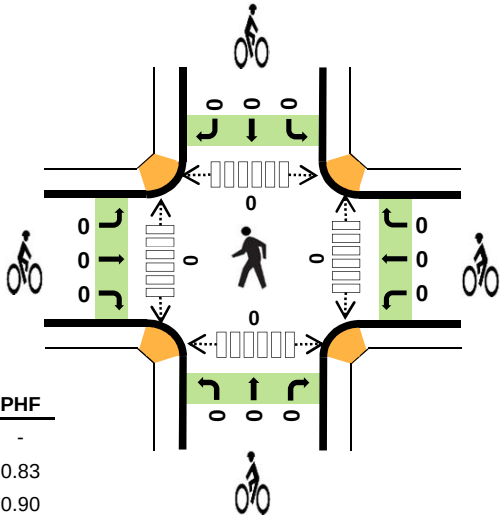
Interval Start	Marion St			Kern St			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

18th Ave
Kern St

Date: Thu, Sep 11, 2014
Count Period: 4:30 PM to 6:30 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	-	-
WB	6.0%	0.83
NB	5.8%	0.90
SB	9.2%	0.89
TOTAL	6.9%	0.92



Two-Hour Count Summaries

Interval Start		Marion St Eastbound			Kern St Westbound			18th Ave Northbound			18th Ave Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM		**0**	**0**	**0**	**20**	**0**	**5**	**0**	**85**	**13**	**3**	**47**	**0**	**173**	
4:45 PM		**0**	**0**	**0**	**14**	**0**	**5**	**0**	**56**	**13**	**5**	**46**	**0**	**139**	
5:00 PM		**0**	**0**	**0**	**17**	**0**	**8**	**0**	**77**	**17**	**7**	**54**	**0**	**180**	
5:15 PM		**0**	**0**	**0**	**13**	**0**	**1**	**0**	**79**	**21**	**9**	**47**	**0**	**170**	**662**
5:30 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	489
5:45 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	350
6:00 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	170
6:15 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		0	0	0	64	0	19	0	297	64	24	194	0	662	
Peak Hour	**All**	**0**	**0**	**0**	**64**	**0**	**19**	**0**	**297**	**64**	**24**	**194**	**0**	**662**	
	HV	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**14**	**7**	**0**	**20**	**0**	**46**	
	HV%	**-**	**-**	**-**	**8%**	**-**	**0%**	**-**	**5%**	**11%**	**0%**	**10%**	**-**	**7%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:30 PM	**0**	**1**	**7**	**6**	***14***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**0**	**2**	**1**	**3**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**0**	**2**	**7**	**7**	***16***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	**0**	**0**	**6**	**4**	***10***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	0	5	21	20	*46*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**0**	**5**	**21**	**20**	***46***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Two-Hour Count Summaries - Heavy Vehicles

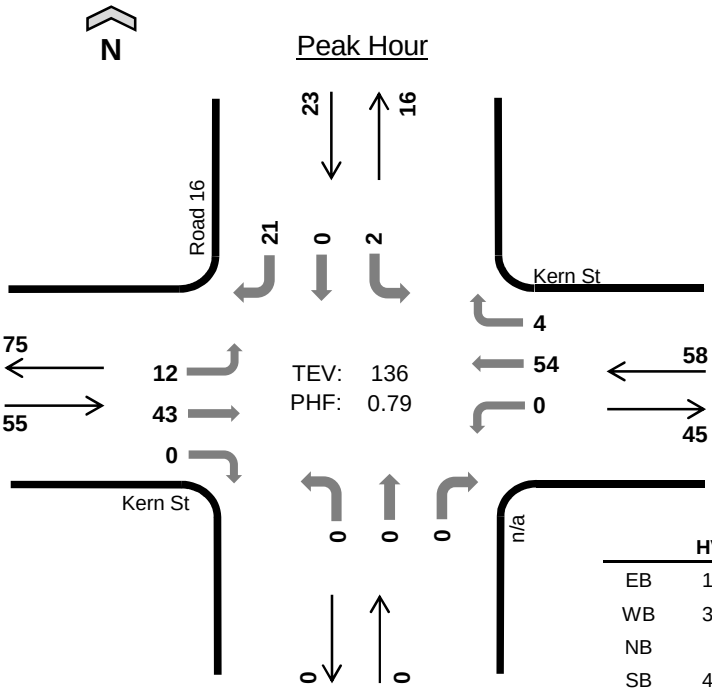
Interval Start	Marion St			Kern St			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**5**	**2**	**0**	**6**	**0**	**14**	
4:45 PM	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**0**	**6**	
5:00 PM	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**6**	**1**	**0**	**7**	**0**	**16**	
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**4**	**0**	**4**	**0**	**10**	**46**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	32
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	26
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	10
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	5	0	0	0	14	7	0	20	0	46	
Peak Hour	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**14**	**7**	**0**	**20**	**0**	**46**	

Two-Hour Count Summaries - Bikes

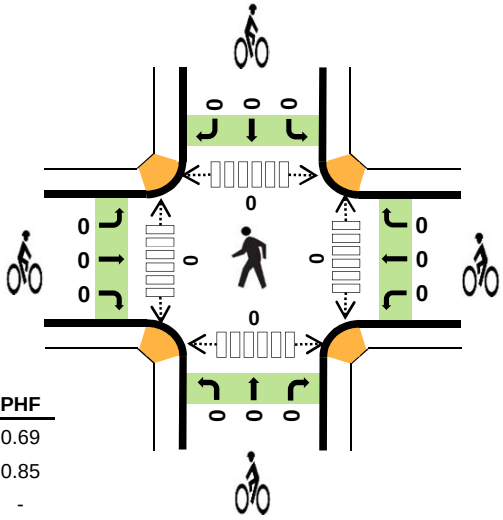
Interval Start	Marion St			Kern St			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

Road 16
Kern St

Date: Thu, Sep 11, 2014
Count Period: 7:30 AM to 9:30 AM
Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	1.8%	0.69
WB	3.4%	0.85
NB	-	-
SB	4.3%	0.64
TOTAL	2.9%	0.79



Two-Hour Count Summaries

Interval Start		Kern St Eastbound			Kern St Westbound			n/a Northbound			Road 16 Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM		**2**	**18**	**0**	**0**	**13**	**1**	**0**	**0**	**0**	**0**	**0**	**9**	**43**	
7:45 AM		**6**	**9**	**0**	**0**	**9**	**3**	**0**	**0**	**0**	**0**	**0**	**8**	**35**	
8:00 AM		**3**	**11**	**0**	**0**	**17**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**33**	
8:15 AM		**1**	**5**	**0**	**0**	**15**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**25**	**136**
8:30 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	93
8:45 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	58
9:00 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	25
9:15 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		12	43	0	0	54	4	0	0	0	2	0	21	136	
Peak Hour	**All**	**12**	**43**	**0**	**0**	**54**	**4**	**0**	**0**	**0**	**2**	**0**	**21**	**136**	
	HV	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**4**	
	HV%	**8%**	**0%**	**-**	**-**	**4%**	**0%**	**-**	**-**	**-**	**50%**	**-**	**0%**	**3%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:30 AM	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:45 AM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:00 AM	**0**	**1**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	**0**	**1**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	1	2	0	1	*4*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**1**	**2**	**0**	**1**	***4***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

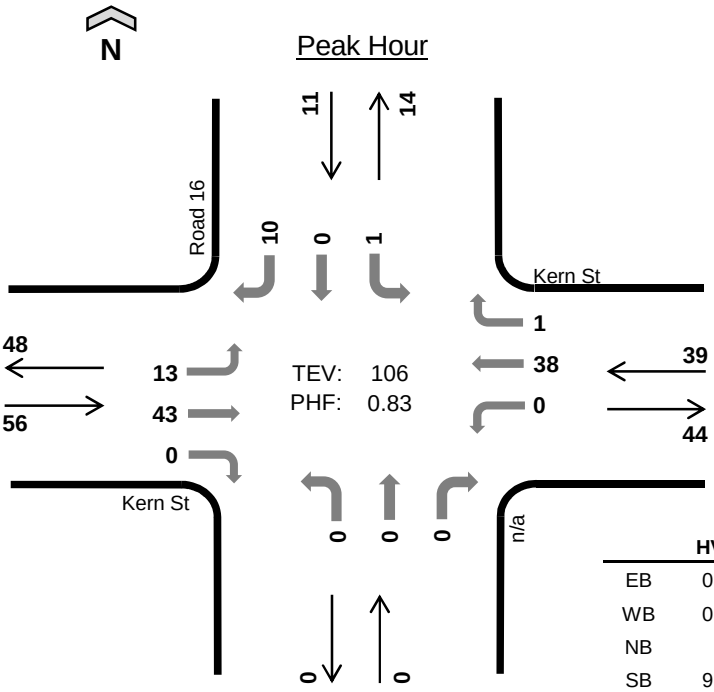
Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Kern St			Kern St			n/a			Road 16			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:00 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	
8:15 AM	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**4**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	1	0	0	0	2	0	0	0	0	1	0	0	4	
Peak Hour	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**4**	

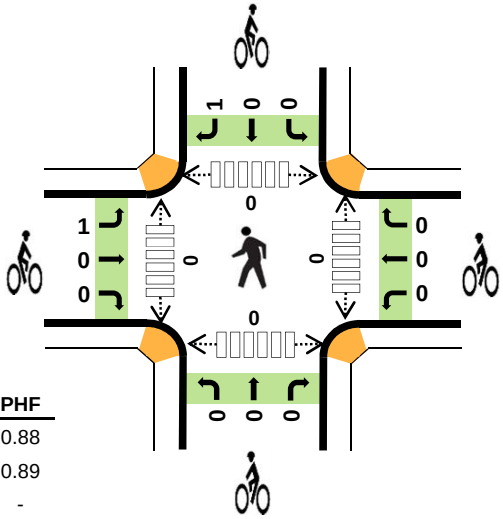
Two-Hour Count Summaries - Bikes

Interval Start	Kern St			Kern St			n/a			Road 16			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

Road 16
Kern St



Date: Thu, Sep 11, 2014
Count Period: 4:30 PM to 6:30 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	0.0%	0.88
WB	0.0%	0.89
NB	-	-
SB	9.1%	0.46
TOTAL	0.9%	0.83

Two-Hour Count Summaries

Interval Start		Kern St Eastbound			Kern St Westbound			n/a Northbound			Road 16 Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM		**5**	**9**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**23**	
4:45 PM		**1**	**10**	**0**	**0**	**9**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**22**	
5:00 PM		**5**	**11**	**0**	**0**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**29**	
5:15 PM		**2**	**13**	**0**	**0**	**10**	**1**	**0**	**0**	**0**	**1**	**0**	**5**	**32**	**106**
5:30 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	83
5:45 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	61
6:00 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	32
6:15 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		13	43	0	0	38	1	0	0	0	1	0	10	106	
Peak Hour	**All**	**13**	**43**	**0**	**0**	**38**	**1**	**0**	**0**	**0**	**1**	**0**	**10**	**106**	
	HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	
	HV%	**0%**	**0%**	**-**	**-**	**0%**	**0%**	**-**	**-**	**-**	**0%**	**-**	**10%**	**1%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:30 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	***1***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**0**	**0**	**0**	**1**	***1***	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***
5:15 PM	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	0	0	0	1	*1*	1	0	0	1	*2*	0	0	0	0	*0*
Peak Hr	**0**	**0**	**0**	**1**	***1***	**1**	**0**	**0**	**1**	***2***	**0**	**0**	**0**	**0**	***0***

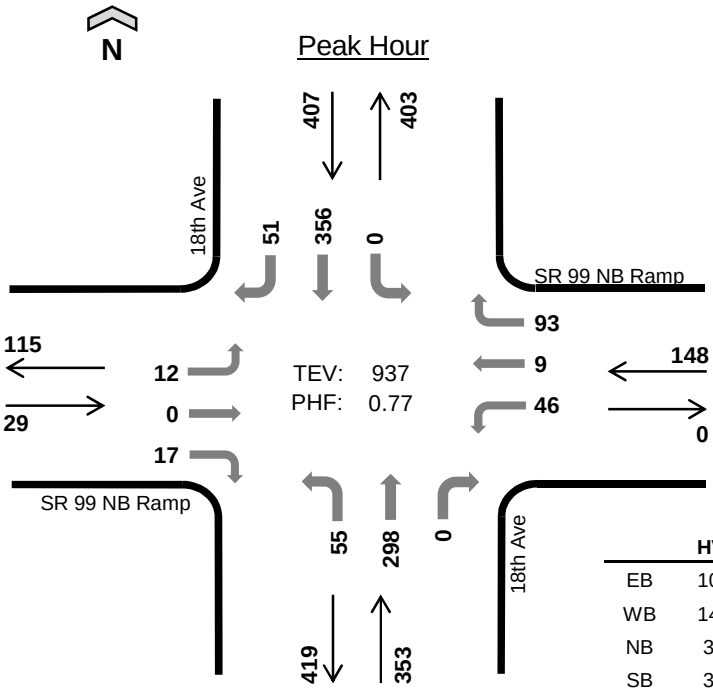
Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Kern St			Kern St			n/a			Road 16			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	1	1	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	

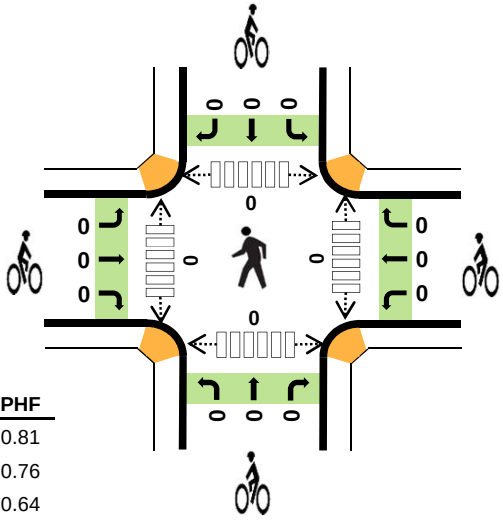
Two-Hour Count Summaries - Bikes

Interval Start	Kern St			Kern St			n/a			Road 16			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	
5:00 PM	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	1	0	0	0	0	0	0	0	0	0	0	1	2	
Peak Hour	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	

18th Ave
SR 99 NB Ramp



Date: Thu, Sep 11, 2014
Count Period: 7:30 AM to 9:30 AM
Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	10.3%	0.81
WB	14.9%	0.76
NB	3.1%	0.64
SB	3.7%	0.91
TOTAL	5.4%	0.77

Two-Hour Count Summaries

Interval Start		SR 99 NB Ramp Eastbound			SR 99 NB Ramp Westbound			18th Ave Northbound			18th Ave Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM		**2**	**0**	**5**	**15**	**1**	**26**	**20**	**83**	**0**	**0**	**96**	**14**	**262**	
7:45 AM		**4**	**0**	**3**	**17**	**0**	**32**	**10**	**127**	**0**	**0**	**94**	**18**	**305**	
8:00 AM		**6**	**0**	**3**	**12**	**5**	**20**	**13**	**62**	**0**	**0**	**93**	**13**	**227**	
8:15 AM		**0**	**0**	**6**	**2**	**3**	**15**	**12**	**26**	**0**	**0**	**73**	**6**	**143**	**937**
8:30 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	675
8:45 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	370
9:00 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	143
9:15 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		12	0	17	46	9	93	55	298	0	0	356	51	937	
Peak Hour	**All**	**12**	**0**	**17**	**46**	**9**	**93**	**55**	**298**	**0**	**0**	**356**	**51**	**937**	
	HV	**2**	**0**	**1**	**11**	**1**	**10**	**3**	**8**	**0**	**0**	**15**	**0**	**51**	
	HV%	**17%**	**-**	**6%**	**24%**	**11%**	**11%**	**5%**	**3%**	**-**	**-**	**4%**	**0%**	**5%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:30 AM	**0**	**5**	**3**	**5**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:45 AM	**2**	**4**	**4**	**4**	***14***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:00 AM	**1**	**10**	**3**	**4**	***18***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	**0**	**3**	**1**	**2**	***6***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	3	22	11	15	*51*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**3**	**22**	**11**	**15**	***51***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Two-Hour Count Summaries - Heavy Vehicles

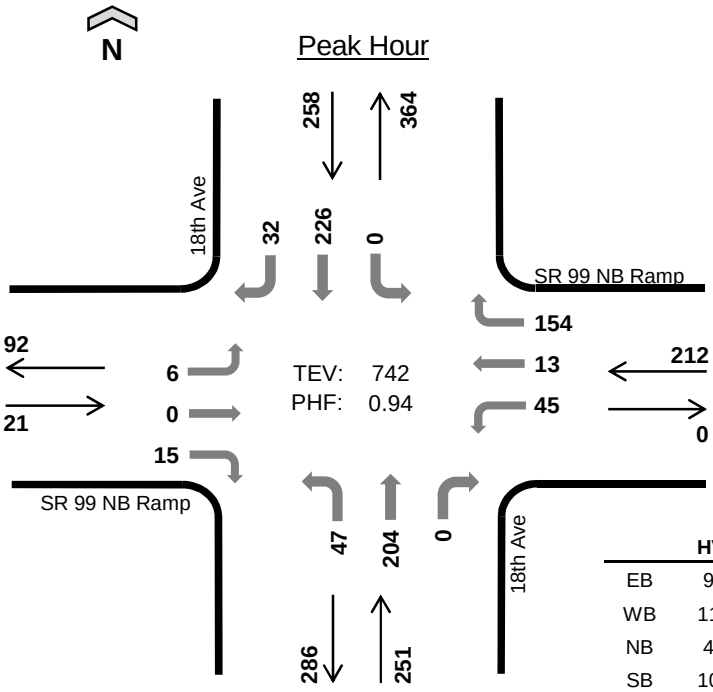
Interval Start	SR 99 NB Ramp			SR 99 NB Ramp			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**0**	**0**	**4**	**0**	**1**	**1**	**2**	**0**	**0**	**5**	**0**	**13**	
7:45 AM	**2**	**0**	**0**	**2**	**0**	**2**	**0**	**4**	**0**	**0**	**4**	**0**	**14**	
8:00 AM	**0**	**0**	**1**	**4**	**1**	**5**	**2**	**1**	**0**	**0**	**4**	**0**	**18**	
8:15 AM	**0**	**0**	**0**	**1**	**0**	**2**	**0**	**1**	**0**	**0**	**2**	**0**	**6**	**51**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	38
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	24
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	6
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	2	0	1	11	1	10	3	8	0	0	15	0	51	
Peak Hour	**2**	**0**	**1**	**11**	**1**	**10**	**3**	**8**	**0**	**0**	**15**	**0**	**51**	

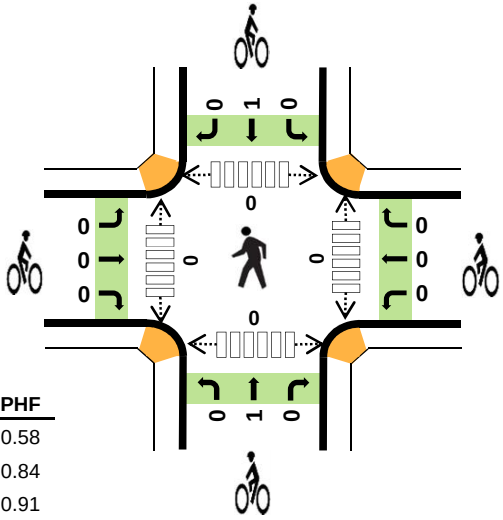
Two-Hour Count Summaries - Bikes

Interval Start	SR 99 NB Ramp			SR 99 NB Ramp			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

18th Ave
SR 99 NB Ramp

Date: Thu, Sep 11, 2014
Count Period: 4:30 PM to 6:30 PM
Peak Hour: 4:30 PM to 5:30 PM





	HV %:	PHF
EB	9.5%	0.58
WB	11.8%	0.84
NB	4.8%	0.91
SB	10.1%	0.90
TOTAL	8.8%	0.94

Two-Hour Count Summaries

Interval Start		SR 99 NB Ramp Eastbound			SR 99 NB Ramp Westbound			18th Ave Northbound			18th Ave Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM		**0**	**0**	**4**	**13**	**6**	**44**	**9**	**51**	**0**	**0**	**56**	**9**	**192**	
4:45 PM		**0**	**0**	**5**	**13**	**5**	**26**	**13**	**45**	**0**	**0**	**55**	**6**	**168**	
5:00 PM		**5**	**0**	**4**	**8**	**2**	**37**	**17**	**52**	**0**	**0**	**62**	**10**	**197**	
5:15 PM		**1**	**0**	**2**	**11**	**0**	**47**	**8**	**56**	**0**	**0**	**53**	**7**	**185**	**742**
5:30 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	550
5:45 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	382
6:00 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	185
6:15 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		6	0	15	45	13	154	47	204	0	0	226	32	742	
Peak Hour	**All**	**6**	**0**	**15**	**45**	**13**	**154**	**47**	**204**	**0**	**0**	**226**	**32**	**742**	
	HV	**1**	**0**	**1**	**12**	**3**	**10**	**4**	**8**	**0**	**0**	**24**	**2**	**65**	
	HV%	**17%**	**-**	**7%**	**27%**	**23%**	**6%**	**9%**	**4%**	**-**	**-**	**11%**	**6%**	**9%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:30 PM	**0**	**7**	**4**	**7**	***18***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**1**	**7**	**2**	**5**	***15***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**1**	**3**	**4**	**9**	***17***	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**0**	**0**	***0***
5:15 PM	**0**	**8**	**2**	**5**	***15***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	2	25	12	26	*65*	0	0	1	1	*2*	0	0	0	0	*0*	
Peak Hr	**2**	**25**	**12**	**26**	***65***	**0**	**0**	**1**	**1**	***2***	**0**	**0**	**0**	**0**	***0***	

Two-Hour Count Summaries - Heavy Vehicles

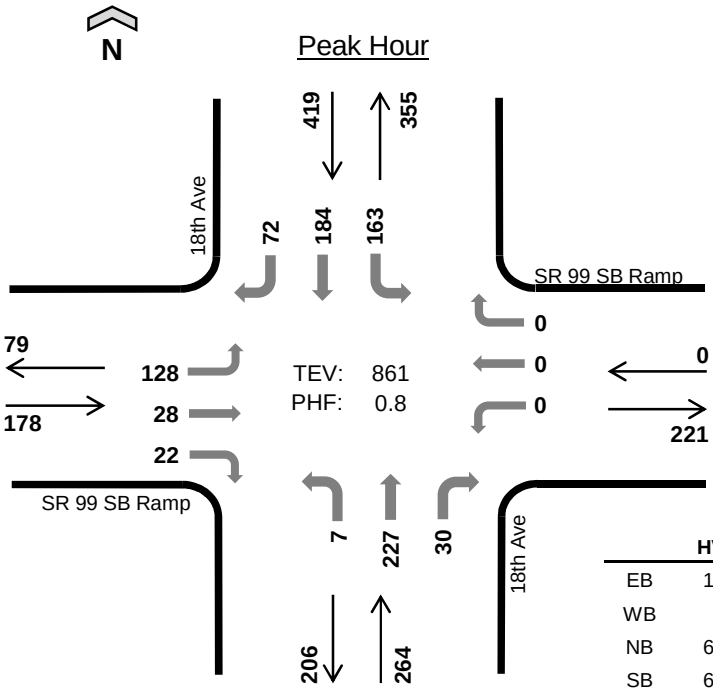
Interval Start	SR 99 NB Ramp			SR 99 NB Ramp			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**0**	**0**	**3**	**1**	**3**	**0**	**4**	**0**	**0**	**7**	**0**	**18**	
4:45 PM	**0**	**0**	**1**	**4**	**2**	**1**	**2**	**0**	**0**	**0**	**4**	**1**	**15**	
5:00 PM	**1**	**0**	**0**	**1**	**0**	**2**	**2**	**2**	**0**	**0**	**8**	**1**	**17**	
5:15 PM	**0**	**0**	**0**	**4**	**0**	**4**	**0**	**2**	**0**	**0**	**5**	**0**	**15**	**65**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	47
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	32
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	15
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	1	0	1	12	3	10	4	8	0	0	24	2	65	
Peak Hour	**1**	**0**	**1**	**12**	**3**	**10**	**4**	**8**	**0**	**0**	**24**	**2**	**65**	

Two-Hour Count Summaries - Bikes

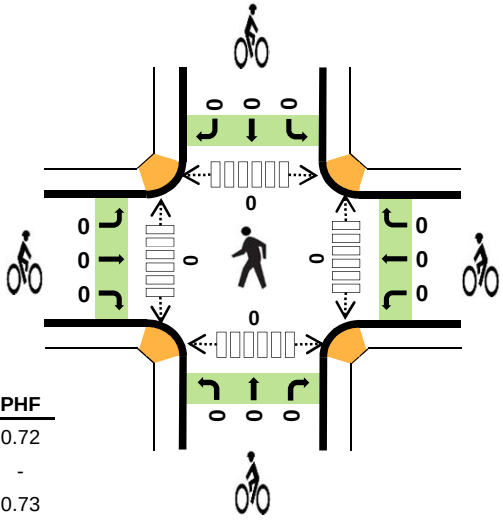
Interval Start	SR 99 NB Ramp			SR 99 NB Ramp			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**2**	
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	1	0	0	1	0	2	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**2**	

18th Ave
SR 99 SB Ramp

Date: Thu, Sep 11, 2014
Count Period: 7:30 AM to 9:30 AM
Peak Hour: 7:30 AM to 8:30 AM



	HV %:	PHF
EB	1.1%	0.72
WB	-	-
NB	6.8%	0.73
SB	6.4%	0.90
TOTAL	5.5%	0.80



Two-Hour Count Summaries

Interval Start		SR 99 SB Ramp Eastbound			SR 99 SB Ramp Westbound			18th Ave Northbound			18th Ave Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM		**34**	**10**	**7**	**0**	**0**	**0**	**1**	**72**	**12**	**47**	**45**	**20**	**248**	
7:45 AM		**54**	**6**	**2**	**0**	**0**	**0**	**1**	**82**	**7**	**41**	**49**	**27**	**269**	
8:00 AM		**28**	**7**	**8**	**0**	**0**	**0**	**3**	**47**	**8**	**43**	**52**	**15**	**211**	
8:15 AM		**12**	**5**	**5**	**0**	**0**	**0**	**2**	**26**	**3**	**32**	**38**	**10**	**133**	**861**
8:30 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	613
8:45 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	344
9:00 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	133
9:15 AM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		128	28	22	0	0	0	7	227	30	163	184	72	861	
Peak Hour	**All**	**128**	**28**	**22**	**0**	**0**	**0**	**7**	**227**	**30**	**163**	**184**	**72**	**861**	
	HV	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**7**	**14**	**13**	**0**	**47**	
	HV%	**2%**	**0%**	**0%**	**-**	**-**	**-**	**0%**	**5%**	**23%**	**9%**	**7%**	**0%**	**5%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:30 AM	**0**	**0**	**7**	**8**	***15***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
7:45 AM	**0**	**0**	**6**	**6**	***12***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:00 AM	**1**	**0**	**3**	**9**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:15 AM	**1**	**0**	**2**	**4**	***7***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
8:30 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
8:45 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:00 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
9:15 AM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	2	0	18	27	*47*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**2**	**0**	**18**	**27**	***47***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Two-Hour Count Summaries - Heavy Vehicles

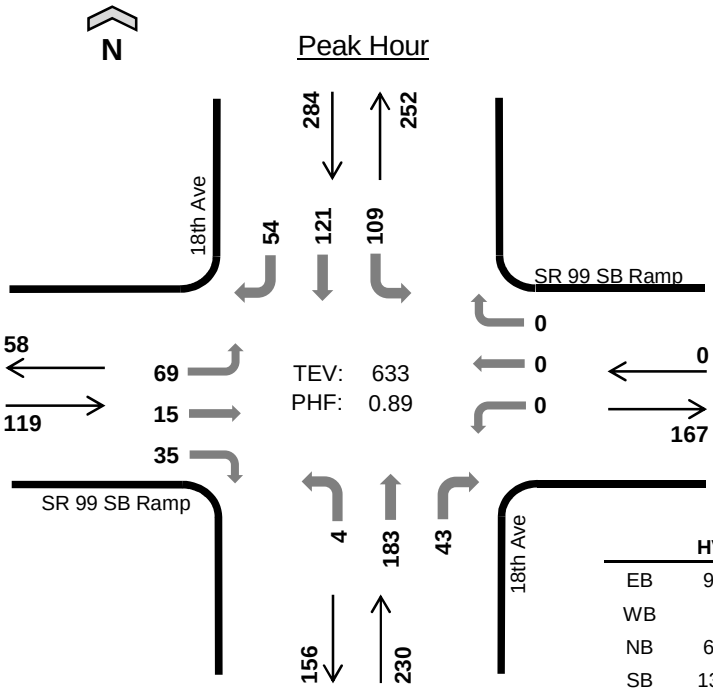
Interval Start	SR 99 SB Ramp			SR 99 SB Ramp			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**3**	**3**	**5**	**0**	**15**	
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**2**	**4**	**2**	**0**	**12**	
8:00 AM	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**4**	**5**	**0**	**13**	
8:15 AM	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**3**	**1**	**0**	**7**	**47**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	32
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	20
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	7
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	2	0	0	0	0	0	0	11	7	14	13	0	47	
Peak Hour	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**7**	**14**	**13**	**0**	**47**	

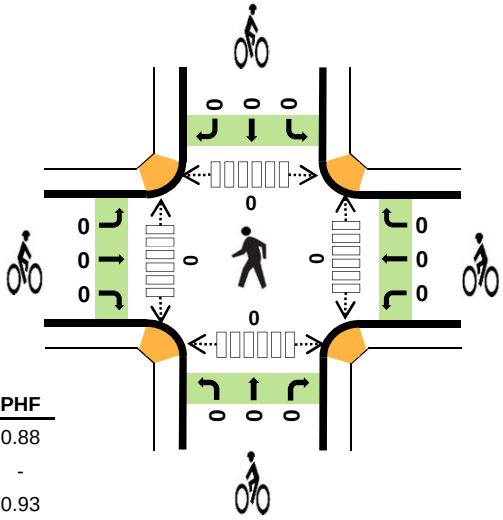
Two-Hour Count Summaries - Bikes

Interval Start	SR 99 SB Ramp			SR 99 SB Ramp			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

18th Ave
SR 99 SB Ramp

Date: Thu, Sep 11, 2014
Count Period: 4:30 PM to 6:30 PM
Peak Hour: 4:30 PM to 5:30 PM





	HV %:	PHF
EB	9.2%	0.88
WB	-	-
NB	6.5%	0.93
SB	13.4%	0.86
TOTAL	10.1%	0.89

Two-Hour Count Summaries

Interval Start		SR 99 SB Ramp Eastbound			SR 99 SB Ramp Westbound			18th Ave Northbound			18th Ave Southbound			15-min Total	Rolling One Hour
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM		**16**	**6**	**12**	**0**	**0**	**0**	**1**	**45**	**10**	**27**	**30**	**15**	**162**	
4:45 PM		**11**	**3**	**8**	**0**	**0**	**0**	**2**	**47**	**11**	**23**	**31**	**13**	**149**	
5:00 PM		**23**	**3**	**7**	**0**	**0**	**0**	**1**	**47**	**14**	**35**	**33**	**15**	**178**	
5:15 PM		**19**	**3**	**8**	**0**	**0**	**0**	**0**	**44**	**8**	**24**	**27**	**11**	**144**	**633**
5:30 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	471
5:45 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	322
6:00 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	144
6:15 PM		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total		69	15	35	0	0	0	4	183	43	109	121	54	633	
Peak Hour	**All**	**69**	**15**	**35**	**0**	**0**	**0**	**4**	**183**	**43**	**109**	**121**	**54**	**633**	
	HV	**3**	**0**	**8**	**0**	**0**	**0**	**0**	**7**	**8**	**12**	**23**	**3**	**64**	
	HV%	**4%**	**0%**	**23%**	**-**	**-**	**-**	**0%**	**4%**	**19%**	**11%**	**19%**	**6%**	**10%**	

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:30 PM	**2**	**0**	**5**	**11**	***18***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
4:45 PM	**3**	**0**	**2**	**8**	***13***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:00 PM	**2**	**0**	**4**	**10**	***16***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:15 PM	**4**	**0**	**4**	**9**	***17***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
5:45 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:00 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*
6:15 PM	0	0	0	0	*0*	0	0	0	0	*0*	0	0	0	0	*0*

Count Total	11	0	15	38	*64*	0	0	0	0	*0*	0	0	0	0	*0*
Peak Hr	**11**	**0**	**15**	**38**	***64***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	SR 99 SB Ramp			SR 99 SB Ramp			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**3**	**4**	**6**	**1**	**18**	
4:45 PM	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**6**	**1**	**13**	
5:00 PM	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**3**	**4**	**6**	**0**	**16**	
5:15 PM	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**2**	**2**	**3**	**5**	**1**	**17**	**64**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	46
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	33
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	17
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	3	0	8	0	0	0	0	7	8	12	23	3	64	
Peak Hour	**3**	**0**	**8**	**0**	**0**	**0**	**0**	**7**	**8**	**12**	**23**	**3**	**64**	

Two-Hour Count Summaries - Bikes

Interval Start	SR 99 SB Ramp			SR 99 SB Ramp			18th Ave			18th Ave			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	

APPENDIX F

AGRICULTURAL CONVERSION STUDY

AGRICULTURAL LAND CONVERSION ANALYSIS

Hash Farms Residential Development

November 2017

PREPARED FOR:

Tulare County Resources Management Agency
5961 South Mooney Blvd.
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APPLICANT:

Steve Hash Farms

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ACRONYMS

AB	Assembly Bill
APN	Assessor's Parcel Number
CDFA	California Department of Food and Agriculture
CEQA	California Environmental Quality Act
DOC	California Department of Conservation
FMMP	Farmland Mapping and Monitoring Program
FPPA	Farmland Protection Policy Act
IFM	Important Farmland Maps
LCC	Land Capability Classification System
LESA	Land Evaluation and Site Assessment
MSL	Mean Sea Level
NRCS	Natural Resources Conservation Service
PRC	Public Resources Code
SCE	Southern California Edison
SUP	Special Use Permit
TCGP	Tulare County General Plan
UDB	Urban Development Boundary
USDA	United States Department of Agriculture
WRCC	Western Regional Climate Center
ZOI	Zone of Influence

SECTION ONE – INTRODUCTION

Agriculture in the United States has been historically afflicted with many challenges such as weather, pests, and disease, as well as fluctuating markets, the need for capital investments, and rapidly advancing technology. In recent decades, however, the pressures for growth have led to the significant conversion of farmland to non-farm use. Clearly, the loss of farmland resources and subsequent land use conflicts that have arisen as a result of non-farm growth have been a legitimate cause for concern. The loss of agricultural lands affects many local economies, threatens the way of life for many farmers, and calls into question the ability of this rapidly-developing world to provide food for this population growth. These challenges, among others, are facing Tulare County, which is located in the San Joaquin Valley, California's top agricultural producing region[1].

The study area includes the portions of Tulare County that will likely face the most intense growth pressures related to urbanization. While the San Joaquin Valley is an important producer of agricultural products worldwide, it is also one of the areas of California that is projected to bear massive future growth as the State's population is expected to reach 50 million by 2050[2]. Growth within the San Joaquin's farming counties is caused by growth restrictions and excessive cost of housing in coastal and urban counties, and relatively inexpensive land sold by willing farmers. Due to these factors, land use regulating agencies across the Valley must act to manage future urban growth while preserving important agricultural lands for future use.

1.1 Purpose and Analysis Methods

This document is an Agricultural Land Conversion Study (Study) for the construction and operation of the Steve Hash Farms Residential Development (Development) located in Tulare County and the City of Kingsburg. The Development includes the construction of 160 single family residential units and up to 40 multi-family residential units over five phases on approximately 54 acres of land.

[1] United States Environmental Protection Agency, Pacific Southwest, Region 9 Strategic Plan, 2011-2014. http://www.epa.gov/region9/strategicplan/sanjoaquin.html. Accessed July, 2014.
[2] California Department of Finance, Press Release – New Population Projections: California To Surpass 50 Million In 2049. http://www.dof.ca.gov/research/demographic/reports/projections/p-1/documents/Projections_Press_Release_2010-2060.pdf. Accessed July, 2014.

Projects involving changes in land use sometimes convert agricultural lands to nonagricultural uses. Conserving productive agricultural lands requires a project-specific evaluation of the direct and indirect effects, as well as the cumulative effects of the agricultural land conversion. This Study provides a checklist of items that should be considered by those analyzing the proposed Project site. In order to analyze the proposed Project's potential impact to agricultural lands, this Study utilized factors identified in the Tulare County General Plan 2030 Update (TCGP) and the California Department of Conservation's California Agricultural Land Evaluation and Site Assessment (LESA) Model (see to Attachment B).

Tulare County, as a Lead Agency, typically bases a determination of agricultural resources significance on the thresholds established by the California Environmental Quality Act (CEQA) Guidelines. The Environmental Checklist Form of the CEQA Guidelines contains a list of impacts that may be deemed potentially significant. The Lead Agency should address questions from this checklist that are relevant to a project's environmental effects. The following significance thresholds are contained in Appendix G of the CEQA Guidelines.

Agricultural Resources *– In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agricultural and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project, and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the Project:*

a) *Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?*

b) *Conflict with existing zoning for agricultural use or a Williamson Act Contract?*

c) *Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code § 12220(q), timberland (as defined by Public Resources Code § 4526), or timberland zoned Timberland Production (as defined by Government Code § 51104(g))?*

d) *Result in the loss of forest land or conversion of forest land to non-forest use?*

e) *Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?*

This study was conducted in the context of CEQA (California Public Resources Code Sections 21000 et seq.).

1.2 Proposed Project Location

The proposed Project will be located at the northwest corner of Road 16 and Avenue 396, partially within the City of Kingsburg, Fresno County and Tulare County. The site is approximately one-half mile east of State Route 99 and approximately one-tenth of a mile south of State Route 201. The 54-acre site is located on Tulare County APNs 028-140-007, 012, 013, 018 and 022, and Fresno County APNs 396-020-008 and 014. The site is currently zoned A in Tulare County and R-1-6 in the City of Kingsburg and is within the Selma 7.5 Minute USGS Quadrangle. The proposed Project site lies within a portion of the NE ¼ of Section 26, Township 16S, Range 22E, M.D.B.&E.

The area surrounding the proposed Project site consists largely of rural agricultural land and homesteads, and the residential units associated with the City of Kingsburg.

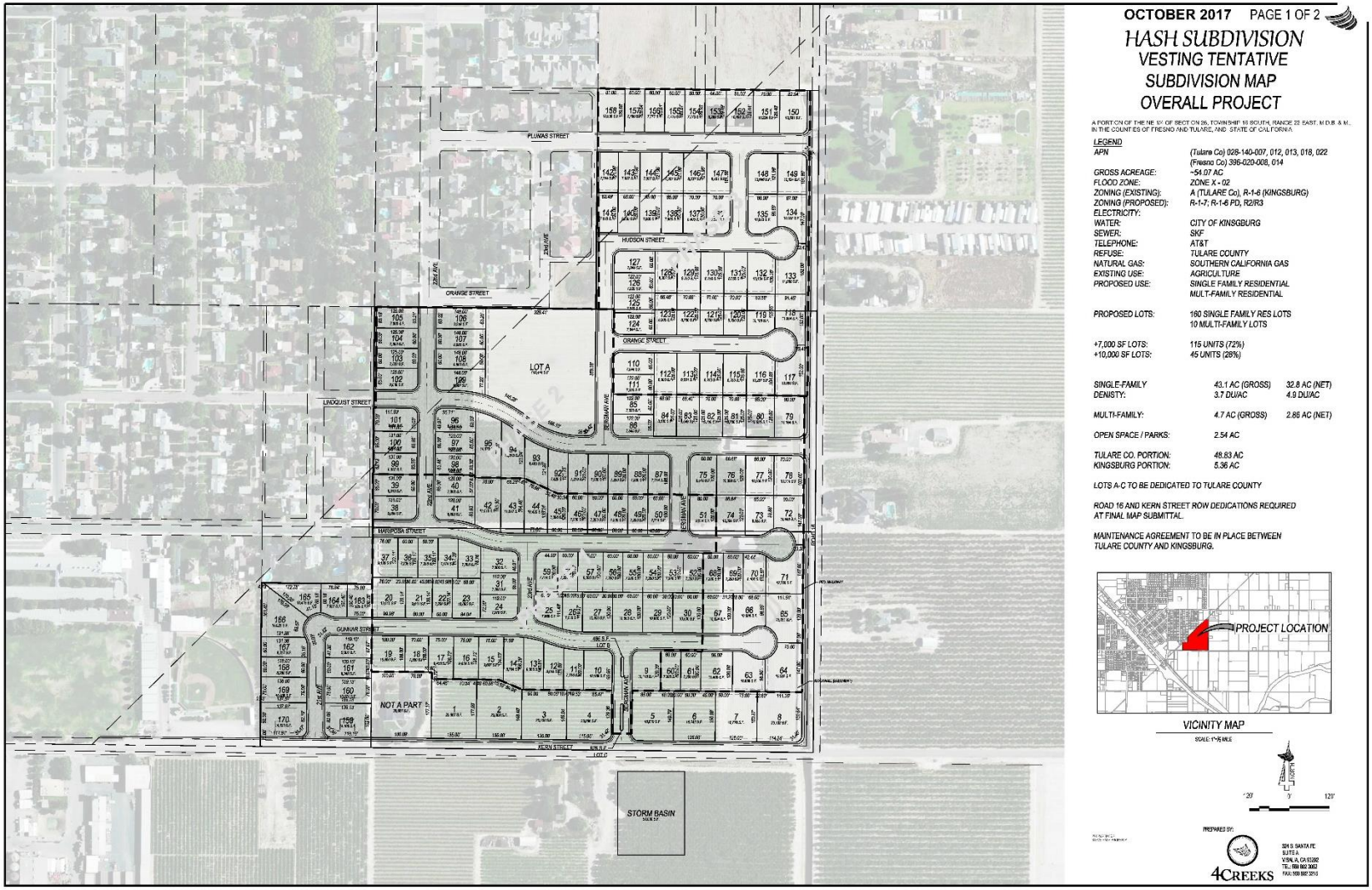
1.3 Proposed Project Characteristics

The proposal for the site consists of the phased construction of 160 single family residential units and 40 multi-family units (see Figure 1). The phasing breakdown is as follows:

- Phase 1 – 51 Single Family units and 16 multifamily units
- Phase 2 – 50 Single Family units and 16 multifamily units.
- Phase 3 – 49 Single Family units
- Phase 4 – 10 Single Family units and 8 multifamily units lots

Also proposed in the development is approximately 2.54 acres of parks, 1.8 acres of perimeter landscaped open space and a pedestrian/bike trail, and a 1.15 acre fenced in stormwater basin. Pacific Gas and Electric will supply electricity, Southern California Gas will provide natural gas, the City of Kingsburg will provide water service and the Selma-Kingsburg-Fowler County Sanitation District will provide sewer service.

Figure 1
Proposed Site Plan



SECTION TWO – REGULATORY SETTING

2.1 Federal

Farmland Protection Policy Act (7 USC 4201)

The purpose of the Farmland Protection Policy Act (FPPA) is to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. It additionally directs Federal programs to be compatible with State and local policies for the protection of farmlands. Congress passed the Agriculture and Food Act of 1981 (Public Law 97–98) containing the FPPA—Subtitle I of Title XV, Sections 1539–1549. The final rules and regulations were published in the Federal Register on June 17, 1994.

The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that, to the extent possible, Federal programs are administered to be compatible with State, local units of government, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every two years. The FPPA does not authorize the Federal Government to regulate the use of private or non-Federal land or, in any way, affect the property rights of owners.

For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of Statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forestland, pastureland, cropland, or other land, but not water or urban built-up land.

Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a Federal agency or with assistance from a Federal agency.[3]

2.2 State of California

California Department of Conservation, Division of Land Resource Protection

[3] USDA Natural Resources Conservation Service. Farmland Protection Policy Act. http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/fppa/. Accessed July, 2014.

The California Department of Conservation (DOC) applies the Natural Resources Conservation Service (NRCS) soil classifications to identify agricultural lands. Pursuant to the DOC's Farmland Mapping and Monitoring Program (FMMP), these designated agricultural lands are included in the Important Farmland Maps (IFM) used in planning for the present and future of California's agricultural land resources. The FMMP was established in 1982 to assess the location, quality, and quantity of agricultural lands and the conversion of these lands. The FMMP provides analysis of agricultural land use and land use changes throughout California. The DOC has a minimum mapping unit of 10 acres, with parcels that are smaller than 10 acres being absorbed into the surrounding classifications.

The list below provides a description of all the categories mapped by the FMMP[4].

- **Prime Farmland**. Farmland that has the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

- **Farmland of Statewide Importance**. Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.

- **Unique Farmland**. Farmland of lesser quality soils used for the production of the State's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

- **Farmland of Local Importance**. Lands that produce dryland grains (barley and wheat); lands that have physical characteristics that would qualify for "Prime" or "Statewide Important" farmlands except for the lack of irrigation water; and lands that currently support confined livestock, poultry, and/or aquaculture operations.

- **Grazing Land**. Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association,

[4] California Department of Conservation Division of Land Resource Protection. A Guide to the Farmland Mapping and Monitoring Program, 2004 Edition.
http://www.conservation.ca.gov/dlrp/fmmp/Documents/fmmp_guide_2004.pdf. Accessed July, 2014.

University of California Cooperative Extension, and other groups interested in the extent of grazing activities. The minimum mapping unit for Grazing Land is 40 acres.

- **Urban and Built-up Land**. Land occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a 10-acre parcel. This land is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.

- **Other Land**. Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines and borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

California Land Conservation (Williamson Act)

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is promulgated in California Government Code Sections 51200–51297.4, and therefore is applicable only to specific land parcels within the State of California. The Williamson Act enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space uses in return for reduced property tax assessments. Private land within locally designated agricultural preserve areas is eligible for enrollment under Williamson Act contracts. However, an agricultural preserve must consist of no less than 100 acres. In order to meet this requirement, two or more parcels may be combined if they are contiguous, or if they are in common ownership.

The Williamson Act program is administered by the DOC, in conjunction with local governments, which administer the individual contract arrangements with landowners. The landowner commits the parcel to a 10-year period wherein no conversion out of agricultural use is permitted. Each year the contract automatically renews unless a notice of non-renewal or cancellation is filed. In return, the land is taxed at a rate based on the actual use of the land for agricultural purposes, as opposed to its unrestricted market value. An application for immediate cancellation can also be requested by the landowner, provided that the proposed immediate cancellation application is consistent with the cancellation criteria stated in the California Land Conservation Act and those adopted by the affected county or city. Non-renewal or immediate cancellation does not change the zoning of the property. Participation in

the Williamson Act program is dependent on county adoption and implementation of the program and is voluntary for landowners.

As defined by the Williamson Act, prime agricultural land includes: (1) Class I and II soils as classified by the NRCS; (2) land that qualifies for rating 80 through 100 in the Storie Index Rating by the University of California, Division of Agricultural Sciences; (3) land that supports livestock used for the production of food and fiber and with at least one animal unit per acre; 4) land planted with fruit or nut-bearing crops that yield not less than $200 per acre annually during commercial bearing periods; or (5) land that has returned from the production of unprocessed agricultural plant products and annual gross value of not less than $200 per acre for three of the previous five years[5].

The Williamson Act states that a board or council by resolution shall adopt rules governing the administration of agricultural preserves. The rules of each agricultural preserve specify the uses allowed. Generally, any commercial agricultural use will be permitted within any agricultural preserve. In addition, local governments may identify compatible uses permitted with a use permit California Government Code Section 51238 states that, unless otherwise decided by a local board or council, the erection, construction, alteration, or maintenance of electric and communication facilities, as well as other facilities, are determined to be compatible uses within any agricultural preserve. Also Section 51238 states that board of supervisors may impose conditions on lands or land uses to be placed within preserves to permit and encourage compatible uses in conformity with Section 51238.1. Further, California Government Code Section 51238.1 allows a board or council to allow as compatible any use that without conditions or mitigations would otherwise be considered incompatible. However, this may occur only if that use meets the following conditions:

- The use will not significantly compromise the long-term productive agricultural capability of the subject contracted parcel or parcels on other contracted lands in agricultural preserves.
- The use will not significantly displace or impair current or reasonably foreseeable agricultural operations on the subject contracted parcel or parcels or on other contracted lands in agricultural preserves. Uses that significantly displace agricultural operations on the subject contracted parcel or parcels may be deemed compatible if they relate directly to the production of commercial agricultural products on the subject contracted

[5] Government Code, Section 51201(c)(1)-(5)).

parcel or parcels or neighboring lands, including activities such as harvesting, processing, or shipping.

- The use will not result in the significant removal of adjacent contracted land from agricultural or open-space use.

Farmland Security Zone Act

The Farmland Security Zone Act is similar to the Williamson Act and was passed by the California State Legislature in 1999 to ensure that long-term farmland preservation is part of public policy. Farmland Security Zone Act contracts are sometimes referred to as "Super Williamson Act Contracts." Under the provisions of this act, a landowner already under a Williamson Act contract can apply for Farmland Security Zone status by entering into a contract with the county. Farmland Security Zone classification automatically renews each year for an additional 20 years. In return for a further 35 percent reduction in the taxable value of land and growing improvements (in addition to Williamson Act tax benefits), the owner of the property promises not to develop the property into nonagricultural uses.

Public Resources Code Section 21060.1

The Public Resource Code (PRC) Section 21060.1 defines agricultural land for the purposes of assessing environmental impacts using the FMMP. The FMMP was established in 1982 to assess the location, quality, and quantity of agricultural lands and the conversion of these lands. The FMMP provides analysis of agricultural land use and land use changes throughout California.

2.3 Tulare County

Tulare County General Plan

The Tulare County General Plan 2030 Update (TCGP) has policies that apply to projects within Tulare County that serve to protect farmland. General Plan policies that are generally applicable to the proposed Project are listed below.

AG-1.1 Primary Land Use: The County shall maintain agriculture as the primary land use in the valley region of the County, not only in recognition of the economic importance of agriculture, but also in terms of agriculture's real contribution to the conservation of open space and natural resources.

AG-1.2 Coordination: The County shall coordinate its agricultural policies and programs with State and federal regulations to preserve agricultural lands.

AG-1.3 Williamson Act: The County should promote the use of the California Land Conservation Act (Williamson Act) on all agricultural lands throughout the County located outside established Urban Development Boundaries (UDB). However this policy carries with it a caveat that support for the Williamson Act is premised on continued funding of the State subvention program that offsets the loss of property taxes.

AG-1.6 Conservation Easements: The County shall consider the use of conservation easements to preserve agricultural lands.

AG-1.7 Preservation of Agricultural Lands: The County shall promote the preservation of its agricultural economic base and open space resources through the implementation of resource management programs and the identification of maximum growth parameters for all urban areas located in the County.

AG-1.9 Agricultural Preserves Outside Urban Boundaries: The County shall grant approval of individual applications for agricultural preserves located outside a UDB provided that the property involved meets the requirements of the Williamson Act and the rules of Tulare County.

AG-1.14 Right-to-Farm Noticing: The County shall condition discretionary permits for special uses and residential development within or adjacent to agricultural areas upon the recording of a Right-to-Farm Notice (Tulare County Ordinance No. 2931), which is an acknowledgement that residents in the area should be prepared to accept the inconveniences and discomfort associated with normal farming activities and that an established agricultural operation shall not be considered a nuisance due to changes in the surrounding area.

AG-1.15 Soil Productivity: The County shall encourage landowners to participate in voluntary programs that reduce soil erosion and increase soil productivity. To this end, the County shall promote coordination between the Natural Resources Conservation Service, Resource Conservation Districts, University of California Cooperative Extension, and other similar agencies and organizations.

AG-1.16 Agricultural Water Resources: The County shall seek to protect and enhance surface water and groundwater resources critical to agriculture.

SECTION THREE – ENVIRONMENTAL SETTING

3.1 State of California

State of California Agricultural Production

The sales value generated by California agriculture increased by 3.2% between the 2011 and 2012 crop years. The State's 80,500 farms and ranches received a record $44.7 billion for their output, up from the $43.3 billion received in 2011. California's increase in revenue was led by the grape industry, followed by the cattle sector and almond production, respectively[6].

Grape production generated $4.45 billion in cash receipts in 2012, up 15% from the previous record high received in 2011. Production was virtually the same, but prices received by growers increased from $578 per ton of grapes in 2011 to $666 per ton in 2012. Revenue generated from the cattle sector improved to a record high for the third year in a row as cash receipts were nearly $3.3 billion for the crop year. Receipts increased nearly 17% from 2011 despite production increasing by only 5%. Almond cash receipts increased for the third year in a row despite decreased production. Cash receipts increased 8.5% due to a rise in prices from $1.99 per pound of almonds in 2011 to $2.20 per pound in 2012[7].

The dairy industry, California's leading commodity in cash receipts, generated $6.90 billion for milk production in 2012, down 10% from the record production of 2011. Milk production increased less than one percent, but a drop in prices resulted in an overall reduction in cash receipts for the crop year. Milk prices received by producers fell from $18.54 per hundred pounds of milk sold in 2011 to $16,52 in 2012. As the leading dairy producing state in the country, California produced nearly 21% of the nation's supply in 2012[8].

State of California Farmland Conversion

Of California's approximately 100 million acres of land, 43 million acres are used for agriculture. Of this, 16 million acres are grazing land and 27 million acres are cropland. Only

[6] United States Department of Agriculture. California Agricultural Statistics, 2012 Crop Year. http://www.nass.usda.gov/Statistics_by_State/California/Publications/California_Ag_Statistics/Reports/2012cas-all.pdf. Accessed July, 2014.
[7] Ibid.
[8] Ibid.

about nine million acres of irrigated land are considered to be Prime, Unique or of Statewide Importance.[9]

"Irrigated farmland in California decreased by more than 91 square miles (58,587 acres) between 2010 and 2012. The highest-quality agricultural soils, known as Prime Farmland, comprised 81 percent of the loss. Urban development, which totaled 29, 342 acres, decreased by 34 percent compared with the 2010 update. The 2012 urban land increase was the lowest recorded in the program's history, reflecting impacts of the recent recession. Of the nearly 46 square miles of new Urban and Build-up Land in the state, 43 percent occurred in the Southern California region.

Land was removed from irrigated categories – to uses aside from urban – at a rate of 41 percent lower than compared with the prior update (252,473 acres in 2010 and 149,577acres in 2012). Land idling and reversion to dry farming were responsible for the majority of this type of conversion. The southern San Joaquin Valley and counties in the Sacramento-San Joaquin Delta were most impacted by land idling. Three counties had 10,000 or more acres of this conversion type: Fresno, Kern, and Kings."[10]

3.2 Tulare County

Tulare County Agricultural Production

Agricultural products are one of Tulare County's most important resources. The *2015 Tulare County Annual Crop and Livestock Report* stated "Tulare County's total gross production value for 2015 as $6,980,977,800. This represents a decrease of $1,703,694,600 or 13.7% below 2014's values of $8,084,672,400. Milk continues to be the leading agricultural commodity in Tulare County; with a total gross value of $1,718,001,000, a decrease of $822,231,000 or 32.4%. Milk produce represents 24.6% of the total crop and livestock value for 2015. Total milk production in Tulare County remained relatively stable. Livestock and Poultry's gross value of $1,022,620,000 represents a decrease of 4.89% below 2014, mostly due to lower per unit value for cattle and less poultry production."[11]

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[9] California Department of Food and Agriculture. AgVision 2030 White Paper. Agricultural Land Loss & Conversion. July 2009. http://www.cdfa.ca.gov/agvision/docs/Agricultural_Loss_and_Conservation.pdf. Accessed June 2017.

[10] California Department of Conservation. 2015 California Farmland Conversion Report. http://www.conservation.ca.gov/dlrp/fmmp/Pages/FMMP_2010-2012_FCR.aspx. Accessed July 2017.

[11] 2015 Tulare County Annual Crop and Livestock Report, August 2016. Cover letter from Marilyn Kinoshita, Agricultural Commissioner. http://agcomm.co.tulare.ca.us/default/index.cfm/standards-and-quarantine/crop-reports1/crop-reports-2011-2020/2015-tulare-county-annual-crop-and-livestock-report-pdf/. Accessed June, 2017.

"Tulare County's agricultural strength is based on diversity of the crops produced. The 2015 report covers more than 120 different commodities, 45 of which had a gross value in excess of $1,000,000. Although individual commodities may experience difficulties from year to year, Tulare County continues to produce high-quality crops that provide food and fiber to more than 90 countries throughout the world."[12]

Tulare County Farmland Conversion

In line with the State of California, Tulare County has also seen a decrease in FMMP-designated farmland, with the total inventoried land down over one percent, as seen in **Table 1** between the years 1998 and 2012. Between the years 2010 and 2012, Tulare County lost 13,488 acres of Prime Farmland, Farmland of Statewide Importance, and Unique Farmland.[13]

Table 1
Tulare County FMMP-Designated Land (1998-2012)

Farmland Category	Total Acres Inventoried						
	1998[14]	2000[15]	2002[16]	2004[17]	2006[18]	2010[19]	2012[20]
Prime Farmland	396,130	393,030	387,620	384,340	379,760	370,249	368,527
Farmland of Statewide Importance	357,220	351,720	345,760	339,580	332,160	323,599	321,296
Unique Farmland	11,790	11,720	12,750	12,530	12,220	11,593	11,474
Important Farmland Subtotal	**765,140**	**756,470**	**746,130**	**736,450**	**724,140**	**705,441**	**701,297**
Farmland of Local Importance	110,040	124,140	126,820	137,440	143,830	154,550	158,823
Grazing Land	439,960	434,050	440,550	440,620	440,140	440,042	439,940
Total	1,315,140	1,314,660	1,313,500	1,314,560	1,308,110	1,300,033	1,300,060

[12] Ibid.
[13] California Department of Conservation. California Farmland Conversion Report 2015. September. Table A-44. http://www.conservation.ca.gov/dlrp/fmmp/Documents/fmmp/pubs/2010-2012/FCR/FCR%202015_complete.pdf. Accessed November, 2017.
[14] Tulare County General Plan 2030 Update Recirculated Draft EIR Sch#2006041162. Table 3.10-4.
[15] Ibid.
[16] Op. Cit.
[17] Op. Cit.
[18] Op. Cit.
[19] California Department of Conservation, Division of Land Resource Protection. Farmland Mapping and Monitoring Program California Farmland Conversion Report 2015. http://www.conservation.ca.gov/dlrp/fmmp/Documents/fmmp/pubs/2010-2012/FCR/FCR%202015_complete.pdf. Accessed July 2017.
[20] Ibid.

Much of Tulare County's farmland is under California Land Conservation Act (Williamson Act) contracts, a program designed to prevent premature conversion of farmland to residential or other urban uses. As shown in Table 2, as of January 1, 2014 there were 1,081,936 acres of farmland under Williamson Act or Farmland Security Zone contracts in Tulare County. This total includes 565,190 acres of Williamson Act prime, 505,654 acres nonprime, and 11,1101 acres of Farmland Security Zone lands (The acreage totals also include 3,838 acres Williamson Act prime contracted land in nonrenewal and 7,301 acres of Williamson Act nonprime in nonrenewal.).[21] The proposed Project site is not under a Williamson Act contract.

Table 2
2014 Tulare County Lands under Williamson Act or Farmland Security Zone Contracts

Acres	Category
565,190	*Total prime = Prime active + NR Prime
505,645	*Total Nonprime = Nonprime active + NR Prime
11,101	Farmland Security Zone
1,081,936	Total Acres in Williamson Act and Farmland Security Zone contracts
565,190	*Total prime = Prime active + NR Prime

*Prime total includes 3,838 acres in nonrenewal; Nonprime total includes 7,301 acres in nonrenewal

3.3 Proposed Project Site

The 54-acre proposed Project site is currently in active agricultural production. The following section describes the crop types and relative yields of crops grown on the proposed Project site during the past five years. The total value of the crops is based on 2012 crop data from the Tulare County Agricultural Crop and Livestock Report. The site is currently owned and operated by Steve Hash Farms.

3.3.1 Agricultural Crops and Yields

According to Steve Hash of Steve Hash Farms, grapes, plums, nectarines, and peaches have been grown on the proposed Project site for the past five years. Approximately 14 acres of the 54-acre proposed Project site is either open space or housing. The crops, yields, and total value are provided in Table 3.

[21] Tulare County Subvention Report "California Open Space Subvention Act Program Survey for Fiscal Year 2012-2013" (submitted to Department of Conservation November 21, 2012)

Grapes

Grapes were ranked number four among the top 15 crops grown in Tulare County for the year 2015 with a value of $643,621,000. The Tulare County Crop 2015 Report indicates an acre produced a yield of 11.80 tons with a crop value of $1,350 per ton.

Plums

Plums and pluots were ranked number 15 among the top 15 crops grown in Tulare County for the year 2015 with a value of $74,444,000. The Tulare County 2015 Crop Report indicates an acre produced a yield of 5.70 tons with a crop value of $1,480 per ton.

Nectarines

Nectarines were ranked number 13 among the top 15 crops grown in Tulare County for the year 2012 with a value of $118,584,000. The Tulare County 2015 Crop Report indicates an acre produced a yield of 7.98 tons with a crop value of $1,620 per ton.

Peaches

Peaches were ranked number 11 among the top 15 crops grown in Tulare County for the year 2015 with a value of $174,234,000. The Tulare County 2015 Crop Report indicates an acre of freestone peaches produced a yield of 10.30 tons with a crop value of $1,800 per ton.

Table 3
Project Site Crop Yield

Crops	Bearing Acreage	Per Acre Yield/Ton	Total Tons	Unit Value per Ton ($)	Total Value ($)
Grapes	14	11.80	165.20	1,350	223,020
Plums	14	5.70	79.80	1,480	118,104
Nectarines	6	7.98	47.88	1,620	77,566
Peaches	4	10.30	41.20	1,800	74,160
Total	38				492,850

3.3.2 Land Classifications

According to the FMMP[22], the 54-acre proposed Project site is mapped as containing approximately 2 acres of Farmland of Local Importance, 0.5 acres of Prime Farmland, 49 acres of Farmland of Statewide Importance, and the remaining 2.5 acres is urban and built-up land.

3.3.3 Soil Suitability

Soils

The 54-acre proposed Project site is composed of four different soil types, as depicted in Table 4.

Table 4
Project Site Soils and Storie Index[23]

Soil Type	Acreage	Site %	Storie Index	Characteristics
Calgro-Calgro	45.6	86.5	Grade 4	Saline-Sodic complex, 0-2% slopes, alluvium derived from granitic rock sources, moderately well drained, no frequency of ponding, low available water storage
Tujunga loamy sand	5.8	11.0	Grade 2	0-2% slopes, alluvium derived from granitic rock sources, well drained, no frequency of ponding, moderate ability to store water
Hanford sandy loam	0.8	1.5	Grade 1	0-2% slopes, alluvium derived from granitic rock sources, well drained, no frequency of ponding, moderate ability to store water
Hesperia fine sandy loam	0.6	1.1	Grade 1	0-2% slopes, parent material is granitic alluvium, well drained with no frequency of ponding, moderate availability to store water

[22] California Department of Conservation. Farmland Mapping and Monitoring Program. Tulare County. ftp://ftp.consrv.ca.gov/pub/dlrp/fmmp/pdf/2014/tul14_no.pdf. Accessed October 2017.
[23] United States Department of Agriculture, NRCS, Web Soil Survey: USDA Soil Survey of Eastern Fresno Area and Tulare County, Western Part. Accessed July, 2014. Attachment A.

Storie Index

The Storie Index is a soil rating based on soil properties that govern a soil's potential for cultivated agriculture in California. Four factors that represent the inherent characteristics and qualities of the soil are considered in the index rating: profile characteristics, texture of the surface layer, slope, and other factors (e.g., drainage, salinity). A score ranging from 0 to 100 percent is determined for each factor, and the scores are then multiplied together to derive an index rating. Storie Index ratings have been combined into six grade classes as follows: Grade 1 (excellent), 100 to 80, Grade 2 (good), 79 to 60; Grade 3 (fair), 59 to 40; Grade 4 (poor), 30 to 20, Grade 5 (very poor), 19 to 10, and Grade 6 (nonagricultural), less than 10. The Storie Index of the proposed Project site can be seen in Table 6.

Land Capability Classification

The Land Capability Classification System is used by the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) to determine a soil's agricultural productivity. The Land Capability Classification indicates the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops and the way they respond to management. Soils are rated from Class I to Class VIII, with soils having the fewest limitations receiving the highest rating (Class I). The "prime" soil classification indicates the absence of soil limitations, which if present, would require the application of management techniques (e.g., drainage, leeching, special fertilizing practices) to enhance production. A general description of soil classifications, as defined by NRCS, is provided in Table 7. The majority of the Project site (48.7 acres or 94%) is rated as having Class III soils. The site also has less than an acre of Class I soils and less than an acre of Class II soils.

Table 7
Land Capability Classification[24]

Soil Classification	Description
I	Soils have few limitations that restrict their use.
II	Soils have moderate limitations that reduce the choice of plants, or that require special conservation practices.
III	Soils have severe limitations that reduce the choice of plants, require conservation practices, or both.

[24] United States Department of Agriculture, NRCS, Web Soil Survey: USDA Soil Survey of Eastern Fresno Area and Tulare County, Western Part. Accessed July, 2014. Attachment A.

IV	Soils have very severe limitations that reduce the choice of plants, require very careful management, or both.
V	Soils are not likely to erode but have other limitations; impractical to remove soils that limit their use largely to pastures or range, woodland, or wildlife habitat.
VI	Soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture, or range, woodland, or wildlife habitat.
VII	Soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland or wildlife habitat.
VIII	Soils and landforms have limitations that preclude their use for commercial plant production and restrict their use to recreation, wildlife habitat, or water supply, or to aesthetic purposes.

3.3.4 Williamson Act Contracts

As discussed in the Section 2.1, the California Land Conservation Act, also known as the Williamson Act, is a voluntary program that allows agricultural property owners to have their property assessed on the basis of its agricultural production rather than at the current market value. The proposed Project site is not under a Williamson Act Contract.

3.3.5 Water

The proposed Project lies over the Kings Groundwater Sub-Basin and is within the Tulare Lake Hydrologic Region. Surface water is provided by Consolidated Irrigation District and groundwater is pumped from existing on-site agricultural wells.

According to water well measurements maintained by the California Department of Water Resources between the years 2000 and 2010, water surface elevations in the proposed Project area has ranged from 270 feet to 253 feet[25].

3.3.6 Climate

The proposed Project site is located in the southern Central Valley of California; this area has the rainy winters and dry summers that are characteristic of a Mediterranean climate. The Central Valley has greater temperature extremes than the coastal areas because it is less affected by the moderating influence of the Pacific Ocean.

[25] California Department of Water Resources, Water Data Library. http://www.water.ca.gov/waterdatalibrary/. Accessed July, 2014.

The area is semi-arid with mild winters and hot, dry summers. The average rainfall is approximately 11 inches per year.[26] The majority of rainfall occurs from November through April. The Western Regional Climate Center (WRCC) provides quality climate data derived from stationary weather stations throughout the western United States. WRCC has developed a data set for monthly climate for the Visalia area (1927 to 2005); this data set is based on weather readings taken from the Visalia 049367 Station. The monthly average maximum was 97.2°F in July and the monthly average minimum was 37.3°F in January.[27]

[26] Kaweah Delta Water Conservation District Groundwater Management Plan, Updated November 7, 2006.
[27] Western Regional Climate Center. Period of Record Monthly Climate Summary, Visalia, California. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?cavisa+sca. Accessed July, 2014.

SECTION FOUR – FARMLAND CONVERSION

4.1 Methodology

This study follows the California Land Evaluation Site Assessment Model to assess the proposed Project's potential impacts to agricultural lands.

4.1.1 Land Evaluation and Site Assessment

The California Land Evaluation and Site Assessment Model (LESA) provides guidelines for rating the relative quality of land resources based on specific measurable features. It is intended "to provide lead agencies with an optional methodology to ensure that significant effects on the environment of agricultural land conversions are quantitatively and consistently considered in the environmental review process."[28] It is designed to make determinations of the potential significance of a project's conversion of agricultural lands.

The LESA is composed of six different factors, which are divided into two sets: Land Evaluation and Site Assessment factors. Two Land Evaluation factors (Land Capability Classification Rating and Storie Index Rating) are based upon measures of soil resources quality and intended to measure the inherent, soil-based qualities of land as they relate to agricultural suitability. Four Site Assessment factors (Project Size Rating, Water Resource Availability Rating, Surrounding Agricultural Lands Rating, and Surrounding Protected Resource Lands Rating) are intended to measure social, economic, and geographic attributes that also contribute to the overall value of agricultural land.

The two sets of factors are evenly weighted, meaning the two Land Evaluation factors and four Site Assessment factors are of equal importance; however, for a given project, each of these six factors is separately rated in a 100-point scale. The factors are then weighted relative to one another and combined, resulting in a single numeric score for a given project, with a maximum attainable score of 100 points. This final project score becomes the basis for making a determination of the potential impacts' level of significance for the project, based upon a range of established scoring thresholds.

Land Evaluation Factors

The LESA includes two Land Evaluation factors, discussed below, that are separately rated.

The Land Capability Classification Rating (LCC): The LCC indicates the suitability of soils for most kinds of crops. Groupings are made according to the limitations of the soils when used to

[28] Public Resources Code Section 21095

grow crops and the risk of damage to soils when used in agriculture. Soils are rated from Class I to Class VIII, with soils having the fewest limitations receiving the highest rating (Class I). Specific subclasses are also utilized to further characterize soils.

The Storie Index Rating: The Storie Index provides a numeric rating (based upon a zero to 100 scale) of the relative degree of suitability or value of a given soil for intensive agriculture. The rating is based upon soil characteristics only. Four factors that represent the inherent characteristics and qualities of the soil are considered in the Storie Index rating: profile characteristics, texture of the surface layer, slope, and other factors such as drainage or salinity. In some situations, only the United States Department of Agriculture's LCC information may be available. In those cases, the Storie Index ratings can be calculated from information contained in soil surveys by qualified soil scientists; however, if limitation of time and/or resources restrict the derivation of the Storie Index rating for a given project, it may be possible to adapt the Land Evaluation by relying solely upon the LCC rating.

Site Assessment Factors

The four Site Assessment factors that are separately rated and included in the LESA as discussed below.

The Project Size Rating: The Project Size rating is based upon identifying acreage figures for three separate groupings of soil classes within the project site, and then determining what grouping generates the highest Project Size score. The Project Size Rating relies upon acreage figures that were tabulated under the Land Capability Classification Rating.

The Water Resources Availability Rating: The Water Resources Availability rating is based upon identifying the various water sources that may supply a given property, and then determining whether different restrictions in supply are likely to take place in years that are characterized as being periods of drought and non-drought.

The Surrounding Agricultural Land Rating: Determination of the Surrounding Agricultural Land rating is based upon identification of a project's Zone of Influence (ZOI), which is defined as that land near a given project, both directly adjoining and within a defined distance away, that is likely to influence, and be influenced by, the agricultural land use of the subject project site. The Surrounding Agricultural Land rating is designed to provide a measurement of the level of agricultural land use for lands close to a given project. The LESA rates the potential significance of the conversion of an agricultural parcel that has a large proportion of surrounding land in agricultural production more highly than one that has relatively small percentage of surrounding land in agricultural production. The definition of the ZOI that accounts for surrounding lands (up to a minimum of 0.25 mile from the project boundary) is the result of several iterations during model development for assessing an area that will generally be a representative sample of surrounding land use. Figure 2 shows the ZOI

surrounding the proposed Project site and the FMMP classifications. There are 523.62 acres of land within the ZOI of the project site; of those lands, 24.45 acres are Prime Farmland, 284.97 are Farmland of Statewide Importance, 10.49 are Farmland of Local Importance, and the remaining 203.71 acres consist of rural residential land and urban and built-up land.

The Surrounding Protected Resource Land Rating: The Surrounding Protected Resource Land rating is essentially an extension of the Surrounding Agricultural Land rating, and it is scored in a similar manner. Protected resource lands are those lands with long-term use restrictions that are compatible with or supportive of agricultural uses of land. Included among them are the following:

- Williamson Act contracted lands
- Publicly owned lands maintained as a park, forest, or watershed resources
- Lands with agricultural, wildlife habitat, open space, or other natural resource easements that restrict the conversion of such land to urban and industrial uses

Final LESA Scoring

A single LESA score is generated for a given project after all the individual Land Evaluation and Site Assessment factors have been scored and weighted. The LESA is weighted so that 50 percent of the total LESA score of a given project is derived from the Land Evaluation factors and 50 percent is derived from the Site Assessment factors. The final LESA score was determined for the proposed Project and the modeling results are described in Table 8.

Figure 2
Zone of Influence

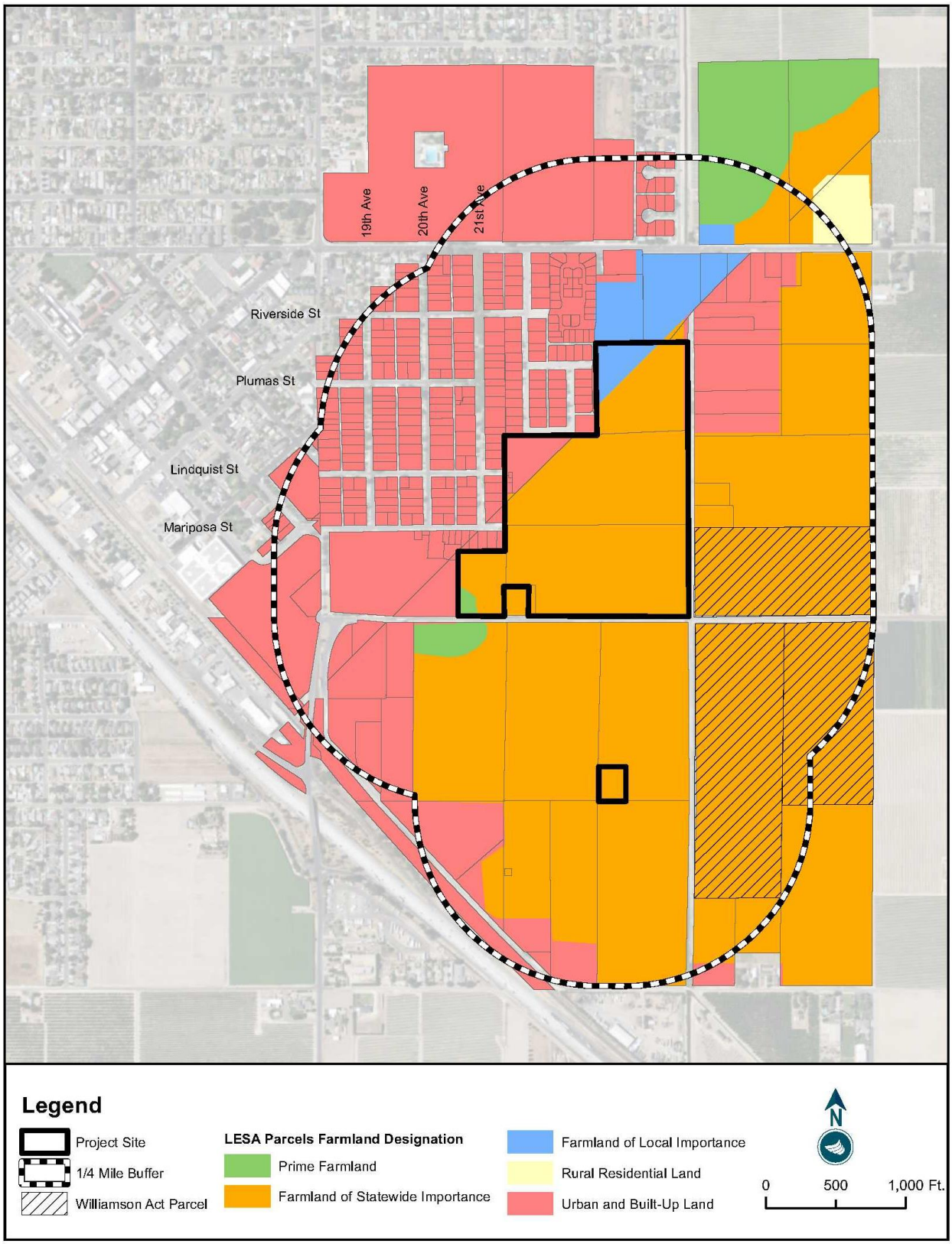


Table 8
Land Evaluation and Site Assessment Model Scoring Summary

Category	Factor	Raw Points	Factor Weight	Weighted Points	Comments
Land Evaluation	Land Capability Class	60.2	0.25	15.05	Majority of site is LCC III
	Storie Index	3.69	0.25	0.92	Majority of site is ranked as 4
		Subtotal	**0.50**	**15.97**	
Site Assessment	Project Size	60	0.15	9	
	Water Resource Availability	100	0.15	15	Groundwater is available via on-site wells
	Surrounding Agricultural Land	50	0.15	7.5	
	Surrounding Protected Resource Lands	0	0.05	0	13% of ZOI is under contract
		Subtotal	**0.50**	**31.5**	
			Final Score	**47.47**	

Thresholds of Significance

The LESA is designed to make determinations of the potential significance of a project's conversion of agricultural lands during the Initial Study phase of the CEQA process. Scoring thresholds are based upon both the total LESA score and the component Land Evaluation (LE) and Site Assessment (SA) separate subscores. In this manner, the scoring thresholds are dependent upon the attainment of a minimum score for the LE and SA subscores so that a single threshold is not the result of heavily skewed subscores (i.e., a site with a very high LE score but a very low SA score, or vice-versa). The LESA scoring thresholds are described in Table 9.

Table 9
LESA Scoring Thresholds

Total LESA Score	Scoring Decision
0 to 39 points	Not considered significant
40 to 59 points	Considered significant only if LE and SA subscores are each greater than or equal to 20
60 to 79 points	Considered significant unless either LE or SA subscore is less than 20 points
80 to 100 points	Considered significant

According to the LESA Threshold of Significance, the total score of 47.47 for the proposed Project site is considered not significant as the LE subtotal is not greater than 20. The LESA model worksheets can be seen in Attachment B.

SECTION FIVE – IMPACT ANALYSIS

5.1 Farmland Conversion

According to the FMMP[29], the 54-acre proposed Project site is mapped as containing approximately 2 acres of Farmland of Local Importance, 0.5 acres of Prime Farmland, 49 acres of Farmland of Statewide Importance, and the remaining 2.5 acres is urban and built-up land.

A Land Evaluation and Site Assessment (LESA) was conducted to analyze potential impacts resulting from the conversion of farmland. The LESA was developed by the California Department of Conservation to make determinations of the potential significance of a project's conversion of agricultural lands. As seen in Section 4.1.1 above, the LESA determined that the site-specific conversion of agricultural land would be less than significant. Additionally, the Project site is within the Tulare County Urban Development Boundary and the City of Kingsburg Sphere of Influence, and as such, has already been planned for development.

Level of Significance: Less Than Significant.

5.2 Zoning or Wiliamson Act Contract Conflicts

This impact evaluates the potential for the proposed Project to conflict with any existing Williamson Act Contract on the site or conflict with the existing zone designation. The Project site does not have a Williamson Act contract so there would be impact to a Williamson Act Contract. As part of the Project, the Agricultural Zone on approximately 49 acres of the Project site would be changed to R-1 and R-2/3, which would accommodate the proposed Project. There would be no impact impacts resulting from a zoning conflict.

Level of Significance: No Impact.

[29] California Department of Conservation. Farmland Mapping and Monitoring Program. Tulare County. ftp://ftp.consrv.ca.gov/pub/dlrp/fmmp/pdf/2014/tul14_no.pdf. Accessed October 2017.

5.3 Loss or Conversion of Forest Land

This impact evaluates the potential for the proposed Project to conflict with existing Forest Land zoning or result in the loss of forest land or result in the conversion of forest land to non-forest use. There is no forest land zoning on the proposed Project site and there are no forest uses on the site. No loss of forest land would occur and no conflicts would forest land zoning would occur. Therefore, no impacts would occur.

Level of Significance: No Impact.

5.4 Other Conversion Factors

The requested Zone Change is site specific and does not apply to any properties other than approximately 49 acres of the 54-acre Project site. The site is within the City of Kingsburg's adopted Sphere of Influence and Tulare County's adopted Urban Development Boundary for the City of Kingsburg. The site has been planned for development and as such, there is little potential for the proposed Project to result in the conversion of any surrounding agricultural lands.

Level of Significance: Less Than Significant.

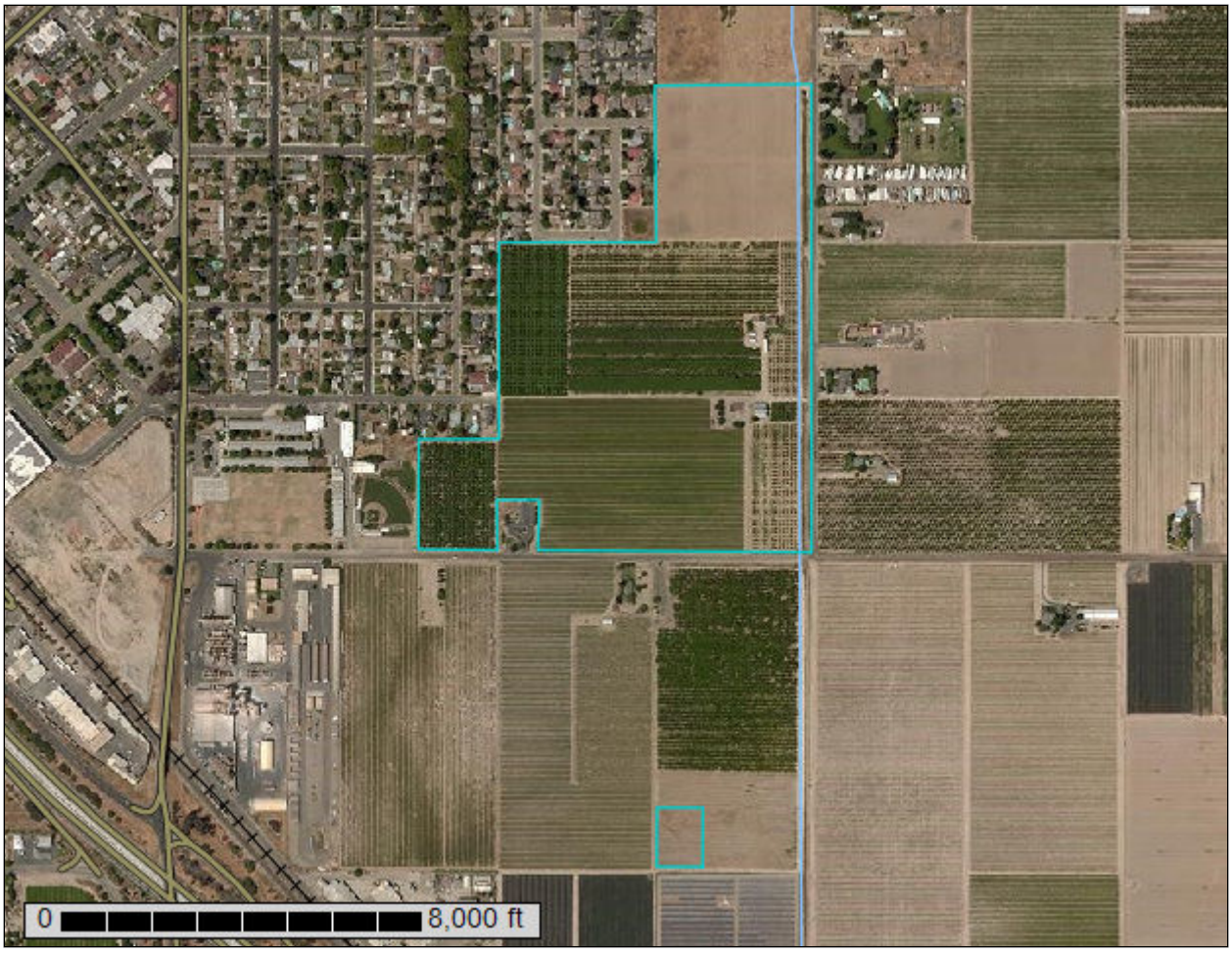
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Eastern Fresno Area, California; and Tulare County, Western Part, California



November 28, 2017

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Fresno Area, California
Survey Area Data: Version 10, Oct 4, 2017

Soil Survey Area: Tulare County, Western Part, California
Survey Area Data: Version 11, Sep 8, 2017

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
105tw	Calgro-Calgro, saline-Sodic complex, 0 to 2 percent slopes	2.0	3.8%
Hm	Hanford fine sandy loam	0.2	0.3%
Hst	Hesperia fine sandy loam moderately deep	0.6	1.2%
TzbA	Tujunga loamy sand, 0 to 3 percent slopes	2.0	3.9%
Subtotals for Soil Survey Area		**4.9**	**9.2%**
Totals for Area of Interest		**52.8**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
105	Calgro-Calgro, saline-Sodic, complex, 0 to 2 percent slopes	43.6	82.5%
124	Hanford sandy loam, 0 to 2 percent slopes	0.6	1.1%
138	Tujunga loamy sand, 0 to 2 percent slopes	3.8	7.3%
Subtotals for Soil Survey Area		**48.0**	**90.8%**
Totals for Area of Interest		**52.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a

particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Eastern Fresno Area, California

105tw—Calgro-Calgro, saline-Sodic complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hldf
Elevation: 250 to 480 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Calgro and similar soils: 60 percent
Calgro, saline-sodic, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Calgro

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 7 inches: sandy loam
Bw - 7 to 25 inches: sandy loam
2Bkqm - 25 to 33 inches: cemented
2Bkq - 33 to 53 inches: gravelly loamy sand
3Bkqm - 53 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Calgro, Saline-sodic

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 8 inches: sandy loam
Bw - 8 to 24 inches: sandy loam
2Bkqm - 24 to 33 inches: cemented
2Bkq - 33 to 52 inches: gravelly loamy sand
3Bkqm - 52 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 4 percent
Salinity, maximum in profile: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 100.0
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Colpien

Percent of map unit: 5 percent
Landform: Fan remnants
Hydric soil rating: No

Grangeville

Percent of map unit: 4 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: No

Exeter

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Hm—Hanford fine sandy loam

Map Unit Setting

National map unit symbol: hl5p
Elevation: 200 to 500 feet
Mean annual precipitation: 8 to 15 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hanford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanford

Setting

Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope, rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 16 inches: fine sandy loam
C - 16 to 72 inches: fine sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Available water storage in profile: Moderate (about 7.8 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Unnamed, loam

Percent of map unit: 10 percent
Landform: Flood plains
Hydric soil rating: No

Unnamed, steeper slopes

Percent of map unit: 4 percent
Landform: Benches
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Landform: Drainageways on flood plains
Hydric soil rating: Yes

Hst—Hesperia fine sandy loam moderately deep

Map Unit Setting

National map unit symbol: hl65
Elevation: 200 to 400 feet
Mean annual precipitation: 8 to 10 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 225 to 250 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hesperia and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hesperia

Setting

Landform: Alluvial fans, fan skirts
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 11 inches: fine sandy loam

C - 11 to 32 inches: fine sandy loam
Ck - 32 to 43 inches: fine sandy loam
2Ck - 43 to 60 inches: silt

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.5 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Unnamed, reclaimed

Percent of map unit: 10 percent
Landform: Fan skirts
Hydric soil rating: No

Unnamed, loam surface

Percent of map unit: 5 percent
Landform: Alluvial fans
Hydric soil rating: No

TzbA—Tujunga loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hlc1
Elevation: 180 to 400 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 62 to 64 degrees F
Frost-free period: 225 to 275 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Tujunga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting

Landform: Alluvial fans, flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 4 inches: loamy sand
C - 4 to 60 inches: stratified sand to loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Unnamed, loamy coarse sand

Percent of map unit: 12 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Unnamed, compact substratum

Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

Unnamed, flooded

Percent of map unit: 1 percent
Landform: Flood plains
Hydric soil rating: Yes

Tulare County, Western Part, California

105—Calgro-Calgro, saline-Sodic, complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp47
Elevation: 250 to 480 feet
Mean annual precipitation: 8 to 12 inches
Mean annual air temperature: 62 to 65 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Calgro and similar soils: 60 percent
Calgro, saline-sodic, and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Calgro

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 7 inches: sandy loam
Bw - 7 to 25 inches: sandy loam
2Bkqm - 25 to 33 inches: cemented
2Bkq - 33 to 53 inches: gravelly loamy sand
3Bkqm - 53 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 12.0
Available water storage in profile: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Calgro, Saline-sodic

Setting

Landform: Fan remnants
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 8 inches: sandy loam
Bw - 8 to 24 inches: sandy loam
2Bkqm - 24 to 33 inches: cemented
2Bkq - 33 to 52 inches: gravelly loamy sand
3Bkqm - 52 to 60 inches: cemented

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 20 to 40 inches to duripan
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Low to moderately high (0.01 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 4 percent
Salinity, maximum in profile: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 100.0
Available water storage in profile: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Colpien

Percent of map unit: 5 percent
Landform: Fan remnants
Hydric soil rating: No

Grangeville

Percent of map unit: 4 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Tujunga

Percent of map unit: 3 percent
Landform: Flood plains
Hydric soil rating: No

Exeter

Percent of map unit: 2 percent
Landform: Fan remnants
Hydric soil rating: No

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

124—Hanford sandy loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hp4v
Elevation: 220 to 490 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 280 days
Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Hanford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanford

Setting

Landform: Flood plains, alluvial fans
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granitic rock sources

Typical profile

Ap - 0 to 6 inches: sandy loam
C1 - 6 to 30 inches: fine sandy loam
C2 - 30 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: Very rare
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 7.0
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups
Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Exeter
Percent of map unit: 5 percent
Landform: Fan remnants
Hydric soil rating: No

Tujunga
Percent of map unit: 5 percent
Landform: Flood plains
Hydric soil rating: No

Calgro
Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Yettem
Percent of map unit: 2 percent
Landform: Alluvial fans, flood plains
Hydric soil rating: No

138—Tujunga loamy sand, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hp59
Elevation: 210 to 520 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 63 to 64 degrees F
Frost-free period: 250 to 300 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Tujunga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 14 inches: loamy sand
C - 14 to 70 inches: stratified coarse sand to loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water storage in profile: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Grangeville

Percent of map unit: 5 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: Yes

Yettem

Percent of map unit: 4 percent
Landform: Flood plains, alluvial fans
Hydric soil rating: No

Akers, saline-sodic

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Akers

Percent of map unit: 3 percent
Landform: Fan remnants
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

California Revised Storie Index (CA)

The Revised Storie Index is a rating system based on soil properties that govern the potential for soil map unit components to be used for irrigated agriculture in California.

The Revised Storie Index assesses the productivity of a soil from the following four characteristics:

- Factor A: degree of soil profile development

- Factor B: texture of the surface layer

- Factor C: steepness of slope

- Factor X: drainage class, landform, erosion class, flooding and ponding frequency and duration, soil pH, soluble salt content as measured by electrical conductivity, and sodium adsorption ratio

Revised Storie Index numerical ratings have been combined into six classes as follows:

- Grade 1: Excellent (81 to 100)

- Grade 2: Good (61 to 80)

- Grade 3: Fair (41 to 60)

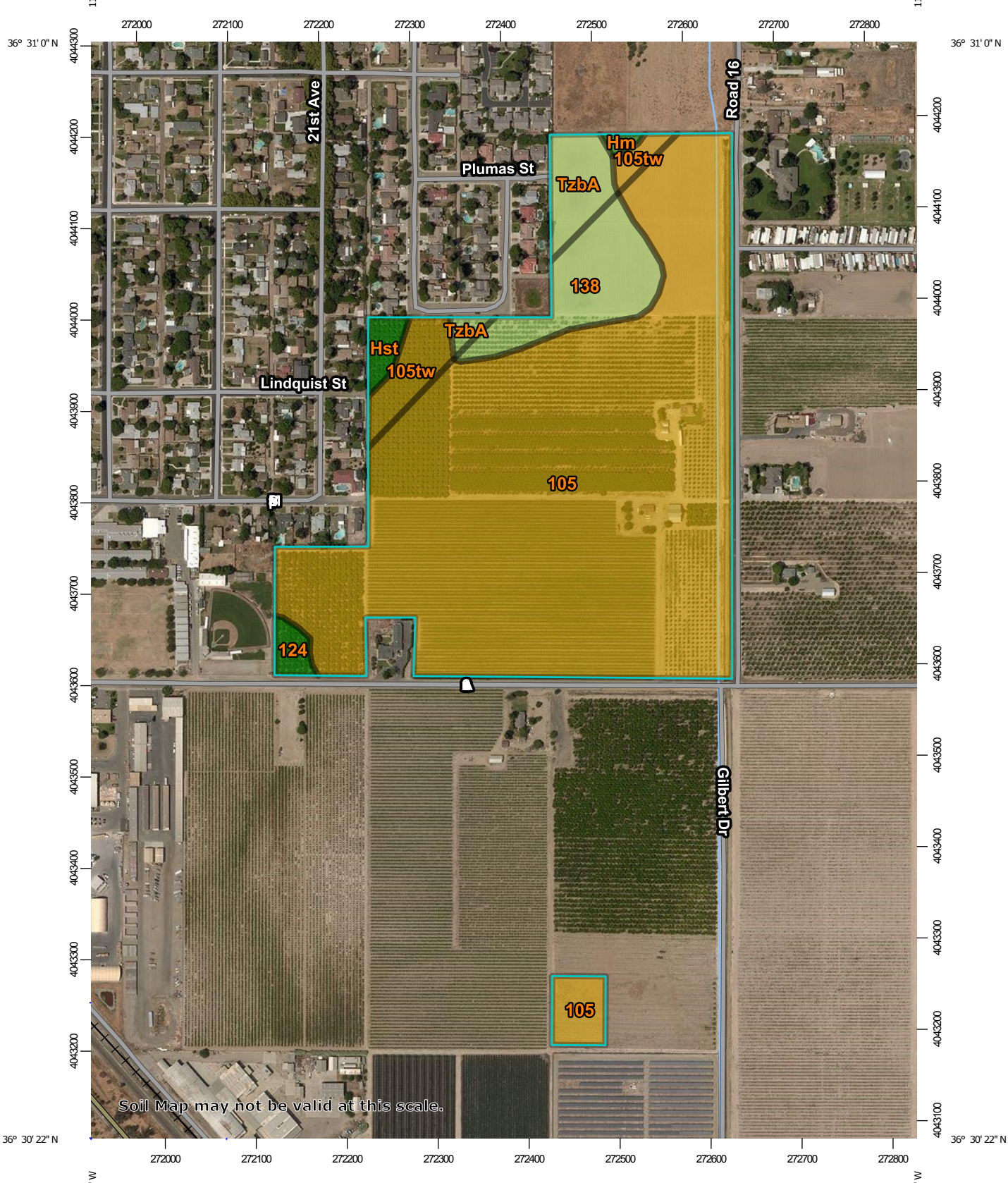
- Grade 4: Poor (21 to 40)

- Grade 5: Very poor (11 to 20)

- Grade 6: Nonagricultural (10 or less)

The components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as the one shown for the map unit. The percent composition of each component in a particular map unit is given to help the user better understand the extent to which the rating applies to the map unit.

Other components with different ratings may occur in each map unit. The ratings for all components, regardless the aggregated rating of the map unit, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.


119° 32' 48" W
119° 32' 11" W
36° 31' 0" N
36° 30' 22" N
272000
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272600
272700
272800
4044300
4044200
4044100
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4043900
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4043600
4043500
4043400
4043300
4043200
4043100
21st Ave
Road 19
Plumas St
Lindquist St
Gilbert Dr
Hm
105tw
TzbA
138
TzbA
Hst
105tw
105
124
105
Soil Map may not be valid at this scale.
Map Scale: 1:5,850 if printed on A portrait (8.5" x 11") sheet.
Meters
0 50 100 200 300
Feet
0 250 500 1000 1500
N
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Grade 1 - Excellent
- Grade 2 - Good
- Grade 3 - Fair
- Grade 4 - Poor
- Grade 5 - Very Poor
- Grade 6 - Nonagricultural
- Not rated
- Not rated or not available

Soil Rating Lines
- Grade 1 - Excellent
- Grade 2 - Good
- Grade 3 - Fair
- Grade 4 - Poor
- Grade 5 - Very Poor
- Grade 6 - Nonagricultural
- Not rated
- Not rated or not available

Soil Rating Points
- Grade 1 - Excellent
- Grade 2 - Good
- Grade 3 - Fair
- Grade 4 - Poor
- Grade 5 - Very Poor
- Grade 6 - Nonagricultural
- Not rated
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Fresno Area, California
Survey Area Data: Version 10, Oct 4, 2017

Soil Survey Area: Tulare County, Western Part, California
Survey Area Data: Version 11, Sep 8, 2017

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—California Revised Storie Index (CA)

Map unit symbol	Map unit name	Rating	Component name (percent)	Acres in AOI	Percent of AOI
105tw	Calgro-Calgro, saline-Sodic complex, 0 to 2 percent slopes	Grade 4 - Poor	Calgro (60%)	2.0	3.8%
Hm	Hanford fine sandy loam	Grade 1 - Excellent	Hanford (85%)	0.2	0.3%
Hst	Hesperia fine sandy loam moderately deep	Grade 1 - Excellent	Hesperia (85%)	0.6	1.2%
TzbA	Tujunga loamy sand, 0 to 3 percent slopes	Grade 2 - Good	Tujunga (85%)	2.0	3.9%
Subtotals for Soil Survey Area				**4.9**	**9.2%**
Totals for Area of Interest				**52.8**	**100.0%**

Map unit symbol	Map unit name	Rating	Component name (percent)	Acres in AOI	Percent of AOI
105	Calgro-Calgro, saline-Sodic, complex, 0 to 2 percent slopes	Grade 4 - Poor	Calgro (60%)	43.6	82.5%
124	Hanford sandy loam, 0 to 2 percent slopes	Grade 1 - Excellent	Hanford (85%)	0.6	1.1%
138	Tujunga loamy sand, 0 to 2 percent slopes	Grade 2 - Good	Tujunga (85%)	3.8	7.3%
Subtotals for Soil Survey Area				**48.0**	**90.8%**
Totals for Area of Interest				**52.8**	**100.0%**

Rating Options—California Revised Storie Index (CA)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

California Revised Storie Index (CA)

The Revised Storie Index is a rating system based on soil properties that govern the potential for soil map unit components to be used for irrigated agriculture in California.

The Revised Storie Index assesses the productivity of a soil from the following four characteristics:

- Factor A: degree of soil profile development

- Factor B: texture of the surface layer

- Factor C: steepness of slope

- Factor X: drainage class, landform, erosion class, flooding and ponding frequency and duration, soil pH, soluble salt content as measured by electrical conductivity, and sodium adsorption ratio

Revised Storie Index numerical ratings have been combined into six classes as follows:

- Grade 1: Excellent (81 to 100)

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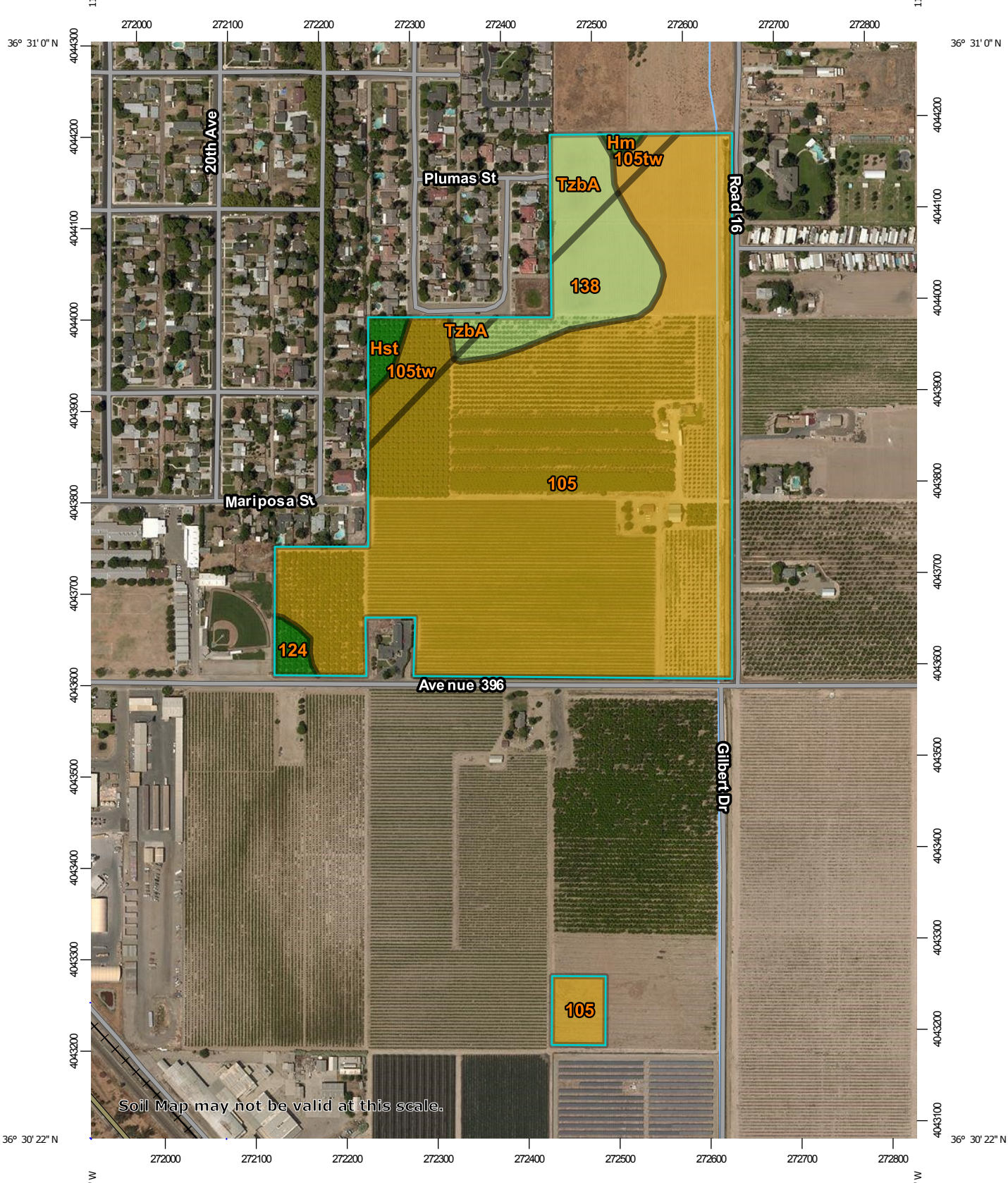

Map Scale: 1:5,850 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 250 500 1000 1500

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

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- Streams and Canals

Transportation
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- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Survey Area Data: Version 10, Oct 4, 2017

Soil Survey Area: Tulare County, Western Part, California
Survey Area Data: Version 11, Sep 8, 2017

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

MAP LEGEND

MAP INFORMATION

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Table—California Revised Storie Index (CA)

Map unit symbol	Map unit name	Rating	Component name (percent)	Acres in AOI	Percent of AOI
105tw	Calgro-Calgro, saline-Sodic complex, 0 to 2 percent slopes	Grade 4 - Poor	Calgro (60%)	2.0	3.8%
Hm	Hanford fine sandy loam	Grade 1 - Excellent	Hanford (85%)	0.2	0.3%
Hst	Hesperia fine sandy loam moderately deep	Grade 1 - Excellent	Hesperia (85%)	0.6	1.2%
TzbA	Tujunga loamy sand, 0 to 3 percent slopes	Grade 2 - Good	Tujunga (85%)	2.0	3.9%
Subtotals for Soil Survey Area				**4.9**	**9.2%**
Totals for Area of Interest				**52.8**	**100.0%**

Map unit symbol	Map unit name	Rating	Component name (percent)	Acres in AOI	Percent of AOI
105	Calgro-Calgro, saline-Sodic, complex, 0 to 2 percent slopes	Grade 4 - Poor	Calgro (60%)	43.6	82.5%
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Subtotals for Soil Survey Area				**48.0**	**90.8%**
Totals for Area of Interest				**52.8**	**100.0%**

Rating Options—California Revised Storie Index (CA)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

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Attachment B - Steve Hash Farms Development

LESA Worksheet (cont.)

NOTES

Final LESA Score Sheet

Calculation of the Final LESA Score:

(1) Multiply each factor score by the factor weight to determine the weighted score and enter in Weighted Factor Scores column.
(2) Sum the weighted factor scores for the LE factors to determine the total LE score for the project.
(3) Sum the weighted factor scores for the SA factors to determine the total SA score for the project.
(4) Sum the total LE and SA scores to determine the Final LESA Score for the project.

	Factor Scores	Factor Weight	Weighted Factor Scores
LE Factors			
Land Capability Classification	<1> 60.2	0.25	15.05
Storie Index	<2> 3.69	0.25	0.92
LE Subtotal		***0.50***	15.97
SA Factors			
Project Size	<3> 60	0.15	9
Water Resource Availability	<4> 100	0.15	15
Surrounding Agricultural Land	<5> 50	0.15	7.5
Protected Resource Land	<6> 0	0.05	0
SA Subtotal		***0.50***	31.5
		Final LESA Score	47.47

For further information on the scoring thresholds under the California Agricultural LESA Model, consult Section 4 of the Instruction Manual.

NOTES

According to USDA Soil survey - total acreage is 52.8 acres.

Calculation of the Land Evaluation (LE) Score

Part 1. Land Capability Classification (LCC) Score:

(1) Determine the total acreage of the project.
(2) Determine the soil types within the project area and enter them in **Column A** of the **Land Evaluation Worksheet** provided on page 2-A.
(3) Calculate the total acres of each soil type and enter the amounts in **Column B**.
(4) Divide the acres of each soil type (**Column B**) by the total acreage to determine the proportion of each soil type present. Enter the proportion of each soil type in **Column C**.
(5) Determine the LCC for each soil type from the applicable Soil Survey and enter it in **Column D**.
(6) From the LCC Scoring Table below, determine the point rating corresponding to the LCC for each soil type and enter it in **Column E**.

LCC Scoring Table

LCC Class	I	IIe	IIs,w	IIIe	IIIs,w	IVe	IVs,w	V	VIe,s,w	VIIe,s,w	VIII
Points	100	90	80	70	60	50	40	30	20	10	0

(7) Multiply the proportion of each soil type (**Column C**) by the point score (**Column E**) and enter the resulting scores in **Column F**.
(8) Sum the LCC scores in **Column F**.
(9) Enter the LCC score in box <1> of the **Final LESA Score Sheet** on page 10-A.

Part 2. Storie Index Score:

(1) Determine the Storie Index rating for each soil type and enter it in **Column G**.
(2) Multiply the proportion of each soil type (**Column C**) by the Storie Index rating (**Column G**) and enter the scores in **Column H**.
(3) Sum the Storie Index scores in **Column H** to gain the Storie Index Score.
(4) Enter the Storie Index Score in box <2> of the **Final LESA Score Sheet** on page 10-A.

Land Evaluation Worksheet

Land Capability Classification (LCC) and Storie Index Scores

A	B	C	D	E	F	G	H
Soil Map Unit	Project Acres	Proportion of Project Area	LCC	LCC Rating	LCC Score	Storie Index	Storie Index Score
105 tw/ 105	45.6	0.86	III	60	51.6	4	3.44
138	3.8	0.07	III	60	4.2	2	0.14
TzbA	2.0	0.04	IV	40	1.6	2	0.08
Hm/ 124	0.8	0.02	I	100	2	1	0.02
Hst	0.6	0.01	II	80	0.8	1	0.01
Totals	1.0	(Must Sum to 1.0)		***LCC Total Score***	60.2	***Storie Index Total Score***	3.69

Site Assessment Worksheet 1.

Project Size Score

	I	J	K
	LCC Class I - II	LCC Class III	LCC Class IV - VIII
		45.6	
		3.8	
			2.0
	0.8		
	0.6		
Total Acres	1.4	49.4	2.0
Project Size Scores	0	60	0

Highest Project Size Score 60

Updated 2011

NOTES

Calculation of the Site Assessment (SA) Score

Part 1. Project Size Score:.

(1) Using **Site Assessment Worksheet 1** provided on page 2-A, enter the acreage of each soil type from **Column B** in the **Column - I, J or K** - that corresponds to the LCC for that soil. (Note: While the Project Size Score is a component of the Site Assessment calculations, the score sheet is an extension of data collected in the Land Evaluation Worksheet, and is therefore displayed beside it).
(2) Sum **Column I** to determine the total amount of class I and II soils on the project site.
(3) Sum **Column J** to determine the total amount of class III soils on the project site.
(4) Sum **Column K** to determine the total amount of class IV and lower soils on the project site.
(5) Compare the total score for each LCC group in the Project Size Scoring Table below and determine which group receives the highest score.

Project Size Scoring Table

Class I or II		Class III		Class IV or Lower	
Acreage	Points	Acreage	Points	Acreage	Points
>80	100	>160	100	>320	100
60-79	90	120-159	90	240-319	80
40-59	80	80-119	80	160-239	60
20-39	50	60-79	70	100-159	40
10-19	30	40-59	60	40-99	20
10<	0	20-39	30	40<	0
		10-19	10		
		10<	0		

(6) Enter the **Project Size Score** (the highest score from the three LCC categories) in box <3> of the **Final LESA Score Sheet** on page 10-A.

LESA Worksheet (cont.)

NOTES

Part 2. Water Resource Availability Score:

(1) Determine the type(s) of irrigation present on the project site, including a determination of whether there is dryland agricultural activity as well.

(2) Divide the site into portions according to the type or types of irrigation or dryland cropping that is available in each portion. Enter this information in **Column B** of **Site Assessment Worksheet 2. - Water Resources Availability**.

(3) Determine the proportion of the total site represented for each portion identified, and enter this information in **Column C**.

(4) Using the Water Resources Availability Scoring Table, identify the option that is most applicable for each portion, based upon the feasibility of irrigation in drought and non-drought years, and whether physical or economic restrictions are likely to exist. Enter the applicable Water Resource Availability Score into **Column D**.

(5) Multiply the Water Resource Availability Score for each portion by the proportion of the project area it represents to determine the weighted score for each portion in **Column E**.

(6) Sum the scores for all portions to determine the project's total Water Resources Availability Score

(7) Enter the Water Resource Availability Score in box <4> of the **Final LESA Score Sheet** on page 10-A.

Site Assessment Worksheet 2. - Water Resources Availability

A	B	C	D	E
Project Portion	Water Source	Proportion of Project Area	Water Availability Score	Weighted Availability Score (C x D)
1	well	1	100	100
2				
3				
4				
5				
6				
		(Must Sum to 1.0)	***Total Water Resource Score***	100

Water Resource Availability Scoring Table

Option	Non-Drought Years			Drought Years			WATER RESOURCE SCORE
	RESTRICTIONS			RESTRICTIONS			
	Irrigated Production Feasible?	Physical Restrictions ?	Economic Restrictions ?	Irrigated Production Feasible?	Physical Restrictions ?	Economic Restrictions ?	
1	YES	NO	NO	YES	NO	NO	100
2	YES	NO	NO	YES	NO	YES	95
3	YES	NO	YES	YES	NO	YES	90
4	YES	NO	NO	YES	YES	NO	85
5	YES	NO	NO	YES	YES	YES	80
6	YES	YES	NO	YES	YES	NO	75
7	YES	YES	YES	YES	YES	YES	65
8	YES	NO	NO	NO	--	--	50
9	YES	NO	YES	NO	--	--	45
10	YES	YES	NO	NO	--	--	35
11	YES	YES	YES	NO	--	--	30
12	Irrigated production not feasible, but rainfall adequate for dryland production in both drought and non-drought years						25
13	Irrigated production not feasible, but rainfall adequate for dryland production in non-drought years (but not in drought years)						20
14	Neither irrigated nor dryland production feasible						0

NOTES

Part 3. Surrounding Agricultural Land Use Score:

(1) Calculate the project's Zone of Influence (ZOI) as follows:

(a) a rectangle is drawn around the project such that the rectangle is the smallest that can completely encompass the project area.

(b) a second rectangle is then drawn which extends one quarter mile on all sides beyond the first rectangle.

(c) The ZOI includes all parcels that are contained within or are intersected by the second rectangle, less the area of the project itself.

(2) Sum the area of all parcels to determine the total acreage of the ZOI.

(3) Determine which parcels are in agricultural use and sum the areas of these parcels

(4) Divide the area in agriculture found in step (3) by the total area of the ZOI found in step (2) to determine the percent of the ZOI that is in agricultural use.

(5) Determine the Surrounding Agricultural Land Score utilizing the Surrounding Agricultural Land Scoring Table below.

Surrounding Agricultural Land Scoring Table

Percent of ZOI in Agriculture	Surrounding Agricultural Land Score
90-100	100
80-89	95
70-79	90
65-69	85
60-64	80
55-59	70
50-54	60
45-49	50
40-44	40
35-39	30
30-34	20
20-29	10
<19	0

(5) Enter the Surrounding Agricultural Land Score in box <5> of the **Final LESA Score Sheet** on page 10-A.

Site Assessment Worksheet 3.
Surrounding Agricultural Land and Surrounding Protected Resource Land

A	B	C	D	E	F	G
Zone of Influence						
Total Acres	Acres in Agriculture	Acres of Protected Resource Land	Percent in Agriculture (A/B)	Percent Protected Resource Land (A/C)	Surrounding Agricultural Land Score (From Table)	Surrounding Protected Resource Land Score (From Table)
523.62	319.91	66.13	61%	13%	50	0

NOTES

Part 4. Protected Resource Lands Score:

The Protected Resource Lands scoring relies upon the same Zone of Influence information gathered in Part 3, and figures are entered in Site Assessment Worksheet 3, which combines the surrounding agricultural and protected lands calculations.

(1) Use the total area of the ZOI calculated in Part 3. for the Surrounding Agricultural Land Use score.
(2) Sum the area of those parcels within the ZOI that are protected resource lands, as defined in the California Agricultural LESA Guidelines.
(3) Divide the area that is determined to be protected in Step (2) by the total acreage of the ZOI to determine the percentage of the surrounding area that is under resource protection.
(4) Determine the Surrounding Protected Resource Land Score utilizing the Surrounding Protected Resource Land Scoring Table below.

Surrounding Protected Resource Land Scoring Table

Percent of ZOI Protected	Protected Resource Land Score
90-100	100
80-89	95
70-79	90
65-69	85
60-64	80
55-59	70
50-54	60
45-49	50
40-44	40
35-39	30
30-34	20
20-29	10
<20	0

(5) Enter the Protected Resource Land score in box <6> of the **Final LESA Score Sheet** on page 10-A.

APPENDIX G

NOTICE OF PREPARATION, SCOPING MEETING, AND AGENCY COMMENT LETTERS RECEIVED

NOTICE OF PREPARATION

To:	State Clearinghouse PO Box 3044/ 1400 Tenth St Sacramento CA 95814	From:	County of Tulare – RMA 5961 S Mooney Blvd Visalia CA 93277

Date: September 7, 2016

Subject: **Notice of Preparation (NOP) of a Draft Environmental Impact Report**

Project Title: Hash Farms Development Project

Project Applicant: Steve Hash Farms

Project Location: The project is located at the northwest corner of Kern Street and Rd 16, in both Tulare and Fresno Counties. The entire 54-acre site is within the Selma USGS 7.5 minute quadrangle and is on Tulare County APNs 028-140-007, 012, 013, 018 and 022, and Fresno County APNs 396-020-008 and 014. The site is within the NE ¼ portion of Section 26, Township 16 South, Range 22 East M.D.B. &M.

Tulare County Resource Management Agency (RMA) will be the Lead Agency and will prepare an environmental impact report of the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached materials. The NOP is available on the County website at:
http://tularecounty.ca.gov//rma/index.cfm/documents-and-forms/planning-documents/environmental-planning/environmental-impact-reports/

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

A scoping meeting is scheduled for **Thursday, September 15, 2016 at 1:30 p.m.** in the Main Conference Room of the Tulare County Resource Management Agency at the address shown above.

Please direct your response to Hector Guerra, Chief Environmental Planner at the address shown above. He may be contacted by e-mail at hguerra@co.tulare.ca.us or by telephone at 559-624-7121.

Please provide us with the name of a contact person in your agency.

Signature _____ Date: 9/6/16
Hector Guerra
Title: Chief Environmental Planner

Signature _____ Date: 9/6/16
Benjamin Ruiz Jr.
Title: Resource Management Agency Director/Environmental Assessment Officer

Reference: California Code of Regulations, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375

PROJECT LOCATION AND SETTING

The proposed Project will be located at the northwest corner of Road 16 and Avenue 396, partially within the City of Kingsburg, Fresno County and Tulare County. The site is approximately one-half mile east of State Route 99 and approximately one-tenth of a mile south of State Route 201. The 54-acre site is located on Tulare County APNs 028-140-007, 012, 013, 018 and 022, and Fresno County APNs 396-020-008 and 014. The site is currently zoned A in Tulare County and R-1-6 in the City of Kingsburg and is within the Selma 7.5 Minute USGS Quadrangle. The proposed Project site lies within a portion of the NE ¼ of Section 26, Township 16S, Range 22E, M.D.B.&E.

The area surrounding the proposed Project site consists largely of rural agricultural land and homesteads, an elementary school and associated recreational park, and residential units within the City of Kingsburg.

PROJECT DESCRIPTION:

In accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing an Draft Environmental Impact Report (EIR) to evaluate the environmental effects associated with the residential development (Project).

The Applicant is proposing a change of zone from A-1 to R-1/R-2/R-3 to allow a 192-lot residential subdivision. The proposal for the site consists of the phased construction of 185 single family residential units and seven multi-family lots. The phasing breakdown is as follows:

- Phase 1 – 59 lots
- Phase 2 – 35 lots
- Phase 3 – 48 lots
- Phase 4 – 43 lots
- Phase 5 – Seven multi-family lots (up to 28 units)

Also proposed in the development is approximately two acres of open space/parks and two acres of bioswales/ponds. Pacific Gas and Electric will supply electricity, Southern California Gas will provide natural gas, the City of Kingsburg will provide water service and the Selma-Kingsburg-Fowler County Sanitation District will provide sewer service.

To accommodate the proposed development, the following actions will need to occur:

- Annexation of approximately two acres from Fresno County to the City of Kingsburg
- Annexation of approximately 49 acres of land in Tulare County into the Selma-Kingsburg-Fowler County Sanitation District
- Formation of a Community Facilities District and a Tulare County Service Area
- Tulare County approval of a Tentative Map
- Tulare County approval of a Special Use Permit or a Specific Plan
- City of Kingsburg approval of a Master Plan
- City of Kingsburg approval of a Tentative Map
- Detachment from Consolidated Irrigation District

If you require additional information related to this notice, please contact:

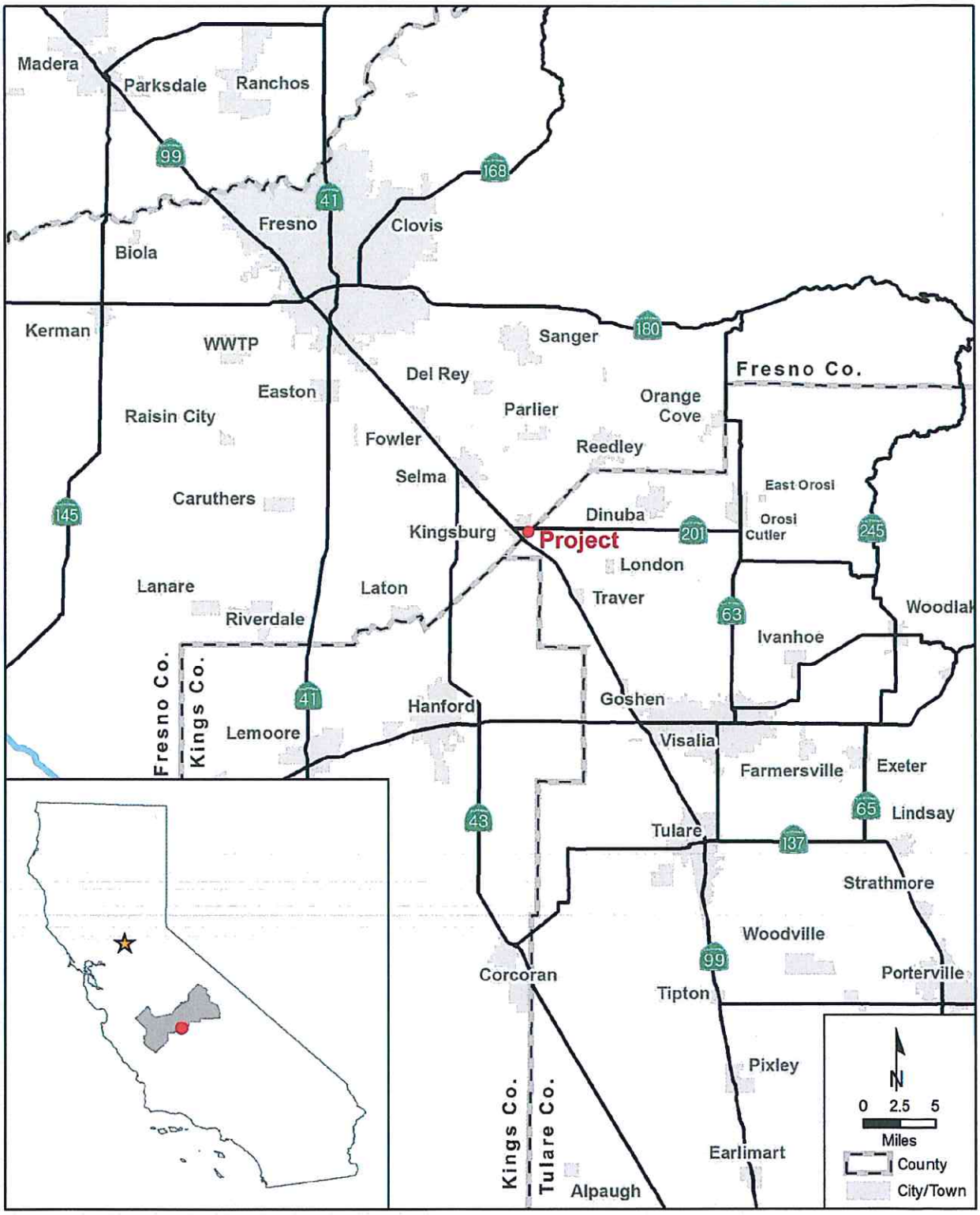
Hector Guerra, Chief Environmental Planner
hguerra@co.tulare.ca.us or at (559) 624-7121

Potential Approvals Required:

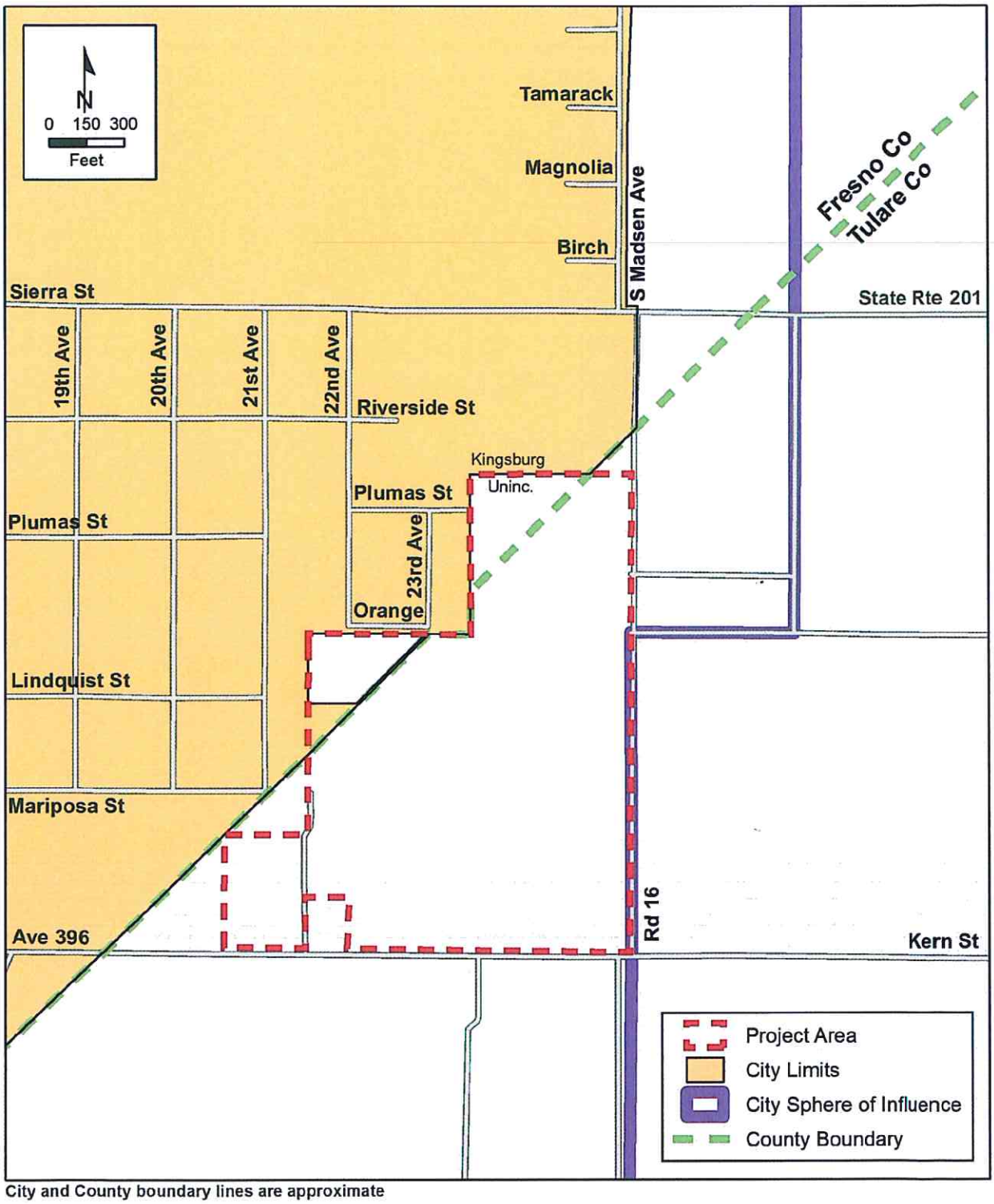
The following agencies may have jurisdiction over elements of the proposed Project:

County of Tulare Resource Management Agencies (Planning Branch, Public Works)
Fresno County Public Works and Planning Department, Development Services Division
City of Kingsburg
Fresno County Local Agency Formation Commission
County of Tulare Health and Human Services Agency
California Department of Fish and Wildlife
California Department of Transportation
Regional Water Quality Control Board
Tulare County Local Agency Formation Commission
San Joaquin Valley Unified Air Pollution Control District
U.S. Fish and Wildlife Service
U.S. Army Corps of Engineers

Regional Vicinity Map for Hash Farms Development Project

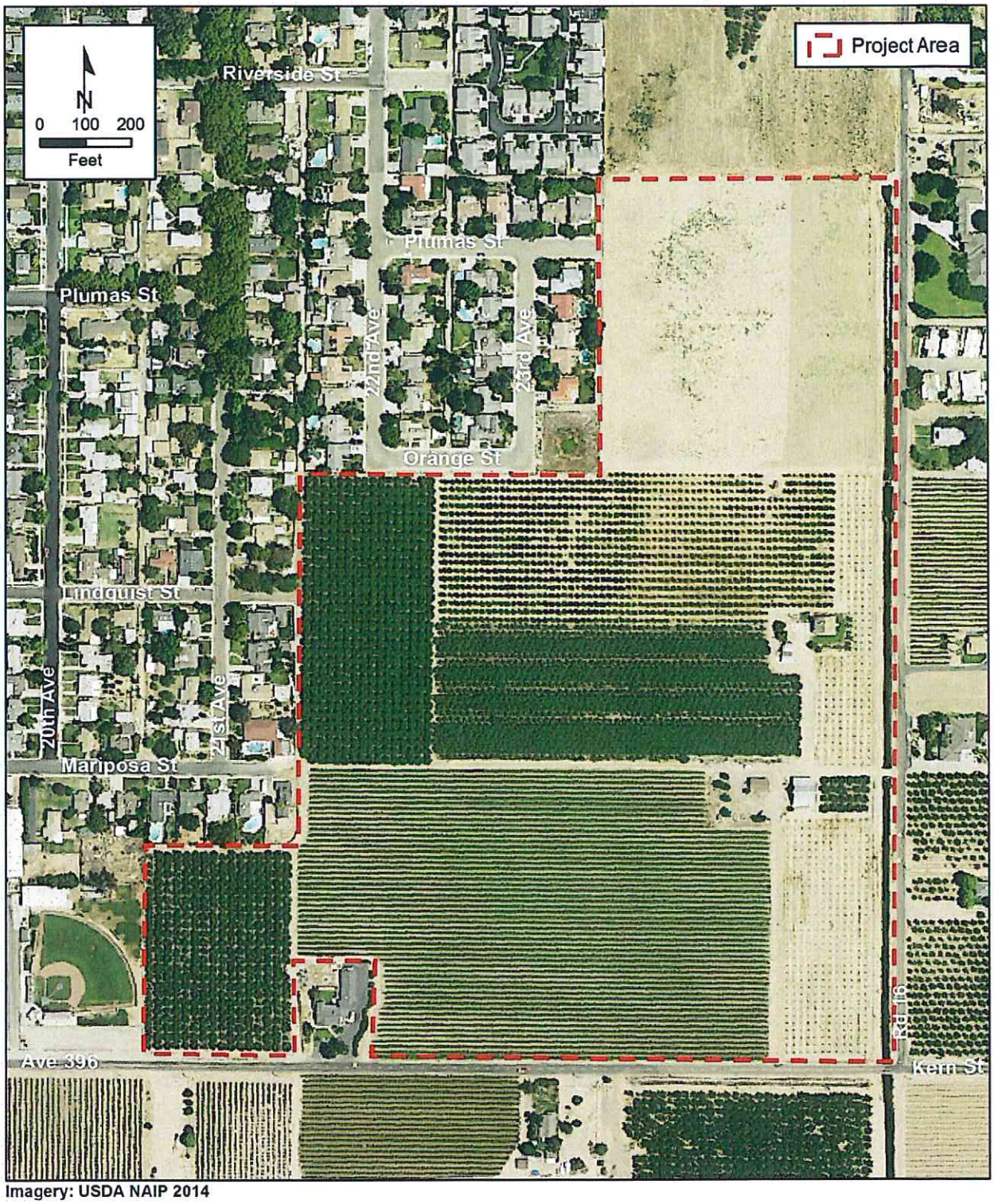


City-County Boundaries for Hash Farms Development Project



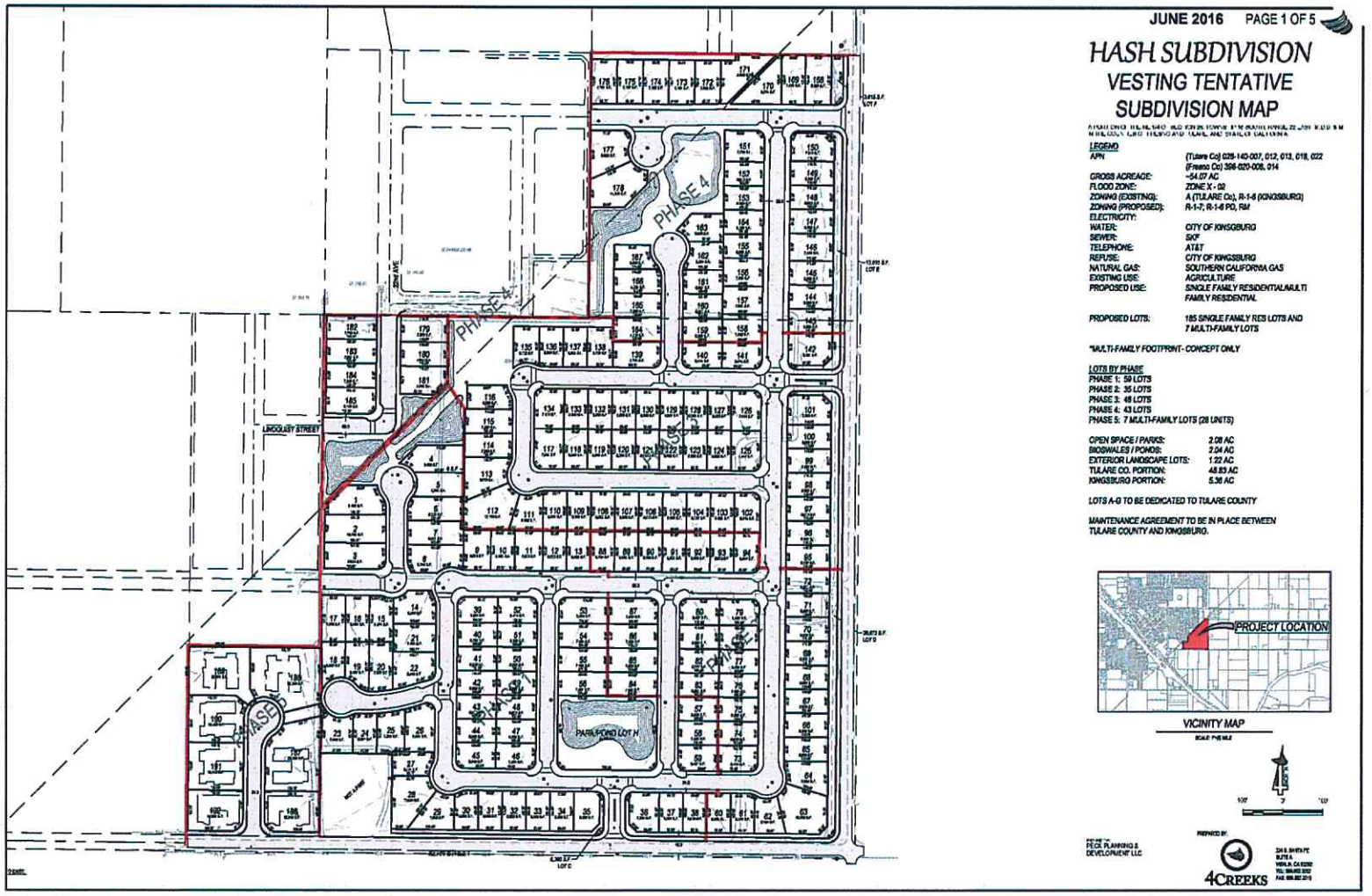
City and County boundary lines are approximate

Site Aerial for Hash Farms Development Project



Imagery: USDA NAIP 2014

Proposed Site Layout for Hash Farms Development



POTENTIAL ENVIRONMENTAL EFFECTS

The EIR will evaluate, among other things, the probable direct and cumulative environmental impacts associated with construction and operation of the Hash Farms Development Project. Mitigation measures will be recommended, where feasible, to mitigate potentially significant impacts. The following issues are proposed for analysis in the EIR:

Environmental Factors Potentially Affected:

☒ Aesthetics	☒ Agriculture and Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Geology/Soils
☒ Greenhouse Gases	☒ Hazards & Hazardous Materials	☒ Hydrology/Water Quality
☒ Land Use/Planning	☒ Mineral Resources	☒ Noise
☒ Population/Housing	☒ Public Services	☒ Recreation
☒ Transportation/Traffic	☒ Utilities / Service Systems	☒ Mandatory Findings of Significance

Aesthetic/ Visual Resources

The County portions of the proposed Project site can be characterized as agricultural land with scattered rural residences. Surrounding agricultural lands consist of stone fruit orchards, row crops and other farmed lands. The Cole Slough canal borders the site to the east. The EIR will provide an assessment of Project impacts to visual resources, as well as lighting and glare impacts. To address such impacts, a detailed landscaping plan will be part of the Draft EIR.

Agriculture Resources

Approximately 49 acres of the proposed Project site are within the City of Kingsburg Sphere of Influence, Tulare County's Kingsburg Urban Development Boundary, and is zoned AE (Exclusive Agriculture) by Tulare County. Approximately two acres is within Fresno County and will be annexed into the City of Kingsburg. The remaining approximate three acres is within the City of Kingsburg and is zoned R-1-6.

The proposed Project site is mapped as containing 2.5 acres of Farmland of Local Importance, 0.5 acres of Prime Farmland, 46 acres of Farmland of Statewide Importance, and the remaining three acres is urban and built-up land by the California Department of Conservation Farmland Mapping and Monitoring Program; however, it is not enrolled in a Williamson Act Contract. The site is actively farmed with stone fruit and grapes. The site is adjacent to urban and built up land to the north and west and actively farmed Farmland of Statewide Importance to the east and south.

The EIR will provide an assessment of potential Project impacts to agricultural resources, including a Land Evaluation and Site Assessment developed by the California Department of Conservation, to determine any potential impacts resulting from agricultural land conversion.

Air Quality/Greenhouse Gas Emissions

The EIR will describe regional and local air quality in the vicinity of the proposed Project site and evaluate impacts to air quality associated with Project construction and operation. An air quality study will be prepared to establish baseline, project, and cumulative impacts. The proposed Project's estimated air emissions will be compared to emissions thresholds of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The EIR will describe existing air quality conditions within the San Joaquin Valley Air Basin and will evaluate the proposed Project's potential air quality impacts. Potential air quality emissions impacts include odor, dust, pathogens, and construction related activities. The EIR will also include a discussion of greenhouse gas emissions and the proposed Project's contribution to potential cumulative impacts on global climate.

Biological Resources

The proposed Project site has been and remains actively disturbed as a result from intense agricultural activity. The proposed Project site is surrounded on two sides by agricultural land which may provide foraging ground for sensitive animal species. A biological reconnaissance of the proposed Project site will be conducted and the proposed Project's potential to affect biological resources will be analyzed in the EIR.

Cultural Resources

There are no visibly identifiable or recognizable cultural resources within the proposed Project site. Although the proposed Project will be constructed on previously disturbed, agriculturally productive areas, it cannot be definitively concluded that cultural resources are absent. As such, a search of the Southern San Joaquin Valley Information Center California Historical Resources Information System will be conducted. The Native American Heritage Commission will be consulted to identify potential areas of traditional cultural significance. As such, the proposed Project's potential to affect cultural resources will be analyzed in the EIR.

Geology, Soils, and Mineral Resources,

Initial construction, buildout, and operation of the proposed Project on the project site could result in impacts related to geotechnical hazards, including seismicity of the area, potential for liquefaction and subsidence, potential for soil erosion, soil stability characteristics, and shrink/swell potential of site soils, as applicable. According to the USDA Natural Resources Conservation Service Soil Resource Reports for Western Tulare County and Eastern Fresno Area, the site contains Calgro-Calgro, Tujunga loamy sand, Hanford sandy loam and Hesperia fine sandy loam, which are well drained soils. According to the Tulare County General Plan 2030 Update EIR, there are no known potential mineral resources. It is currently unknown

whether the proposed Project site soils have the potential to contain paleontological resources. If such resources exist on the site, construction, expansion, and continued operational activities could result in potentially significant impacts. The EIR for the proposed Project will evaluate potential site-specific impacts related to geology, soils, mineral resources, and paleontological resources.

Hazards and Hazardous Materials

There are no known hazards or hazardous materials located within the proposed Project site, nor is the proposed Project site located on a Cortese List site. The EIR will evaluate the potential for the proposed Project to result in, or be affected by, impacts associated with hazards and hazardous materials.

Hydrology, Water Quality, and Water Supply

The Tulare County General Plan 2030 Update DEIR, Figure 3.6-5 indicates that the proposed Project area is outside of the 100-Year and 500-Year Flood Zones and but is located within the Dam Failure Inundation Area of Pineflat Dam. The proposed Project is within the Kings River Watershed and over the Kings River groundwater basin. Water for the proposed Project will be supplied through the City of Kingsburg, which has an existing main line located at the southwest corner of the site. The EIR will describe the proposed Project's effect, both directly and cumulatively on the hydrology, water quality, and water supply resources. A water supply/quality study will be prepared to establish baseline, project, and cumulative impacts.

Land Use and Planning

The EIR will describe the proposed Project's potential effects on existing and planned land uses. The proposed Project lies within the jurisdiction of the County of Tulare, the County of Fresno and the City of Kingsburg. Approximately 49 acres of the proposed Project site lie within Tulare County and according to Tulare County's General Plan, the subject property is currently designated "Agriculture", within the County's City of Kingsburg Urban Area Boundary and within the City of Kingsburg's Sphere of Influence. Approximately two acres is within Fresno County and will be annexed into the City of Kingsburg as a part of the Project. The approximate three-acre portion of the proposed Project site within the City of Kingsburg is zoned R-1-6 and is an allowable use within that Zone District. As a part of the proposed Project, the Agriculture Zone designation in Tulare County would be changed from A to R-1 (single family residential zone) and R-2/R-3 (multiple-family zone).

The EIR will provide a discussion of relevant local plans and policies because conflicts could potentially result in environmental impacts.

Noise

The EIR will describe the noise levels associated with proposed Project construction and operation and will compare these levels to applicable noise thresholds to determine whether the proposed Project would result in a significant noise impact.

Population and Housing

The EIR will evaluate the Project's effect on population and housing in the local area based on estimations of Project employment and distribution of the employees by place of residence.

Public Services and Recreation

The EIR will evaluate the proposed Project's potential to create an adverse impact to schools, and will also evaluate effects on local police and fire services along with parks and regional recreational facilities.

Transportation/Traffic

The EIR will evaluate the proposed Project's impact on regional and local transportation facilities based on a transportation analysis that will assess both construction-related impacts (heavy truck trips and construction worker trips), as well as operational impacts (residential trips). The proposed Project will have two points of entrance and exit on Road 16, and one point of entrance and exit on Kern Street, Plumas Street, Lindquist Street, and Mariposa Street. Road 16 is a County-designated Major Collector street and the Tulare County General Plan 2030 Update DEIR considers LOS D as the minimum acceptable LOS standard during peak hours for major roadways and intersections. A traffic study will be prepared to establish baseline, project, and cumulative impacts for the proposed Project in consultation with the City of Kingsburg, County of Tulare, the Tulare County Association of Governments, and CalTrans. Similarly, the Draft EIR will examine alternative traffic distribution.

Utilities

The proposed Project site is currently a mixture of orchards, vineyards and fallow land. To accommodate the residential units associated with the proposed Project, electricity would be provided by Southern California Edison, Southern California Gas Company would provide gas, and the City of Kingsburg would provide water. Wastewater services would be provided by the Selma-Kingsburg-Fowler County Sanitation District and maintenance of the shared greenspace would be accommodated through a maintenance agreement between the City of Kingsburg and Tulare County. The EIR will analyze the current capacity of the above-mentioned services and the proposed Project's impact on these systems and the capacity available to support the proposed Project. The EIR will also describe the solid waste facilities that would serve the proposed site.

The applicant would be required to construct infrastructure to urban development standards set forth by both Tulare County and the City of Kingsburg, including the construction of appropriate road improvements to Road 16 and Avenue 396 to the extent that an appropriate nexus to the proposed Project is determined. The EIR prepared for the Project will analyze the adequacy of infrastructure services for the Project including road, water and wastewater services, and if appropriate, may require mitigation measures.

Growth Inducement

The EIR will evaluate the proposed Project's potential for growth inducement resulting from expansion or extension of infrastructure improvements, as well as new demand for housing, and goods and services. The effect of primary and secondary increases in employment and economic activity will be discussed.

Cumulative Impacts

The EIR will discuss the incremental contribution of the proposed Project to cumulative effects of other past, current, and planned and reasonably foreseeable Projects in the vicinity. The summary of projects method will be used where applicable. Also, to the extent feasible, the Cumulative Impacts section will quantify the degree of severity of any cumulative impact.

ALTERNATIVES EVALUATED IN THE EIR

In accordance with the CEQA Guidelines Section 15126.6, the EIR will describe a reasonable range of alternatives to the proposed Project that are capable of meeting most of the proposed Project's objectives, but would avoid or substantially lessen any of the significant effects of the proposed Project. The EIR will also identify any alternatives that were considered but rejected by the Lead Agency as infeasible and briefly explain the reasons why. The EIR will also provide an analysis of the No Project Alternative.

OPPORTUNITY FOR PUBLIC COMMENT

Interested individuals, groups, and agencies may provide to the County of Tulare Resource Management Agency, Planning Branch, written comments on topics to be addressed in the EIR for the proposed Project. Because of time limits mandated by state law, comments should be provided no later than ***5:00 p.m. October 3, 2016***. Agencies that will need to use the EIR when considering permits or other approvals for the proposed Project should provide the name of a staff contact person. Please send all comments to:

Hector Guerra, Chief Environmental Planner
Tulare County Resource Management Agency
Planning Branch
5961 South Mooney Boulevard
Visalia, CA 93277-9394
or via e-mail at: HGuerra@co.tulare.ca.us
or via facsimile: 559-730-2653
or via phone: 559-624-7121

NOTICE OF PREPARATION AND NOTICE OF SCOPING MEETING FOR AN ENVIRONMENTAL IMPACT REPORT

NOTICE IS HEREBY GIVEN of Tulare County's intent to prepare an Environmental Impact Report (EIR). A public scoping meeting will be held on Thursday, September 15, 2016, at 1:30 PM, to receive oral comments concerning the scope of this EIR in the Main Conference Room of the Resource Management Agency at 5961 South Mooney Blvd., Visalia, California 93277-9394.

1. **PROJECT**: Hash Farms Development Project
2. **APPLICANT/AGENT:** Hash Farms / Steve Peck
3. **PROJECT LOCATION:** The project is located at the northwest corner of Kern Street and Rd 16, in both Tulare and Fresno Counties. The entire 54-acre site is within the Selma USGS 7.5 minute quadrangle and is on Tulare County APNs 028-140-007, 012, 013, 018 and 022, and Fresno County APNs 396-020-008 and 014. The site is within the NE ¼ portion of Section 26, Township 16 South, Range 22 East M.D.B. &M.
4. **PROJECT DESCRIPTION:** The Applicant is proposing a change of zone from A-1 to R-1/R-2/R-3 to allow a 192-lot residential subdivision. The proposal for the site consists of the phased construction of 185 single family residential units and seven multi-family lots. The phasing breakdown is as follows: Phase 1 – 59 lots; Phase 2 – 35 lots; Phase 3 – 48 lots; Phase 4 – 43 lots; and Phase 5 – Seven multi-family lots (up to 28 units). Also proposed in the development is approximately two acres of open space/parks and two acres of bioswales/ponds. Pacific Gas and Electric will supply electricity, Southern California Gas will provide natural gas, the City of Kingsburg will provide water service and the Selma-Kingsburg-Fowler County Sanitation District will provide sewer service. To accommodate the proposed development, the following actions will need to occur: Annexation of approximately two acres from Fresno County to the City of Kingsburg; Annexation of approximately 49 acres of land in Tulare County into the Selma-Kingsburg-Fowler County Sanitation District; Formation of a Community Facilities District and a Tulare County Service Area; Tulare County approval of a Tentative Map; Tulare County approval of a Special Use Permit or a Specific Plan; City of Kingsburg approval of a Master Plan; City of Kingsburg approval of a Tentative Map; Consolidated Irrigation District Detachment.
5. **ENVIRONMENTAL DOCUMENT:** Environmental Impact Report. The NOP is available on the County website at:http://tularecounty.ca.gov//rma/index.cfm/documents-and-forms/planning-documents/environmental-planning/environmental-impact-reports/
6. **NOTICE OF PREPARATION COMMENT PERIOD:** September 7, 2016 – October 7, 2016 at 5:00 p.m.

All interested parties are invited to attend and be heard. Please call Hector Guerra, Chief Environmental Planner, at (559) 624-7121, if you have any questions regarding this environmental document. If you challenge the decision on any of the foregoing matters in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the Tulare County Resource Management Agency, Economic Development and Planning Branch within the review period described herein. In compliance with the American Disabilities Act, if you need special assistance to participate in meetings call (559) 624-7000 48-hours in advance of the meeting.

Benjamin Ruiz, Jr, SE, PE, ENVIRONMENTAL ASSESSMENT OFFICER

Hash Farms Development Project
Scoping Meeting
Thursday, September 15, 2016

Name	Agency/Organization	Mailing Address	Phone Number	E-mail
Other than RMA staff, no one attended the meeting.				

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

Notice of Preparation

September 7, 2016

Tulare County
Resource Management
Agency
Tulare County
Resource Management
Agency
SEP 12 2016

To: Reviewing Agencies

Re: Hash Farms Development Project
SCH# 2016091017

Attached for your review and comment is the Notice of Preparation (NOP) for the Hash Farms Development Project draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Hector Guerra
Tulare County
5961 South Mooney Boulevard
Visalia, CA 93277-9394

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH#	2016091017
Project Title	Hash Farms Development Project
Lead Agency	Tulare County

Type NOP Notice of Preparation

Description

In accordance with the CEQA (Pub. Resources Code, §21000 et seq.), the County of Tulare Resource Management Agency (RMA) will be preparing an DEIR to evaluate the environmental effects associated with the residential development (Project).

The Applicant is proposing a change of zone form A-1 to R-1/R-2/R-3 to allow a 192 lot residential subdivision. The proposal for the site consists of the phased construction of 15 single family residential units and seven multi-family lots. The phasing breakdown is as follows:

Phase 1 - 59 lots
Phase 2 - 35 lots
Phase 3 - 48 lots
Phase 4 - 43 lots
Phase 5 - Seven multi-family lots (up to 28 units)

Also proposed in the development is approx. 2 acres of open space/parks and two acres of bioswales/ponds. PG&E will supply electricity, Southern CA Gas will provide natural gas, the City of Kingsburg will provide water service and the Selma-Kingsburg-Fowler County Sanitation District will provide sewer service.

To accommodate the proposed development, the following actions will need to occur:

Annexation of approx. 2 acres from Fresno County to the City of Kingsburg
Annexation of approx. 49 acres of land in Tulare County into the Selma-Kingsburg-Fowler County Sanitation District
Formation of a Community Facilities District and a Tulare County Service Area
Tulare County approval of a Tentative Map
Tulare County approval of a Special Use Permit or a Specific Plan
City of Kingsburg approval of a Master Plan
City of Kingsburg approval of a Tentative Map
Detachment form Consolidated Irrigation District

Document Details Report
State Clearinghouse Data Base

Lead Agency Contact

Name	Hector Guerra
Agency	Tulare County
Phone	559-624-7121 *Fax*
email	
Address	5961 South Mooney Boulevard
City	Visalia *State* CA *Zip* 93277-9394

Project Location

County	Tulare, Fresno
City	Kingsburg
Region	
Cross Streets	Road 16 and Ave. 396
Lat / Long	36° 30' 38.56" N / 119° 32' 06.48" W
Parcel No.	028-140-007,012,013,018; 022 396-020-008 and 014
Township	16S *Range* 22E *Section* 26 *Base* MDBE

Proximity to:

Highways	SR 99
Airports	
Railways	UPRR
Waterways	Slough Canal
Schools	Lincoln ES
Land Use	The proposed Project lies within the jurisdiction of the County of Tulare and the City of Kingsburg (Fresno County). It is zoned A-1 (Agricultural) within the Kingsburg Urban Development Boundary (Tulare County) and is zoned R-1 (Residential) and zoned for Agriculture in the Fresno County portion of the project. The General Plans designations is Agricultural for both the Tulare county and Fresno County portions.

Project Issues	Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Wildlife; Growth Inducing; Landuse; Cumulative Effects
Reviewing Agencies	Resources Agency; Cal Fire; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Wildlife, Region 4; Department of Housing and Community Development; Native American Heritage Commission; Public Utilities Commission; California Highway Patrol; Caltrans, District 6; Regional Water Quality Control Bd., Region 5 (Fresno)

Date Received 09/07/2016 *Start of Review* 09/07/2016 *End of Review* 10/06/2016

2016091017

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613

For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Hash Farms Development Project

Lead Agency: Tulare County Resource Management Agency

Contact Person: Hector Guerra, Chief Env. Planner

Mailing Address: 5961 S. Mooney Blvd.

Phone: 559-624-7121

City: Visalia Zip: 93277-9394

County: Tulare County

Project Location: County: Tulare / Fresno

City/Nearest Community: Kingsburg

Cross Streets: Road 16 and Avenue 396

Zip Code: 93257

Lat./Long: 36 ° 30'38.56"N/119 ° 32'06.48"W

Total Acres: 54

Assessor's Parcel No: Tulare County APNs 028-140-007, 012, 013, 018; 022 and Fresno County APNs 396-020-008 and 014

Section: 26 Township 16 S , Range 22E, M.D.B.& E

Within 2 Miles: State Hwy: SR 99

Waterways: Slough Canal

Airports:

Railways: UPRR

School: Lincoln Elementary

Governor's Office of Planning & Research

SEP 07 2016

STATE CLEARINGHOUSE

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR ☐ Draft EIS Other:

NEPA: ☐ NOI ☐ EA ☐ Other ☐ FONSI

Other: ☐ Joint Document ☐ Final Document

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan

☒ Specific Plan ☐ Master Plan ☐ Planned Unit Dev. ☐ Site Plan

☒ Rezone ☐ Prezone ☐ Use Permit ☒ Land Division (Sub.)

☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☐ Other

Development Type:

☒ Residential: Units 213 Acres 54

☐ Office: Sq. ft. Acres Employees

☐ Commercial: Sq. ft. Acres Employees

☐ Industrial: Sq. ft. Acres Employees

☐ Educational:

☐ Recreational:

☐ Water Facilities: Type MGD

☐ Transportation: Type

☐ Mining: Mineral

☐ Power: Type MW

☐ Waste Treatment: Type MGD

☐ Hazardous Waste: Type

☐ Other:

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☒ Agricultural Land
☒ Air Quality
☒ Archaeological/Historical
☒ Biological Resources
☐ Coastal Zone
☒ Drainage/Absorption
☐ Economic/Jobs
☐ Other:

☐ Fiscal
☒ Flood Plain/Flooding
☒ Forest Land/Fire Hazard
☒ Geologic/Seismic
☒ Minerals
☒ Noise
☒ Population/Housing Balance
☒ Public Services/Facilities

☒ Recreation/Parks
☒ Schools/Universities
☒ Septic Systems
☒ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☒ Solid/Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation

☒ Vegetation
☒ Water Quality
☒ Water Supply/Groundwater
☒ Wetland/Riparian
☒ Wildlife
☒ Growth Inducing
☒ Land Use
☒ Cumulative Effects

Present Land Use/Zoning/General Plan Designation:

The proposed Project lies within the jurisdiction of the County of Tulare and the City of Kingsburg (Fresno County). It is zoned A-1 (Agricultural) within the Kingsburg Urban Development Boundary (Tulare County) and is zoned R-1 (Residential) and zoned for Agriculture in the Fresno County portion of the project. The General Plans designation is Agricultural for both the Tulare County and Fresno County portions.

IOP Distribution List

County: TULARE / FRESNO CR **SCH#** 2016091017

ources Agency

Resources Agency
Nadell Gayou

- ☐ **Dept. of Boating & Waterways**
  Denise Peterson
- ☐ **California Coastal Commission**
  Elizabeth A. Fuchs
- ☐ **Colorado River Board**
  Lisa Johansen
- ☒ **Dept. of Conservation**
  Elizabeth Carpenter
- ☐ **California Energy Commission**
  Eric Knight
- ☐ **Cal Fire**
  Dan Foster
- ☐ **Central Valley Flood Protection Board**
  James Herota
- ☐ **Office of Historic Preservation**
  Ron Parsons

Dept of Parks & Recreation
Environmental Stewardship Section

- ☐ **California Department of Resources, Recycling & Recovery**
  Sue O'Leary
- ☐ **S.F. Bay Conservation & Dev't. Comm.**
  Steve Goldbeck
- ☒ **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou

Fish and Game

- ☐ **Depart. of Fish & Wildlife**
  Scott Flint
  Environmental Services Division
- ☐ **Fish & Wildlife Region 1**
  Curt Babcock
- ☐ **Fish & Wildlife Region 1E**
  Laurie Harnsberger
- ☐ **Fish & Wildlife Region 2**
  Jeff Drongesen
- ☐ **Fish & Wildlife Region 3**
  Craig Weightman
- ☒ **Fish & Wildlife Region 4**
  Julie Vance
- ☐ **Fish & Wildlife Region 5**
  Leslie Newton-Reed
  Habitat Conservation Program
- ☐ **Fish & Wildlife Region 6**
  Tiffany Ellis
  Habitat Conservation Program
- ☐ **Fish & Wildlife Region 6 I/M**
  Heidi Calvert
  Inyo/Mono, Habitat Conservation Program
- ☐ **Dept. of Fish & Wildlife M**
  William Paznokas
  Marine Region

Other Departments

- ☐ **Food & Agriculture**
  Sandra Schubert
  Dept. of Food and Agriculture
- ☐ **Depart. of General Services**
  Public School Construction
- ☐ **Dept. of General Services**
  Cathy Buck/George Carollo
  Environmental Services Section
- ☐ **Delta Stewardship Council**
  Kevan Samsam
- ☒ **Housing & Comm. Dev.**
  CEQA Coordinator
  Housing Policy Division

Independent Commissions,Boards

- ☐ **Delta Protection Commission**
  Erik Vink
- ☐ **OES (Office of Emergency Services)**
  Monique Wilber
- ■ **Native American Heritage Comm.**
  Debbie Treadway
- ☒ **Public Utilities Commission**
  Supervisor
- ☐ **Santa Monica Bay Restoration**
  Guangyu Wang
- ☐ **State Lands Commission**
  Jennifer Deleong
- ☐ **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Cal State Transportation Agency CalSTA

- ☐ **Caltrans - Division of Aeronautics**
  Philip Crimmins
- ☐ **Caltrans – Planning**
  HQ LD-IGR
  Terri Pencovic
- ■ **California Highway Patrol**
  Suzann Ikeuchi
  Office of Special Projects

Dept. of Transportation

- ☐ **Caltrans, District 1**
  Rex Jackman
- ☐ **Caltrans, District 2**
  Marcelino Gonzalez
- ☐ **Caltrans, District 3**
  Eric Federicks – South
  Susan Zanchi - North
- ☐ **Caltrans, District 4**
  Patricia Maurice
- ☐ **Caltrans, District 5**
  Larry Newland
- ☒ **Caltrans, District 6**
  Michael Navarro
- ☐ **Caltrans, District 7**
  Dianna Watson
- ☐ **Caltrans, District 8**
  Mark Roberts
- ☐ **Caltrans, District 9**
  Gayle Rosander
- ☐ **Caltrans, District 10**
  Tom Dumas
- ☐ **Caltrans, District 11**
  Jacob Armstrong
- ☐ **Caltrans, District 12**
  Maureen El Harake

Cal EPA

Air Resources Board

- ☐ Airport & Freight
  Cathi Slaminski
  - ☐ Transportation Projects
    Nesamani Kalandiyur
  - ☐ Industrial/Energy Projects
    Mike Tollstrup
- ☐ **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- ☐ **State Water Resources Control Board**
  Cindy Forbes – Asst Deputy
  Division of Drinking Water
- ☐ **State Water Resources Control Board**
  Div. Drinking Water #_____
- ☐ **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- ☐ **State Water Resouces Control Board**
  Phil Crader
  Division of Water Rights
- ☐ **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- ☐ **Department of Pesticide Regulation**
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- ☐ **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- ☐ **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- ☐ **RWQCB 3**
  Central Coast Region (3)
- ☐ **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- ☐ **RWQCB 5S**
  Central Valley Region (5)
  - ☒ **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - ☐ **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- ☐ **RWQCB 6**
  Lahontan Region (6)
  - ☐ **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- ☐ **RWQCB 7**
  Colorado River Basin Region (7)
- ☐ **RWQCB 8**
  Santa Ana Region (8)
- ☐ **RWQCB 9**
  San Diego Region (9)

- ☐ **Other** _____
- ☐ _____
  Conservancy

Last Updated 7/19/2016

STATE OF CALIFORNIA Edmund G. Brown Jr., Governor
NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone (916) 373-3710
Fax (916) 373-5471
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

September 12, 2016

Hector Guerra
Tulare County
5961 South Mooney Boulevard
Visalia, CA 93277-9394

sent via e-mail:
hguerra@co.tulare.ca.us

RE: SCH# 2016091017; Hash Farms Development Project, Notice of Preparation for Draft Environmental Impact Report, Tulare County, California

Dear Mr. Guerra:

The Native American Heritage Commission has received the Notice of Preparation (NOP) for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, § 15064.5 (b) (CEQA Guidelines Section 15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared. (Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd.(a)(1) (CEQA Guidelines § 15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a **separate category of cultural resources**, "tribal cultural resources" (Pub. Resources Code § 21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code § 21084.3 (a)). **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. § 800 et seq.) may also apply.

The NAHC recommends **lead agencies consult with all California Native American tribes** that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments. **Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.**

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a **lead agency** shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
    a. A brief description of the project.
    b. The lead agency contact information.
    c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code § 21080.3.1 (d)).
    d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code § 21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A **lead agency** shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code § 21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or environmental impact report. (Pub. Resources Code § 21080.3.1(b)).
    a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18). (Pub. Resources Code § 21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
    a. Alternatives to the project.
    b. Recommended mitigation measures.
    c. Significant effects. (Pub. Resources Code § 21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
    a. Type of environmental review necessary.
    b. Significance of the tribal cultural resources.
    c. Significance of the project's impacts on tribal cultural resources.
    d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code § 21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code § 21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
    a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
    b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code § 21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
    a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
    b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code § 21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code § 21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code section 21084.3 (b). (Pub. Resources Code § 21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
        i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
   i. Protecting the cultural character and integrity of the resource.
   ii. Protecting the traditional use of the resource.
   iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code § 21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a nonfederally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code § 815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code § 5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An environmental impact report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code section 21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code § 21082.3 (d)).

    This process should be documented in the Cultural Resources section of your environmental document.

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires **local governments** to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code § 65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code § 65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code section 65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code sections 5097.9 and 5097.993 that are within the city's or county's jurisdiction. (Gov. Code § 65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have been already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
    a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
    b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
    a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
    b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
    c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

Please contact me if you need any additional information at gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

cc: State Clearinghouse

TABLE MOUNTAIN RANCHERIA

TRIBAL GOVERNMENT OFFICE

Tulare County
Resource Management
Agency

SEP 16 2016

September 12, 2016

Hector Guerra
Chief Environmental Planner
Resource Management Agency
5961 South Mooney Blvd.,
Visalia, Ca. 93277

Leanne Walker-Grant
Tribal Chairperson

Beverly J. Hunter
Tribal Vice-Chairperson

Craig Martinez
Tribal Secretary/Treasurer

Matthew W. Jones
Tribal Council Member

Richard L. Jones
Tribal Council Member

RE: Project Notification for the Hash Farms Development Project.

Dear Hector Guerra:

This is in response to your letter dated August 24, 2016, regarding Project Notification for the Hash Farms Development Project.

We appreciate receiving notice; however, this project site is beyond our area of interest.

Sincerely,

Bob Pennell
Cultural Resources Director

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93626
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Bruce Blayney
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COUNCIL MEMBERS
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Sherman Dix

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City Manager

September 21, 2016

Mr. Michael Washam
Assistant Director
Economic Development & Planning Branch
Tulare County RMA
5961 South Mooney Blvd
Visalia, CA 93277

RE: Hash Subdivision Development Project:
Specific Plan No. SPA 16-001; Zone Change No. PZC 16-004;
Map No. TSM 16-002; Special Use Permit No. PSP 16-029

Dear Michael:

We are in receipt of your request for consultation and comment on the proposed environmental document for this project.

Given the complexity of the proposal, not only of the scale of the project but of the unique multijurisdictional nature of the proposal, the City of Kingsburg respectfully requests that an Environmental Impact Report be prepared and circulated for comment to all interested parties.

We look forward to consulting with you regarding the scope and content of the analysis with your staff and with the applicant.

Sincerely,

Holly R Owen, AICP
City of Kingsburg

County of Fresno

DEPARTMENT OF PUBLIC WORKS AND PLANNING
STEVEN E. WHITE, DIRECTOR

October 3, 2016

Tulare County
Resource Management
Agency
OCT 05 ...

County of Tulare - RMA
Attn: Hector Guerra, Chief Environmental Planner
5961 S. Mooney Blvd.
Visalia, CA 93277

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report (EIR): Hash Farms Development Project

Dear Mr. Guerra:

The County of Fresno appreciates the opportunity to review and comment on the subject Notice of Preparation. In addition to the environmental impacts identified in the Notice of Preparation (NOP), Fresno County requests that the following additional items be addressed in the EIR as follows:

Transportation/Traffic:

An analysis should be provided of Road 16, the intersection of State Route 201 and Road 16, and the intersection of State Route 201 and Madsen Avenue, which are under joint jurisdiction of Caltrans and the County. In addition, please include the Design and Road Maintenance and Operations Divisions of the Fresno County Public Works and Planning Department on the list of agencies to be consulted during the preparation of the traffic/transportation study. If you have specific questions relating to traffic and roads, please contact Frank Daniele by email at FDaniele@co.fresno.ca.us or by phone at (559) 600-4268 or Tong Xiong at TonXiong@co.fresno.ca.us or (559) 600-4532.

Land Use/Planning:

The NOP indicates that wastewater services will be provided by the Selma-Kingsburg-Fowler (SKF) County Sanitation District. SKF currently operates under Fresno County approved Classified Conditional Use Permit (CUP) Application No. 3225. A determination will need to be made whether the proposed project triggers the need to amended CUP No. 3225. Questions relating to existing use permits may be directed to me at the information below.

We appreciate the opportunity to comment on the project. If you have any questions, you may e-mail me at cmonfette@co.fresno.ca.us or contact me at (559) 600-4245.

Sincerely,

Christina Monfette, Planner
Development Services Division

CMM:jem
G:\4360Devs&Pln\EnvPlan\OAR\County - Tulare\Tulare County RMA\Hash Farms Development Project\Comment Ltr.doc

c: Bernard Jimenez, Deputy Director
William M. Kettler, Development Services
Chris Motta, Development Services
Frank Daniele, Road Maintenance and Operations
Tong Xiong, Design Division
John Adams, Policy Planning

State of California • Natural Resources Agency
Department of Conservation
Division of Land Resource Protection
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Sacramento, CA 95814
(916) 324-0850 • FAX (916) 327-3430

Edmund G. Brown Jr., *Governor*
Benjamin Turner, *Acting Assistant Director*

October 5, 2016

Tulare County
Resource Management
Agency
1 1 2016

Hector Guerra, Chief Environmental Planner
Tulare County Resource Management Agency
Planning Branch
5961 South Mooney Blvd.
Visalia, Ca 93277-9394

Dear Mr. Guerra:

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT, HASH FARMS DEVELOPMENT PROJECT, SCH# 2016091017

The Department of Conservation (Department) has reviewed the Notice of Preparation of an Environmental Impact Report for the Hash Farms Development Project submitted by Tulare County (County). The Department monitors farmland conversion on a statewide basis and administers the Williamson Act, California Farmland Conservancy Program, and other agricultural land conservation programs. The Department, as a commenting agency, offers the following recommendations with respect to the proposed project.

PROJECT DESCRIPTION

The Applicant is proposing a change of zone from A-1 to R-l/R-2/R-3 to allow a 192-lot residential subdivision. The proposal for the site consists of the phased construction of 185 single family residential units and seven multi-family lots. The project will be located at the northwest comer of Road 16 and Avenue 396, partially within the City of Kingsburg, Fresno County and Tulare County. The site is approximately one-half mile east of State Route 99 and approximately one-tenth of a mile south of State Route 201. The 54-acre site is located on Tulare County APNs 028-140-007, 012, 013, 018 and 022, and Fresno County APNs 396-020-008 and 014.

DEPARTMENT COMMENTS

The Department recommends the following discussion under the Agricultural Resources section of the Draft Environmental Impact Report (DEIR):

- Type, amount, and location of farmland conversion resulting directly and indirectly from implementation of the proposed project.
- Impacts on any current and future agricultural operations in the vicinity; e.g., land-use conflicts, increases in land values and taxes, loss of agricultural support infrastructure such as processing facilities, etc.
- Incremental impacts leading to cumulative impacts on agricultural land. This would include impacts from the proposed project, as well as impacts from past, current, and likely future projects.

Thank you for giving us the opportunity to comment on the Notice of Preparation of an Environmental Impact Report for the Hash Farms Development Project. Please provide this Department with notices of any future hearing dates as well as any staff reports pertaining to this project. If you have any questions regarding our comments, please contact Farl Grundy, Environmental Planner at (916) 324-7347 or via email at Farl.Grundy@conservation.ca.gov.

Sincerely,

Meri A. Meraz

Meri A. Meraz
Conservation Program Support Supervisor

DEPARTMENT OF TRANSPORTATION
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FRESNO, CA 93778-2616
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TTY 711
www.dot.ca.gov

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Tulare County
Resource Management
Agency
OCT 11 2016

October 5, 2016

06-TUL-99-53.67
2135-IGR/CEQA
HASH FARMS
NOP
TSM 16-002, PZC 16-004, SPA 16-001, PSP 16-029
SCH # 2016091017

Mr. Hector Guerra
Chief Environmental Planner
Tulare County Resource Management Agency
5961 S Mooney Blvd.
Visalia, CA 93277

Dear Mr. Guerra:

Thank you for the opportunity to review the Notice of Preparation (NOP) for the draft Environmental Impact Report to subdivide 54 acres into 185 single family residential lots and 7 multi-family lots for 28 units by Tentative Subdivision Map 16-002. An amendment to the Specific Plan (SPA 16-001), a Zone Change from agriculture to residential zoning (PZC 16-004) and a Use Permit (PSP 16-029) will also need to be approved.

The project is located at the northwest corner of Road 16 and Kern Street (Avenue 396). A small portion of the site lies with the Kingsburg city limits and the remainder is located within both Tulare County and Fresno County. The site is directly adjacent to the Kingsburg city limits and is within the City's Sphere of Influence. The site is approximately ¾ miles northeast of the State Route (SR) 99/18th Avenue Interchange and 1/4 mile south of the SR 201/Road 16 intersection.

The mission of Caltrans is to provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability. The Local Development- Intergovernmental Review (LD-IGR) Program reviews land use projects and plans through the lenses of our mission and state planning priorities of infill, conservation, and travel-efficient development. To ensure a safe and efficient transportation system, we encourage early consultation and coordination with local jurisdictions and project proponents on all development projects that utilize the multimodal transportation network. Caltrans provide the following comments consistent with the State's smart mobility goals that support a vibrant economy, and build communities, not sprawl:

1. Caltrans estimates that the proposed subdivision would generate approximately 203 trips during the weekday afternoon peak hour based on the Trip Generation Handbook 9th Edition at full buildout. Caltrans anticipates that these trips will impact both SR 99 and SR 201.

2. The NOP indicates a transportation impact study (TIS) will be prepared. Please provide project trip generation estimates and trip distribution for each phase of the project. Please forward the TIS to Caltrans for review/comments when completed.

3. The environmental document should include an analysis of the multimodal travel demand expected from the proposed project. This analysis should also identify potentially significant adverse impacts from such demands and avoidance, minimization, and mitigation measures needed to address them.

   Early collaboration, such as sharing the analysis for review and comment prior to the environmental document, leads to better outcomes for all stakeholders. Given that Caltrans current guidelines are in the process of being updated, a transportation impact study scoping meeting with District staff could be used to discuss the most appropriate methodology for this analysis.

4. As a point of information, on November 3, 2014, Caltrans reviewed a Traffic Impact Study for the Grace Church of the Valley to be located on the former Del Monte food packing site, adjacent to Avenue 18 and SR 99. The TIS conducted a peak-hour signal warrant analysis (Warrant 3) for all intersections operating at unsatisfactory levels-of-service (LOS). The TIS concluded that for the Year 2035 Conditions With Project, the SR 99/18th Avenue ramps did meet traffic signal warrants during the A.M. peak hour.

5. The intersection of SR 201 at Madsen Avenue & at Road 16 is an off-set intersection. It appears the existing canal dictated the alignment of Road 16 north and south of SR 201. Caltrans recommends that the County investigate as to whether the project can set the alignment of Road 16 so that this intersection can be re-aligned to a standard four-leg intersection. This may affect the alignment of Road 16 within the project boundaries. This may also require the canal to be piped underground, as it is north from the projects boundary to SR 201.

6. Caltrans recommends the project design should incorporate use of active modes of transportation. Active modes of transportation will increase the potential for walking and bicycling, especially among students, including the identification of walking and bicycling routes to and from schools, transit facilities, community centers, employment centers, and other destinations, thereby increasing and improving connectivity and mobility of non-motorized users.

   On September 26, 2013, Governor Brown signed legislation creating the Active Transportation Program (ATP) in the Department of Transportation under Senate Bill 99, Chapter 359 and Assembly Bill 101, Chapter 354. The ATP consolidates existing federal and state transportation programs, including the Transportation Alternatives Program (TAP), Bicycle Transportation Account (BTA), and State Safe Routes to School (SR2S), into a single program with a focus to make California a national leader in active transportation.

   The purpose of ATP is to encourage increased use of active modes of transportation by achieving the following goals:

   - Increase the proportion of trips accomplished by biking and walking,
   - Increase safety and mobility for non-motorized users,
   - Advance the active transportation efforts of regional agencies to achieve greenhouse gas reduction goals,
   - Enhance public health,
   - Ensure that disadvantaged communities fully share in the benefits of the program, and

- Provide a broad spectrum of projects to benefit many types of active transportation users.

Construction of or improvements for active modes of transportation within, near or adjacent to the project site may be eligible for Federal and/or State grants through the ATP. The ATP is administered by the Caltrans Division of Local Assistance, Office of Active Transportation and Special Programs (website: http://www.dot.ca.gov/hq/LocalPrograms/atp/index.html).

7. Ongoing development will make traffic operations significantly worse by adding considerably to delay and congestion. Transit alternatives can help reduce congestion and delay and reduce overall degradation of air quality and gridlocked intersections. The County and Developer should focus on ways to eliminate trips in addition to enhancing capacity. The following are transportation alternatives that should consider:

   - Park and ride facilities on site or within the proximity of this project.
   - A study of the general accommodation and provision of mass transit in this area to provide insight on ways of increasing transit usage.
   - Exploring the potential of commuter shuttles. The shuttle could be financed through an assessment district and provide a way for individuals to utilize a park-and-ride facility or commercial area parking lot and be shuttled to various commercial/office centers within the area. Commuters who need to go further could use City of Fresno transit if the City planned for convenient connections. This may help to reduce the Single Occupancy Vehicle (SOV) demand seeking to use the State Highway System.
   - Providing for continuity of non-motorized transportation.
   - Exploring the potential for employer-sponsored carpools/vanpools or monthly transit passes for employees as well as including as a condition of project approval a covered transit stop as mitigation for project-related impacts to the transportation/circulation system.
   - Exploring the potential for linking the purchase of a monthly transit pass with new residential development as partial mitigation for congestion and air quality impacts, and to ensure the long term viability of public transportation.

If you have any other questions, please call David Deel, Associate Transportation Planner at (559) 488-7396.

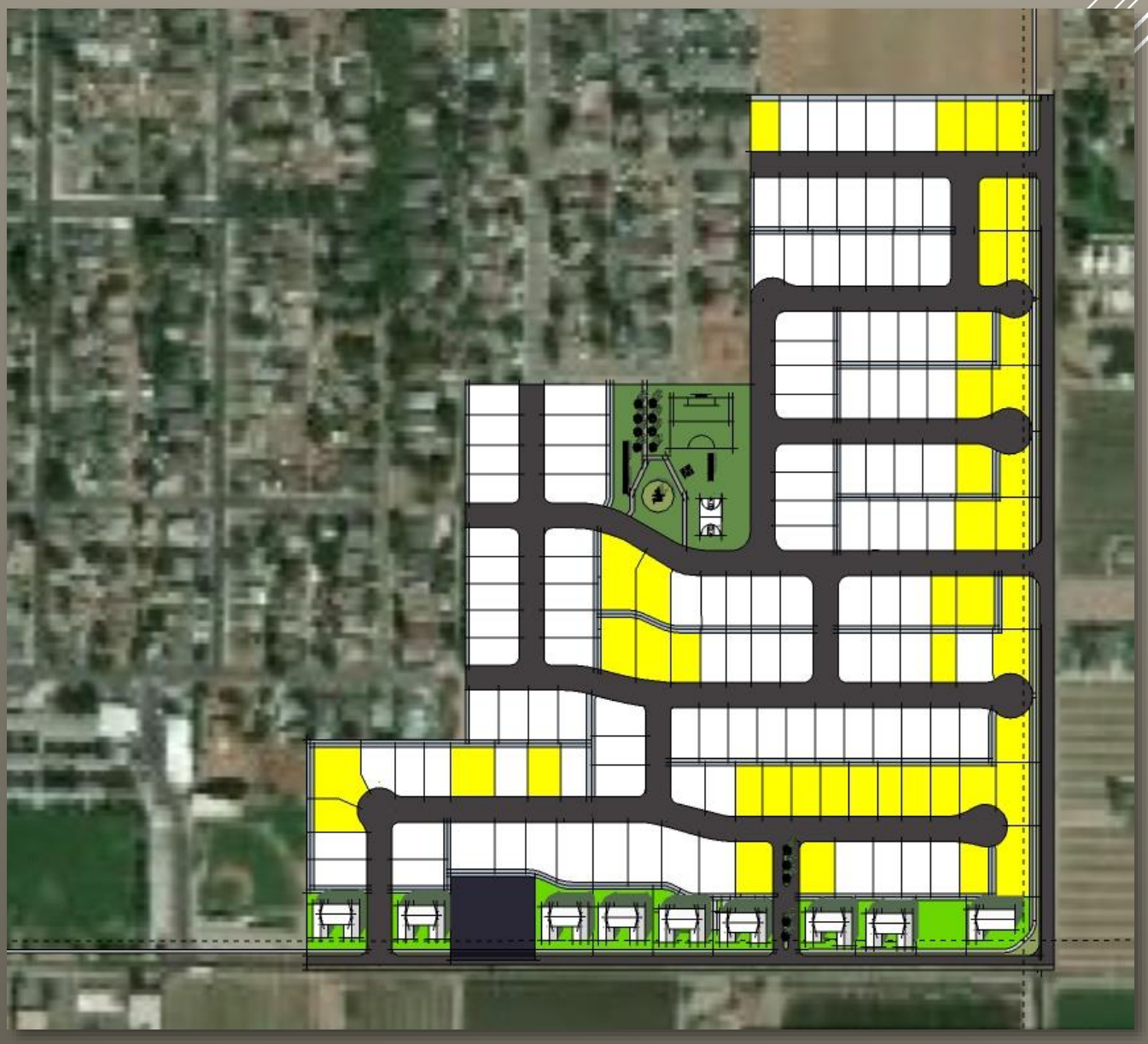
Sincerely,

MICHAEL NAVARRO, Chief
Planning North Branch

c: Mr. Michael Washam, Assistant Director, Tulare County Resource Management Agency

APPENDIX H

SPECIFIC PLAN



DRAFT ANDERSEN VILLAGE SPECIFIC PLAN

County of Tulare & City of Kingsburg

Prepared by the

County of Tulare

Resource Management Agency

5961 S Mooney Boulevard

Visalia, CA 93277-9394

(559) 624-7000

In cooperation with

City of Kingsburg
1401 Draper St.
Kingsburg, CA
93631

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Part One: Introduction

1.1 Introduction

Andersen Village (Hash Development Project) is a development in the southeast portion of the City of Kingsburg and the northern portion of Tulare County. It is uniquely situated because it has been designated for many years to be developed as an integral part of the southeast portion of the City of Kingsburg, yet it is situated in both Tulare County and Fresno County. (See Figures 1-1 and 1-2.) Both the City of Kingsburg and the County of Tulare have long histories of city-centered growth. As part of their respective growth plans, each has adopted various regulatory documents that encourage (and in some cases, require) that urban developments be confined to urban settings. The County of Tulare was one of the first in the state to adopt an Urban Boundaries Element to its General Plan, and it has utilized Urban Development Boundaries to focus growth. The City of Kingsburg has employed similar mechanisms such as growth phasing lines and a Sphere of Influence to identify areas that should be urbanized as part of Kingsburg.

The Andersen Village project is a property that is both in the County of Tulare's Kingsburg Urban Development Boundary and Kingsburg's Sphere of Influence. Tulare County designates it for mixed use (commercial and residential), while Kingsburg's General Plan designates it for lower density residential development. The range of uses permitted by the County's plan is quite broad and extensive, with some uses possibly conflicting with existing nearby residential neighborhoods. As might be expected, the two jurisdictions have different development standards, and zoning regulations that, if applied in their present forms, would lead to inconsistent development, and development that does not meet normal urban development standards for Tulare County cities or for Fresno County cities. The purpose of this Specific Plan is to establish planning standards and an implementation and regulatory framework that insures the development's compatibility with Kingsburg's development and design standards.

The content and approach of the Specific Plan is based on the following objectives:

1. Zoning and lot development standards that are as consistent as practicable with the Kingsburg Zoning Ordinance, and are like the North Kingsburg Specific Plan. It is the intent that this document, when adopted by ordinance by the County, will establish those standards for the County areas, the same as they do for the City portions of the Specific Plan.
2. Development of a residential area that blends with and transitions from the existing development pattern in southeast Kingsburg, to the project's newer development pattern.
3. Development of a mix of residential land uses that will provide a variety of housing opportunities, including larger lot single family, standard single-family lots, and limited low-rise attached single family uses.
4. Improvement standards for roads and utilities that are consistent with the City of Kingsburg's adopted Improvement Standards. It is the intent that this document, when adopted by ordinance by the County, will establish those standards for the County areas, the same as they do for the City portions of the Specific Plan.

5. Development of special improvement standards and regulations that will enhance the amenities for the project, including bike paths, pedestrian connections, parks and other features.

6. Development of an infrastructure financing and implementation mechanism that ensures that appropriate infrastructure is installed, and that capital needs for each jurisdiction are met, including the provision of needed public safety facilities.

7. Development of a fiscal framework that ensures that the City and County do not carry a fiscal burden to support the project. To achieve this, special agreements and financing mechanisms shall be established that will provide for adequate ongoing fiscal revenues to the City and the County, and that adequate provision is made for the maintenance of public infrastructure and private open space and improvements. This will require the development of a tax sharing agreement between the City and County, and establishment of infrastructure financing and maintenance mechanisms such as a Landscaping and Lighting District (LLD) or a Community Facilities District (CFD).

This Specific Plan sets for the framework and regulations to achieve the above goals and objectives. Following this Introduction, the Specific Plan document contains the following sections and elements.

Part Two: Plan Goals and Objectives—Goals and policies for the Specific Plan and how they are compatible with the Fresno County General Plan, the Kingsburg General Plan, the Tulare County General Plan, and respective LAFCo policies.

Part Three: Land Use and Zoning--Land Use Designations and Zoning designations for the Specific Plan, and zoning standards, including setbacks, height and other applicable standards.

Part Four: Circulation and Street Design—Designation of street classification in the Specific Plan area, including local streets, collectors and arterials, and street cross-sections that meet or exceed Kingsburg's standards. Also, an onsite pedestrian and bicycle circulation network that connects to existing facilities.

Part Five: Utilities and Infrastructure—The sewer, water and storm drainage plan for the Plan Area.

Part Six: General Services—Public services for the project including public safety, recreation, parks and emergency services.

Part Seven: Development Standards and Design Guidelines--These standards have been adapted from the City's North Kingsburg Specific Plan and tailored to the project site, as appropriate.

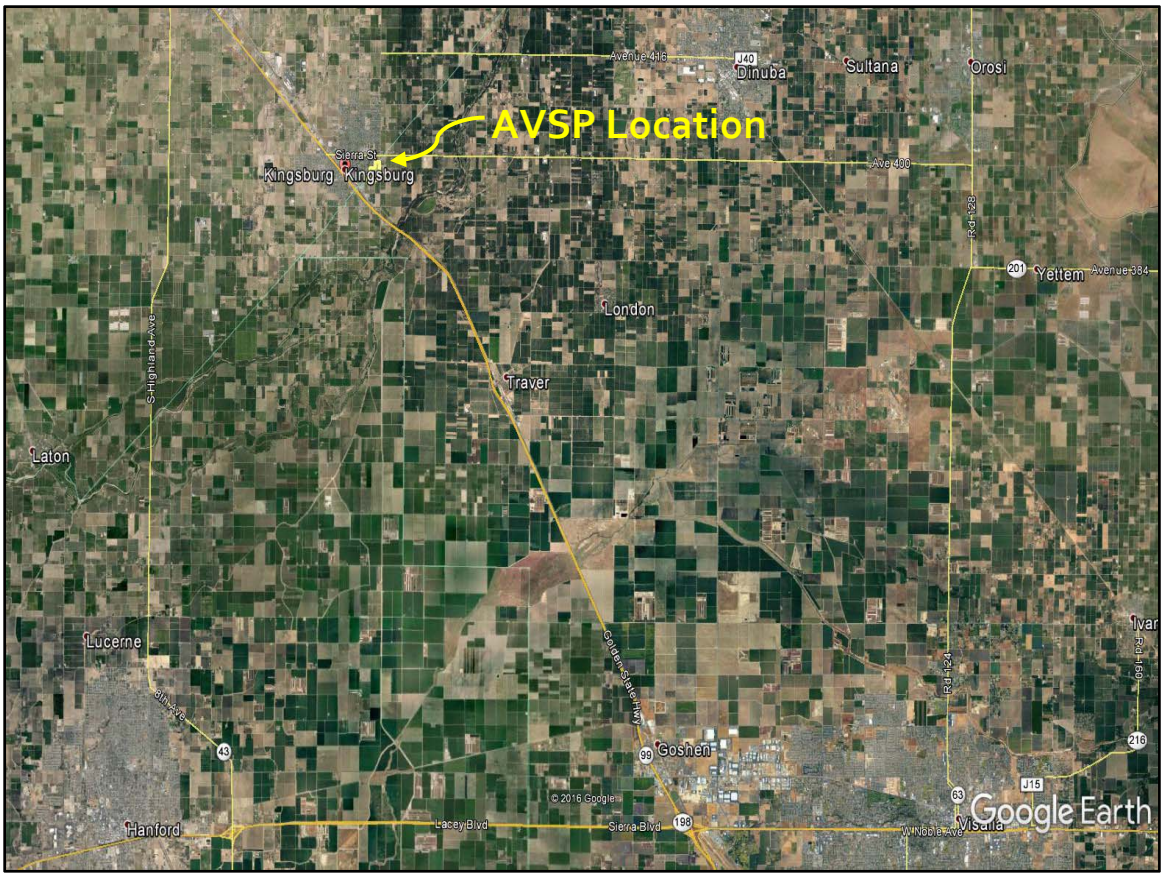
Part Eight: Financing and Implementation—Recommended financing mechanisms, tax sharing, applicable City and County impact fees in the Plan Area.

Part Nine: Environmental—Summary of the EIR and applicable mitigation measures adopted as part of the Specific Plan.

Part Ten: Specific Plan Enforcement and Implementation—Implementation of the Specific Plan after adoption, and processes and authorities for amending, interpreting and adjusting the Specific Plan.

Figure 1-1

Location Map



1.2 Executive Summary

The Andersen Village Specific Plan ("AVAVSP" or the "Plan") will guide development on 52 acres in the City of Kingsburg and the unincorporated area of Tulare County. Currently, the Plan Area has two (2) acres in Fresno County, two (2) acres in the City, and roughly 48 acres in Tulare County. The Plan will provide for a mix of residential uses from low density to low rise medium density neighborhoods. The Plan calls for meeting the City's R-1-7 residential lot requirements (7,000 square foot) in the single-family areas, and the City's RM-3.0 standards for the multi-family neighborhood (fourplexes) fronting along Kern. Amenities include approximately 2.5 acres of multi-use park features, street side landscaping, and a multi-use pedestrian and bike trail around the perimeter of the project and connecting sidewalks and trails at Madsen/Sierra and Kern/18th Avenue. Streets include landscaped pedestrian corridors, parkways and perimeters, and bulbouts. (See Figures 1-3, 1-3A and 1-4.)

The Local Agency Formation Commissions (LAFCO) for both Fresno and Tulare County will play a large role in approving the various reorganizations required. The intent is to service the project with City water, which will require an Extraterritorial Service approval by Tulare County LAFCo, the annexation of the (2) acres in Fresno County to the City, and the annexation of the Tulare County portion of the Plan Area to the Selma Kingsburg Fowler (SKF) Sanitation District (it is presently in the District Sphere of Influence to be annexed). Through intra-jurisdictional agreements for water, parks, streets, landscaping and lighting maintenance will be provided to the areas (+/- 48 acres) within Tulare County by the City of Kingsburg. The Selma Kingsburg Fowler Sanitation District will annex the areas within Tulare County into its borders to provide waste water treatment.

This Specific Plan will require approval by the County of Tulare Board of Supervisors. This Specific Plan (SPA 16-001) includes Change of Zone PZC 16-004 (from Agriculture to a Specific Plan Area), and under Government Code 65850 adoption of plans that effectively rezone property must be completed by ordinance. Tentative Map TTM 16-002 was also submitted, which was reviewed and approved concurrently with the SPA / PZC. No further "Use Permits" are required as all Site Plan Review and Exceptions are approved as part of the Specific Plan / Development Plan approval process.

The City 's annexation of the land within Fresno County has changed the Fresno County's land use from "Agriculture" to "Residential" consistent with the City's General Plan. The areas already in the City are consistent with the City's R-1-7 residential designation, and the County considers the land use in Tulare County to be "Mixed Use." The Project is consistent with the long-term goals for Fresno County General Plan, the Tulare County General Plan, and the City of Kingsburg's General Plan, and has been anticipated for development within the City's Sphere of Influence (SOI) since the City's expansion of the SOI / Urban Limit Line.

The proposal for this subdivision is for 160 R-1-7 single family residential units and ten (10) multi-family (fourplex) lots (with a total of 40 units). By establishing a common development code for the Plan Area, compatible and consistent development can take place across City and County lines. Development is expected to occur over four (4) phases and be achieved through a "Vesting Tentative Map." (See Figure 1-4). Once the Specific Plan is adopted, each jurisdiction will adopt a conforming tentative map for areas under its jurisdiction.

Design standards from the *North Kingsburg Specific Plan* have been adapted for the Project site and this Specific Plan contains special site development and design regulations in Part 7 of this Specific Plan. The

Plan will be implemented through the *finance plan* described in Part Eight and regulated by the *developer agreement*. Water and General Services will be provided by the City for the most part, through a revenue/ tax sharing agreement with the County. The project is located adjacent to existing schools, with the students attending Kingsburg Schools, and medical services and communications already exist in the City.

1.3 Authority

The adoption of the Specific Plan by the County of Tulare and City of Kingsburg is authorized by the California Government Code, Title 7, Division 1, Chapter 3, Article 8, Sections 65450 through 65457. As set forth by the Government Code, specific plans must contain the information outlined below in text or exhibits. References to the location of this information within the Specific Plan are shown below in italics.

- The distribution, location, and extent of the uses of land, including open space, within the area covered by the plan. (See Part Three, Land Use and Zoning; and Part Seven, Development Standards and Design Guidelines.)

- The proposed distribution, location, extent, and intensity of major components of public and private transportation, sewage, water, drainage, solid waste disposal, energy, and other essential facilities proposed to be located within the area covered by the plan and needed to support the land uses described in the plan. (See Part Four, Circulation and Street Design; Part Five, Utility Infrastructure; and Part Six, General Services.)

- Standards and criteria by which development will proceed, and standards for the conservation, development, and utilization of natural resources, where applicable. (See Part Nine, Environmental; Part Seven, Development Standards and Design Guidelines.)

- A program of implementation measures including regulations, programs, public works projects, and financing measures necessary to carry out the above items. (See Part Seven, Development Standards and Design Guidelines; Part Eight, Financing and Implementation; and Part Ten, Plan Enforcement and Implementation.)

- A statement of the relationship of the Specific Plan to the General Plan (See Part Two, Plan Goals and Objectives.)

Specific plans may be adopted by resolution or by ordinance (Government Code Section 65453). Both Planning Commissions and County Board of Supervisors and City of Kingsburg City Council hearings are required. Tentative maps, parcel maps, and zoning ordinances applicable to the Specific Plan area, and local public works projects must be consistent with the Specific Plan (Government Code Section 65455).

Figure 1-2
Aerial of AVASP Project Site

Figure 1-3

AVSP Conceptual Design Plan

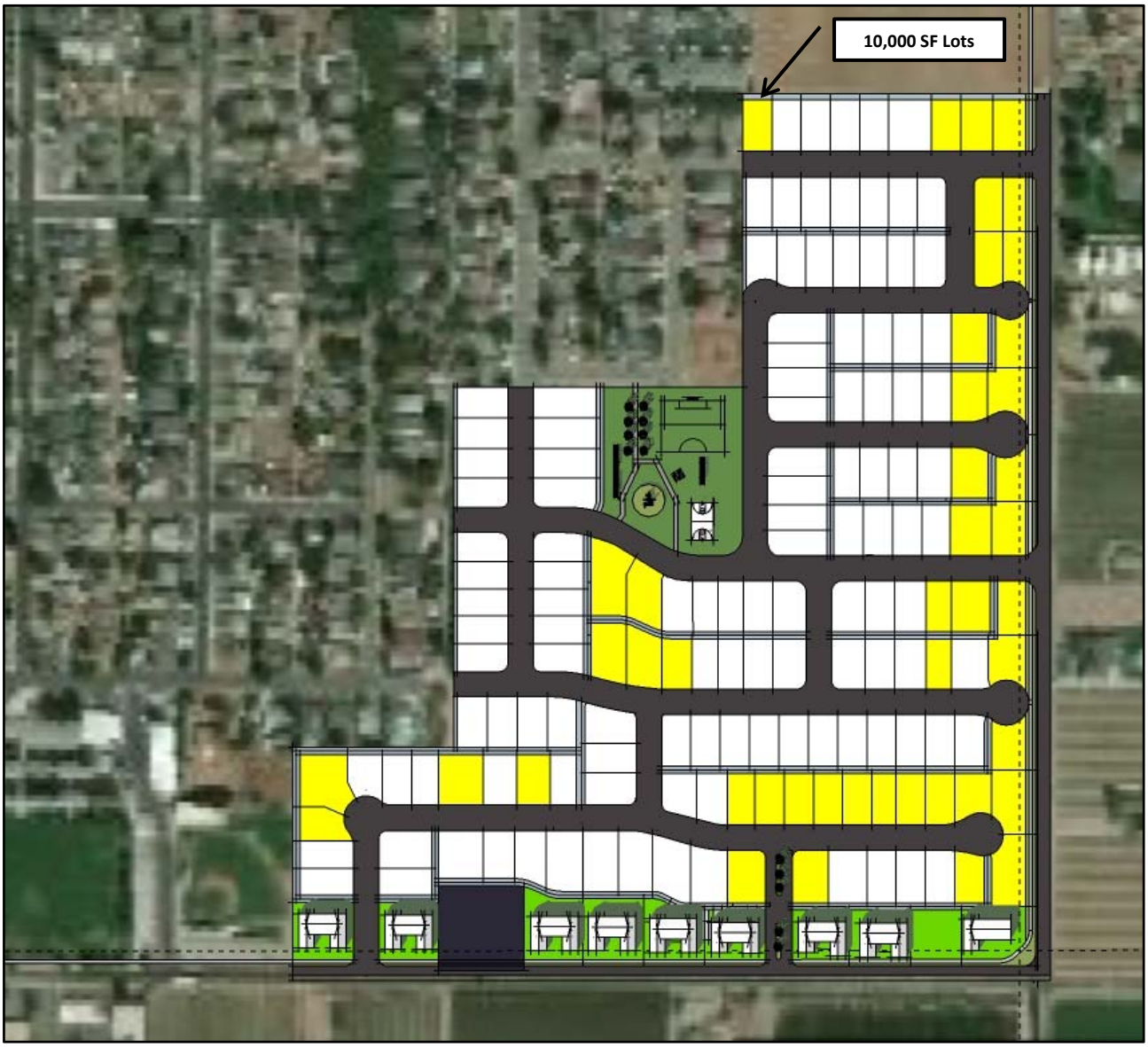


Figure 1-4

Vesting Tentative Map

Part Two: Plan Goals and Objectives

2.1 Goals and Objectives

The AVSP goal is to guide the development of this project across multi-jurisdictional boundaries in a clear functioning document to be used by all agencies, through the numerous entitlements, annexations and agreements required for the successful implementation of this plan.

The plan itself borrows the best of the zoning and design standards from these agencies, and its objective is to include the following:

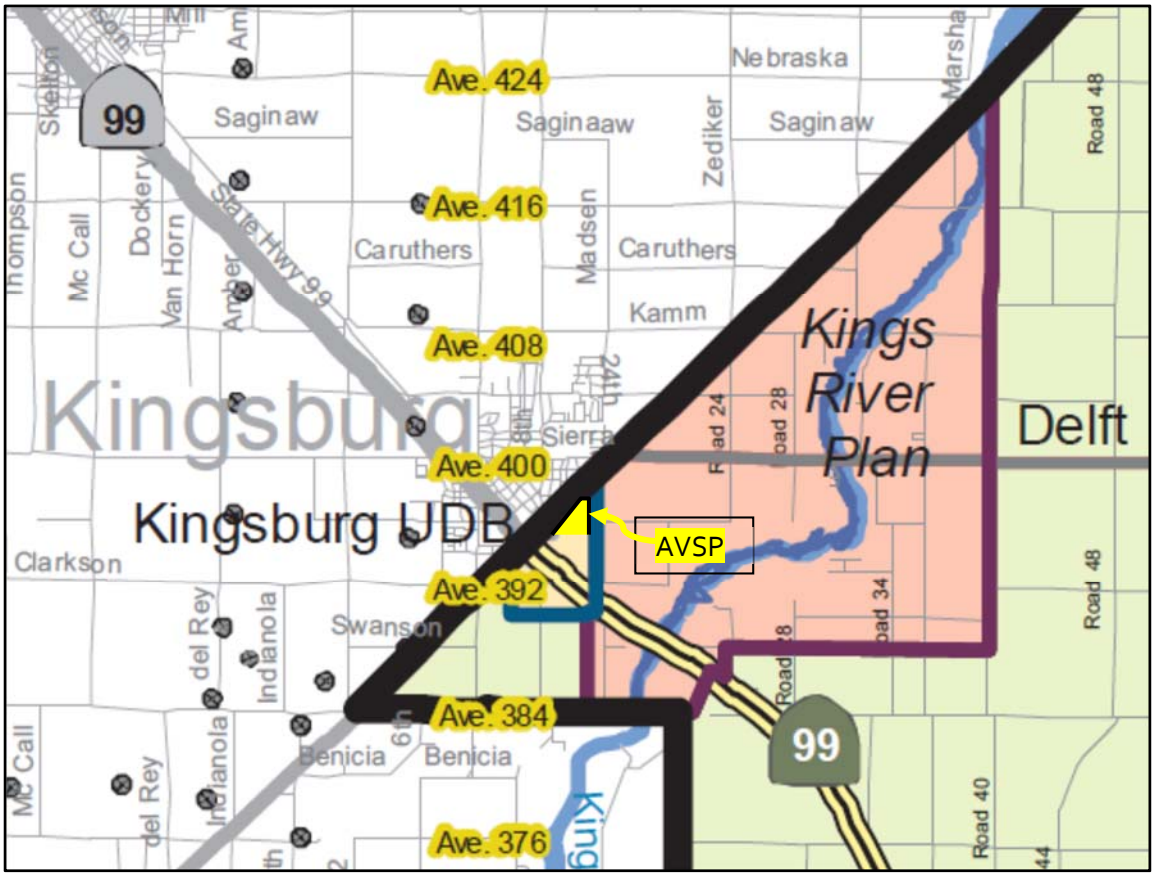
- *2.1.1 Provide a mix of residential housing development*
- *2.1.2 Provide a community with lot sizes consistent with the North Kingsburg Specific Plan standards*
- *2.1.3 Provide a cohesive neighborhood across multi-jurisdictional boundaries*
- *2.1.4 Provide additional new housing in the City of Kingsburg and the unincorporated area of Tulare County to benefit the Kingsburg Downtown area*
- *2.1.5 Provide concentric development along the edge of an existing development pattern*
- *2.1.6 Provide a development pattern that is woven into the existing City Street Network, and with traffic calming features to reduce significant added trips through the existing neighborhood*
- *2.1.7 Provide additional open space and recreational amenities, and a rate that exceeds current City standards*
- *2.1.8 Provide safer and quieter streets and efficient street patterns*
- *2.1.9 Provide a higher quality of development pattern and development standards*
- *2.1.10 Provide a positive fiscal impact for the City and County as a whole*

2.2 Relationship to the 2030 Tulare County General Plan (2012)

The Tulare County General Plan (TCGP) recognizes that the area outside the City to the south has an existing Urban Development Boundary (UDB), but no “Area Plan” has been adopted. The Kings River Plan (KRP) is adjacent to the AVSP, but the project is not impacted by the policies of the KRP (See Figure 2-1). The KRP begins immediately east of the project area and is designated for agricultural, conservation, and recreation with minor developments along SR 201, Road 33 and Road 40. The 1982 KRP will limit any potential development expansion eastward and has established natural resource, agricultural and other environmental conservation goals.

Figure 2-1

Kings River Plan and Kingsburg UDB



Source: TCGP (2012)

Figure 2-1 above and Figure 2-2 below depict the Project area's location regarding the County-designated Kingsburg UDB line (Blue Line) and the Kings River Plan Boundary Line. The County's General Plan Goal PF-4 directs development within UDB's, that such growth be well planned, and has necessary infrastructure. County General Plan Policy PF 4.13 states that the County requires projects adjacent to cities meet city development standards. County General Plan policies PF-4.13 through PF-4.27 call for coordination and collaboration with City's affected by County developments including requests for annexation and the imposition of impact fees within a County Adopted City Urban Development Boundary (CACUDB) such as the County's Kingsburg Urban Development Boundary illustrated in Figures 2-1 and 2-2. Therefore, this project, subject to agreements with the City of Kingsburg, is consistent with the Tulare County General Plan (TCGP).

Other applicable Tulare County General Plan policies including the following:

PF-1.2 Location of Urban Development - The County shall ensure that urban development only takes place in the following areas:

1. Within incorporated cities and County Adopted City Urban Development Boundaries (CACUDBs);

2. Within the UDBs of adjacent cities in other counties, unincorporated communities, planned community areas, and HDBs of hamlets;
3. Within foothill development corridors as determined by procedures set forth in Foothill Growth Management Plans;
4. Within areas set aside for urban use in the Mountain Framework Plan and the mountain sub-area plans; and
5. Within other areas suited for non-agricultural development, as determined by the procedures set forth in the in the Rural Valley Lands Plan.

PF-4.1 CACUABs for Cities - The County shall establish CACUABs which define the area where land uses are presumed to have an impact upon the adjacent incorporated city, and within which the cities' concerns may be given consideration as part of the land use review process. The lands within the UAB are the next logical area in which urban development may occur and the area within which UDBs may ultimately be expanded.

PF-4.13 City Design Standards - Where the Board of Supervisors finds that it is consistent with General Plan objectives to approve development within the UDBs of incorporated cities, the County may require the project to substantiate sufficient water supply and meet the County adopted city development standards of the city in question.

PF-4.14 Compatible Project Design - The County may ensure proposed development within CACUABs is compatible with future sewer and water systems, and circulation networks as shown in city plans.

PF-4.15 Coordination with Cities on Development Proposals - The County shall ensure that urban development only take place in CACUDBs if one of the following has occurred:

1. The adjacent city does not consent to annex the property for development purposes (as evidenced through pre-zoning, development agreements, etc.); it shall be conclusively presumed that a city has not consented if it has not submitted an annexation proposal to LAFCo within six months from the date a request to annex is submitted to the city; or
2. Annexation is not possible under the provisions of State law, but it is determined by the County that development of the site does not constitute incompatible development.

PF-4.17 Cooperation with Individual Cities - The County may use the policies set forth under this goal (PF-4A) to work with individual cities to further manage development within that CACUDB or CACUAB to the extent that the financial needs of the County are met and the County's ability to provide facilities and County services used by all the residents in the County and cities is enhanced. The County and cities will establish a working committee to facilitate the policies identified in this section 4A.

PF- 4.27 Impacts of Development within the County on City Facilities and County Facilities - The County may work with a city to consider the adoption, imposition and collection for payment to the city pursuant to agreement in Development Impact Fees within the CACUDB, as may be proposed by the city from time to time to offset the impacts of development in the County on city facilities. Reciprocally and under the

same conditions, the city will consider the collection of Development Impact Fees within the city to offset the impacts of development within the city on County facilities.

LU-3.1 **Residential Developments -** The County shall encourage new major residential development to locate near existing infrastructure or employment centers, services, and recreation.

LU-3.8 **Rural Residential Interface -** The County shall minimize potential land use conflicts at the interface between urban development and existing developed rural-residential areas.

LU-7.10 **Gateways/Entry-points -** The County shall identify key entry points on the edges of the communities and support programs and projects that enhance gateways and transitional zones between communities to make each community more distinctive and inviting for residents and visitors.

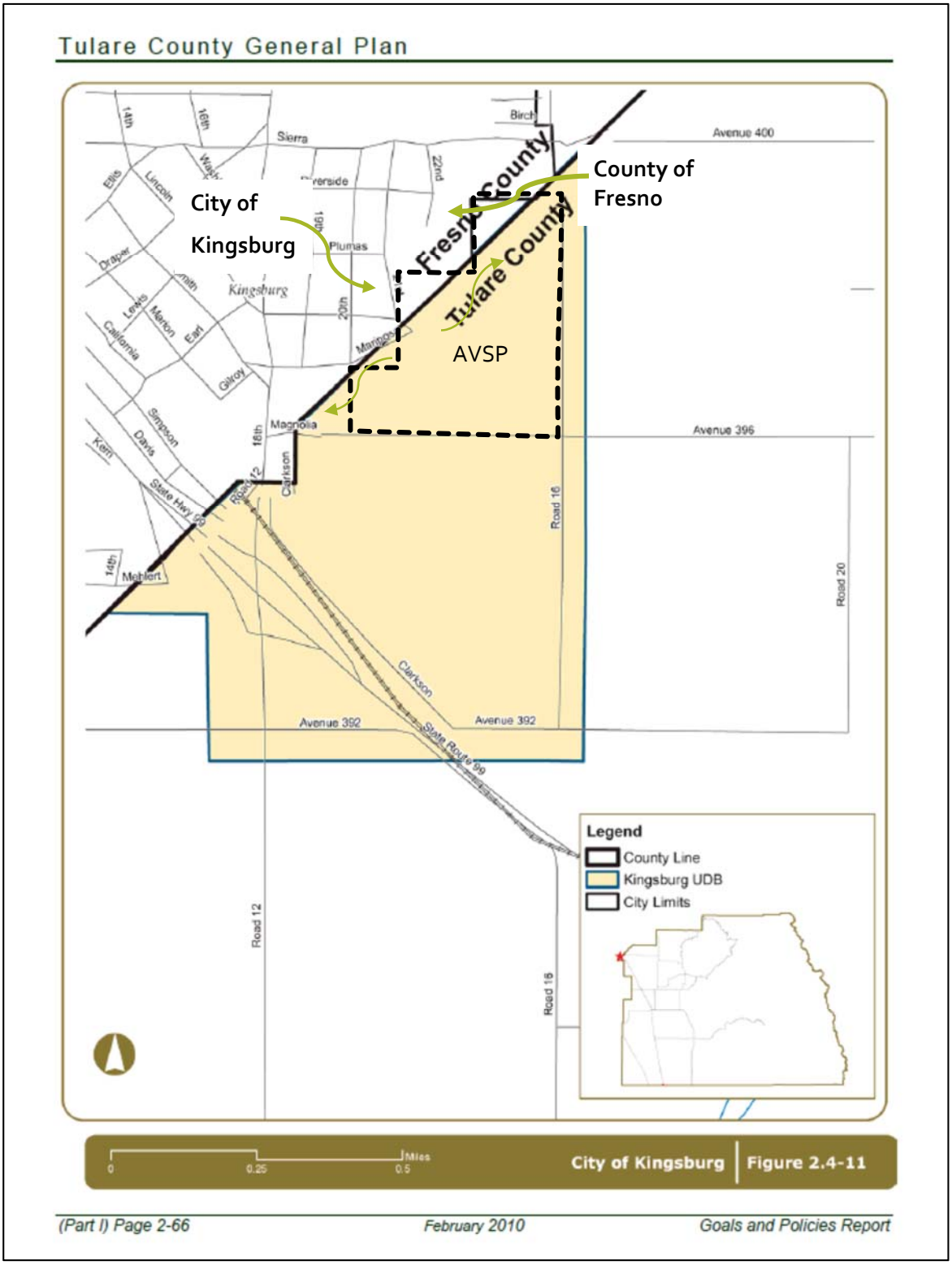
LU-7.16 **Water Conservation -** The County shall encourage the inclusion of "extra-ordinary" water conservation and demand management measures for residential, commercial, and industrial indoor and outdoor water uses in all new urban development.

PFS-1.4 **Standards of Approval -** The County should not approve any development unless the following conditions are met:

1. The applicant can demonstrate all necessary infrastructure will be installed and adequately financed;
2. Infrastructure improvements ae consistent with adopted County infrastructure plans and standards; and
3. Funding mechanisms are provided to maintain, operate, and upgrade the facilities throughout the lie of the project.

Figure 2-2

Existing Kingsburg Boundaries

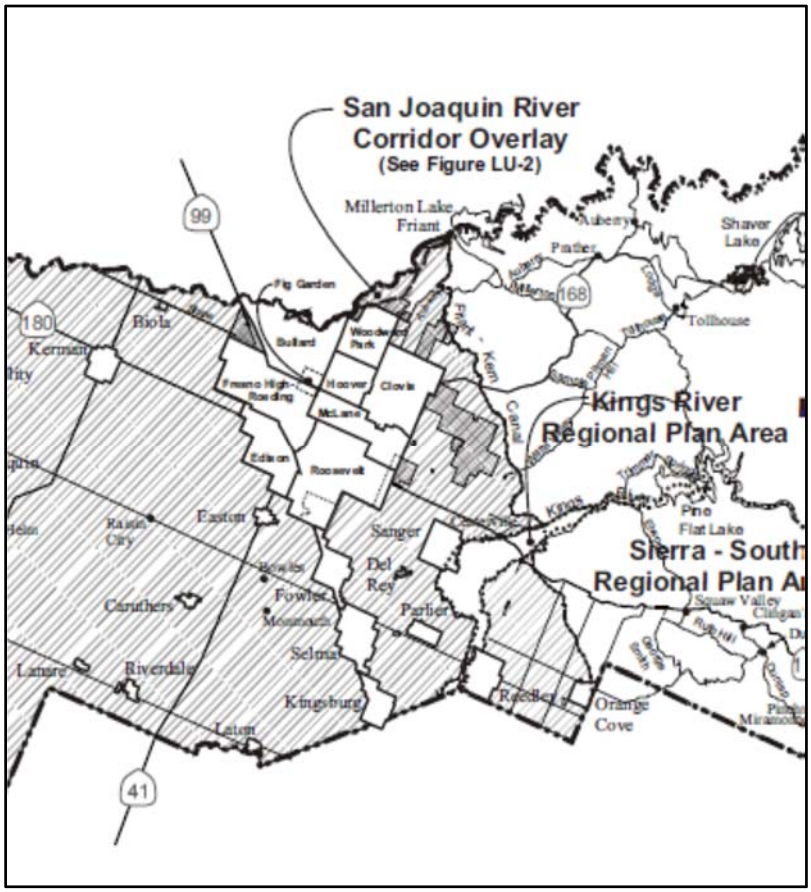


2.3 Relationship to the County of Fresno General Plan (2000)

Like Tulare County's Policy Framework and General Plan, the Fresno County General Plan (FCGP) addresses what they consider "fringe development" next to cities in the County. While the Fresno County regulations and policies do not apply in Tulare County, the Fringe Development policies are like Tulare County's and provide consistency. Of the two areas of the project currently within the County of Fresno, the more south westerly triangle is in the City, (see Figure 2-3). The northerly triangle is in the County of Fresno and will be annexed into the City of Kingsburg, which requires consultation with the County of Fresno. The County's current Land Use designation for the site is "Agriculture" will change with the annexation. Moreover, the City of Kingsburg is in the Fresno County Highway 99 Industrial Corridor Planning Area. Although the land is designated Agriculture in the FCGP, it is also in the SOI of the City, where its considered designated low density residential; thus, it is anticipated to develop consistent with Fresno County Policy General Plan LU-G.4, as follows.

Figure 2-3

Fresno County General Plan Land Use



FCGP Goal LU-G.4

"To direct urban development within city spheres of influence to existing incorporated cities and to ensure that all development in city fringe areas is well planned and adequately served by necessary public facilities and infrastructure and furthers countywide economic development goals." (Source: FCGP (2000))

As this is in the City's fringe area adjacent to existing development, public facilities, and infrastructure and was pre-designated Residential by the Kingsburg General Plan, the AVSP is consistent with Fresno County General Plan Goals, Policies and Land Use.

2.4 Relationship to the City of Kingsburg General Plan (1992)

The City of Kingsburg General Plan has the following Goals to direct development in their City. As noted above, the project is within the City's city development boundary, and the site is designated for lower density residential uses. The City General Plan Goals, as applied to this Specific Plan's Objectives above, show the AVSP's compliance with the City's General Plan.

"General Plan Goal Number 1: *Balancing the social and economic costs of urbanization through growth management - Policies and proposals of the General Plan should seek to expand job-creating and revenue-generating activities, including levels of retail, commercial service and industrial expansion which are necessary to support government services required by the expanding population base, consistent with the rate of growth established by the General Plan. The General Plan gives emphasis to the development of tax revenue and job-creating activities as a matter of primary importance to achieving other goals of the Plan. Despite pressures and demands that are certain to emerge to build housing units at a rapid pace, a clear policy of the General Plan is to limit the pace and quantity of housing construction to annual allocations in reasonable balance with the growth of Kingsburg's economic base.*

City government has the authority and responsibility to accommodate urban expansion at costs which are reasonable in relation to the benefits received. This principle is sound but elusive to achieve without enlarging the community's economic base. Costs resulting from urban development are both direct and indirect. Examples of direct costs include public land acquisition, construction of improvements, and long-term maintenance of public facilities. Examples of indirect costs include omission or postponement of needed improvements or services; an inconvenient pattern of urbanization; difficulty in municipal management; and the disproportionate burdening of existing residents with responsibility to meet needs generated by new residents.

General Plan Goal No. 2: *Equal Opportunity - Growth in the local economy will foster equality in opportunity for existing residents, for racial and ethnic minorities and for people of low and moderate income in the provision and availability of public services and facilities and in meeting employment and housing needs. Insofar as reasonably may be possible, policies and proposals of the General Plan are intended to provide for and support the attainment of such equality of opportunity.*

> *Policy 3 of Goal No. 2 states that: Residential expansion should reflect the considerable variety of housing types that comprise the residential market of the region. In addition to conventional single-family detached housing, there is a strong market for small lot detached and attached (townhouse) single-family purchase housing for entry level buyers as an alternative to multi-family rentals. As an*

alternative to large multi-family rental projects, there also is a market for owner-occupied multi-plexes. Other alternatives are the purchase and rental condominium, the single story garden apartment and well-designed mobile home park. As an overall standard, the City will seek to maintain a 70% to 30% ratio in the combined variety of single-family units provided as compared to the combined variety of multi-family units. This percentage is a fair reflection of regional characteristics of housing market demand, and will assure that Kingsburg will meet its fair share of the regional market for housing to meet the needs of low and low-moderate income households.

General Plan Goal No. 3: *Quality in the Form, Design and Functions of the Urban Area - The building of the future city and the rehabilitation of existing older areas are not to be approached as a collection of subdivisions and commercial and industrial enterprises, to be built out as rapidly as the private sector may desire. The City of Kingsburg has a unique opportunity and responsibility to:*

- *Manage the timing and phasing of development;*
- *Create and hold more directly to an overall town design; and*
- *Gain the level of cooperation required of developers and landowners to assemble land and to propose units of development in conformance with this goal.*
- *New development and redevelopment are to reflect quality in community design and image. Development is to be phased to create a community which exhibits the best that community building and management experience will allow, limited only by the economics of market opportunity. New development, public as well as private, is to reflect high levels of community appearance and image through development regulations which express appropriate concern for visual quality.*
- *Such regulations include site planning and engineering, architectural design, landscaping, use of signs, and maintenance of public and private buildings and sites.*

General Plan Goal No. 4: *Enhancing the Quality of Life - It is a goal of the General Plan to enhance the quality of living for present and future generations of residents by preventing degradation of the natural and man-made environment, and by taking steps to offset and alleviate the effects of that degradation which already has occurred, or which cannot be avoided. The standard of living and the quality of life available will be influenced in part by public policies which reflect sensitivity to the many ways in which "environmental quality" is nurtured and achieved.*

With its very name so closely tied to the environment of the Kings River, the City will also seek to establish a physical (if not jurisdictional) tie with the river environment which will provide expanded recreation and living opportunity of mutual benefit for the people who reside within and close to the river environment.

> ***Policy 2 of Goal No. 4, Residential Areas:*** *Multi-family projects shall include landscaped open space in addition to yard areas required by the zoning ordinance, to be developed for the common recreation use of tenants. Minimum facilities may be required for common recreation areas. Examples include tot lots for pre-school children, and passive recreation areas for lounging, sun bathing, barbecuing, quiet conversation and reading, including area to be shaded by trees and shade structures.*

> ***Policy 4 of Goals 4, Residential Areas:*** *Multi-family site development and maintenance shall be in accordance with a comprehensive landscape development plan, including automatic irrigation.*

General Plan Goal No. 5: *Growth Management - The City will seek to manage the rates of population and housing growth at levels which do not exceed the capacity of the City and local school districts to provide the necessary levels of community and educational services and facilities required, consistent with all other goals of the General Plan.*

General Plan Goal No. 6: *Transportation/Circulation/Traffic – It is a goal of the General Plan to guide and provide for the development of an integrated system of transportation and internal circulation, and to provide access to other parts of Fresno County and the region. This goal is intended to benefit all citizens of Kingsburg.*

- *Increased transportation safety for citizens.*
- *The efficient movement of people and goods.*
- *Lower vehicle operating costs.*
- *Lower vehicle miles traveled with consequent reduction in vehicle emissions. f Economy in street construction and maintenance.*
- *A circulation system correlated and consistent with the land use patterns fostered by the General Plan.*
- *Avoidance of the disruption of residential areas caused by through traffic on minor streets.*
- *Protection of rights-of-way needed for future arterial and collector street widening in developed areas.*

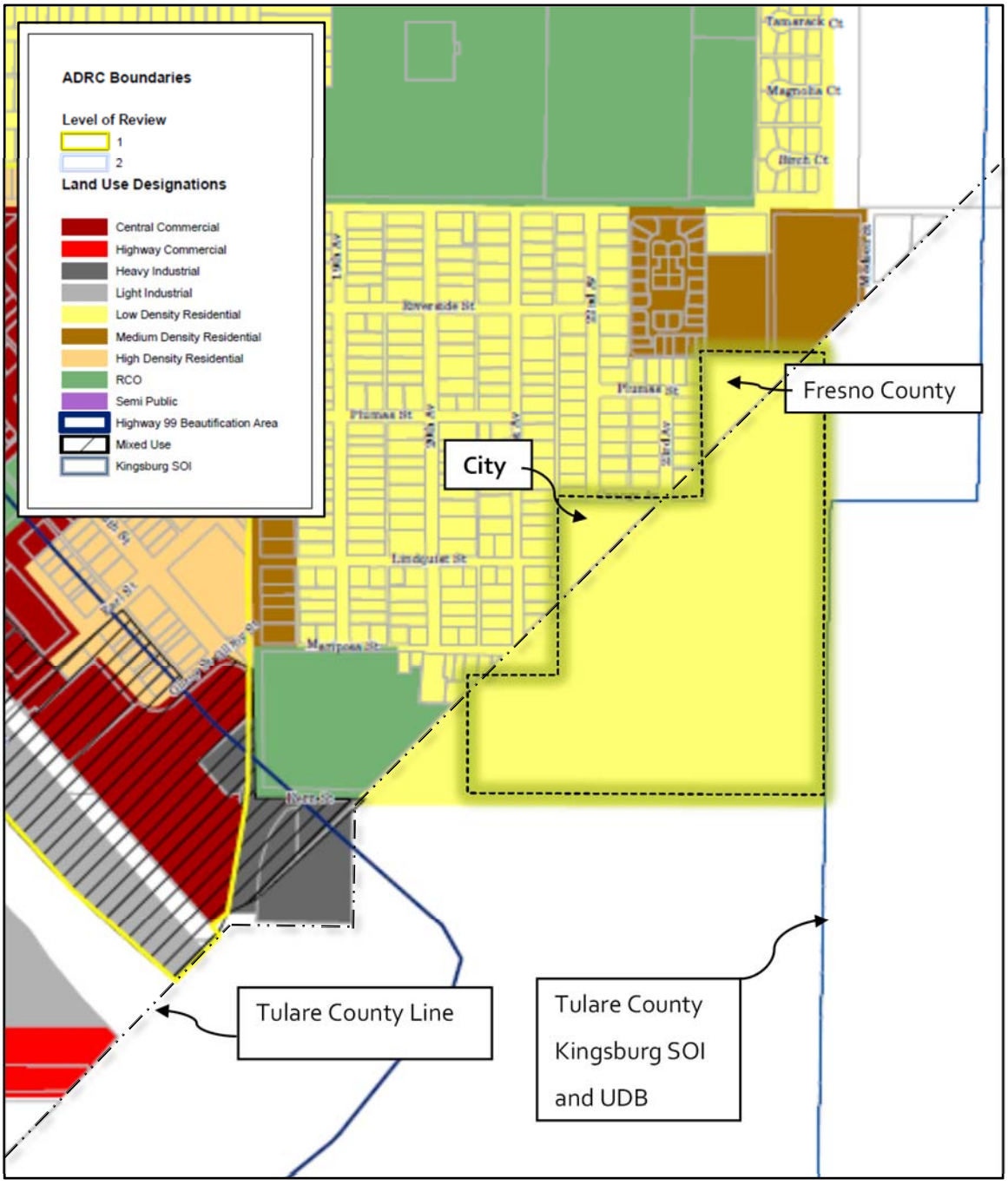
General Plan Goal No. 7: *Noise Hazards - Goals for the noise environment of the community are to protect citizens from the harmful effects of exposure to excessive noise..."*

2.4.1 City of Kingsburg Sphere of Influence

The AVSP is within the Sphere of Influence of the City (see Figure 2-3). It was also pre-designated for "Low Density Residential" Land Use by the City's Updated General Plan Land Use Diagram, as revised (GPA 2014-01).

Figure 2-4

Kingsburg General Plan Land Use Diagram



Part Three: Land Use and Zoning

3.1 Tulare County Land Use

The current land use designation for the Tulare County portion of the Plan area within the Kingsburg UDB and south of the City Limits is Mixed Use. This land use was given to all Planned Communities under the TCGP (2012), where no "Area Plan" has been adopted. Under the TCGP, Mixed Use is defined as "Any combination of retail/commercial, service, office, residential, hotel, or other use in the same building or on the same site typically configured in one (1) of the following ways:

- Vertical Mixed Use. A single structure with the above floors used for residential or office use and a portion of the ground floor for retail/commercial or service uses.
- Horizontal Mixed Use – Attached. A single structure which provides retail/commercial or service use in the portion fronting the public or private street with attached residential or office uses behind.
- Horizontal Mixed Use – Detached. Two (2) or more structures on one (1) site which provide retail/commercial or service uses in the structure(s) fronting the public or private street, and residential or office uses in separate structure(s) behind or to the side. (See Part 1 Page 4-2)"

The County Mixed Use Land Use designation allows 1 to 30 units per acre, with a .5 Floor Area Ratio (FAR) (development of 1/2 of 1 acre), generally. In an unincorporated "Planned Community Area," such as Kingsburg, it has yet to be determined (see TBD in Table 3-1 below) what the Density and Floor Area Ratio should be. Therefore, the proposed zoning density were yet to be determined (and were to be determined as part of a Community Area Plan); and therefore, other accessory uses (support uses) including parks, which are typically allowed under Residential Land Use Designations are not limited under the TCGP (and the discretionary boards must power to expand the definition of uses under this Specific Plan). Hence, a different zoning density, FAR, and accessory uses are also allowed within UDB's "Mixed Use" designations because there is no language in the General Plan definition of the Mixed-Use Designation limiting the use of different zoning, FAR, or accessory uses such as parks in residential areas. Under the County's current land use definition for the project site may accommodate between 50 and 1,500 dwelling units. This Specific Plan will further refine that range to be equivalent to that allowed through application of City R-1-7 and City RM-3.0 development standards.

3.2 City's "Low Density Residential" Consistency with County "Mixed Use" Land Use

As discussed, the City's General Plan Land Use designation for the site is "Low Density Residential." The City's Low Density Residential (LDR) complies, as the MU LU per Table 3-1 allows as low as 1 unit per acre (but is even more flexible, TBD, in the Planned Community Areas). Either LU will allow for all the proposed zoning contemplated on this site, without having to do a General Plan Amendment (GPA), except in relationship to changing the City Limit Boundary. (See Figure 3-1.)

3.3 Zoning Changes Considered through the AVSP

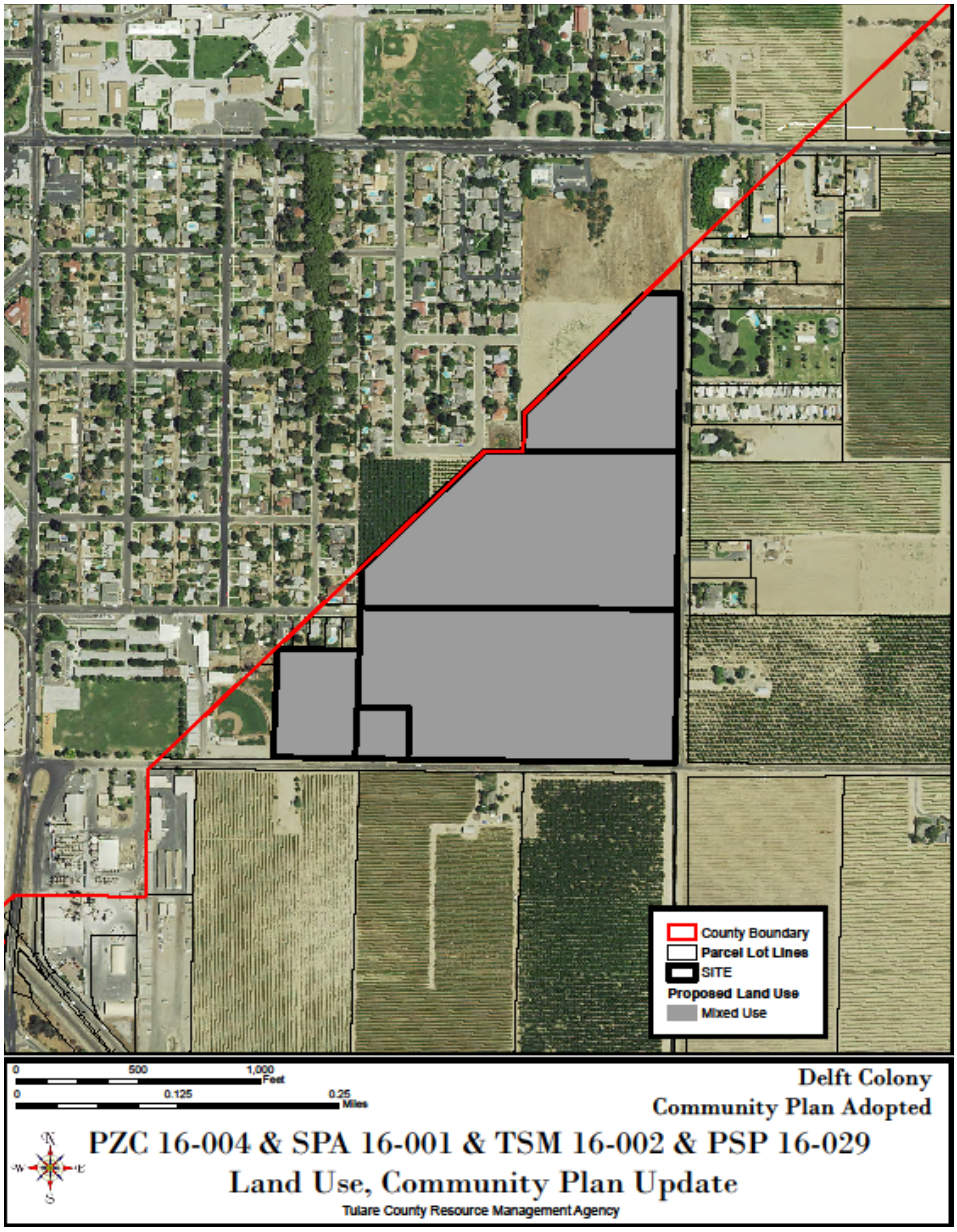
The existing underlying zoning is comprised of "R-1-7" (Residential, 7,000 square feet maximum) in the City, "A-1" (Agriculture) in Tulare County and "A" (Agriculture) in Fresno County. The Specific Plan will

effectively rezone the County properties through Ordinance, as approved by both the City and County to reflect the below proposed zoning.

As proposed, the project is to comprise of two separate and distinct zoning and design districts. The suggested changes to the City and County Zoning requirements below will be adopted as part of this Specific Plan and become the Zoning Districts, specifically, and only will be applied to the AVSP in both the City and County. Therefore, there is no requirement to the overall zoning language changes to create new districts in the County. The City Zoning and Development Standards, as described in the below Design Guidelines and Performance Standards will be applied to the R-1-7 Zone District. (See Figure 3-2.)

Figure 3-1

Existing County General Plan Land Use



3.3.1 R-1-7 Zone

The R-1-7 portions of the project will be consistent with the City's "R-1-7", 7,000 square foot lot, residential zoning standards (see Figure 3-2). This will include all others other than the RM-3.0 lots that front on to Kern Street. Setback and development standards will be as shown in Table 3-1. Consistent with City requirements, there will be a requirement that at least 20% of R-1-7 lots to be 10,000 square foot or larger. The 45.1-acre R-1-7 portion of the Project contains a total of 160 R-1-7 lots, with 44 of the lots 10,000 SF or larger (27.5 percent), and 116 lots 7,000 SF or larger. Average density for the R-1-7 portion of the Project is 3.5 dwelling units per gross acre. Average density of the various blocks and neighborhoods west of the Project between Sierra and 18th Avenue ranges from 3.1 to 3.5 units per gross acre. The following is a list of the current requirements for the R-1-7 Zone per the Kingsburg Zoning Code: 17.28.050 - Property development standards that will apply to the project.

- Fences, Walls and Hedges. Fences, walls and hedges shall be permitted in accordance with the provisions of Section 17.24.060 of the Kingsburg Municipal Code.
- Site Area. The minimum site area for the R-1-7 district shall be seven thousand (7,000) square feet.
- Frontage, Width and Depth of Site.
  - Each site in an R district shall have not less than sixty (60) feet of frontage on a public street except that those sites which front on a cul-de-sac or loop-out street may have a frontage of not less than forty (40) feet provided the width of the site, as measured along the front yard setback line, is at least sixty (60) feet in the R-1-7 district.
  - The minimum width of each site in an R-1-7 district shall be sixty (60) feet for an interior lot and sixty-five (65) feet for a corner lot.
  - The minimum depth of each site in an R-1-7 district shall be ninety (90) feet for an interior lot and eighty (80) feet for a corner lot.

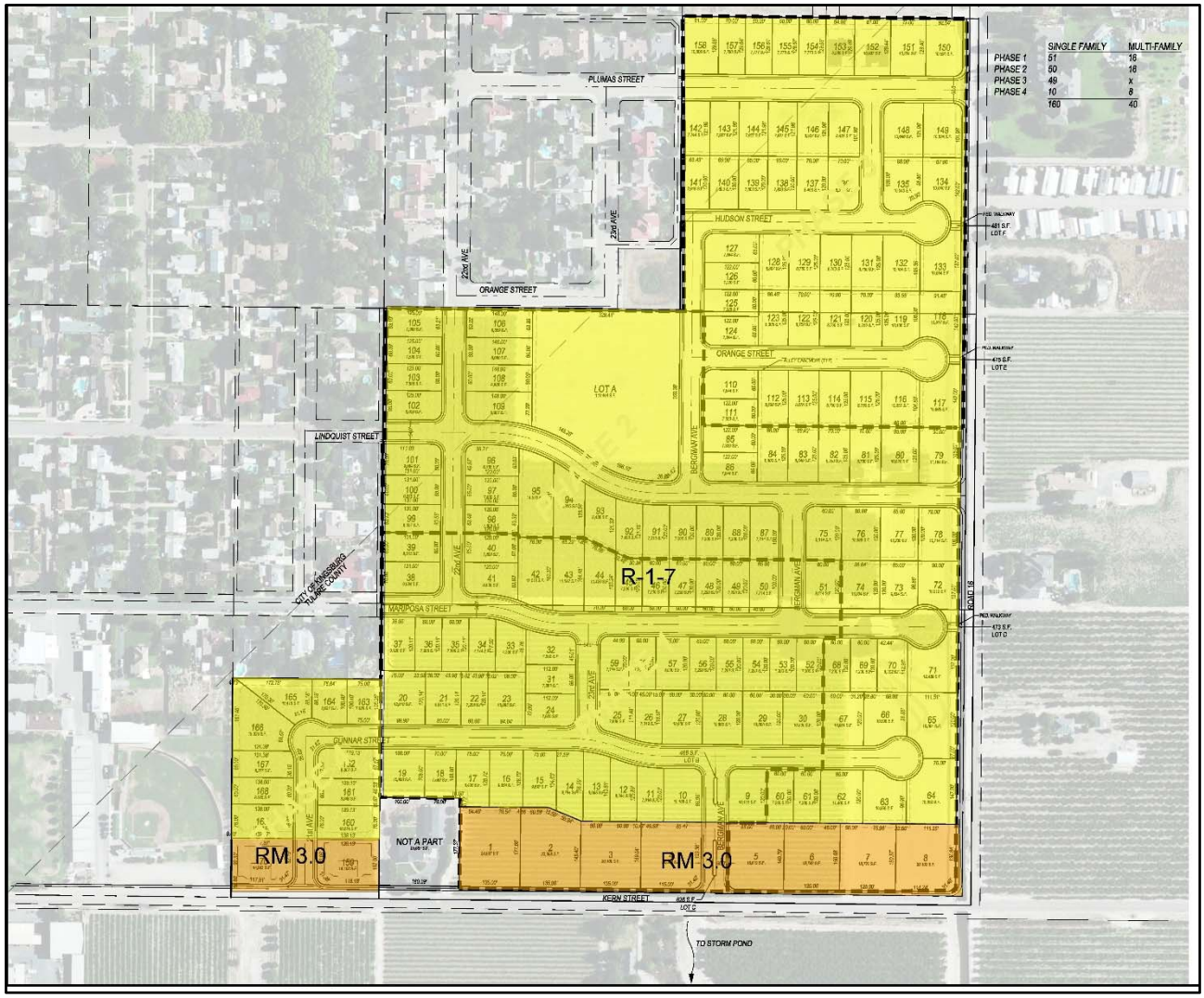
3.3.2 RM-3.0 Multifamily

The RM-3.0 Multifamily zone (consistent with the County's "R-3" Multiple Family Zone standards) in the Project is intended to accommodate fourplexes, with common drives, private garages, and attached homes. This product type includes single story or low-rise buildings, with dwelling units that have amenities and sizes like smaller single-family units, but in an attached configuration. These units would be used as a landscaped "liner" along Kern Street, and would avoid the need for a block wall or fencing along the frontage. All the units have yards and private entrances and alley-loaded garages. Design standards for these units are further described the Design Guidelines in Part Seven of the Specific Plan. There are 40 RM-3.0 units planned on 6.9 acres in the southwest portion of the project along the Kern Street frontage, which results in an average

density in the zone district of 5.8 dwelling units per gross acre. Typically, the County R-3 Zone includes a requirement for later site plan approval, but the AVSP approval will constitute all final design guidelines and site plan configurations. Approval of the AVSP by the Board of Supervisors will serve as the same function as a site plan approval.

Figure 3-2

Proposed Zoning District Boundary Plan



Part Four: Circulation & Street Design

4.1 Functional Classification

Residential Street Standards ("Local Roads" in the TCGP and "Minor Roads" in the North Kingsburg Specific Plan) are proposed to enhance the aesthetics of the project, ensure compatibility with the City's standards, and to provide for pedestrian amenities. The street standard for internal "local" streets, perimeter collectors and arterials, main entries, and intersection bulbouts for traffic calming and amenities are established by this Specific Plan and are illustrated in the exhibits in this Part. City standards are followed where there is a continuation of existing City Streets (Lindquist Street, 22nd Ave, Mariposa and Bergman.).

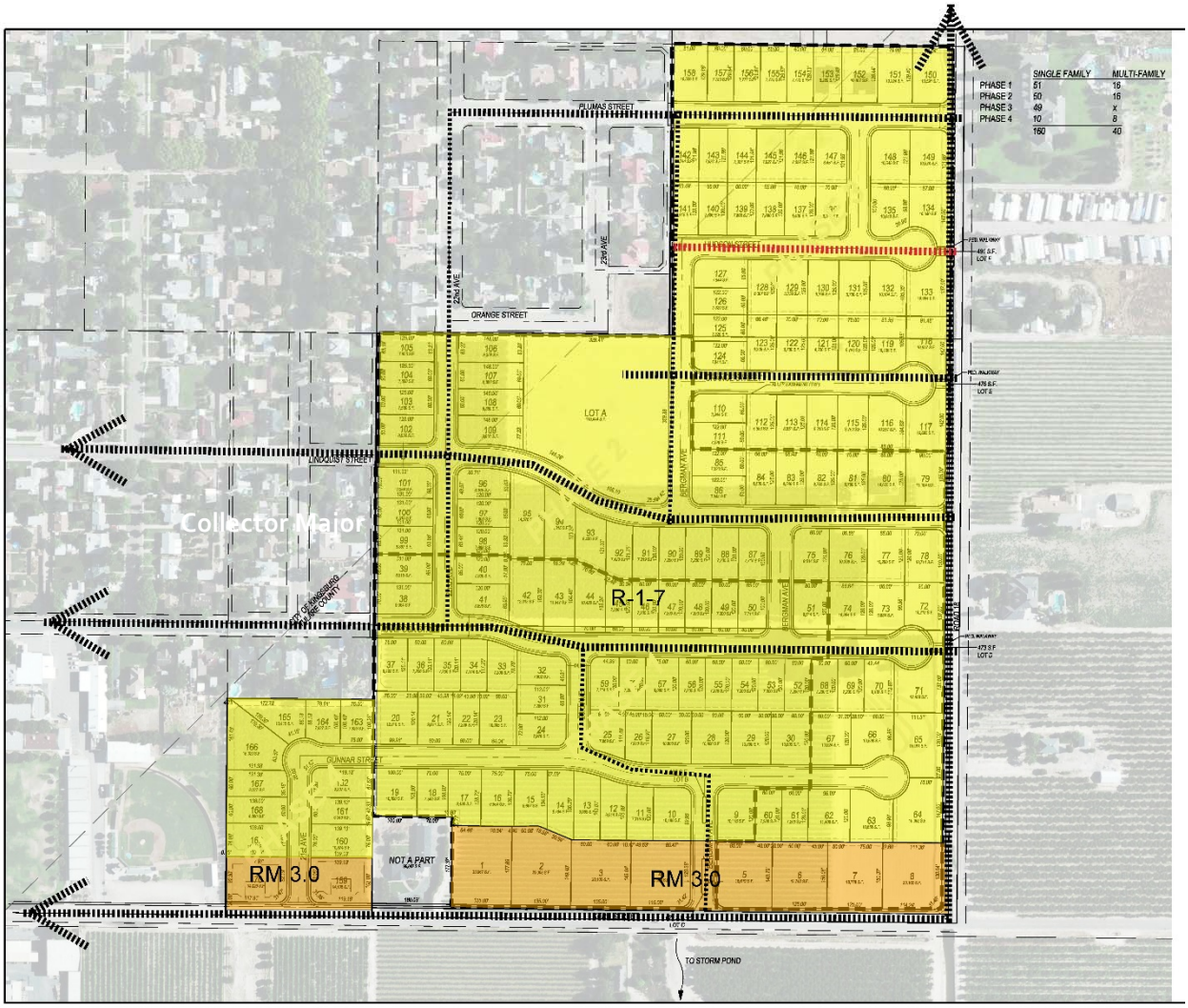
The allowed level of service (LOS) in Tulare County is LOS D. Since this is where the majority of the project is located this standard should be applied to the project's Classification System defines Local Roads as to provide direct access to abutting property and connect with other local roads, collectors, and arterials. Local roads are typically developed as two-lane undivided roadways. Access to abutting private property and intersecting streets shall be permitted.

State Route 201 connects to Road 16/Madsen and is considered a Collector-Major under the Tulare County General Plan. The North Kingsburg Specific Plan calls out "minor roads" within villages. Lindquist St. and 22nd Ave. would be built out to the classification consistent with the City Functional Classification of a "minor road." The residential functional classification, as a local road and/or a "minor road," is consistent with both Circulation Elements of the City and County's General Plans.

Figure 4-1
Functional Classification Diagram

Figure 4-2

Pedestrian and Bicycle Connections



4.2 Street Design Standards

Street rights of way and adjacent landscaped areas and entries are the most visible and some of the most important elements of a neighborhood's character. Elements that are significant to accomplishing this intent are discussed below in greater detail, while other elements are discussed more generally to permit greater variety and flexibility.

4.2.1 Complete Streets

The Project complies with Tulare County's Complete Streets Program and Standard. Pedestrian paths are primarily developed as part of the roadway and trail systems of the community and reflect the interconnected nature of circulation and transportation systems as a wholesale. The sidewalks and pedestrian paths connect to the external city and county area to encourage active transportation modes and to establish safe routes to school. Enhanced pedestrian crossings and sidewalks are included in areas where high pedestrian demand occurs. A bike and pedestrian trail will be completed around the perimeter of the project, and extended to 18th Avenue/Kern and to Madsen/Sierra. Figure 4-2 shows the pedestrian and bicycle linkages for the Project.

The Project will also include selective usage of landscape residential street bulbouts and chokers (see Figure 4-14) to provide visual relief and traffic calming. Bulbouts for traffic calming are proposed at Mariposa Street/22nd Avenue, and at Lindquist/22nd Avenue.

4.2.2 Improvement Standards

Typical street sections showing the width, thickness and descriptions of the pavement section, as well as the geometrics of the graded roadbed, side improvements and side slopes are described in this Specific Plan. In Tulare County, the two most common cross sections are shown for two or four lane roads, varying in width based upon the number of lanes, parking, sidewalks, shoulders, bike lanes, etc. Figure 4-1 shows the cross section for two-lane roads and Figure 4-2 identifies a typical four-lane cross section. The NKSP calls for a Minor Street (Local Road) with a 60' Right of Way and 18' Travel Lane. (See Figure 4-3).

Figure 4-3
Tulare County Typical Class 1, 2 & 3 Two Lane Roads

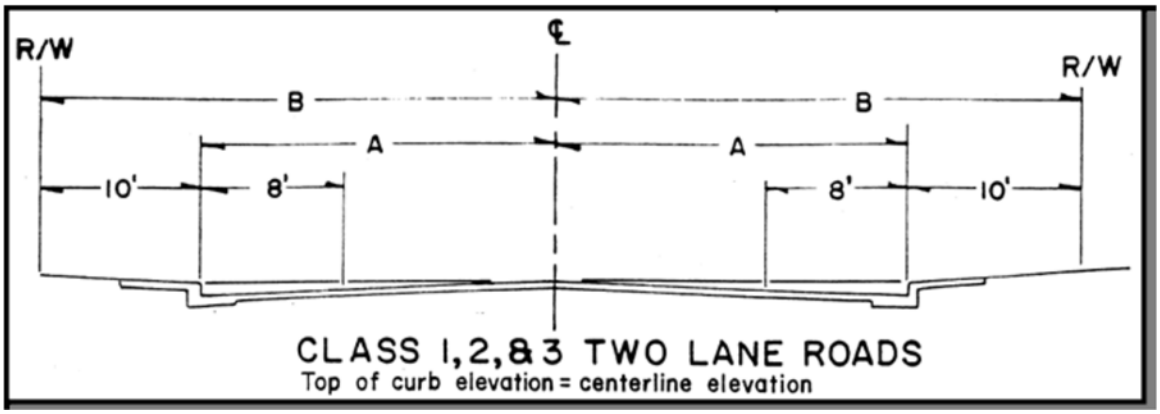


Figure 4-4

Tulare County Class 3 Four Lane Road

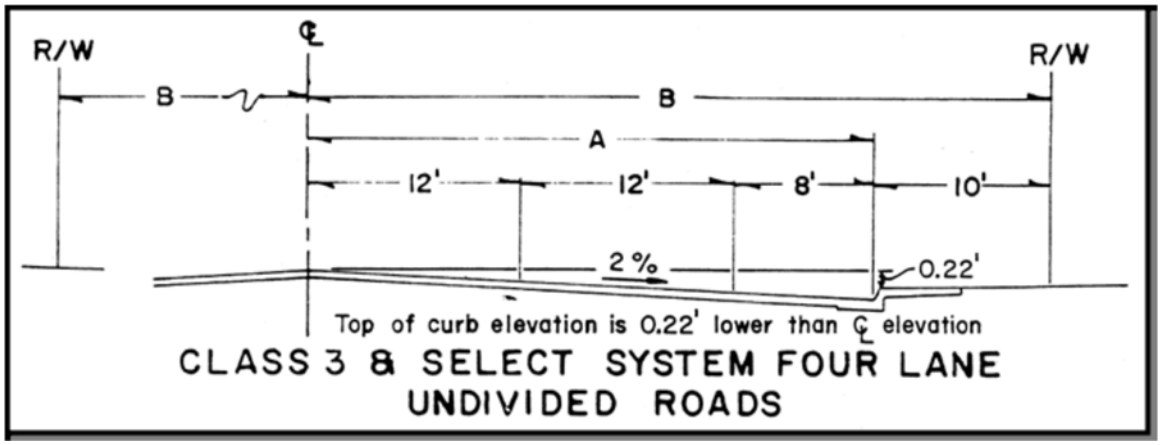
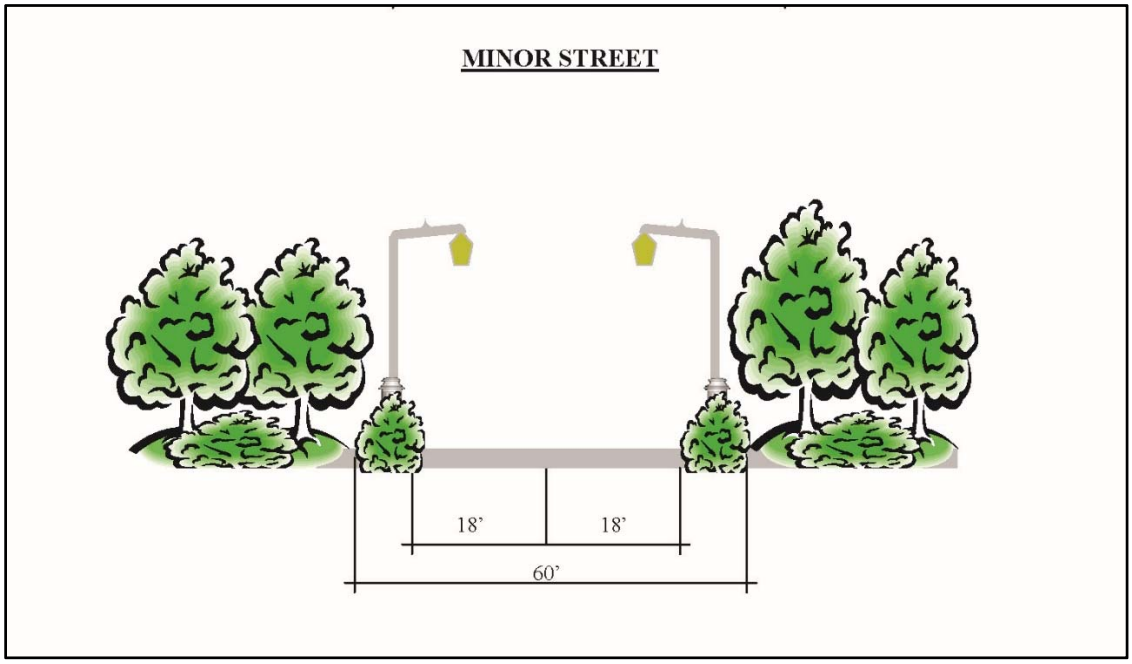


Figure 4-5

NKSP Typical "Minor Street"



4.2.3 AVSP Street Design

The roadways designed for this project will have the following characteristics (see Figures 4-4 through 4-13). These deviate slightly from the roadway standard design for Tulare County and the City. As stated Lindquist / 22nd Ave. will be consistent with the "Minor Road" standard (see Figure 4-12.)

Generally, the road improvements within the AVPS within Tulare County would comply with the Class 1, Class 2, or Class 3 County Road standards as defined in the Tulare County Improvement Standards (1997), except where there is an exception to the 60' standard down to a 54' standard. These standards are typical County roadway standards and have been modified from to meet the objectives of the AVSP in creating a higher quality and more attractive neighborhood to be built consistently with Figures 4-6 through 4-14.

These deviations include:

- From 60 feet to a 56-foot local street standard, but with the same curb to curb dimensions for adequate fire access and on-street parking; and
- Cul-de-sac radius to a 50-foot design

The roadway dimension deviations and exceptions that may vary slightly from City standards are made through the approval of this Specific Plan and are inclusive of the Figures 4-4 through 4-14, which show the street design exactly as it will be built in the Specific Plan Area. The following will also be required during build out of the Project.

- All Sidewalks will be required to be constructed prior to completion of the subdivision improvements. Sidewalks may be deferred to completion during the construction of the dwelling unit.

- One-foot reserve strips dedicated to the County or City, where the phase break is located, are required at locations that divide phases or along the subdivision boundaries.
- Standard barricades shall be constructed at the end of all stubbed streets shown in Plate A-23 to prevent access to and from adjacent un-subdivided land.
- Temporary turn arounds shall be constructed at the end of each street during phased development.

4.2.4 County Collector Frontage Improvements

Avenue 396 and Road 16 shall be constructed to a Class 3 road standard along the subdivision frontage at a minimum, with 60-foot Rights of Way, as shown in Figures 4-10 and 4-11. Any exceptions from these standards have been approved through this AVSP.

4.2.5 Deviations.

Any deviation of the roadway design will require approval by the Public Works Director of the jurisdiction where the exception from the standard is located and the other jurisdiction will be notified and consulted with prior to approving the exception. Also refer to Part Ten, Specific Plan Enforcement and Administration.

Figure 4-6
Street Design
Kern Street and Road 16

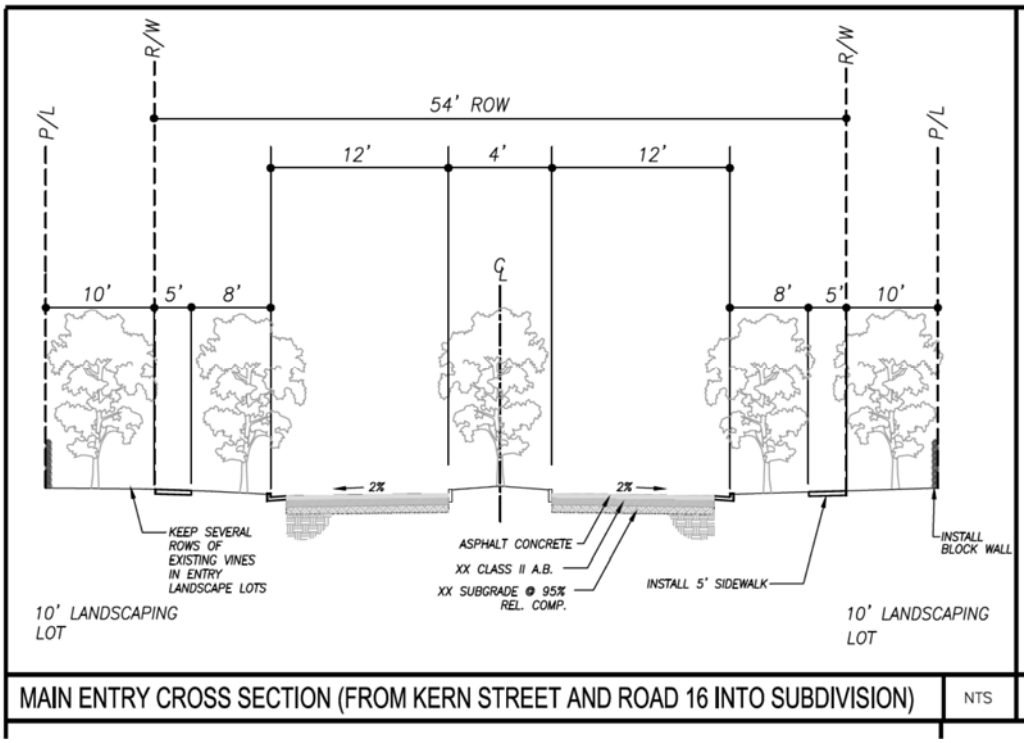


Figure 4-7
Street Design
Local Streets Thoroughfares

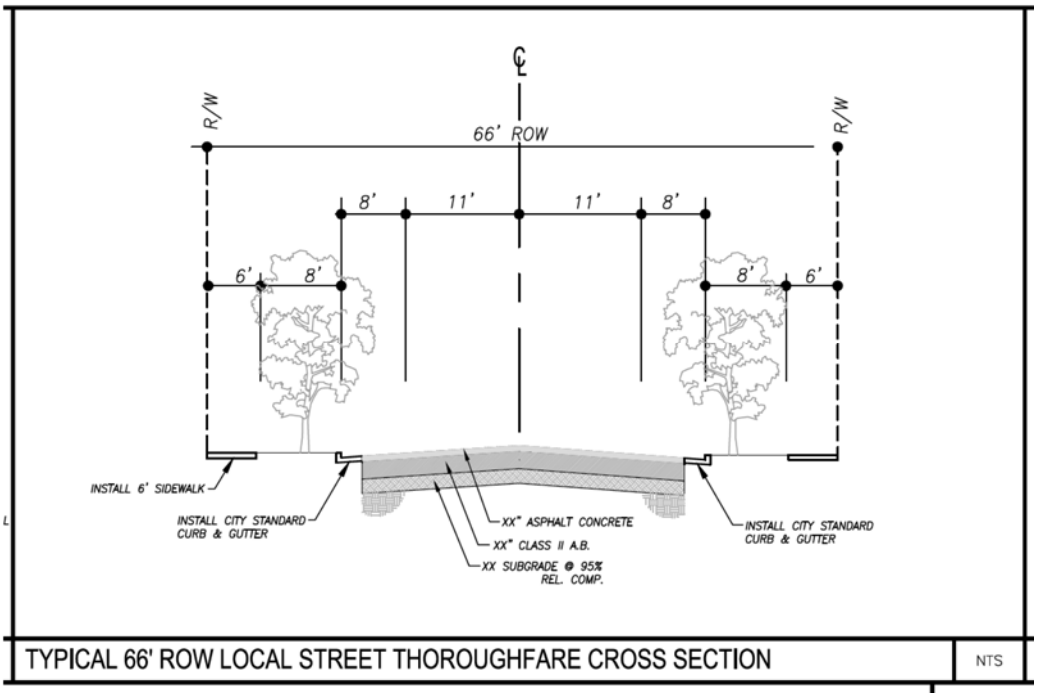


Figure 4-8
Street Design
54’ ROW Local Street

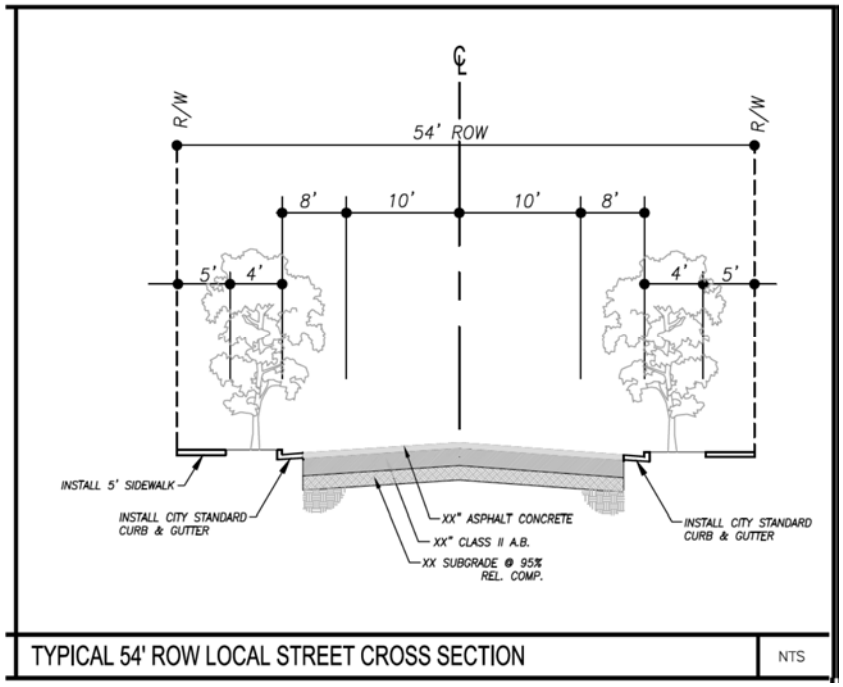


Figure 4-9
Street Design
54’ ROW Local Street

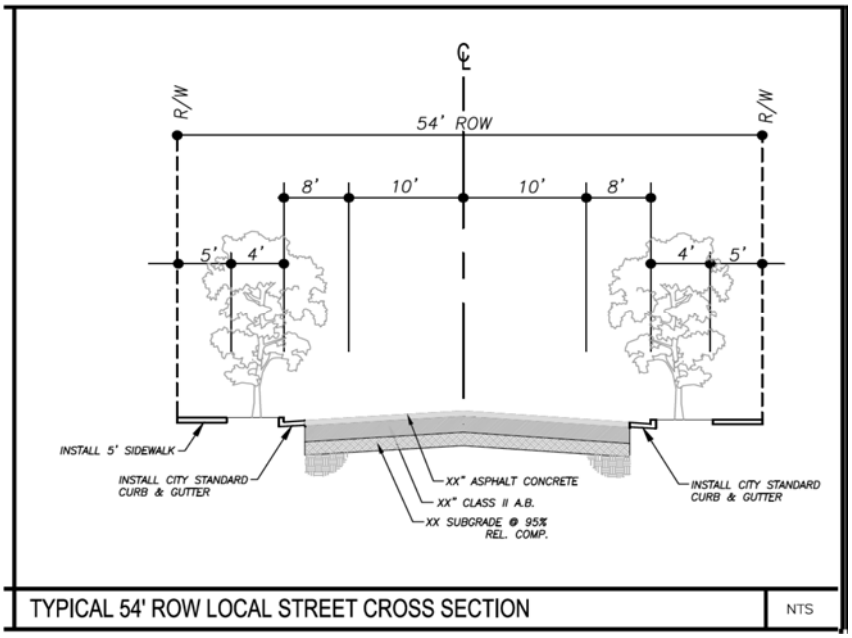


Figure 4-10
Street Design
Kern Street 60’ ROW

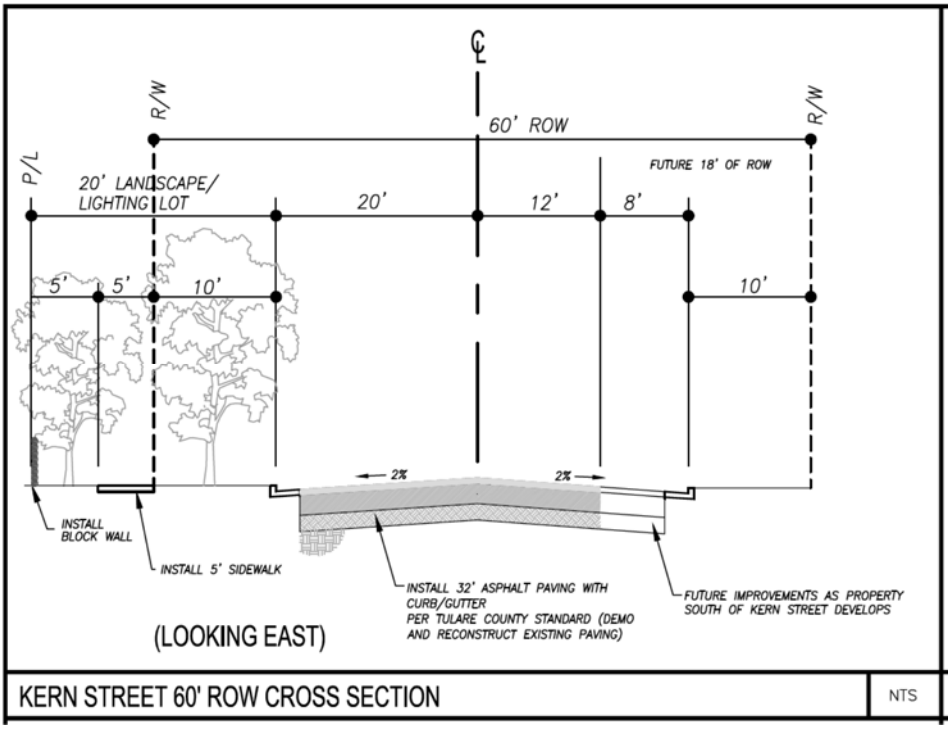


Figure 4-11
Street Design
Road 16 60’ ROW

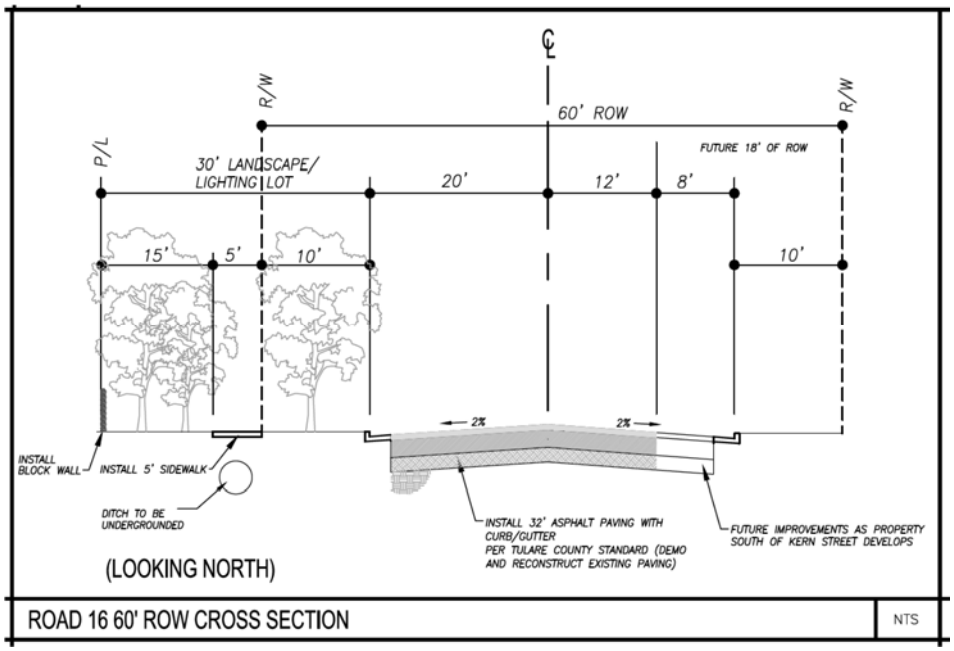


Figure 4-12
Street Design
Linquist St. and 22nd Ave.

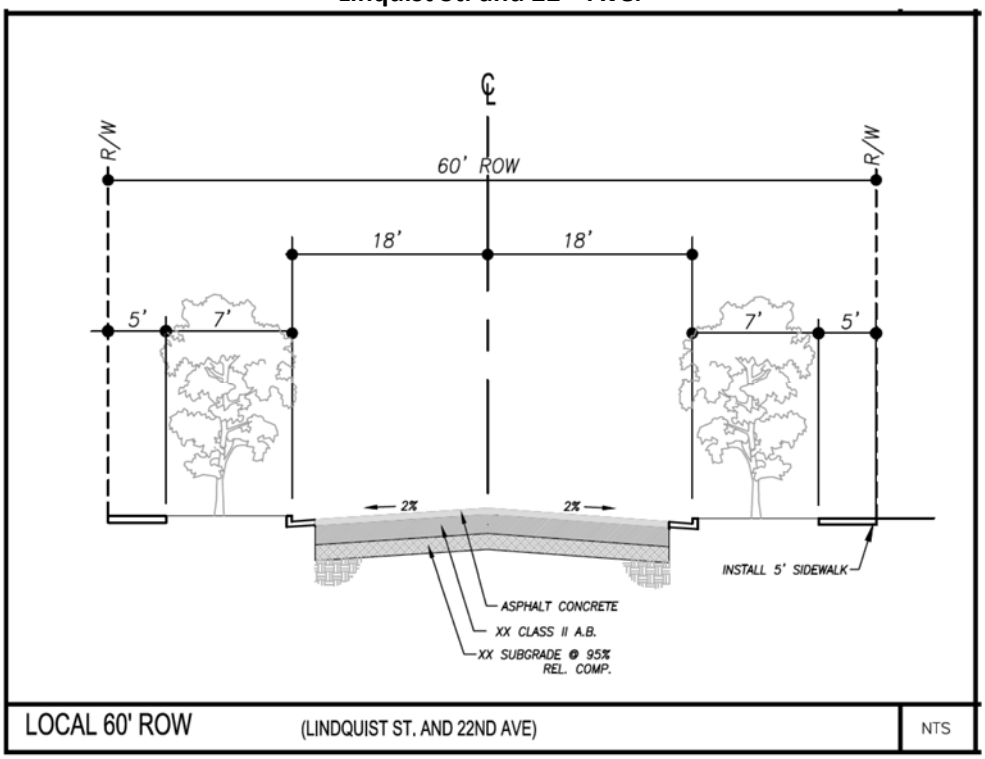


Figure 4-13
Alley Design
Typical 16' ROW Alley

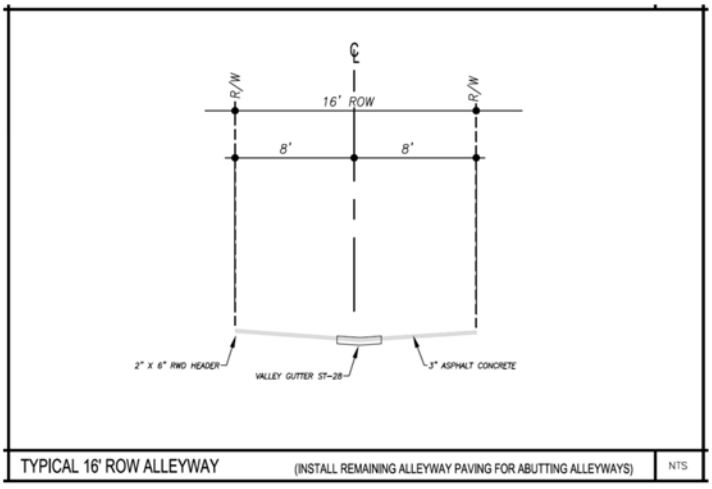
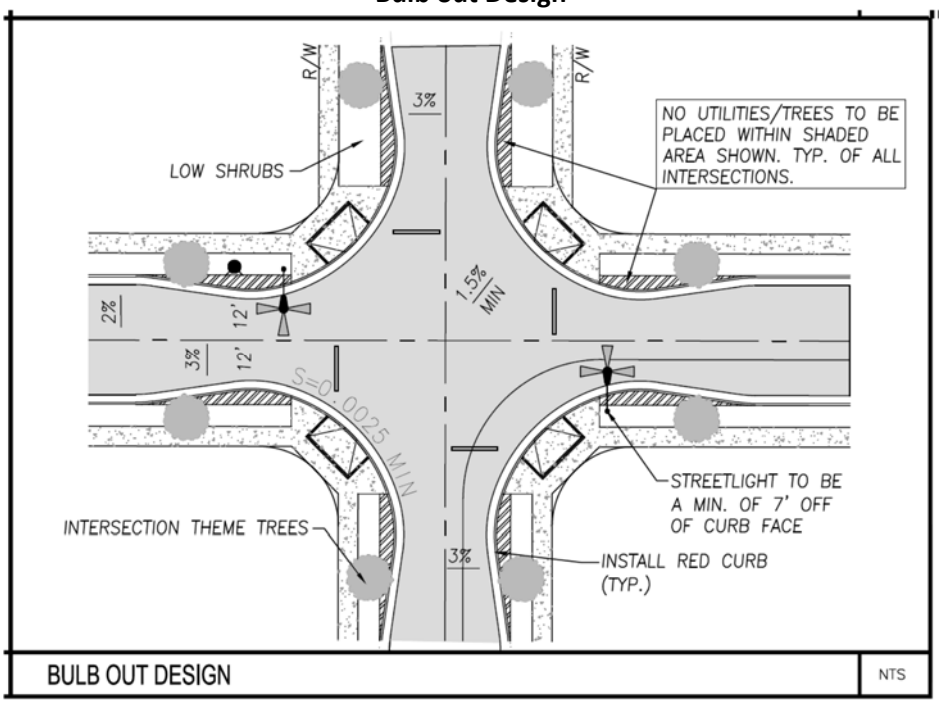


Figure 4-14
Intersection Design
Bulb out Design



4.2.6 Streetscape Design

The streetscape theme for arterial and collector streets utilizes rows of canopy trees similar in character to the canopy trees along streets in pre-World War II residential neighborhoods of the Community and shaded farmsteads of the surrounding agricultural landscape. The streetscape theme of the Specific Plan's residential streets is to recreate neighborhoods with large canopy trees arching over the street and sidewalks separated from curbs by turfed parkways.

4.3 Road Maintenance

Subject to agreements between the City and County and funding through a tax sharing agreement and a Community Facilities District, the City will maintain all internal residential roadways, frontages, street trees, and external frontage improvements and roads. The developer is to establish a funding mechanism such as an Landscape and Lighting District or a Community Facilities District to fully fund these maintenance costs. If the County and City are unable to establish such an agreement, the County shall maintain the County portion and the City shall maintain the City portion, and the maintenance district funds shall be allocated to each jurisdiction according the number of lots within the City and County, respectively.

The external roads (Kern and Madsen within the County) will be maintained under the Tulare County Pavement Management System (PMS), which is a planning tool used to aid pavement management decisions.

- Typical tasks performed by Tulare County PMS include:
- Inventory pavement conditions, identifying good, fair and poor pavements;

- Assign importance ratings for road segments, based on traffic volumes, road functional class, and community demand;
- Schedule maintenance of good roads to keep them in good condition; and,
- Schedule repairs of poor and fair pavements as remaining available funding allows.

Part Five: Utility Infrastructure

5.1 Water Supply and Distribution

5.1.1 Under an extraterritorial service agreement through Tulare County LAFCo, the City of Kingsburg will provide water service to the project. Points of connection are in Madsen Road at the approximate Orange Street alignment, and in Mariposa to form a loop system (See Figure 5-1.)

5.1.2 Water Distribution System

The existing City water distribution system is a well-developed grid system of interconnected pipes of varying sizes. Pumps at the water wells provide pressure for the system, and the high-water elevation of the storage tank sets the upper limits for pressure within the system. Demands for water in gallons per minute were placed at each pipe junction based upon an even distribution of flow over the entire system. The water demand ranges from a high of 209 Acre-Feet (AF) per year (without mitigation) to a low of 111 AF per year (with mitigation). However, for engineering purposes, the average annual water demand for the project is expected to be 150-175 AF per year. The planned water line loop in Kern may or may not be necessary, depending on water pressure modeling.

5.1.3 Existing Wells

For the 2005 Water System Master Plan, the City had five existing wells operating on a rotating basis and one well on emergency standby status. Their approximate combined production was 5,400 gpm.

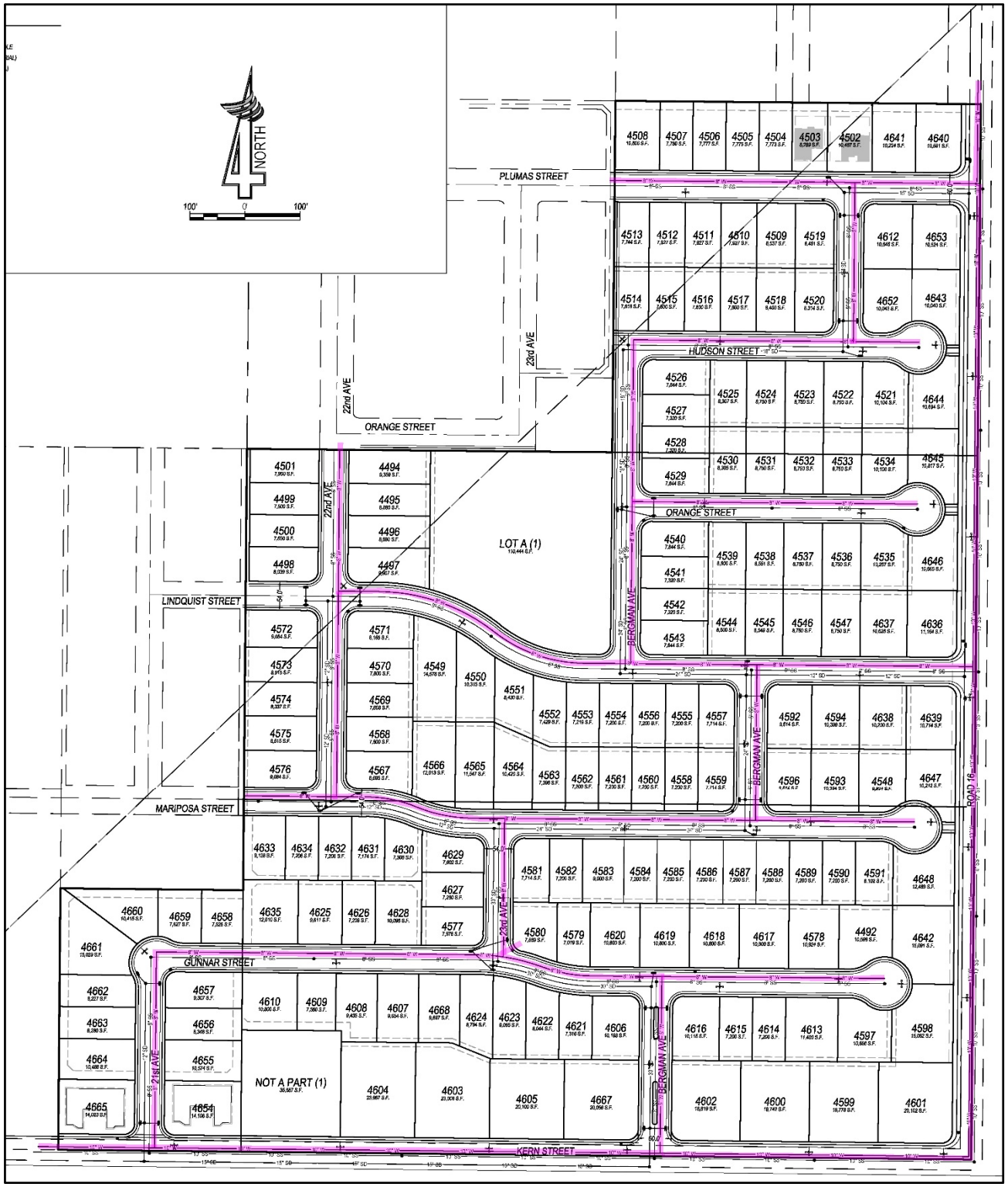
5.1.4 Storage Tanks

The above ground storage tank located at Downtown Park was constructed in 1911, and has a storage capacity of 60,000 gallons and a height of 122 feet.

5.1.5 Adequacy of Future Water Supply

Based on the City's current General Plan, the pumping capacity of the future water distribution system with the five older wells, one newly-developed well and seven future wells will be adequate for future demand. The water pressures projected for the system at buildout under the General Plan will be at or above the minimum required pressures of 30 pounds per square inch (psi) for peak-hour demand conditions and 20 psi for maximum day demand plus fire flow requirements.

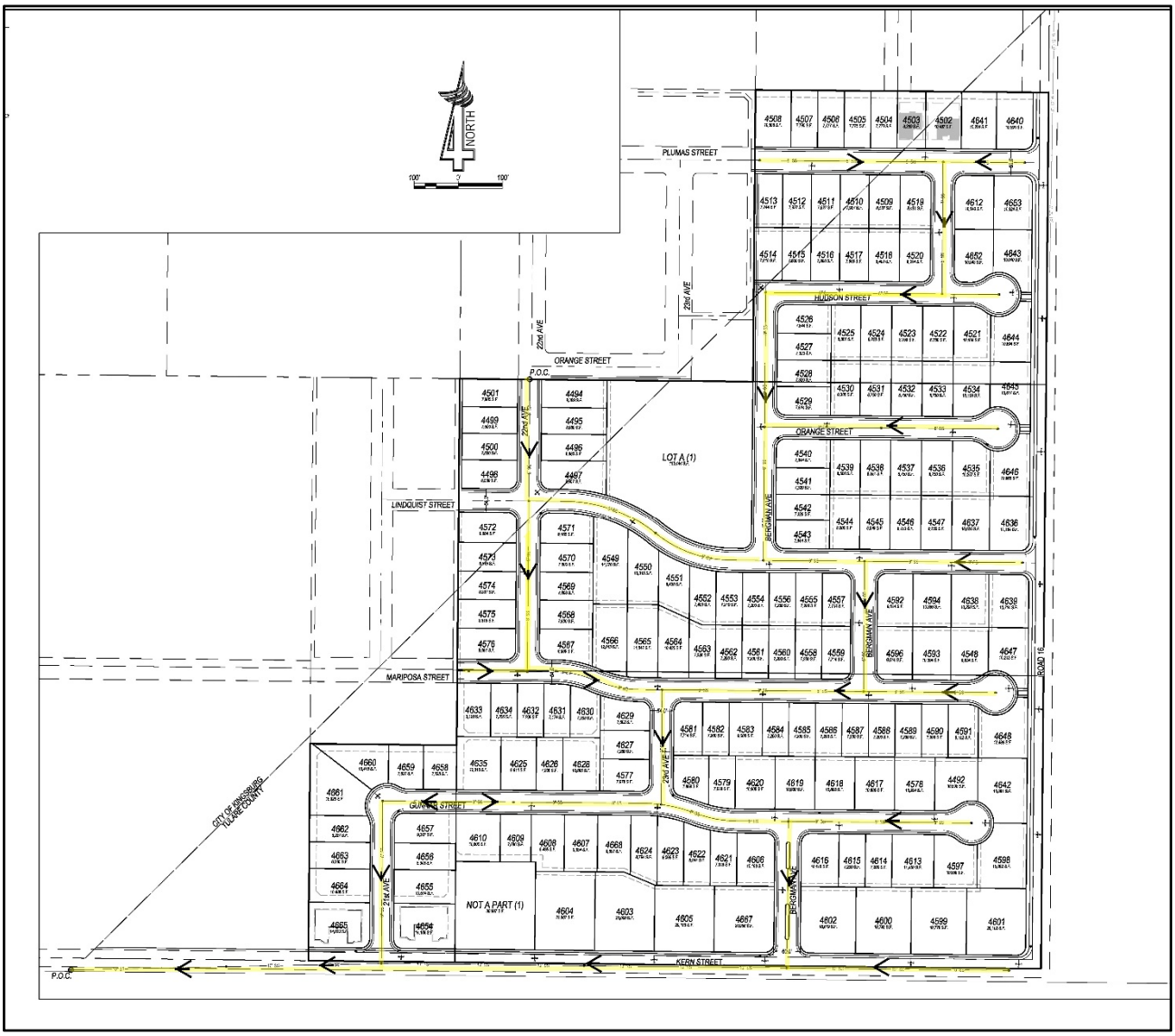
Figure 5-1
Water Supply Plan



5.2 Waste Water Collection, Treatment and Disposal (SKF Requirements)

Sanitary sewer system improvements consist of major sanitary sewer mains in Kern Street approximately 300 lineal feet west of the west Project boundary, and intract gravity lines. The backbone sanitary sewer mains and connections to the City's sanitary sewer system will be financed and constructed by the Developer or homebuilder as part of the backbone infrastructure of AVSP, and impact fees paid to SKF and the City. The collection mains along local streets and lanes will be financed and constructed by the homebuilders for each neighborhood and by the commercial developer(s) for the commercial portion of the project. Maintenance of the sanitary sewer system in both the public and private areas of the community will be the responsibility of the Selma-Kingsburg-Fowler County Sanitation District. Funding for maintenance of the sanitary sewer system will be provided through sewer fees. Figure 5-2 shows the wastewater collection system.

Figure 5-2
Sanitary Sewer Collection System



5.2.3 Storm Water and Other Surface Drainage (City Standards)

Surface water drainage facilities will be designed in conformance with the update of the City's Master Drainage Plan, and will rely on onsite collection system and a 1-acre pond south of Kern Street. The AVSP will provide storm water drainage for the 10-year – 10-day event. Overland flow will be provided along local streets, and to the farmland south of Kern Street.

5.3.1 Storm Water Collection

The existing City collection system will not be used to support the project. The onsite system of drain inlets and gravity systems will be used exclusively to support the project. Plan Area streets are designed to act as the first stage of the collection system. Properly designed and constructed to the right gradients, the bio-swales and streets carry runoff water to strategically located points of collection where drop inlets then transfer water from gutters into underground pipelines for disposal into ponds on-site. Figure 5-3 shows the proposed storm drainage system for the Project.

5.3.2 Storm Water Storage and Disposal

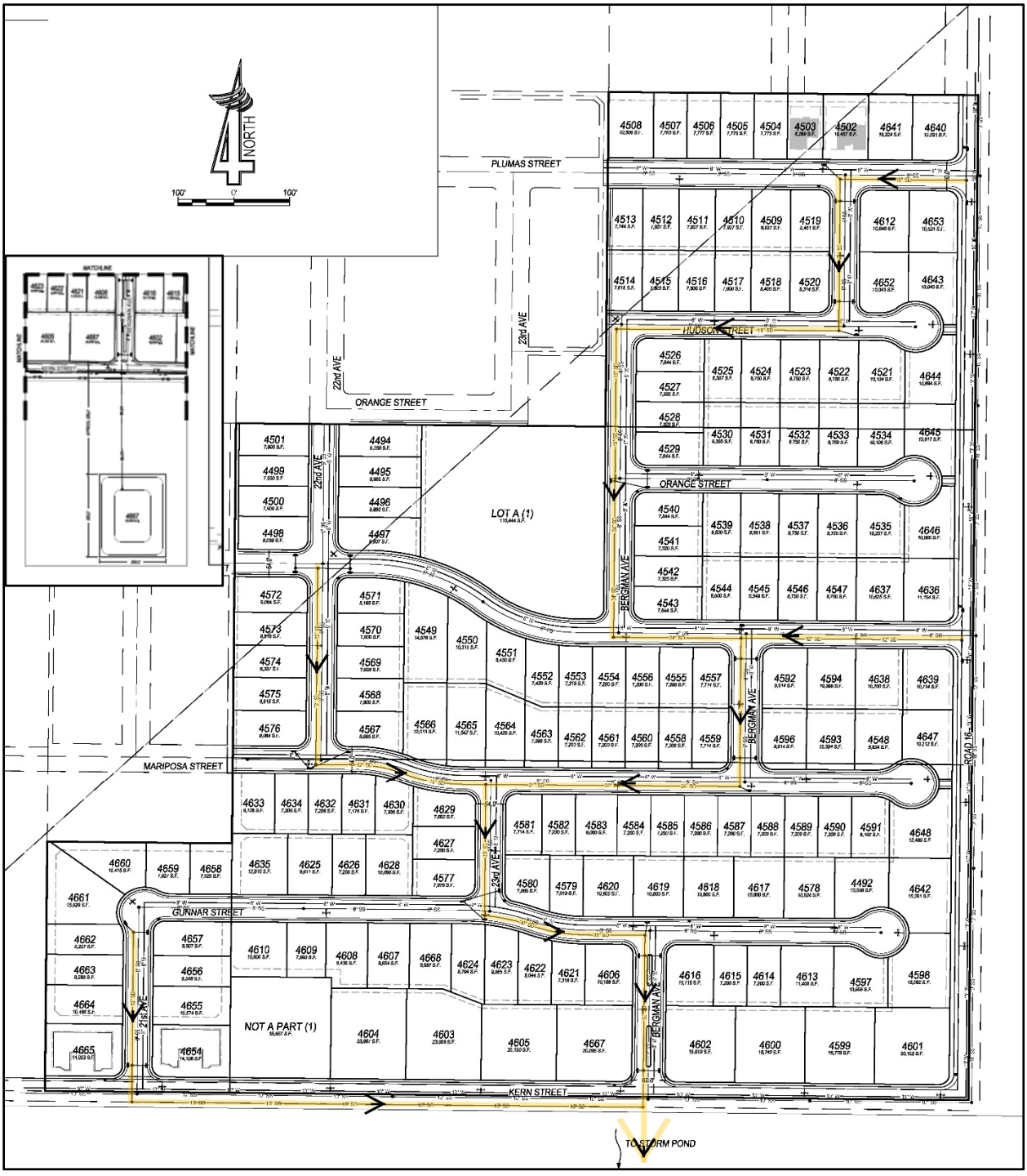
Storm water retention demand is estimated to be 11.5 acre-feet. This will be provided using a one-acre, 11.7-acre-foot pond south of Kern Street which is designed to handle the projected 10-year, 10-day event and the amount of run-off from drainage areas within the AVSP specific boundaries.

5.4 Gas, Electric, and Communication

Gas and electric service will continue to be provided by the Pacific Gas and Electric Company and The Gas Company (Southern California Gas Company) via the extension of existing electric and gas distribution lines within the North Kingsburg planning area. In accordance with existing Public Utilities Commission and local regulations, new distribution lines will be placed underground. Telephone services will be provided to the planning area by a variety of servers via existing telephone lines and wireless communications systems. As development occurs, new phone lines will be placed underground in accordance with City regulations. Cable television lines are recommended to be extended as development within the planning area occurs. Through a franchise agreement with the City, Comcast is designated as the sole cable television provider. High-speed internet services are provided by Comcast and by the telephone provider SBC. Centralized services are proposed within the industrial corridors that are required for access to telecommunication satellites and telecommunication systems which can be expected to serve the Fresno-Clovis metropolitan area. Such access is necessary to having a competitive edge in attracting research and development firms to the Corridor. The installation of fiber optic conduit should be encouraged.

Figure 5-3

Storm Drainage System



5.4 Solid Waste

Solid waste management services are provided to the community under a franchise agreement between the City and a private waste management company. Such franchise service is expected to continue over the period of buildout of residential, commercial and industrial development within the North Kingsburg planning area. Currently Mid Valley Disposal is the Private Waste Management Company for the City of Kingsburg, and the agreement would have to be updated to include the areas in the County.

5.5 AVSP Master Infrastructure Plan Policies

Then infrastructure plans are designed to comply with the City's Improvement Standards, and the City/SKF Sanitation District's Waste Water Standards. The pipeline distance separations comply with general engineering standards, City of Kingsburg of Kingsburg standards, SKF standards, and those in Title 22, Chapter 16 of the California Code of Regulations.

5.6.1 Infrastructure Policies

5.6.2 Policy: Evidence of Water and Sewer Availability and adequate system capacity must be provided prior to approval of any final maps.

5.6.3 Policy: All development in the AVSP shall be required to connect to the City's water and SKF's sanitation, except in extreme cases where exclusions may be granted, but must connect to the community water system when service becomes available.

5.6.4 Policy: Storm Drainage will be held on site per the master plan, unless and until other arrangements can be worked out with the City to provide alternative storm drainage methods.

Part Six: General Services

A number of the services and facilities will be provided directly by the Project itself through an assessment district or a community facilities district. The County will continue to be responsible for all building, planning, code enforcement, health and human services, and other municipal services (other than those described below). There are several key facilities and services that the City of Kingsburg may provide: 1) community-level parks and recreation; 2) police; 3) fire; 4) general city admin; and, 5) water supply. Each of these is described below. Storm drainage will be provided onsite and maintained by the assessment district and no City or County fees will be necessary to construct or maintain these facilities.

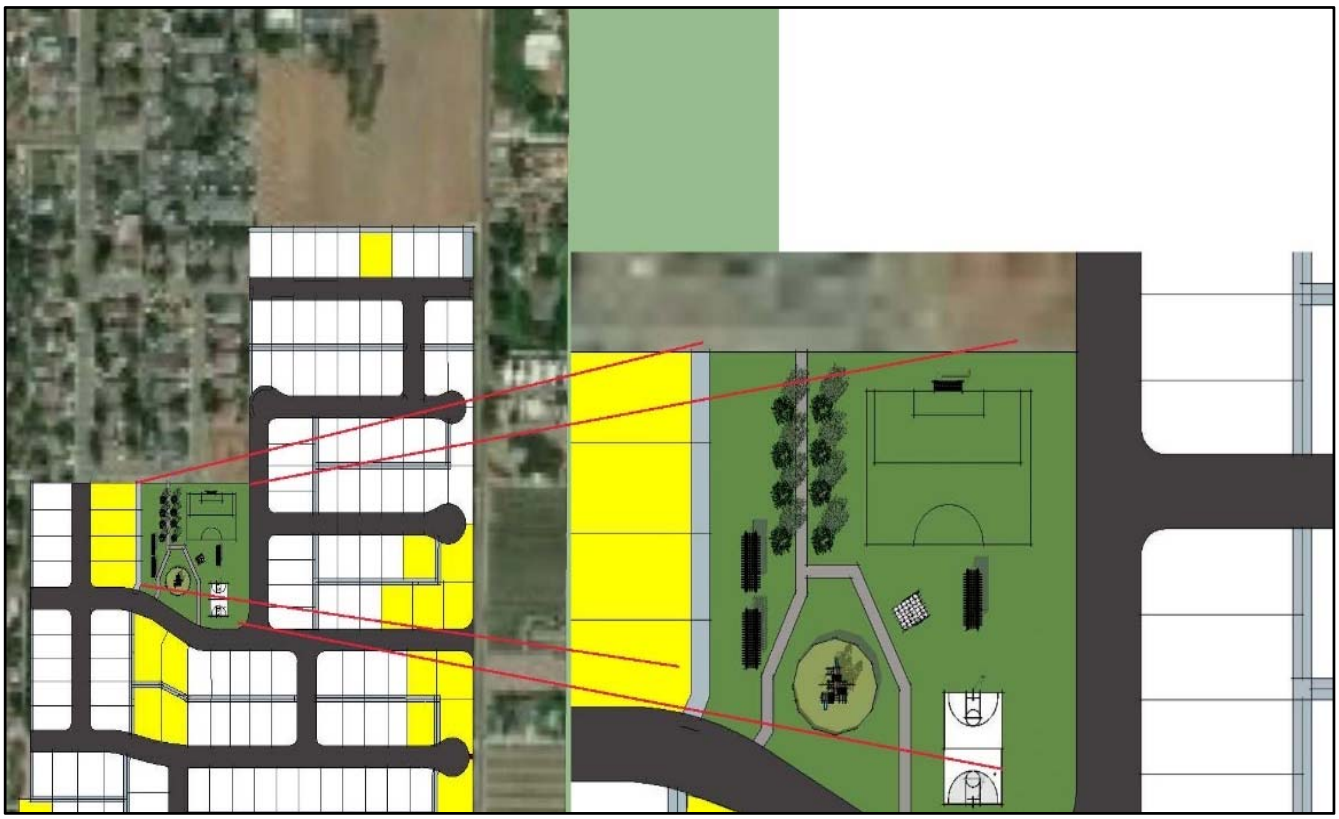
6.1 Community-Level Parks and Recreation

The project will provide parks and open space at a level that meets or exceeds the County's and City's standards. These facilities will be maintained through a community facilities district. The project and the adjacent neighborhood will be served by a 2.5-acre neighborhood park located at Lindquist, Orange and 23rd Street. According to the City of Kingsburg General Plan (1990), neighborhood parks are to be provided an overall standard of 2.7acres/1,000 population. According to this standard, the project creates a need for 1.5 acres of developed parkland. The project would provide an additional acre of park area, which would serve a population of 375 persons outside of the Project boundaries. The park is located at the intersection of Lindquist, Bergman, Orange and 23rd Avenue to facilitate access by existing residents of the neighborhood as well as Project residents.

The park will include a "splash pad", practice soccer field or open sports fields, basketball courts, shade structures, a central tot lot with play structure, picnic tables and shelters and other features, as illustrated in Figure 6-1 below.

Figure 6-1

Neighborhood Park



6.2 Police

The Tulare County Sheriff will continue to service the site, with City police forces assumed to be the first responders. The Project proposes to pay the City's Public Safety Impact Fee, plus an amount to fund 0.50 FTE in the police department. The project will provide this through a combination of property tax sharing from Tulare County and special assessments as part of the Community Facilities District.

6.3 Fire

Tulare County/CalFire will continue to service the site, but the City Ambulance/Fire assumed to be the first responders. The Project proposes to pay the City's Public Safety Impact Fee. The project will provide funding from the CFD and tax sharing agreement to 0.25 FTE in the fire department. The project will provide this through a combination of property tax sharing from Tulare County General Fund, Tulare County Fire Fund, and special assessments as part of the Community Facilities District.

Part Seven: Development Standards & Design Guidelines

These standards will be applied to this Vesting Tentative Map that is to be built out in 4 phases over the next 3 to 5 years. These development standards are based on the City and County zoning and development codes. In addition to the development standards in the Kingsburg Zoning Ordinance that will apply to the project (Chapter 17.28-R for the R-1-7 portion, and Chapter 17.32 for the RM 3.0 portion), this Specific Plan sets for special development and design guidelines for the project area.

The project is comprised of two land use and design districts: 1) R-1-7 areas which are intended to follow the City of Kingsburg single family design district, and the special requirements of the North Kingsburg Specific Plan. These areas will typically have alley access since they share existing alleys in the City; and, 2) a R-2/R-3, RM-3.0 multifamily area along the Kern Street frontage that is intended to accommodate fourplexes with common drives, private garages, and attached homes. Figure 3-2 shows the proposed locations of these land use districts.

7.1 Development Standards for Low Density (R-1-7) Residential Areas

The following standards apply to Low Density single family detached or attached housing within the Project.

7.1.1 Siting Criteria

It is important that every residential project create a streetscape that provides visual quality and variety. This can be achieved by siting buildings with varying setbacks, providing differentiation in garage locations relative to the street and alley, reversing plans so that garages and entries are adjacent to each other, limiting the number of houses within a given block where the garage opening is closer to the front property line than the house, and by providing relief with porches or other single-story elements along the street.

7.1.2 Massing and Detail

The buildings shall be articulated so that the massing of the perceived streetscape of a neighborhood has variety and visual interest. This requirement is applicable to the front and street-facing side elevations of corner lots as well as easily visible rear elevations such as those that back onto streets or alleys. Unless it is not appropriate to the architectural styles, this can be accomplished by providing a variety of both single- and double-story elements. Solutions to achieve these objectives include:

- A reasonable mixture of one- and two-story units in each block.
- At least half of the houses shall have covered entries and/or porches.
- Window and balcony placement on second stories shall avoid direct views to the rear yards of adjacent lots. Where this is not possible, obscure glass or louvered windows will be provided.
- A consistent scale of elements shall be used throughout the design.
- Individual elements shall be designed in proportion to each other.
- Units backing or siding onto streets shall have enhanced elevations where they are visible from the streets, including building articulation and window treatments. Where possible, the principal roof line of buildings adjacent to Kern or Madsen shall run parallel to the centerline of the street to provide noise attenuation.
- For corner lots, the building materials on the front facade should wrap to a logical termination point on the street side yard elevation.

7.1.3 Roofs

A variety of roof plans and pitches is desired to assist the massing and site criteria. The following limitations are to be observed during building design and construction:

- Where mechanical equipment is located on the roof, it shall be screened.
- Satellite dishes shall be sited so that they are limited from view from the street as much as possible.
- Roof penetrations for vents shall be on the rear side of roof ridges whenever possible. All vents shall be painted to match the roof color.

7.1.4 Garages and Driveways

Garages and driveways should not be the primary feature of a house. As discussed above in Siting Criteria, differing garage locations are important. Other ways to accomplish this are:

- The design treatment shall strive to reduce the overall visual mass of the garage.
- Architectural forms shall de-emphasize the garage by highlighting other elements of the house.
- Provide a minimum difference of four feet between the living area elevation or porch/covered entry element and garage elevation unless the garage is flush with the living area.
- Utilize a variety of garage elevations, with placement of the garage door parallel to the access street or alley. Garages that front on the alley (in R-1-7 zones) shall have backup space no less than 25 feet from the face of the garages to the other side of the alley.
- Garages and driveway widths shall be limited to no more than 50 percent of the lot frontage.
- Front-facing three-car garages shall have at least one garage door set back a minimum of three feet from the other two garage doors.
- Driveways shall be varied in width as appropriate to the site plan.

- Roll up or sectional garage doors shall be used.
- Driveways should alternate along the street as much as possible.
- Hollywood driveways that permit turf or other low groundcovers to be planted within the center of the driveway are strongly encouraged for long or very wide driveways.

7.1.5 Corner Lots

The garage and driveway are to be placed along the interior side yard, at the rear of the street side yard, or with access from the alley. Side street garage entries are encouraged. This option for corner lots provides adequate on-street parking along both the front yard and side yard for resident and guest parking. Limiting the driveway to eight feet in length prevents the resident from parking in the driveway, and preserves a more useable and pleasant rear yard.

7.1.6 Porches and Decks

As discussed above under Massing, porches can be used as single-story elements of the street elevations if they are incorporated into the roof lines and architecture. Because of this, corner lots are encouraged to include a wrap-around porch. The following standards shall apply:

- A minimum of one-third of the houses in a given block shall have porches or covered entries.
- Porches and decks shall be designed to reflect the appropriate scale and detail for the architectural style involved.
- Where porches are used, they shall extend along a minimum of 50 percent of the façade of the living area (not including the garage), with a minimum depth of five feet.
- At least two house plans of a project must have a porch option that can be converted to a wrap-around corner treatment. Where a corner lot is wide enough to accommodate a wrap-around porch, a minimum of 50 percent of single-family corner lots in a project shall have wrap-around porches.

7.1.7 Windows and Doors

- As with roofs, windows and doors shall vary because of the various elevation styles required among the house plans.
- Windows may be provided in various shapes and sizes, and double entry doors with or without side panels may be provided, as long as they are appropriate to the building's architectural style.
- Dormer windows shall be architecturally correct in scale, proportion and detail with the selected architectural style.
- Bay windows should be carried down to grade or express appropriate visual support of a cantilevered condition. The wall area of bay windows shall be detailed in a manner that is appropriate to the architectural style.

7.1.8 Materials and Colors

Within a given architectural style, the exterior shall receive a consistent use of materials and colors on all sides. Accent materials such as brick and stone used on street facing elevations shall be returned to a logical point of termination on the adjacent elevation. Natural or natural- appearing materials should be used as details to compliment the architectural style. These materials include wood, stone, brick and copper. Full metal roofs are prohibited.

7.1.9 Mechanical Equipment and Accessory Structures

Mechanical equipment shall be located in the rear yard when the side yard setback is less than seven feet. Where the side yard setback is greater than seven feet, mechanical equipment shall be located a minimum of five feet from a side property line adjoining an interior lot that contains a residential use unless adequate noise attenuation is provided.

Accessory and garden structures under seven feet in height and 120 square feet in area may be located in any portion of a required rear or side yard, except in the street side yard of a corner lot, provided proper building separation is maintained.

7.1.10 Standards

- Dwellings in the R-1-7 districts shall comply with requirements of Chapter 28-R of the Kingsburg Zoning Ordinance.
- Lot areas may be reduced up to 15 percent if amenities such as pedestrian corridors and connectors are provided for the benefit of local residents. Such connectors and corridors include “kissing” cul de sacs with pedestrian access, and cul de sacs that open on to parks or open spaces.
- In any residential zone, an equivalent area in landscaped pedestrian corridors or other type of recreation open space may be substituted for alleys, except where alleys are required for garage access, if waste receptacles are stored within decorative walled or fenced areas.

7.1.11 Lot Design and Arrangement

Typical residential lots in the Central Valley are based on past lifestyle choices, banking and underwriting regulations, and other factors. Existing standards and regulations provide little if any common open space, and place open space and recreation areas in individual rear and front yards. Environmental concerns and lifestyle changes have caused homeowners to recognize the cost and disadvantage of overly large lots, and common amenities can meet these needs. Younger families also desire less yard area to manage maintenance expenses. While projects with smaller lots are often viewed as “substandard”, in most cases they are able to provide greater livability if there is common open space and pedestrian features. To address these lifestyle changes, the following lot design, subdivision design and arrangement objectives are encouraged:

Single-family lots shall not front on to Arterials, and should not front on to Collectors whose traffic volumes are expected to exceed 2,500 average daily trips (ADT). Regardless of lot width or the ability to provide circular drives or back-a-rounds, this arrangement degrades the traffic capacity and safety of the

street.

7.2 Development Standards for Medium Density (RM-3.0) Residential Areas

The RM 3.0 district is a combination of the County R-2 and R-3 zones, and the City RM 3.0. The County R-2 zone permits "two-family dwellings" (duplexes), while the R-3 zone provides for units with more than two dwellings. The intent of this zone is to permit two and four-unit dwellings, but not permit general apartment buildings or buildings with more than four units. Developments in this zone are to follow Chapter 17.32 of the Kingsburg Zoning Ordinance. Due to the location and transitional uses, these units shall be single story only, or there shall be no second story views into adjacent single-family yards if a second story is allowed.

7.2.1 Housing Product Types

7.2.1.1 Duets (duplex and fourplex units)

Duets (commonly referred to as a duplex) are two attached housing units with a shared wall.

They can be designed to appear as a single house. With appropriate massing and floor plan design, these units can achieve privacy and individuality for each unit, and allow the for the integration of small floor plans without and obvious change in apparent massing and product size compared to the single-family portion of the project. When intended for separate ownership, these units are often referred to as a "half-plex" and are sited on corner lots within otherwise single-family detached housing on conventional lots. Creative site planning and architectural design that incorporates shared driveways, side entries and alternate front, rear and side entry garages are encouraged. The minimum lot size for duets is 3,000 square feet per unit or 6,000 square feet for the pair of units.

7.2.1.1 Fourplex

Fourplexes are four units attached in series that provide single story dwelling units that have most of the features and amenities of single family detached houses such as attached garages, private entries, modern floor plans, etc., but share a driveway, yard areas and landscaping. These are often owned with the owner living in one of the units and renting the other three units, or they may be rented and managed by a professional property manager. They provide the typical amenities of a single-family home, with the actual maintenance responsibilities conducted by the owner or a property

manager. The fourplex is normally one architecture style with the front door and entry locations articulated. While each fourplex is expected to have a single architectural style, duplication or repetition of that single style form lot to lot is prohibited. For the design of corner and end units, creative architectural massing and unit design solutions are required. For fourplex units the minimum lot size is based on 3,250 square feet per unit.

7.2.2 Massing and Detail

The following guidelines shall be reflected in all submittals to create and maintain the desired streetscape:

- Articulate the building massing to minimize the "business" of medium density housing types. This is applicable to any street-facing side elevations.
- Utilization of a variety of compatible styles.
- Provide one-story building massing. Two story units are prohibited.
- The street facing units in the fourplex or duplex shall have porches or covered entries similar to those required for Low Density residential units.
- Units backing or siding onto an arterial street shall have enhanced elevations where they are visible from the street. This shall include, but not be limited to, one or more of the following: building articulation, window treatments, and/or massing variation.

7.2.3 Garages

Due to the density of this type of housing, garages shall not be permitted to dominate front elevations, and the principal access to garage units shall be from a common drive in the side yard area. Where front access is required, the portion of lot frontage for driveways and garage elements shall not exceed 40 percent of the lot frontage. In any configuration, there must be a minimum difference of four feet between living area or porch elevation and garage elevation unless the garage is flush with the living area. The following additional guidelines are applicable:

- Roll-up or sectional garage doors shall be utilized.
- Garage location options include: tandem, detached, shallow, mid-recessed, deep recessed located toward the rear of the lot, swing-ins (if feasible) and rear access from an alley. No one garage location option with access from a street shall exceed more than 40 percent of a block and neighborhoods unit design. Private garages shall be provided for at least one of the 2 required off-street covered parking spaces.
- Hollywood driveways (those that permit turf, pervious pavers or other low groundcovers to be planted within the center of driveway) are encouraged on long or wide driveways.

7.2.4 Corner Lots

The garage and driveway are to be placed along the interior side yard, or accessed from the side street at the rear of the yard or from the alley. The alternative of providing side street or alley garage access provides many benefits, including allowing a more interesting front facade, and increasing the

amount of landscaped area in the front yard. The lack of front yard driveways is typical of traditional neighborhood designs of the early and mid-1900s and enhances pedestrian experience and safety of a street. The relocation of the garage also permits greater flexibility and innovation in house design.

Side street garage access provides adequate parking along both the front and side streets for resident and guest parking, while alley access for inferior lots substantially increases curb parking for residents and guests. Side street driveways shall be limited to eight feet in length between garage and sidewalk to discourage residents from parking in the driveway.

7.2.5 Porches

As discussed under massing (above), porches can be used as single-story elements of the street elevation. Because of the two public faces, a wrap-around porch is encouraged for the corner lot.

- Porches and decks shall be designed to reflect the appropriate scale and detail for the architectural style of the housing unit.
- Where porches are provided, the length shall be a minimum of 50 percent of the width of the front living area (structure width not including yards or parking).
- Porches are to be a minimum of five feet in depth and can extend into the required front yard.
- At least two house plans must have a porch option that can be converted to a wrap-around corner treatment, if feasible.
- Where corner lots are sufficiently wide to accept wrap-around porches, at least half of the corner lots shall have wrap-around porches. (Other significant architectural elements appropriate to the architectural style of the unit may work as a substitute).

7.2.6 Windows and Doors

As with roofs, windows and doors shall vary because of the different elevation styles used. They shall reflect restraint in the numbers of types, styles and sizes. Consistency of window and door detailing on all elevations must be maintained. More specifically:

- On all elevations, openings shall be articulated with an appropriate head and sill detail as a minimum. Jamb trim can be added where appropriate.
- Shutters shall be sized and designed appropriate to house style.
- Window grids, if appropriate to the architectural style, shall be used on all street facing elevations.
- Windows may be provided in various shapes and sizes, as long as they are appropriate to the architectural style of the building.
- Dormer windows shall be architecturally correct in scale, proportion and detail with the selected architectural style.
- Bay windows shall be carried down to grade or express appropriate visual support of a cantilevered condition. The wall area of bay windows shall be detailed in a manner that is appropriate to

the architectural style.

7.2.7 Materials and Colors

Within a given architectural style, the exterior shall receive a consistent use of materials and colors on all sides. Accent materials such as brick and stone used on street facing elevations shall be returned to a logical point of termination on the adjacent elevation. Natural or natural- appearing materials should be used as details to compliment the architectural style. No combination of elevation, style, and colors may be repeated any more frequently that once every four units along an individual block face.

7.2.8 Mechanical Equipment and Accessory Structures

Mechanical equipment shall be located in the rear yard when the side yard setback is less than seven feet. Where the side yard setback is greater than seven feet, mechanical equipment shall be located a minimum of five feet from a side property line adjoining an interior lot that contains a residential use, unless adequate noise attenuation is provided. Accessory and garden structures under seven feet in height and 120 square feet of area may be located in any portion of a required rear or side yard, except in the street side yard of a corner lot, provided that proper building separations are maintained.

7.3 Residential Landscape Guidelines

7.3.1 Theme

The plant theme for the Project is to create a neighborhood with broad shade trees, recreation areas and pedestrian-friendly street systems. Tree species have been selected for median strips, parkways, tree wells and front yard and street side yard setback areas to provide visual unity for the project. It is the intent of these guidelines to provide flexibility and diversity in the design of landscaped areas and the street trees selected. The species of street tree throughout the project shall be consistent throughout the Project and shall be selected from the City of Kingsburg's permitted Street List Master List.

7.3.2 Landscape Designs

The landscape plans for all public sites and areas are to be designed by a landscape architect licensed by the State of California, including street rights-of-way in all residential areas, and the street-facing front yards and side yards of multi-family development. Landscape plans and specifications shall reflect the guidelines of this section.

7.3.3 Streets

Street rights-of-way and adjacent landscaped areas and entries are the most visible and some of the most important elements of a community's character. Elements that are significant to accomplishing this intent are discussed below in greater detail, while other elements are discussed more generally to permit greater variety and flexibility. The streetscape theme for arterial and collector streets utilizes rows of canopy trees similar in character to the canopy trees along streets in pre-World War II residential neighborhoods of the community and shaded farmsteads of the surrounding agricultural landscape. The streetscape theme of North Kingsburg's residential streets is to recreate neighborhoods of old with large

canopy trees arching over the street and sidewalks separated from curbs by turfed parkways.

Figures 4-6 through 4-14 show the proposed street standards for the project. These street standards are to be adopted by approval of a Special Use Permit in the County of Tulare. City of Kingsburg standards will apply in the City of Kingsburg portion of the project.

Part Eight: Financing and Implementation

8.1 Introduction

This Specific Plan, to be adopted by the County, will ensure conformance with City development standards. The Specific Plan will be adopted by ordinance and will contain the following regulations; 1) Kingsburg's Public Improvements Engineering Standards; 2) Design and Development Standards comparable to the North Kingsburg Specific Plan as contained in Part Seven; 3) applicable portions of the Title 8 of the Kingsburg Municipal Code related to trash and rubbish, nuisances, weed and rubbish abatement; and, 4) Title 6 of the Kingsburg Municipal Code relating to the keeping of animals. In addition, this Specific Plan provides a framework for the financial and administrative mechanisms necessary to implement the project, including a Tax Sharing Agreement, Memorandum of Understanding on the role of the City and the County in providing the various public services, and formation of a Community Facilities District, or similar mechanism to fund maintenance and services.

8.2 Services and Facilities

Many the services and facilities will be provided directly by the Project itself through an assessment district or a community facilities district. The County will continue to be responsible for all building, planning, health and human services, and other municipal services (other than those described below). There are several key facilities and services that the City of Kingsburg may provide including the following: 1) police; 2) fire; 3) general government and code enforcement; and, 3) water supply. Each of these is described below. Storm drainage will be provided onsite and maintained by the assessment district and no City or County fees will be necessary to construct or maintain these facilities.

8.2.1 Police

The Tulare County Sheriff will continue to service the site, but in all practicality in a back-up capacity, with City police forces are assumed to be the first responders. The impact of the project is estimated to 0.75 full time equivalent fire personnel, approximately $95,000 per year as shown in Table 8-1. The project will provide its share of funding for City police services from a property tax sharing agreement with Tulare County and special assessments as part of the Community Facilities District. The Project proposes to pay the City's Police Facility Impact fee.

8.2.2 Fire Protection and Emergency Services

Tulare County/CalFire will continue to service the site, but in a back-up capacity, with City Ambulance/Fire assumed to be the first responders. The City estimates that approximately 0.75 FTE will be needed to service the project, or approximately $50,000 per year. The project will provide this through a combination of fifty-five percent (55%) of the incremental property taxes from the County

General portion of Tulare County property taxes, eighty five percent (85%) of the incremental property taxes from the Tulare County Fire Fund, and special assessments as part of the Community Facilities District as shown in Table 8-1. The Project proposes to pay the City of Kingsburg's $1,874/unit Fire Facility Impact fee.

8.2.3 City Hall and General Government

The City and the County have agreed that to the greatest extent practicable and legal, the City should provide, and be adequately compensated for, normal general government functions such as code enforcement, complaint management, and other such functions. The City estimates that is will take approximately 0.125 FTE to provide the services to be performed by the City in lieu of the County. This will require approximately $30,000 per year to be funded from the tax sharing agreement with Tulare County.

8.2.4 Water Supply

The City will extend water services to the site and Project residents will pay typical monthly water service fees according to the City's fee schedule. This rate includes an amount to provide groundwater recharge under an agreement with the Consolidated Irrigation District. These services can be extended with the permission of the Tulare County LAFCo. The Project proposes to pay the $1,454/unit City of Kingsburg Water Impact Fee.

8.3 Project Financing Mechanisms

To implement and finance the financing Specific Plan, there will need to be special financial mechanisms to ensure that services and maintenance are adequately provided. Cities and counties typically fund needed services and maintenance through a combination of governmental revenues that are based on local population, through special assessments, through property taxes, sales taxes, utility users' taxes, and other fiscal resources. Since the bulk of the Project is to remain in Tulare County, with services provided by the City of Kingsburg, special revenue generation and tax sharing mechanism shall be adopted to effectively provide these services. The two principal sources of financing include a property tax sharing agreement between the Tulare County and the City of Kingsburg, and a Community Facilities District to be formed over the entire project, with revenues collected by the County and transferred to the City for services and maintenance expenses described herein.

8.3.1 Tulare County Property Tax Sharing

The proposed financing plan assumes some property tax sharing from Tulare County. This tax sharing proposal has been crafted after the "Master Tax Agreement" in Tulare County that currently guides annexations in Tulare County and its cities for tax sharing upon annexation. That agreement calls for the County to retain all of its existing revenues from the site (the "Base"), and to share in the increased property tax revenues resulting from development after annexation ("Increment"). Certain

City services such as special property tax assessments for fire, police and roads are not allocated any Increment under the Master Tax Agreement if the annexing entity provides those services. Under the proposal described herein, the County would share 55 percent of the County General property tax allocation for increment in the Project area, and up to 85 percent of the increment allocated to the Fire Fund from the project. Under this arrangement, $79,400 of incremental property taxes generated by the Project in Tulare County would be paid to the City of Kingsburg, with annual increases based on the annual increase in assessed valuation.

The tax sharing proposal to the County is based on the following assumptions:

1. Approximately eighty-five percent (85%) of the incremental property taxes to the Tulare County Fire Fund would be re-allocated to the City of Kingsburg to cover the estimated Kingsburg General Fund portion of the Fire/Ambulance operating costs. This would recognize that the City would be the closest responder and the County/CalFire station would provide backup. It also recognizes that over 75% of the emergency services calls for service are medical related and the City's response time can best service this need. The actual amount of the shift in the Fire Fund could be based on a fixed amount each year per call for service, or based on the actual number of calls for service for the City and the County, similar to the agreement between the City of Exeter and the County of Tulare.
2. Fifty-five percent (55%) of the post-ERAF adjusted Tulare General County property tax increment would be allocated to the City of Kingsburg. This amount would recognize the reduced burden on the Tulare County Sheriff under the proposed service arrangement.
3. The County would retain all other intergovernmental allocations based on population, road miles, etc. such as gas tax, VLF and others. Kingsburg would retain the sales taxes occurring in the City.

Table 8-2 shows the existing allocation of property taxes to the respective taxing entities, and the projected allocation of the property tax increment before and after the tax sharing agreement.

8.3.2 Community Facilities District

The ability of the tax sharing agreement to address all fiscal needs is limited. The Project includes facilities that need to be maintained that are above and beyond the capacity of either the City or the County to address. Cities and counties routinely include special assessments to maintain streets, landscaping, parks, and to provide additional fiscal revenues where there is a need for "fiscal mitigation". Cities and counties have used landscaping and lighting districts to maintain subdivision improvements, and used Community Facilities Districts under the Mello Roos Act to fund maintenance where there is also a need to provide additional funding for services. Since there is a potential need to augment property taxes from Tulare County to make the city "whole" for the anticipated services, a Community Facilities District is the appropriate tool. Other assessment districts may maintain improvement but a CFD may also levy a special tax for services as well. This district would be set up and administered in the County, with annual pass throughs to the City based on the special taxes levied.

Table 8-1 shows the overall financing plan and the CFD capital, maintenance and city pass through assessments. Under this plan an assessment would be established for maintenance of all project streets and landscaping improvements (in the City and in the County), and establish a service reimbursement to the City for Police and Fire services, provide for reimbursement of capital expenses, and provide for administration, contingency and reserves. Total proposed CFD revenues to the City for fire services, police services, and the maintenance of subdivision improvements would total $252,350 per year in the initial years of development, with annual increases based on the increase in costs.

With the CFD reimbursements, property tax shifts, and the indirect revenues from sales taxes, direct revenues from water operations and fees, and revenues from properties in the City, the total direct and indirect revenues to the City would be $463,900 per year, compared to the current property tax allocations of $126 per year. Total annual County revenue from full buildout of the Project is estimated to be $204,300 for County General, Fire and Library property tax sources, plus other County fiscal revenues from VLF, sales taxes, franchise fees, real property transfer tax gas tax, and other sources. Current County revenue from the County portion of the project is $1,950 per year as shown in Table 8-2 (General County, Library and Fire Fund property taxes on $832,800 base year assessed valuation). Based on these projections, both the City and County are projected to have a positive fiscal condition after buildout of the Project.

Table 8-1

Project Costs and Financing

City Financials Revenue For Services and Expenses

	Annual Cost	Revenue: CFD	Revenue: Other	Revenue: Tulare County Tax Sharing[1]	Revenue: Total Revenue[3]	Net Revenue	Comment
Fire Services	$ 48,913	$ 22,700		$ 26,213	$ 48,913	$ -	Budgeted at 0.75 FTE per City Request
Police	$ 93,750	$ 69,690		$ 24,060	$ 93,750	$ -	Budgeted at 0.75 FTE per City Request
General Government and Support	$ 29,167	$ -		$ 29,167	$ 29,167	$ -	Budgeted at 0.10 FTE per Estimate
CFD Direct Maintenance and Expense							
Subdivsion Maintenance							
Public Streets	$ 37,620	$ 37,620			$ 37,620	$ -	All Intract Streets, Kern and Madsen Frontages
Street Lighting	$ 7,524	$ 7,524			$ 7,524	$ -	Intract Street Lighting
Parks and Landscaping (onsite)	$ 60,067	$ 60,067			$ 60,067	$ -	Onsite Parks, Parkways and Perimeter Roads
Storm Drainage (onsite)	$ 10,000	$ 10,000			$ 10,000	$ -	Onsite Storm Drainage
Capital/Debt Service	$ -						
CFD Administration	$ 20,760	$ 20,760			$ 20,760	$ -	At 7.5% of Direct CFD Expenditures
CFD Contingency and Reserve @ 10%	$ 11,521	$ 11,521			$ 11,521	$ -	Contigency and Reserve on Maintenance Exp.
General Contingency	$ 12,467	$ 12,467			$ 12,467	$ -	General Contingency
Water Fund Net Revenue2	$ 57,346				$ 93,323	$ 35,977	Average OM Cost/Gallon + Incremental Wages
City Property Taxes			$ 7,053		$ 7,053	$ 7,053	Taxes on City Portion of Project; No Expenses
Other City Revenue (sales tax, VLF, etc)			$ 61,451		$ 61,451	$ 61,451	Local Sales Taxes Captured;
Total	**$ 389,135**	**$ 252,350**	**$ 68,505**	**$ 79,440**	**$ 493,617**	**$ 104,482**	

Total Revenue/Dwelling Unit	$ 2,361.80
Current Total Revenue/DU	

Impact Fees

	County Portion: Single Family: Impact Fee	County Portion: Single Family: Total	County Portion: Multifamily: Impact Fee	County Portion: Multifamily: Total	City Portion: Single Family: Impact Fee	City Portion: Single Family: Total	Total
Traffic and Circulation	$ 765	$ 123,930	$ 499	$ 15,957.33	$ 765	$ 11,475	$ 151,362.33
Fire	$ 1,874	$ 303,588	$ 1,263	$ 40,405.33	$ 1,874	$ 28,110	$ 372,103.33
Police	$ 396	$ 64,152	$ 268	$ 8,576	$ 396	$ 5,940	$ 78,668.00
City Hall and General Government		$ -		$ -	$ 760	$ 11,400	$ 11,400.00
Subdivision Parks and Recreation		$ -		$ -		$ -	$ -
Corp Yard and Public Works Facilities		$ -		$ -	$ 573	$ 8,595	$ 8,595.00
Library		$ -		$ -	$ 1,142	$ 17,130	$ 17,130.00
Water	$ 1,454	$ 235,548	$ 728	$ 23,296	$ 1,454	$ 21,810	$ 280,654.00
City Sewer Charge	$ 1,521	$ 246,402	$ 1,521	$ 48,672	$ 1,521	$ 22,815	$ 317,889.00
Storm Drainage		$ -				$ -	$ -
	$ 6,010	**$ 973,620**	**$ 4,278**	**$ 136,907**	**$ 8,485**	**$ 127,275**	**$ 1,237,802**

CFD Maintenance

	County Portion	City Portion	Total
Subdivsion Maintenance			
Public Streets	$ 34,920	$ 2,700	$ 37,620
Street Lighting	$ 6,984	$ 540	$ 7,524
Parks and Landscaping (onsite)	$ 55,756	$ 4,311	$ 60,067
Storm Drainage (onsite)	$ 9,282	$ 718	$ 10,000
Capital/Debt Service/Reserve	$ -	$ -	$ -
Fire Services	$ 22,700		$ 22,700
Police	$ 69,690		$ 69,690
City Hall and General Government			$ -
CFD Administration	$ 19,933	$ 827	$ 20,760
CFD Contingency and Reserve @ 10%	$ 10,694	$ 827	$ 11,521
General Contingency	$ 12,302	$ 165	$ 12,467
Total	**$ 242,262**	**$ 10,088**	**$ 252,350**
Per Year/Unit	$ 1,249	$ 673	$ 1,207
Per Month/Unit	$ 104.06	$ 56.04	$ 100.62
Supplemental Tax Rate	0.447%	0.207%	0.427%

Table 8-2

Existing and Proposed Property Tax Allocations

City Financials Revenue For Services and Expenses

	Annual Cost	Revenue: CFD	Revenue: Other	Revenue: Tulare County Tax Sharing[1]	Revenue: Total Revenue[3]	Net Revenue	Comment
Fire Services	$ 48,913	$ 22,700		$ 26,213	$ 48,913	$ -	Budgeted at 0.75 FTE per City Request
Police	$ 93,750	$ 69,690		$ 24,060	$ 93,750	$ -	Budgeted at 0.75 FTE per City Request
General Government and Support	$ 29,167	$ -		$ 29,167	$ 29,167	$ -	Budgeted at 0.10 FTE per Estimate
CFD Direct Maintenance and Expense							
Subdivsion Maintenance							
Public Streets	$ 37,620	$ 37,620			$ 37,620	$ -	All Intract Streets, Kern and Madsen Frontages
Street Lighting	$ 7,524	$ 7,524			$ 7,524	$ -	Intract Street Lighting
Parks and Landscaping (onsite)	$ 60,067	$ 60,067			$ 60,067	$ -	Onsite Parks, Parkways and Perimeter Roads
Storm Drainage (onsite)	$ 10,000	$ 10,000			$ 10,000	$ -	Onsite Storm Drainage
Capital/Debt Service	$ -						
CFD Administration	$ 20,760	$ 20,760			$ 20,760	$ -	At 7.5% of Direct CFD Expenditures
CFD Contingency and Reserve @ 10%	$ 11,521	$ 11,521			$ 11,521	$ -	Contigency and Reserve on Maintenance Exp.
General Contingency	$ 12,467	$ 12,467			$ 12,467	$ -	General Contingency
Water Fund Net Revenue2	$ 57,346				$ 93,323	$ 35,977	Average OM Cost/Gallon + Incremental Wages
City Property Taxes			$ 7,053		$ 7,053	$ 7,053	Taxes on City Portion of Project; No Expenses
Other City Revenue (sales tax, VLF, etc)			$ 61,451		$ 61,451	$ 61,451	Local Sales Taxes Captured;
Total	**$ 389,135**	**$ 252,350**	**$ 68,505**	**$ 79,440**	**$ 493,617**	**$ 104,482**	

[1] Assuming 85% of Tulare County Fire Fund PPTX Increment to Kingsburg and 50% of General Fund Increment to Kingsburg

[2] Base Rate and 150 R-GPDP With Metered Usage; includes $2.60 surcharge for outside city limits

Total Revenue/Dwelling Unit	$ 2,361.80
Current Total Revenue/DU	

Impact Fees

	County Portion: Single Family Impact Fee	County Portion: Single Family Total	County Portion: Multifamily Impact Fee	County Portion: Multifamily Total	City Portion: Single Family Impact Fee	City Portion: Single Family Total	Total
Traffic and Circulation	$ 765	$ 123,930	$ 499	$ 15,957.33	$ 765	$ 11,475	$ 151,362.33
Fire	$ 1,874	$ 303,588	$ 1,263	$ 40,405.33	$ 1,874	$ 28,110	$ 372,103.33
Police	$ 396	$ 64,152	$ 268	$ 8,576	$ 396	$ 5,940	$ 78,668.00
City Hall and General Government		$ -		$ -	$ 760	$ 11,400	$ 11,400.00
Subdivision Parks and Recreation		$ -		$ -		$ -	$ -
Corp Yard and Public Works Facilities		$ -		$ -	$ 573	$ 8,595	$ 8,595.00
Library		$ -		$ -	$ 1,142	$ 17,130	$ 17,130.00
Water	$ 1,454	$ 235,548	$ 728	$ 23,296	$ 1,454	$ 21,810	$ 280,654.00
City Sewer Charge	$ 1,521	$ 246,402	$ 1,521	$ 48,672	$ 1,521	$ 22,815	$ 317,889.00
Storm Drainage		$ -				$ -	$ -
	$ 6,010	**$ 973,620**	**$ 4,278**	**$ 136,907**	**$ 8,485**	**$ 127,275**	**$ 1,237,802**

CFD Maintenance

	County Portion	City Portion	Total
Subdivsion Maintenance			
Public Streets	$ 34,920	$ 2,700	$ 37,620
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Storm Drainage (onsite)	$ 9,282	$ 718	$ 10,000
Capital/Debt Service/Reserve	$ -	$ -	$ -
Fire Services	$ 22,700		$ 22,700
Police	$ 69,690		$ 69,690
City Hall and General Government			$ -
CFD Administration	$ 19,933	$ 827	$ 20,760
CFD Contingency and Reserve @ 10%	$ 10,694	$ 827	$ 11,521
General Contingency	$ 12,302	$ 165	$ 12,467
Total	**$ 242,262**	**$ 10,088**	**$ 252,350**
Per Year/Unit	$ 1,249	$ 673	$ 1,207
Per Month/Unit	$ 104.06	$ 56.04	$ 100.62
Supplemental Tax Rate	0.447%	0.207%	0.427%

Part Nine: Environmental

9.1 Introduction

The Project was the subject of an environmental impact report to determine the environmental impacts associated with buildout. The EIR concluded that the Project's impacts were less than significant. The Executive Summary of the EIR and the related findings are included below. The full copy of the EIR, and the mitigations and special design features described therein are included by reference.

9.2 EIR Executive Summary

9.2.1 Impact Analysis of Resources

The Resources are discussed in separate sections of Chapter 3 and each section is structured as follows:

- Summary of Findings;
- Introduction, including Thresholds of Significance;
- Environmental Settings;
- Regulatory Settings such as applicable Federal, State, and Local laws, statutes, rules, regulations, and policies;
- Impact Evaluation including Project Impacts, Cumulative Impacts, Mitigation Measures, and Conclusion;
- Definitions and Acronyms; and
- References.

Based on the analysis in the EIR all potential impacts were considered to be Less than Significant. Where mitigation measures are necessary (see Appendix A of the Specific Plan) they are included in the Specific Plan.

9.2.2 Energy

Per Appendix F of the CEQA Guidelines and Public Resources Code Section 21100(b)(2), an EIR must disclose and discuss the potential for the project to result in impacts on energy conservation and/or consumption. A project may have the potential to cause such impacts if it would result in the inefficient, wasteful, or unnecessary consumption of energy, including electricity, natural gas, or transportation fuel supplies and/or resources. Based on the analysis contained in Chapter 4, it can be concluded that the demand for energy (total equivalent BTUs for electrical and natural gas usage) as a result of the Project is lower than County and the state average energy demands, and VMT is 20 percent

less than county and state averages; as such, the Project has been demonstrated to be more energy efficient. When considering the potential for the Project to result in greater conservation of electricity, natural gas, and transportation fuel through the implementation of proposed Project design features and required mitigation measures not quantified above, the proposed Project has a low potential to result in adverse impacts on energy resources and conservation.

9.2.3 Cumulative Impacts

A critically important component of an EIR is the Cumulative Impacts discussion. Chapter 5 of the EIR discusses a Cumulative Impact Analysis under CEQA. Including Past, Present, Probable Future Projects; and a Summary of Cumulative Impacts. Whereas a project in and of itself may not result in an adverse environmental impact, its cumulative effects may. Therefore, the CEQA Guidelines require a discussion of cumulative impacts per Section 15130. The Discussion of Cumulative Impacts defines cumulative impacts per Section 15355 - "Cumulative impacts" refers to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

As noted in Chapter 5, there are no Significant and Unavoidable Impacts; and Less Than Significant Impacts with Mitigation are summarized in Table 5-3 of the EIR. There are a number of cumulative impacts that do not need mitigation; these impacts are listed in Table 5-4 (Checklist Items with Less Than Significant Impacts). Chapter 9 of the EIR contains a complete list of Mitigation Measures to be implemented as part of the proposed Project. Chapter 5 also contains a No Impacts summary in Table 5-5 (Checklist Items with No Impacts).

9.2.4 Alternatives

CEQA Guidelines Section 15126.6 requires that a reasonable range of Alternatives to the proposed Project be discussed in the EIR. The proposed Project is the superior alternative. The conclusion contained in Chapter 6 is based on the criteria established for the site and the three reasonable Alternatives. The three Alternatives evaluated are:

Alternative 1 – Reduced Density (Same Footprint)

Alternative 2 – Increased Density (Smaller Footprint)

Alternative 3 – No Build / No Project

The proposed Alternatives were analyzed based on five evaluation criteria which include each of the objectives of the Project and the assessment of the potential environmental impacts. Each Alternative considered did not meet all the evaluation criteria. The following is a summary of the advantages and disadvantages of each Alternative:

Table 9-1

Advantages and Disadvantages of Project Alternatives

Alternative No. 1 Advantages and Disadvantages	
Advantages	**Disadvantages**
Slightly less impacts to air quality/GHG, noise, traffic, water use, utilities, and population/housing.	Lack of diversity of housing products.
More attractive product to higher-end estate type housing buyers.	Economic feasibility (e.g., housing affordability) in question due to potential lack of higher-end buyers.

Alternative No. 2 Advantages and Disadvantages	
Advantages	**Disadvantages**
Slightly less impacts to air quality/GHG, noise, traffic, water use, utilities, and population/housing.	Does not provide for comprehensive planning of the specific plan area.
More low/moderate income housing.	Lack of diversity of housing products.
Less impacts to agriculture, biological and cultural resources.	Lack of continuity with existing neighborhoods.
	Difficulty in farming a small remaining section of the land.

Alternative No. 3 Advantages and Disadvantages	
Advantages	**Disadvantages**
No environmental impacts beyond baseline conditions.	Does not meet any project objectives or project-specific elements.

As discussed in Alternatives 1 and 2, each of the Alternatives could result in more adverse environmental impacts than the proposed Project as specified on the CEQA resources checklist. Therefore, the proposed Project is the environmentally superior alternative.

Environmental impacts associated with each of the alternatives presented compared to the Preferred Alternative are shown in Table 6-1 Impacts of Alternatives Compared to the Proposed Project. Table 6-2 is a matrix comparing each Alternative's and the Preferred Alternative's abilities to achieve the Evaluation Criteria.

9.2.5 Economic, Social, & Growth Inducing Impacts

This Chapter discusses the Economic, Social, and Growth Inducing effects of the Project. It contains Table 7-1 which provides the CEQA requirements and a summary of the impact analysis as follows:

- Economic Effects - The proposed Project will not result in negative impacts to the region. It will result in increases in economic benefits to the region in the short term and long term. The Project will result in temporary construction-related jobs. Long term economic benefits include payment of property taxes as well as on-going income expenditures of the residents of the new housing in and around Kingsburg (such as groceries, gasoline, household items, etc.).
- Social Impacts - The proposed Project would not result in disproportionate environmental effects on minority populations, low income populations, or Native Americans. The proposed Project does not pose any adverse environmental justice issues that would require mitigation. The project would improve the availability of quality residential housing in the area.
- Growth Inducing Effects - The proposed Project would not result in significant growth inducing impacts. The Project site is already in the Kingsburg Sphere of Influence and is planned for residential development. The growth and associated population increase is in accordance with the housing parameters set forth in the City of Kingsburg General Plan and the Tulare County General Plan in reaching their RHNA goals.

The EIR concluded that implementation of the proposed Project will result in Less Than Significant environmental impacts, either individually or cumulatively, caused by either economic, social, or growth inducing effects.

9.2.6 Immitigable Impacts

This discussion provides determinations consistent with CEQA Guidelines Sections 15126.2 (b) Environmental Effects That Cannot Be Avoided, 15126.2 (c) Irreversible Impacts, and Statement of Overriding Considerations. This Project will not result in significant and unavoidable impacts. All impacts have been found to be less than significant, or have been mitigated to a level considered less than significant. Based on the analysis contained in the No Environmental Impacts That Cannot Be Avoided, and the No Irreversible Impact sections contained in Chapter 8, a Statement of Overriding Considerations is not necessary. The Project's merits and objectives are discussed in the Project Description and are found to be consistent with the intent of the County of Tulare and its 2030 General

Plan. As noted earlier, there are one hundred fourteen (114) General Plan Policies that apply to this Project. Chapter 3 of this document provides a complete list of applicable policies for the specific Resource item discussed. Thus, the Project's benefits would outweigh any unavoidable and immitigable impacts to warrant a Statement of Overriding Considerations.

9.2.7 Mitigation Monitoring and Reporting Program

A summary of the Mitigation Monitoring and Reporting Program is contained at the end of this Executive Summary and in its entirety in Chapter 9. CEQA Section 21081.6 requires adoption of a reporting or monitoring program for those measures placed on a project to mitigate or avoid adverse effects on the environment. The mitigation monitoring and reporting program is required to ensure compliance during a project's implementation. Consistent with CEQA requirements, the Mitigation Monitoring and Reporting Program contained in this EIR include the following elements:

- Action and Procedure. The mitigation measures are recorded with the action and procedure necessary to ensure compliance. In some instances, one action may be used to verify implementation of several mitigation measures.
- Compliance and Verification. A procedure for compliance and verification has been outlined for each action necessary. This procedure designates who will take action, what action will be taken and when, and to whom and when compliance will be reported.
- Flexibility. The program has been designed to be flexible. As monitoring progresses, changes to compliance procedures may be necessary based upon recommendations by those responsible for the Mitigation Monitoring and Reporting Program. As changes are made, new monitoring compliance procedures and records will be developed and incorporated into the program.

Appendix A of the Specific Plan includes the Mitigation Monitoring and Reporting Program.

Part Ten: Specific Plan Enforcement and Implementation

10.1 Annexation/Service Agreements

Portions of the Project that are in Tulare County are in SKF's Sphere of Influence but are not in the district. On October 12th, 2017, the SKF Board of Directors provided authorization to issue a "will serve" letter for the Project to permit its annexation to the District. This will be through annexation proceedings through the Tulare County LAFCo. Annexation of the Tulare County portion of the Project to SKF will be during Phase 1 of the Project. The portions of the Project in Fresno County are already in SKF's district. The portion of the Project that is within Fresno County but not yet within the City limits at the time this Specific Plan is adopted will be annexed as part of Phase 3 of the Project by Fresno County LAFCo.

10.2 Zoning

This Specific Plan establishes the zoning and land development standards for the Project. Once adopted the Tulare County Board of Supervisors by Ordinance, the development regulations contained herein will supplant those in the Tulare County Zoning Ordinance.

10.3 Subdivision

The precise location of streets and utilities and the precise boundaries of development sites will be determined as subdivision maps are approved. The Project is proposed in four phases and each will involve a final subdivision map. A Vesting Tentative Subdivision map will be processed concurrently with this Specific Plan and the other related entitlement. The City of Kingsburg will process and approve a Vesting Tentative Map for the portion of the Project in Fresno County, and after the County's certification of the EIR for the Project. A Subdivision Agreement will be processed with each Final Map, and bonds will be provided to ensure faithful completion of the subdivision improvements.

10.4 Architectural and Design Review

In order to ensure consistency with the provisions of this Specific Plan, building permits and housing master plans will be subject to administrative review and approval. The County's Associate Director for Economic Development and Planning, or a designee, shall be responsible for ensuring compliance with the design regulations. In order to ensure concurrence by the City of Kingsburg, house master plans or "stock" plans shall be referred to the City for review and comment prior to approval, and the County shall require revisions where necessary and appropriate to ensure compliance with the provisions of the Specific Plan.

10.5 Building Permits

The County shall be responsible for plan-check, inspection, and occupancy release in the County portion of the Project and the City will be will be responsible for plan-check, inspection, and occupancy release in the City portion of the Project, unless the City and County establish an agreement otherwise.

10.6 Public Facilities Financing

Part Eight of the Specific Plan summarizes the required financing mechanisms for the infrastructure improvements and services that will be required to serve the Project. Table 8-1 identifies the development impact fees applicable to various portion of the Project. The County shall require that City impact fees identified in Table 8-1 are paid prior to issuance of building permits.

Development within the Project area will be supported by public facilities located in the area, and by the extended systems that exist or will be developed. Facilities such as local streets and utility lines will be installed by Project developer(s) of the area and dedicated to the City or County as applicable.

10.7 Interpretation and Amendment

Implementation of this Specific Plan is expected to occur over several years. During that time, questions may arise which the plan does not completely answer. Also, there may be desires to develop some features differently from original proposals described in the Specific Plan. The specific processes and authorized authorities to provide Specific Plan Interpretations, Adjustments, Minor Amendments and Major Amendments is described below.

Interpretations are judgments that apply the stated intent of this plan to specific situations. Interpretations generally are limited to details where the features of this plan may appear to provide different guidance from each other, or from other adopted City or County policies or the requirements of other agencies. Interpretations may be needed when considering a discretionary development application, such as a subdivision map, or a ministerial application, such as a building permit. The person or body with approval authority for the application makes the interpretation. In the case of ministerial development applications, this is the County Economic Development and Planning Director for the County for the portions of the Project located in the County, and the City Manager of the City of Kingsburg for portions of the Project located in the City. In making any such an interpretation, the applicable approving authority shall consult with any other affected City departments, and with the other approving authority (that is, the Economic Development and Planning Director and the City Manager).

Adjustments are minor changes to precise features of the plan, where the resulting difference in development type or capacity is not significant and the change is clearly consistent with the intent of the Specific Plan. This may involve precise zoning boundaries to confirm with legal property boundaries, street locations (although not including adjustments of street locations more than half a street

width), the adjustment of utilities that are in substantial conformance with the utility master plan, or a modification of a lot or site development dimensional requirement (yard setback, height, etc.) of no more than 10 percent of the required dimension. Minimum lot area (including minimum number or percentage of 10,000 square foot lots in the R-1-7 zone) may be permitted as an adjustment, but only with the concurrence of the City approving authority. An adjustment may also include a reduction in the number of total lots by no more than 10 percent, or an increase in the number of lots by no more than 5 percent. The Economic Development and Planning Director shall be authorized to make such adjustments for the portions of the Project in the County, and the City Manager may make such adjustments for area of the Project in the City. In making any such interpretation, the applicable approving authority shall consult with any other affected City departments, and with the other approving authority (that is, the Economic Development and Planning Direct and the City Manager) to ensure consistency.

Amendments are changes to features of the plan involving differences in development type or capacity (including public facilities). Amendments usually involve a question of consistency with the original intent of the Specific Plan, or with the General Plan. Amendments shall include any change that is not an interpretation or an adjustment. ***Minor Amendments*** and ***Major Amendments*** may be permitted to the Specific Plan. Minor Amendments shall include an increase in the number of total lots by more than 5 percent or a reduction in the number of total lots by no more than 10 percent. Minor amendments shall also include a change in the configuration of the Project areas various zoning areas (R-1-7 and RM-3.0), as long as there is no change in the total number of lots. All Minor Amendments shall be approved by the Planning Commission for the City or County, as applicable. All other amendments shall be Major Amendments and shall require the approval by the Board of Supervisors upon review and recommendation of the City of Kingsburg City Council, and the Tulare County Planning Commission.

All actions to implement this Specific Plan (excluding financing mechanisms) are subject to environmental review, and an EIR has been prepared for the Project as described in Part Nine. For projects and implementing actions that are consistent with this Specific Plan, for Adjustments, Interpretations and Minor Amendments, the environmental determination is expected to be that the project is "categorically exempt" due to its type or size, or that further environmental review is not needed because the Environmental Impact Report for the Specific Plan has adequately addressed all environmental issues. Further environmental review may be required for Major Amendments to the Specific Plan area only if, (a) a previously unknown environmental resource or hazard is discovered on the site, or (b) local conditions have changed substantially since the certification of the Environmental Impact Report. In such cases the Lead Agency may prepare an Addendum or Supplement to the EIR, as appropriate, or a subsequent comprehensive or focused EIR.

10.8 Phasing

Development is expected to start in 2017 and to be completed within three to five years thereafter. The sequencing of development shall be in conformance with the phasing indicated on

Figure 1-4. Key features and improvements, and their phasing is described in Table 10-1 below. Unless specified otherwise in Table 10-1, all other improvements will be installed that are within the applicable phase boundary.

Table 10-1

Infrastructure and Improvement Phasing

	Phase			
Improvement	**1**	**2**	**3**	**4**
Sewer				
Connection to SKF Trunk Line	●			
Annexation to SKF District	●			
Water				
Connection to City Water Main in Madsen	●			
Connection to City Water Main in Mariposa	●			
Connection to City Water Main in 22nd Avenue		●		
Storm Drainage				
Pond South of Kern (Initial 7.75 acre-feet of Capacity)	●			
Added 3.0 acre-feet of Pond Capacity		●		
Added 0.8 acre-feet of Pond Capacity				●
21st Avenue and Kern Street Storm Drains				●
Bergman/Gunnar/23rd Avenue 30" Trunk Line to Pond	●			
Streets and Ped Improvement				
Sidewalk/Ped and Bike Path Connections to 18th/Kern	●			
Sidewalk/Ped and Bike Path Connection to Sierra/Madsen			●	
Kern Street Ped/Bike Trail	●			
Madsen Ped/Bike Trail South of Lindquist		●		
Madsen Ped/Bike Trail North of Lindquist			●	
Neighborhood Park		●		
CID Ditch Undergrounding				
South of Lindquist		●		
North of Lindquist			●	

APPENDIX I

WATER WILL SERVE LETTER

City of Kingsburg

1401 Draper Street, Kingsburg, CA 93631-1908
(559) 897-5821 Fax: (559) 897-5568

Michelle Roman
Mayor

Bruce Blayney
Mayor Pro Tem

COUNCIL MEMBERS
Staci Smith
Sherman Dix
Laura North

Alexander J. Henderson
City Manager

October 5, 2017

David Cardenas, Chairman
Selma Kingsburg Fowler County Sanitation District
11301 E. Conejo Ave.
Kingsburg, CA 93631

RE: Request for Will Serve Letter for Hash Farms Development Project

Dear Mr. Cardenas,

I am writing in regards to a proposed project located on the northeast side of the intersection of Road 16 and Ave 396, partially within the City of Kingsburg, Fresno County and Tulare County APNs 028-140-007, 012, 013, 018 and 022.

The City of Kingsburg requests that you provide a "will serve" letter, as the proposed project falls within the City's Sphere of Influence. A specific plan and Environmental Impact Report are currently being prepared by Tulare County. The project will be required to conform the City and SKF's water and sewer standards.

If you have additional questions or require more information, please contact the City's Planner, Greg Collins at (559) 734-8737.

Respectfully,

Alexander J. Henderson; ICMA-CM
City Manager

Committed to our communities. Protecting tomorrow's water resources by treating today's wastewater through innovation and superior level of service.

SELMA - KINGSBURG - FOWLER
COUNTY SANITATION DISTRICT

DIRECTORS
David Cárdenas, Chairman
Buddy Mendes, Vice-Chairman
Nathan Magsig
Yvette Montijo
Michelle Roman

STAFF
Ben Muñoz, Jr., General Manager

October 23, 2017

Sent Via Electronic Mail
Mr. Alexander Henderson
City Manager
City of Kingsburg
1401 Draper Street
Kingsburg, CA. 93631

SUBJECT: Hash Subdivision –APNs 028-140-007,012,018,022
(City of Kingsburg-Portion in Fresno/Tulare County)

Dear Mr. Henderson:

The Selma-Kingsburg-Fowler County Sanitation District has received a will-serve letter request from the City of Kingsburg dated, October 5, 2017 and a will-serve letter request from the Tulare County Resource Management Agency dated, October 3, 2017 requesting that the District issue a will-serve letter for the subject project. The City's request notes the Project will be required to conform to the District's sewer standards. Attached is a copy of Article 7 of Ordinance No. 2014-03 which sets forth District requirements for Outside Permits.

The District will serve the above-referenced development project estimated at 213 Equivalent Single Family Residences (ESFR's). The estimated ESFR's are based on preliminary conceptual information provided by you. The actual ESFR's would be determined as the project may progress. This will-serve letter has a time limit of 2½ years from the date of this letter, or expiration of tentative map, whichever comes later. This will-serve letter is good for the life of a final map.

Sewer Infrastructure Plans - All information provided by the District to date has been provided as a preliminary response to describe District planning documents, policies or existing infrastructure. Discussions, information and this letter shall not be considered to be acceptance of any sewer infrastructure plans. Any interested party must submit to the District a detailed set of sewer infrastructure plans or floor and plumbing plans for all buildings. With regard to a detailed set of sewer infrastructure plans or floor and plumbing plans, District staff will review submitted plans, but plans will not be signed off until the annexation has been completed by LAFCo or the property is within the City boundaries.
Plan check and inspection fees shall be paid at the time of submittal of plans to the District. The plan check process is not complete until the District has signed off on the plans. All sewer improvements required for a project are identified at completion of the plan check process.

MAILING ADDRESS: P.O. Box 158, Kingsburg, CA 93631-0158 SHIP TO: 11301 E. Conejo Ave., Kingsburg, CA 93631-9511
PHONE (559) 897-6500 FAX (559) 897-1985

Design Standards and Master Plan – On site and off site sewer system facilities must be designed and constructed in accordance with the District's Collection System Construction Standards, the District's Sewer System Master Plan and other requirements as may be specified by the District. The Standards and the Master Plan may be viewed on the District's website at www.skfcsd.org.

Fees and Connection Permit - Applicable District annexation fees must be paid for the entire project prior to completion of annexation or, if the fees have been deferred, at the time the District issues the project's first sewer connection permit. District capacity charges must be paid at the time the District issues a sewer connection permit. District capacity charges are subject to change and must be paid at the rates in effect at the time the sewer connection permit is issued by the District. Sewer system improvements must be constructed, tested and approved by the District prior to the issuance of a sewer connection permit. You must contact the City in which the project is located in order to pay the separate City sewer connection fee and to determine if there are applicable reimbursement fees to be paid.

Will-Serve Letters Policy – The District's 6-14-07 Will-Serve Letter Policy states "Staff shall issue will-serve letters, with no up-front fee or deposit, at the request or concurrence of a City/County, with the will-serve letters having a time limit of 2 1/2 years, or expiration of tentative map, whichever comes later, with the will-serve letter being good for the life of the final map."

New City Sewer Collection System Infrastructure Reimbursement - The District does not participate financially in the construction of new City sewer collection system infrastructure. Persons interested in possible reimbursement for such construction must make arrangements in writing with the City in which the infrastructure is constructed and such written arrangements must be made prior to the District signing off on plans.

New District Interceptor System Infrastructure Reimbursement - With regard to the construction of new District interceptor system infrastructure, persons interested in possible reimbursement must obtain agreements or District determinations, each in writing, from the District prior to the District signing off on plans.

Existing City or District Sewer System Infrastructure Reimbursement - With regard to the refurbishment or replacement of existing City or District sewer system infrastructure, persons interested in possible District financial participation must obtain agreements or District determinations, each in writing, from the District prior to the District signing off on plans. Expenditures are determined by District, to the extent of cash accrued for use in each City.

If you have any questions please call the District office. Thank you.

Sincerely,

Veronica Cazares, PE.

Veronica Cazares, PE
District Engineer

Copies: Stephen J. Peck, AICP, Peck Planning and Development, LLC, 2455 Greenwood Avenue, Morro Bay, CA 93442
Steve Hash Properties, PO Box 551270, Lake Tahoe CA 96155, Resource Management Agency, Mike Washam, 5961 S. Mooney Blvd, Visalia CA 93277
Ben Muñoz Jr. & Frank Hernandez; SKF CSD

MAILING ADDRESS: P.O. Box 158, Kingsburg, CA 93631-0158 SHIP TO: 11301 E. Conejo Ave., Kingsburg, CA 93631-9511
PHONE (559) 896-4420 FAX (559) 897-1985

Section 614. Time Limit on Permits. If work under a permit is not commenced within six (6) months from the date of issuance or if after partial completion the work is discontinued for a period of one year, the permit shall thereupon become void, the connection fee refunded, and no further work shall be done until a new permit is secured, and the appropriate connection paid. A new fee shall be paid upon the issuance of a new permit.

ARTICLE 7
PERMITS FOR OUTSIDE SEWERS

Section 701. Permits for Outside Sewers. Permission shall not be granted to connect any lot or parcel of land outside the District to any public sewer in or under the jurisdiction of the District unless a permit therefore is obtained. A permit for Outside Sewer shall be conditioned on all the requirements in this Article. The granting of a permit shall be at the sole discretion of the Board. The Permit may restrict discharge only to specified sewers of District, relocation of discharge, and such other conditions as may be required to effectuate the purpose of this Ordinance. Issuance of the Permit and connection shall require the person to comply with all rules, regulations and ordinances of the District. No Permit issued hereunder is transferable.

Section 702. Agreement for Outside Sewers. The applicant for an Outside Sewer Permit shall first enter into a contract in writing to be recorded, which binds the applicant and applicant's heirs, successors and assigns to abide by all ordinances, rules and regulations in regard to the manner in which such sewer shall be used, the manner of connecting therewith and drainage in connection therewith. Applicant shall agree to pay in advance all fees required for securing the permit including CEQA and LAFCO review, and fees in the amount set by the District for the privilege of using such sewer.

Section 703. Procedure for Obtaining an Outside Service Permit. Persons wishing to make application for an Outside Service Permit shall complete a District application available at the office of the District. The District will review the application, including plans and data. The District may require additional information regarding the service beyond that required on the application form. Upon receipt of all required information, the application shall be processed provided the District Engineer determine surplus sewerage capacity is available, which surplus sewerage capacity is that sewerage capacity not required at the time of application or the reasonably near future as necessary to serve the dischargers within the District, and, if approved by the Board and LAFCO, a Permit will be issued.

Section 704. LAFCO Requirements

A. Under Government Code Section 56133, LAFCO has a role under the Cortese-Knox-Hertzberg Local Government Reorganization Act with respect to Outside Service Agreements.

1. The District is required to obtain LAFCO's written approval prior to entering into contracts with private individuals or organizations to provide services outside the agency's boundaries.

2. LAFCO may authorize a city or district to provide new or extended services outside its jurisdictional boundaries but within its Sphere of Influence in anticipation of a later change of organization.

3. LAFCO may authorize a city or district to provide new or extended services outside its jurisdictional boundaries and outside its sphere of influence to respond to an existing or impending threat to the public health or safety of the residents of the affected territory if two conditions are met:

   (i) The entity applying for the contract approval has provided LAFCO with documentation of a threat to the health and safety of the public or the affected residents; and

   (ii) LAFCO has notified any alternate service provider such as a sewer system corporation that has filed a map and a statement of its service capabilities with LAFCO.

B. Another method for extending service outside the District's boundaries would be to have the applicant pursue annexation and Sphere of Influence extensions. Annexations and Spheres of Influence are governed by LAFCO legislation and regulations. The process includes a Municipal Service Review and CEQA review as well as public meetings.

Section 705. Criteria for Board Determination. The District Board will consider the following criteria in determining whether to approve an Outside Service Permit:

A. The existence of a health and safety hazard.

B. No detriment to the District's continued ability to provide service.

C. Sufficient capacity to allow the District to grow as planned.

D. Only industrial, commercial, or single family residences located in Fresno County which exist prior to February 1, 2014, shall be considered for an Outside Service Permit.

E. Applicant shall be responsible for paying all applicable fees, including but not limited to District, County, LAFCO, and City fees.

Section 706. Revocation of Outside Service Permit. A permit for outside service may be revoked upon the change of ownership of the building or buildings or connection of an additional building or buildings without prior approval of the District. An Outside Service Permit may be revoked upon a finding that:

A. The discharger has violated any condition of the permit.

B. The discharger has violated any provisions of the ordinances, rules and regulations of the District.

C. A determination by the District Engineer that sewerage capacity is no longer available.

No revocation shall be implemented or ordered until a hearing on the question has been held by the Board after the proper notice as hereinafter set forth. The District Secretary shall notify any person found to be in violation of the provisions for outside service or of any limitation, condition or requirement of a Permit issued hereunder before any action is taken to implement revocation of the Outside Service Permit.

Said notice shall be in writing and served in person or by registered or certified mail. If served by mail, the notice shall be sent to the last address as known to the District Secretary. Where the address is unknown, service may be made upon the owner of record of the property involved. Notice shall be deemed to have been given at the time of deposit, postage prepaid, in a facility regularly service by the United State Postal Service.

Any person whose Outside Service Permit has been revoked shall immediately stop all discharge of any sewage covered by the Permit to the sewerage works of the District. The District may disconnect or permanently block from such sewerage works the outside service connection of any person whose Permit has been revoked if such action is necessary to insure compliance with the order of revocation.

Before any further discharge of sewage may be made by the discharger, he or she must apply for a new District Outside Service Permit, pay all charges that would be required upon initial application together with all delinquent fees, charges and penalties and such other sums as the discharger may owe to the District. Costs incurred by the District in disconnecting the outside service connection sewer shall be paid for by the discharger before issuance of a new Outside Service Permit.

ARTICLE 8
ENFORCEMENT

Section 801. Violation. Any person found to be violating any provision of this or any other ordinance, rule or regulation of the District, shall be served by the District Inspector or other authorized person with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. The offender shall, with the period of time stated in such notice, permanently cease all violations. All persons shall be held strictly responsible for any and all acts of agents or employees done under the provisions of this or any other ordinance, rule or regulation of the District. Upon being notified by the District Inspector of any defect arising in any sewer or of any violation of the ordinance, rules or regulations of the District, the person or persons having charge of said work shall immediately correct the same.

Section 802. Public Nuisance. Continued habitation and/or use of any building or continued operation of any industrial facility in violation of the provisions of this or any other ordinance, rule or regulation of the District is hereby declared to be a public nuisance. The District may cause proceedings to be brought for the abatement of the occupancy of the building or industrial facility during the period of such violation.

Section 803. Disconnection. As an alternative method of enforcing the provisions of this or any other ordinance, rule or regulation of the District, the District Inspector shall have the