Carmel Homes II & IV

Draft Initial Study / Mitigated Negative Declaration

July 2023

Prepared for:

The City of MADERA

Planning Department
205 W. 4th Street
Madera, CA 93637

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Chapter 1 Introduction

4Creeks has prepared this Initial Study/Mitigated Negative Declaration (IS/MND) on behalf of the City of Madera to address the environmental effects of the Carmel Homes II & IV Project developed by DMP Development Corp. This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et.seq. The City of Madera is the CEQA lead agency for this proposed Project.

The project is within the scope of the Program EIR prepared for the City's General Plan Update approved in 2009 because the proposed development on the project site is consistent with the General Plan's land use and density for the project site. The Program EIR examined the impacts of development under the General Plan related to loss of prime farmland and groundwater supplies and determined those impacts to be significant and unavoidable and may be referenced in the Program EIR at pages 4.2-26 and 6.0-16. Because those impacts were examined in the Program EIR, no additional analysis is required in this IS/MND pursuant to CEQA Guidelines, section 15168(c); (4) the Program EIR may be accessed at the following link: https://www.madera.gov/wp-content/uploads/2018/01/Draft-EIR.pdf, and is incorporated into the IS/MND. This IS/MND provides a short summary of these significant and unavoidable impacts.

The site and the proposed Project are described in detail in the Chapter 2 Project Description.

1.1 Regulatory Information

An Initial Study (IS) is a document prepared by a lead agency to determine whether a project may have a significant effect on the environment. In accordance with California Code of Regulations Title 14 (Chapter 3, Section 15000, *et seq*.)-- also known as the CEQA Guidelines-- Section 15064 (a)(1) states that an environmental impact report (EIR) must be prepared if there is substantial evidence in light of the whole record that the proposed Project under review may have a significant effect on the environment and should be further analyzed to determine mitigation measures or project alternatives that might avoid or reduce project impacts to less than significant levels. A negative declaration (ND) may be prepared instead if the lead agency finds that there is *no substantial* evidence in light of the whole record that the project may have a significant effect on the environment. An ND is a written statement describing the reasons why a proposed Project, not otherwise exempt from CEQA, would not have a significant effect on the environment and, therefore, why it would not require the preparation of an EIR (CEQA Guidelines Section 15371). According to CEQA Guidelines Section 15070, a ND or *mitigated* ND shall be prepared for a project subject to CEQA when either:

a. *The IS shows there is no substantial evidence, in light of the whole record before the agency, that the proposed Project may have a significant effect on the environment, or*
b. *The IS identified potentially significant effects, but:*
    1. *Revisions in the project plans or proposals made by or agreed to by the applicant before the proposed MND and IS is released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur is prepared, and*
    2. *There is no substantial evidence, in light of the whole record before the agency, that the proposed Project as revised may have a significant effect on the environment.*

1.2 Document Format

This IS/MND contains five chapters plus appendices. Chapter 1 Introduction, provides an overview of the proposed Project and the CEQA process. Chapter 2 Project Description, provides a detailed description of proposed Project components. Chapter 3 Determination identifies the environmental factors potentially affected based on the analyses contained in this IS and includes the Lead Agency's determination based upon those analyses. Chapter 4 Impact Analysis, presents the CEQA checklist and environmental analyses for all impact areas, mandatory findings of significance, and feasible mitigation measures, if applicable. If the proposed Project does not have the potential to significantly impact a given issue area, the relevant section provides a brief discussion of the reasons why the impact is anticipated to be less than significant or why no impacts are expected. If the proposed Project could have a potentially significant impact on a resource, the issue area discussion provides a description of potential impacts, and appropriate mitigation measures and/or permit requirements that would reduce those impacts to a less than significant level. Chapter 5 Mitigation Monitoring and Reporting Program (MMRP), provides the proposed mitigation measures, implementation timelines, and the entity/agency responsible for ensuring implementation.

The CalEEMod Output Files, Biological Evaluation Report, Cultural Resources Information, Energy Calculations, VMT Assessment and Traffic Impact Study are provided as technical Appendix A, Appendix B, Appendix C, Appendix D, Appendix E, and Appendix F respectively, at the end of this document.

Chapter 2 Project Description

2.1 Project Background

2.1.1 Project Title

Carmel Homes II & IV

2.1.2 Lead Agency Name and Address

City of Madera
205 W 4th Street
Madera, CA 93637

2.1.3 Contact Person and Phone Number

Lead Agency Contact

Robert Smith, Senior Planner
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Developer Contact

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2.1.4 Study Prepared By

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2.1.5 Project Location

The proposed project site is located within the southern portion of the City of Madera on the southwest side of the intersection between W Pecan Ave and Stadium Road. The site is approximately 58.04 gross acres and includes parcels 012-480-008 and 012-480-009. The site is bordered by a high school to the north, residential land uses to the east, and agricultural uses to the south and west.

2.1.6 Latitude and Longitude

The centroid of the Project area is 36.934280, -120.066666.

2.1.7 General Plan Designation

The project site is planned Low Density Residential.

2.1.8 Zoning

The project will convert the current R-1 (Residential, One unit/6,000 sq. ft. of site area) zoning designation to PD-4500 (Planned Development, One unit/4,500 sq. ft. of site area).

2.1.9 Description of Project

Project Description

The proposed project involves the development of a residential project on approximately 58 acres in the City of Madera. The Project includes 318 single family residential lots and two open space/pocket parks totaling approximately 29,500 sq. ft. The Project requires changing the current zoning from R-1 to PD-4000. Construction is proposed to begin in December of 2023.

2.1.10 Site and Surrounding Land Uses and Setting

Table 2-1 Existing Uses, General Plan Designations, and Zone Districts of Surrounding Properties

Direction from Project Site	Existing Use	General Plan Designation	Zone District
North	High School	Public and Semi-Public Uses	U
East	Single-family housing	Low Density Residential	R1, PD6000
South	Agriculture/vacant	Village Reserve	AR-40
West	Agriculture/vacant	Industrial and Low Density Residential	IH, AR-5 (Madera County)

2.1.11 Other Public Agencies Whose Approval May Be Required

- Rezone Application to change the zoning from the R-1 (Residential, One unit/6,000 sq. ft. of site area) zone district to the PD-4500 (Planned Development, One unit/4,500 sq. ft. of site area).
- Precise Plan Application for development in a Planned Development district.

2.1.12 Consultation with California Native American Tribes

Public Resources Code Section 21080.3.1, *et seq. (codification of AB 52, 2013-14)*) requires that a lead agency, within 14 days of determining that it will undertake a project, must notify in writing any California Native American Tribe traditionally and culturally affiliated with the geographic area of the project if that Tribe has previously requested notification about projects in that geographic area. The notice must briefly describe the project and inquire whether the Tribe wishes to initiate a request for formal consultation.

Tribes have 30 days from receipt of notification to request formal consultation. The lead agency then has 30 days to initiate the consultation, which then continues until the parties come to an agreement regarding necessary mitigation or agree that no mitigation is needed, or one or both parties determine that negotiation occurred in good faith, but no agreement will be made. The City of Madera has not received any written correspondence from California Native American tribes pursuant to Public Resources Code Section 21080.3.1 requesting notification of projects within the boundaries of the City.

As a General Plan Amendment was originally involved with the proposed project, compliance with SB 18 requires consultation for tribes with traditional lands or places located in geographic area affected by proposed changes. As such, letters were sent out on November 29, 2022. Letters for requests for consultation were sent to a list of tribes in the area that include: Big Sandy Rancheria of Western Mono Indians, Big Valley Rancheria of Pomo Indians, California Valley Miwok Tribe, Chicken Ranch Rancheria of Me-Wuk Indians, Dumna Wo-Wah Tribe, Nashville Enterprise Miwok- Maidu-Nishinam Tribe, North Fork Mono Tribe, North Fork Rancheria of Mono Indians, North Valley Yokuts Tribe, North Valley Yokuts Tribe, Picayune Rancheria of Chukchansi Indians, Picayune Rancheria of Chukchansi Indians, Southern Sierra Miwuk Nation, Tule River Indian Tribe, Tule River Indian Tribe, Tule River Indian Tribe, Tuolumne Band of Me-Wuk Indians, Wuksache Indian Tribe & Eshom Valley Band. No responses for consultation were received within the 30 and 90 day periods for formal consultation under AB 52 and SB 18.

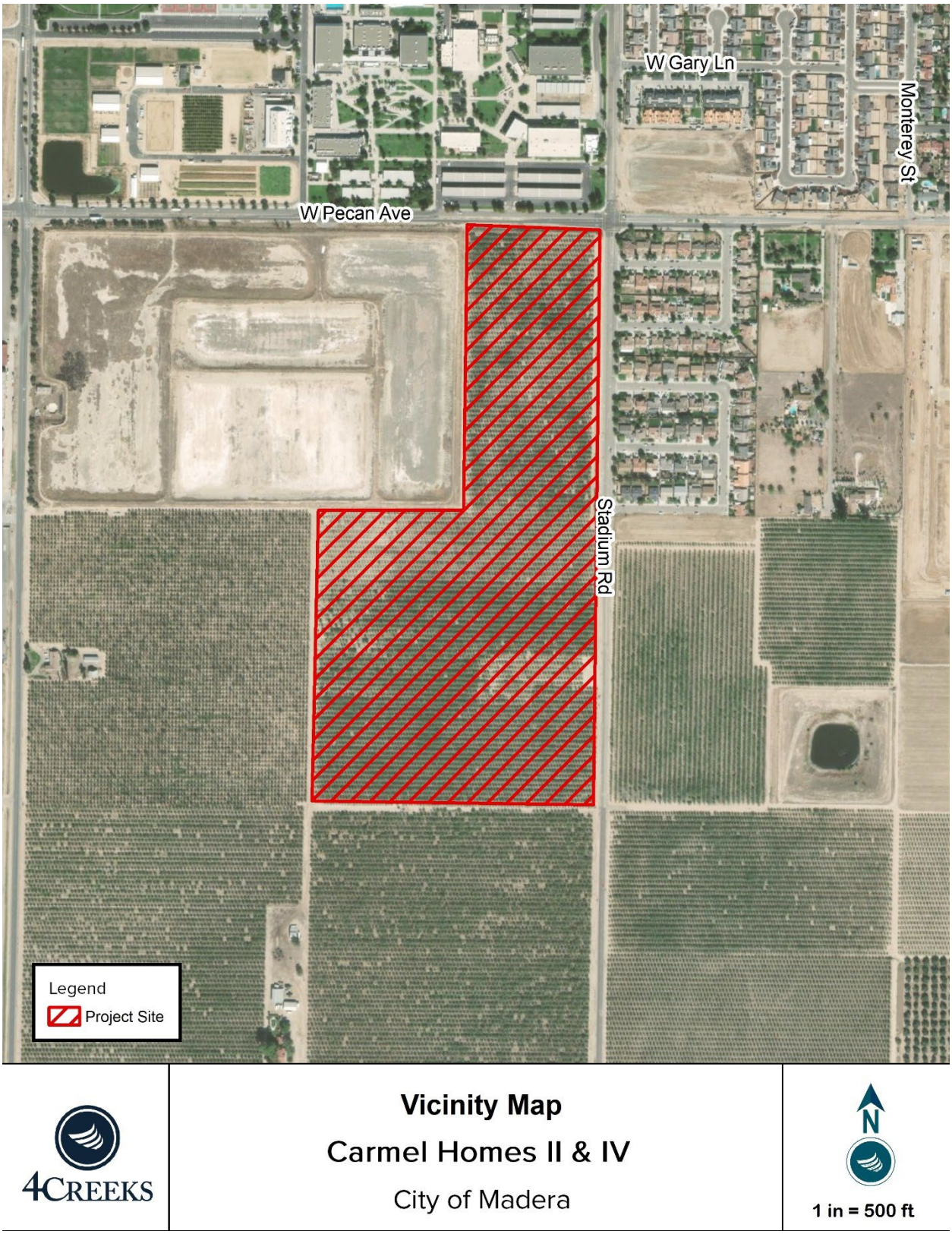

Figure 2-1 Vicinity Map

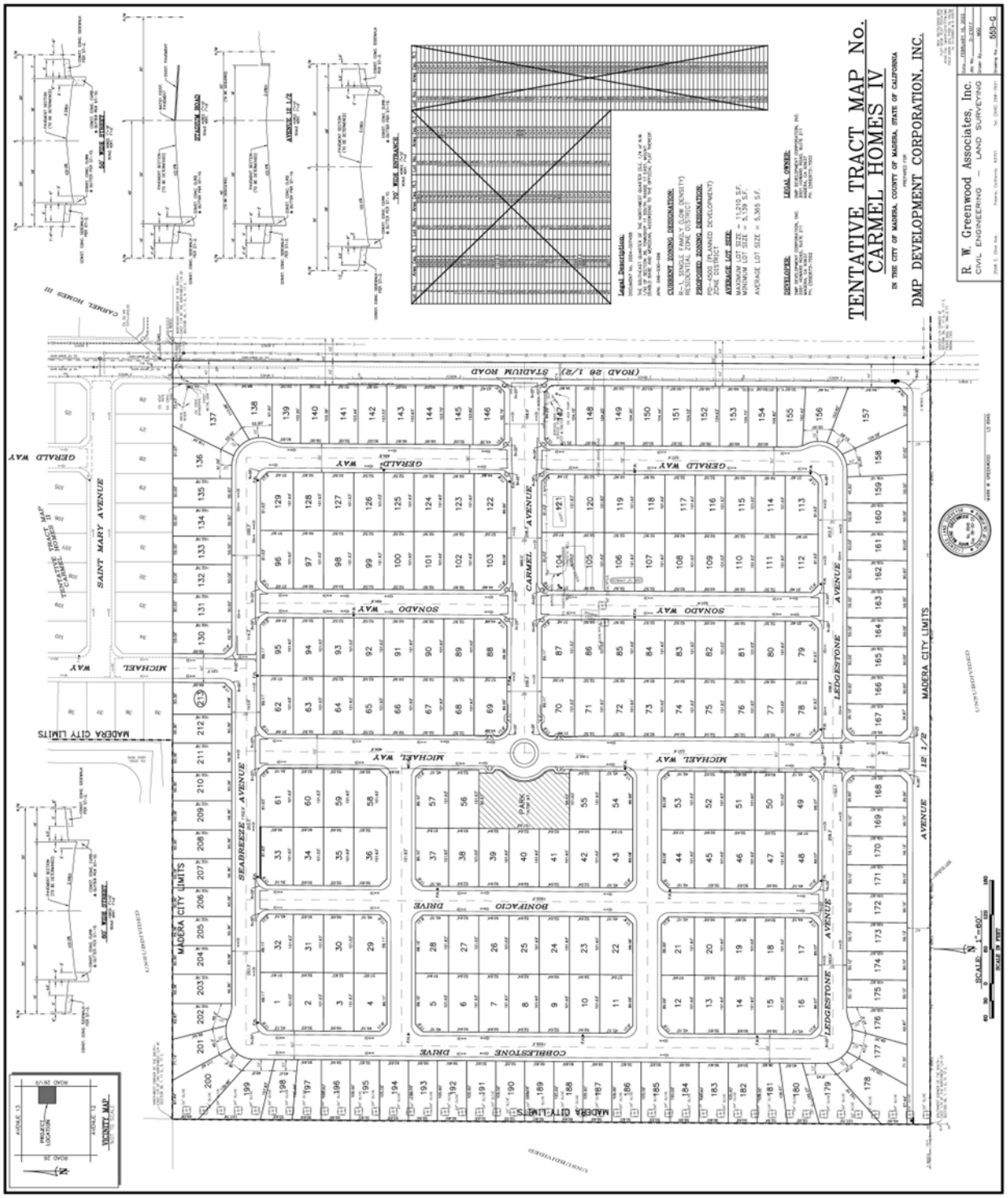

Figure 2-2 Site Plan

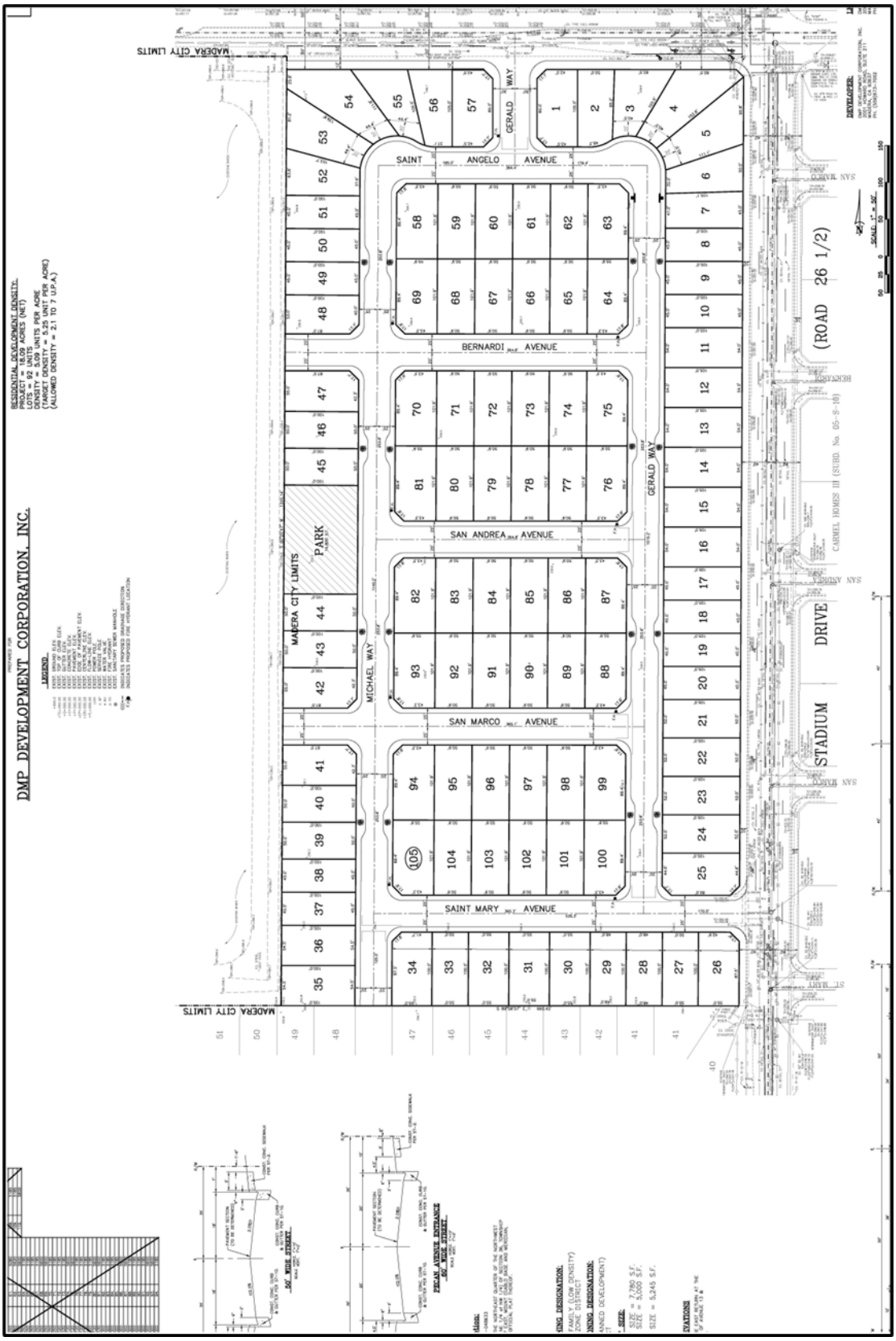

Figure 2-3 Site Plan

Chapter 3 Determination

3.1 Environmental Factors Potentially Affected

As indicated by the discussions of existing and baseline conditions, and impact analyses that follow in this Chapter, environmental factors not checked below would have no impacts or less than significant impacts resulting from the project. Environmental factors that are. checked below would have potentially significant impacts resulting from the project. Mitigation measures are recommended for each of the potentially significant impacts that would reduce the impact to less than significant.

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

The analyses of environmental impacts in Chapter 4 Impact Analysis result in an impact statement, which shall have the following meanings.

Potentially Significant Impact. This category is applicable if there is substantial evidence that an effect may be significant, and no feasible mitigation measures can be identified to reduce impacts to a less than significant level. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

Less than Significant with Mitigation Incorporated. This category applies where the incorporation of mitigation measures would reduce an effect from a "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measure(s), and briefly explain how they would reduce the effect to a less than significant level (mitigation measures from earlier analyses may be cross-referenced).

Less Than Significant Impact. This category is identified when the proposed Project would result in impacts below the threshold of significance, and no mitigation measures are required.

No Impact. This category applies when a project would not create an impact in the specific environmental issue area. "No Impact" answers do not require a detailed explanation if they are adequately supported by the information sources cited by the lead agency, which show that the impact does not apply to the specific project (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

3.2 Determination

On the basis of this initial evaluation (to be completed by the Lead Agency):

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

_____ _____

Signature Date

_____

Printed Name/Position

Chapter 4 Impact Analysis

4.1 Aesthetics

Except as provided in Public Resources Code Section 21099, would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

4.1.1 Environmental Setting

The City of Madera is located within the southwest region of Madera County in Central California. The cities visual features include urbanized land uses, agricultural land uses, and rivers and creeks. The project site is located along the southern border of the city at the intersection of Pecan Avenue and Stadium Road. The surrounding land uses are predominantly vacant or agricultural, with some residential uses, and a high school. The infrastructure around the project site consists of roadways, streetlights, parking lots, and housing. The land is especially flat. There is some visibility to the Sierra Nevada mountains to the east, but this view is typically obstructed by poor air quality.

Existing Visual Character: The following photos demonstrate the aesthetic character of the project area. As shown, the proposed project site area is a flat area characterized by agricultural uses.

Photo 1: Southeast Site Boundary (View northwest) (Source: Google Maps)

Photo 2: North Site Boundary (View south) (Source: Google Maps)

Photo 3: Western Site Boundary (View east) (Source: Google Maps)

Photo 4: Southwest Site Boundary (View northeast) (Source: Google Maps)

State Scenic Highways: The State Scenic Highway Program is implemented by Caltrans and was developed to preserve the aesthetic quality of certain highway corridors. A highway is designated as scenic based on how much of the natural landscape is visible to travelers, the quality of that landscape, and the extent to which development obstructs views of the landscape. There are no designated State Scenic Highways or highways that are eligible for designation within the City of Madera.

City of Madera General Plan: The City of Madera General Plan includes the following aesthetic goals and policies that are intended to protect the City's aesthetic resources and are relevant to the proposed project.

- LU-20: New residential development should be designed to avoid continuous blocks or clusters of dwellings that are connected only by streets, sidewalks, and hardscape. New development shall incorporate amenities which establish a sense of identity at the project or neighborhood level, create opportunities for community interaction, and enhance the visual appeal of the area. Features which accomplish these goals may include pathways, paseos, parks, community gardens, and other semi-public gathering places.
- CD-34: The exterior of residential buildings shall reflect attention to detail as necessary to produce high architectural design and construction quality. Where side and/or rear exterior elevations of residential buildings are visible from any street or public rights-of-way, they shall incorporate architectural treatments in keeping with the front (primary) elevation.

4.1.2 Impact Assessment

a) Would the project have a substantial adverse effect on a scenic vista?

Less than Significant: A scenic vista is defined as a viewpoint that provides expansive views of highly valued landscape for the benefit of the general public. The Sierra Nevada Mountains are the primary scenic vista within this region the City's general plan does not state that view corridors to the mountains should be preserved. Moreover, views of the mountains are not visible on most days due to poor air quality.

Views of the Sierra Nevada Mountains would largely be unaffected by the proposed project because of the distance between the project site and the mountains and the limited visibility of these features due to air quality. The impact is *less than significant.*

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

No Impact: There are no Officially Designated State Scenic Highways within the City of Madera. Highway 168 is the nearest Eligible State Scenic Highway and is located approximately 20 miles south of the project site. This significant distance between the project site and Highway 168 eliminates visibility of the project site from the highway. There is *no impact.*

c) In non-urbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

No Impact: The proposed project site is located within City limits and is considered to be within an urbanized area. However, the proposed project would not conflict with applicable zoning or other regulations governing scenic quality. There is *no impact.*

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

Less than Significant Impact: The proposed project would result in new lighting sources on the project site consistent with residential development. New lighting sources would include interior and exterior lighting associated with residential units and street lighting. All street, landscape and parking area lighting will be consistent with the City's lighting standards, which are developed to minimize impacts related to excessive light and glare. Additionally, the project would comply with the City's General Plan Policy CON-44 to prevent excess energy use, glare, and illumination of the night sky. Although the project will introduce new light sources to the area, all lighting will be consistent with adjacent residential land uses and the City's lighting standards. The impacts are *less than significant.*

4.2 Agriculture and Forestry Resources

Would the project:	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), 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 section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 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 or conversion of forest land to non-forest use?	☐	☐	☐	☒

4.2.1 Environmental Setting

Agriculture is a vital component of the City of Madera's economy and is a significant source of the City's cultural identity. As such, preserving the productivity of agricultural lands is integral to maintaining the City's culture and economic viability. The proposed project site is designated as low-density residential, and the site is currently being used for agricultural purposes.

California Land Conservation Act of 1965: The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, allows local governments to enter into contracts with private landowners to restrict the activities on specific parcels of land to agricultural or open space uses. The landowners benefit from the contract by receiving greatly reduced property tax assessments. The California Land Conservation Act is overseen by the California Department of Conservation; however local governments are responsible for determining specific allowed uses and enforcing the contract. The City of Madera General Plan states

that the City encourages the use of Williamson Act contracts on parcels located outside the urban development boundary.

California Farmland Mapping and Monitoring Program (FMMP): The FMMP is implemented by the California Department of Conservation (DOC) to conserve and protect agricultural lands within the State. Land is included in this program based on soil type, annual crop yields, and other factors that influence the quality of farmland. The FMMP mapping categories for the most important statewide farmland are as follows:

- *Prime Farmland* has the ideal physical and chemical composition for crop production. It has been used for irrigated production in the four years prior to classification and is capable of producing sustained yields.
- *Farmland of Statewide Importance* has also been used for irrigated production in the four years prior to classification and is only slightly poorer quality than Prime Farmland.
- *Unique Farmland* has been cropped in the four years prior to classification and does not meet the criteria for Prime Farmland or Farmland of Statewide Importance but has produced specific crops with high economic value.
- *Farmland of Local Importance* encompasses farmland that does not meet the criteria for the previous three categories. These may lack irrigation, produce major crops, be zoned as agricultural, and/or support dairy.
- *Grazing Land* has vegetation that is suitable for grazing livestock.

City of Madera General Plan: The Conservation and Open Space Element of the City's General Plan includes the following agricultural resource goals and policies that are potentially applicable to the proposed project:

- CON-15 The City will seek to protect land in the Planning Area, which is designated for Agricultural and Resource Conservation, and will encourage the County of Madera to do the same. Measures the City will use (and encourage the County to use) include:
    - Maintaining parcels large enough to sustain agricultural production (preferably a minimum of 20 acres);
    - Preventing the premature conversion of agricultural uses; and
    - Prohibiting uses that are incompatible with long term agricultural production.
- CON-16 The City will facilitate and support agricultural conservation easements, farmland security zone contracts, and land conservation programs when used to preserve agricultural lands and resources.
- CON-17 The City supports the protection of agricultural operations by requiring that buffers be established between urban residential areas and areas planned to remain in agricultural use. The buffers shall be designed to address the physical effects of agricultural practices on urban uses, such as chemical spraying, noise, etc.
- CON-19 The City encourages the growth of environmentally friendly agricultural business and industry in Madera.
- CON-20 The City supports the marketing of local agricultural products to local residents, vendors and restaurants through year-round public farmers' markets and other direct farm-to-table sales.
- CON-21 The City encourages organic and sustainable agricultural practices and crop diversification.

- CON-22 The City encourages the expansion of the local agricultural processing industry, and will maintain sufficient industrially designated land to provide opportunities for expansion and new facilities.

4.2.2 Impact Assessment

a) Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact: The proposed site is designated as Prime Farmland under the California Department of Conservation FMMP. Implementation of the proposed Project would result in the permanent conversion of approximately 58 acres of Prime Farmland to non-agricultural uses.

The City of Madera contains approximately 958 acres of Prime Farmland. Implementation of the project would replace 58 acres of this land resulting in a 6% decrease in the City's Important Farmland Inventory. The 2025 General Plan, however, plans to develop approximately 1,682 acres of important farmland which includes 878 acres of Prime Farmland. The General Plan Land Use Map has designated the Project site as a residential zone. This conversion of Prime Farmland to residential uses has been adequately analyzed in the Program EIR, so no further analysis is required pursuant to CEQA Guidelines, section 15168(c) as the impact to is no greater than what was analyzed in the Program EIR.

b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact: The proposed project site is not zoned for agricultural use or under a Williamson Act Contract. There is *no impact.*

c) Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

No Impact: The project site is not zoned for forest or timberland production and there is no forest land located on the site. Therefore, *no impacts* would occur.

d) Would the project result in the loss of forest land or conversion of forest land to non-forest use?

No Impact: No conversion of forestland, as defined under Public Resource Code or General Code, will occur as a result of the project and there would be *no impacts*.

f) Would the project 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 forest land to non-forest use?

No Impact: As discussed above, the proposed Project would convert Farmland to non-agricultural use. This conversion of Prime Farmland to residential uses has been adequately analyzed in the

Program EIR, so no further analysis is required pursuant to CEQA Guidelines, section 15168(c). This development will also not interfere with surrounding Farmland. The project does not include any features which could result in the conversion of forestland to non-forest use. There is *no impact.*

4.3 Air Quality

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) 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?	☐	☐	☒	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

4.3.1 Environmental Setting

Air pollution is directly related to regional topography. Topographic features can either stimulate the movement of air or restrict air movement. California is divided into regional air basins based on topographic air drainage features. The proposed project site is within the San Joaquin Valley Air Basin, which is bordered by the Sierra Nevada Mountains to the east, Coastal Ranges to the west, and the Tehachapi Mountains to the south. The mountain ranges surrounding the San Joaquin Valley Air Basin (SJVAB) serve to restrict air movement and prevent the dispersal of pollution.

Thresholds of Significance

To assist local jurisdictions in the evaluation of air quality impacts, the SJVAPCD has published the *Guide for Assessing and Mitigating Air Quality Impacts*. This guidance document includes recommended thresholds of significance to be used for the evaluation of short-term construction, long-term operational, odor, toxic air contaminant, and cumulative air quality impacts. Accordingly, the SJVAPCD-recommended thresholds of significance are used to determine whether implementation of the proposed Project would result in a significant air quality impact. Projects that exceed these recommended thresholds would be considered to have a potentially significant impact to human health and welfare. The thresholds of significance are summarized, as follows:

Short-Term Emissions of Particulate Matter (PM10): Construction impacts associated with the proposed Project would be considered significant if the feasible control measures for construction in compliance with Regulation VIII as listed in the SJVAPCD guidelines are not incorporated or implemented, or if project-generated emissions would exceed 15 tons per year (TPY).

Short-Term Emissions of Ozone Precursors (ROG and NOX): Construction impacts associated with the proposed Project would be considered significant if the project generates emissions of Reactive Organic Gases (ROG) or NO_X that exceeds 10 TPY.

Long-Term Emissions of Particulate Matter (PM10): Operational impacts associated with the proposed Project would be considered significant if the project generates emissions of PM_{10} that exceed 15 TPY.

Long-Term Emissions of Ozone Precursors (ROG and NOX): Operational impacts associated with the proposed Project would be considered significant if the project generates emissions of ROG or NOX that exceeds 10 TPY.

Conflict with or Obstruct Implementation of Applicable Air Quality Plan: Due to the region's nonattainment status for ozone, $PM_{2.5}$, and PM_{10}, if the project-generated emissions of either of the ozone precursor pollutants (i.e., ROG and NO_x) or PM_{10} would exceed the SJVAPCD's significance thresholds, then the project would be considered to conflict with the attainment plans. In addition, if the project would result in a change in land use and corresponding increases in vehicle miles traveled, the project may result in an increase in vehicle miles traveled that is unaccounted for in regional emissions inventories contained in regional air quality control plans.

Local Mobile-Source CO Concentrations: Local mobile source impacts associated with the proposed Project would be considered significant if the project contributes to CO concentrations at receptor locations in excess of the CAAQS (i.e. 9.0 ppm for 8 hours or 20 ppm for 1 hour).

Exposure to toxic air contaminants (TAC) would be considered significant if the probability of contracting cancer for the Maximally Exposed Individual (i.e., maximum individual risk) would exceed 10 in 1 million or would result in a Hazard Index greater than 1.

Odor impacts associated with the proposed Project would be considered significant if the project has the potential to frequently expose members of the public to objectionable odors.

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

No Impact: The proposed project is located within the boundaries of the San Joaquin Valley Air Pollution Control District (SJVAPCD) and would result in air pollutant emissions that are regulated by the air district during both its construction and operational phases. The SJVAPCD is responsible for bringing air quality in Madera County into compliance with federal and state air quality standards. The air district has Particulate Matter (PM) plans, Ozone Plans, and Carbon Monoxide Plans that serve as the clean air plan for the basin. Together, these plans quantify the required emission reductions to meet federal and state air quality standards and provide strategies to meet these standards.

Construction Phase: Project construction would generate pollutant emissions from the following construction activities: site preparation, grading, building construction, application of architectural coatings, and paving. The construction related emissions from these activities were calculated using CalEEMod. CalEEMod defaults were used with the exception of the construction phase; the construction phase timeline was updated with estimated dates. The full CalEEMod Report can be found in Appendix A. As shown in Table 4-1 below, project construction related emissions do not exceed the thresholds established by the SJVAPCD.

Table 4-1. Projected Project Emissions Compared to SJVAPCD Thresholds of Significance for Criteria Pollutants related to Construction; Source: SJVAPCD, CalEEMod Analysis (Appendix A)

	CO (tpy)	ROG (tpy)	SOx (tpy)[1]	NOx (tpy)	PM10 (tpy)	PM2.5 (tpy)
Unmitigated Emissions Generated from Project Construction (maximum)	3.06	4.83	.0073	2.71	0.80	0.35
SJVAPCD Air Quality Thresholds of Significance	100	10	27	10	15	15

1. Threshold established by SJVAPCD for SOx, however emissions are reported as SO2 by CalEEMod.

Operational Phase: Implementation of the proposed project would result in long-term emissions associated with area sources, such as natural gas consumption, landscaping, applications of architectural coatings, and consumer products, as well as mobile emissions. Operational emissions from these factors were calculated using CalEEMod. In addition, the following mitigation measures were selected for operations: improve destination accessibility, increase transit accessibility, improve pedestrian network, and no hearths installed. The Full CalEEMod Report can be found in Appendix A. As shown in Table 4-2 below, the Project's operational emissions, both unmitigated and mitigated, do not exceed the thresholds established by the SJVAPCD.

Table 4-2. Projected Project Emissions Compared to SJVAPCD Thresholds of Significance for Criteria Pollutants related to Operations; Source: SJVAPCD, CalEEMod Analysis (Appendix A)

	CO (tpy)	ROG (tpy)	SOx (tpy)[1]	NOx (tpy)	PM10 (tpy)	PM2.5 (tpy)
Emissions Generated from Project Operations, Unmitigated	13.86	4.11	0.03	2.42	3.24	0.91
Emissions Generated from Project Operations, Mitigated	10.76	3.88	0.02	1.88	2.12	0.61
SJVAPCD Air Quality Thresholds of Significance	100	10	27	10	15	15

1. Threshold established by SJVAPCD for SOx, however emissions are reported as SO2 by CalEEMod.

Because the emissions from both construction and operation of the proposed project would be below the thresholds of significance established by the SJVAPCD, the project would not conflict with or obstruct implementation of an applicable air quality plan and there is *no impact.*

b) 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?

Less Than Significant Impact: The SJVAPCD is responsible for bringing air quality in Madera into compliance with federal and state air quality standards. The significance thresholds and rules developed by the SJVAPCD are designed to prevent projects from violating air quality standards or significantly contributing to existing air quality violations. As discussed above, neither construction related emissions nor operation-related emissions will exceed thresholds established by the SJVAPCD. The project will comply with all applicable SJVAPCD rules and regulations, which will further reduce the potential for any significant impacts related to air quality as a result of project implementation. Because these thresholds and regulations are designed to achieve and/or maintain

federal and state air quality standards, and the project is compliant with these thresholds and regulations, the project will not violate an air quality standard or significantly contribute to an existing air quality violation. The impact is *less than significant.*

c) Would the project expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact: The closest sensitive receptors to the project site include the high school located approximately 300 feet north of the Project site, and the residences located approximately 100 feet to the east of the Project site. There is potential for emissions from the project site to expose these sensitive receptors to pollutant concentrations.

The Project does not include any project components identified by the California Air Resources Board that could potentially impact any sensitive receptors, such as heavily traveled roads, distribution centers, fueling stations, and dry-cleaning operations. The most intense construction activities of the project's construction would occur during site preparation and grading phases over a short period. There are no conditions unique to the project site that would require more intense construction activity compared to typical development that would emit high levels of diesel emissions. The project would not expose sensitive receptors to substantial pollutant concentrations. The impact would be *less than significant.*

d) Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less Than Significant Impact: Specific land uses that are considered sources of undesirable odors include landfills, transfer stations, composting facilities, sewage treatment plants, wastewater pump stations, asphalt batch plants and rendering plants. The Project would not consist of such land uses; rather, the Project proposes a residential subdivision and thus is unlikely to produce odors that would be considered to adversely affect a substantial number of people. Further, there are no major odor-generating sources within the Project area. Although some odors would be emitted during construction of the site (i.e., through diesel fuel and exhaust from equipment), these odors would be temporary and last only during construction activities. The proposed project will not introduce conflicting land use (surrounding land includes residential neighborhoods) to the area and will not have any component that would typically emit odors. The project would not create objectionable odors affecting a substantial number of people. Therefore, impacts would be *less than significant.*

4.4 Biological Resources

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☒	☐
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 U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
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?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
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?	☐	☐	☐	☒

Discussion for this section originates from the Biological Resources Assessment that was prepared for this project by Live Oak Associates to identify sensitive biological resources, provide project impact analysis, and suggest mitigation measures. The full document can be found in Appendix B.

4.4.1 Environmental Setting

The site is located at the northeast intersection of Stadium Road and West Pecan Avenue, in the south-central area of the City of Madera, Madera County, California (Figure 1). The site may be found entirely on the *Madera* U.S. Geological Survey (USGS) 7.5-minute quadrangle in Section 36, Township 11 South, Range 17 East (Figure 2). The project site is located on the east side of California's San Joaquin Valley. The San Joaquin Valley is bordered by the Sierra Nevada to the east, the Tehachapi Mountains to the south, and the California coastal ranges to the west, and the Sacramento-San Joaquin Delta to the north. The site is situated in a portion of the San Joaquin Valley that has experienced intensive agricultural disturbances and, more recently, intensive urban development associated with the City of Madera. Native plant and animal species once abundant in the region have experienced large reductions in their populations due to conversion of upland, riparian, and aquatic habitats to agricultural and urban uses. Remaining native habitats are particularly valuable to native wildlife species including special status species that persist in the region.

Prior to any field investigations, a background review of the project site and region was conducted by Live Oak Associates (LOA). Sources of information used included: (1) the *California Natural Diversity Database* (CDFW 2022), (2) the *Online Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2022), and (3) manuals, reports, and references related to plants and animals of the San Joaquin Valley region.

A reconnaissance-level field survey of the project site was conducted on November 23, 2022, by LOA ecologist Colleen Del Vecchio. The survey consisted of walking the project site while identifying its principal land uses and the constituent plants and animals of each land use. The field survey conducted for this study was sufficient to assess the significance of possible biological impacts associated with the development plans for the project site.

LOA's field investigation did not include an aquatic resources delineation or focused surveys for special status species. The field survey was sufficient to generally describe any aquatic features of the project site that could be subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), and/or the Regional Water Quality Control Board (RWQCB), and to assess the significance of possible biological impacts associated with development of the project site. Following the field survey, LOA conducted an analysis of potential project impacts based on the known and potential biotic resources of the project site.

Federal Endangered Species Act (FESA): defines an *endangered species* as "any species or subspecies that is in danger of extinction throughout all or a significant portion of its range." A threatened species is defined as "any species or subspecies that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

The Federal Migratory Bird Treaty Act (FMBTA: 16 USC 703-712): FMBTA prohibits killing, possessing, or trading in any bird species covered in one of four international conventions to which the United States is a party, except in accordance with regulations prescribed by the Secretary of the Interior. The name of the act is misleading, as it actually covers almost all birds native to the United States, even those that are non-migratory. The FMBTA encompasses whole birds, parts of birds, and bird nests and eggs. Although the USFWS and its parent administration, the U.S. Department of the Interior, have traditionally interpreted the FMBTA as prohibiting incidental as well as intentional "take" of birds, a January 2018 legal opinion issued by the Department of the Interior now states that incidental take of migratory birds while engaging

in otherwise lawful activities is permissible under the FMBTA. However, California Fish and Game Code makes it unlawful to take or possess any non-game bird covered by the FMBTA (Section 3513), as well as any other native non-game bird (Section 3800), even if incidental to lawful activities.

Birds of Prey (CA Fish and Game Code Section 3503.5): Birds of prey are protected in California under provisions of the Fish and Game Code (Section 3503.5), which states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes (hawks and eagles) or Strigiformes (owls), as well as their nests and eggs. The bald eagle and golden eagle are afforded additional protection under the federal Bald and Golden Eagle Protection Act (16 USC 668), which makes it unlawful to kill birds or their eggs.

Clean Water Act: Section 404 of the Clean Water Act of (1972) is to maintain, restore, and enhance the physical, chemical, and biological integrity of the nation's waters. Under Section 404 of the Clean Water Act, the US Army Corps of Engineers (USACE) regulates discharges of dredged and fill materials into "waters of the United States" (jurisdictional waters). Waters of the US including navigable waters of the United States, interstate waters, tidally influenced waters, and all other waters where the use, degradation, or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries.

California Endangered Species Act (CESA): prohibits the take of any state-listed threatened and endangered species. CESA defines *take* as "any action or attempt to hunt, pursue, catch, capture, or kill any listed species." If the proposed project results in a take of a listed species, a permit pursuant to Section 2080 of CESA is required from the CDFG.

4.4.2 Impact Assessment

a) Would the project 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?

Less Than Significant Impact: Of the 13 special status animal species known from the regional vicinity, 12 are considered absent or unlikely to occur on the project site due to the absence of suitable habitat, the site's urban and/or agricultural setting, and/or the site's being situated outside of the species distribution. The remaining species, the loggerhead shrike (*Lanius ludovicianus*), has some potential to forage on site from time to time, but would not use the site for nesting or other activities in which it is particularly sensitive to disturbance.

Sixteen special status plant species are known to occur in the region but have no appreciable potential to occur on the project site following decades of agricultural disturbance and present-day use as an almond orchard. The proposed project is not expected to affect any special status plant species or their habitats.

Although, the project site does have the potential to be used for nesting by several native avian species protected by the Migratory Bird Treaty Act and related state laws. If future site buildout takes place during the nesting season (generally February 1-August 31), birds nesting on the site could be injured or killed by construction activities or disturbed such that they would abandon their nests. Significant construction-related disturbance is also a possibility for birds nesting adjacent to the

project site. Construction-related injury, mortality, or disturbance of nesting birds that results in nest abandonment are potential impacts that must be mitigated. The impacts are *less than significant impact.*

b) Would 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?

No Impact: No riparian habitat or other sensitive natural communities were observed in the project area or immediate vicinity. Development of the proposed project would not impact any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the CDFW, or USFWS. There is *no impact.*

c) Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact: The project site does not contain wetlands or any other type of jurisdictional waters. The Proposed Project would have *no impact* on federally protected wetlands as defined by Section 404 of the CWA. Future site buildout would not affect these resources, and there is *no impact.*

d) Would 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 sites?

Less than Significant Impact with Mitigation Incorporation: The project site has the potential to be used for nesting by several native avian species protected by the Migratory Bird Treaty Act and related state laws. If future site buildout takes place during the nesting season (generally February 1-August 31), birds nesting on the site could be injured or killed by construction activities or disturbed such that they would abandon their nests. Significant construction-related disturbance is also a possibility for birds nesting adjacent to the project site. Construction-related injury, mortality, or disturbance of nesting birds that results in nest abandonment are potentially significant adverse environmental effects of the project. Incorporation of Mitigation Measures BIO 1a-1b will reduce potential impacts to sensitive species to a less than significant level. Impacts are *less than significant with mitigation.*

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

No Impact: There are no trees present on the proposed project site. The project would not conflict with any tree preservation policy or local City ordinance which protects native trees. There is *no impact.*

f) Would 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?

No Impact: The project appears to be consistent with those goals and policies of the City of Madera General Plan that pertain to biological resources. There are no known HCPs or NCCPs in effect for the project vicinity. There is *no impact.*

Mitigation Measures for Biological Resources

Mitigation Measure BIO-1a: *(Pre-construction Surveys and Construction Timing*). If construction is to occur between February 1 and August 31, a qualified biologist will conduct pre-construction surveys for active bird nests within 10 days prior to the start of ground disturbing activities should work commence during the nesting season (February 15 to September 15). The survey area will encompass the site and accessible surrounding lands within 250 feet for nesting migratory birds and 500 feet for raptors (i.e., birds of prey).

Mitigation Measure BIO-1b: *(Avoidance of Active Nests*). Should any active nests be discovered in or near proposed construction zones, the biologist will identify a suitable construction-free buffer around the nest. This buffer will be identified on the ground with flagging or fencing and will be maintained until the biologist has determined that the young have fledged and are capable of foraging independently.

4.5 Cultural Resources

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource pursuant to in §15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

4.5.1 Environmental Setting

The Southern San Joaquin Valley Information Center (SSJVIC) provided the results of the records search in a letter dated November 29, 2022 (Records Search File No. 22-446; Appendix C). The results letter indicated that there has been one cultural resource study that has been conducted within the northern border of the Project site. There have also been five studies within a 0.5-mile radius of the Project area. The SSJVIC reported that there is one cultural resource previously recorded within the Project area that was identified as a historic era canal (P-20-002308). There are no further recorded cultural resources in a 0.5-mile radius.

4Creeks reached out to Taylored Archaeology to complete an in-depth investigation into the historic era canal identified on site by the SSHVIC. The Cultural Resources Assessment also identified that there are no 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, for the California State Historic Landmarks. The full Cultural Resources Technical Memorandum is available in Appendix C.

The SB 18 public comment period started on November 28, 2022 and lasted until February 28, 2023 for a total of 90 days. Request for consultation letters went to the following tribes:

- Big Sandy Rancheria of Western Mono Indians
- Big Valley Rancheria of Pomo Indians
- California Valley Miwok Tribe
- Chicken Ranch Rancheria of Me-Wuk Indians
- Dumna Wo-Wah Tribe
- Nashville Enterprise Miwok- Maidu-Nishinam Tribe
- North Fork Mono Tribe
- North Fork Rancheria of Mono Indians
- North Valley Yokuts Tribe

- North Valley Yokuts Tribe
- Picayune Rancheria of Chukchansi Indians
- Picayune Rancheria of Chukchansi Indians
- Southern Sierra Miwuk Nation
- Tule River Indian Tribe
- Tule River Indian Tribe
- Tule River Indian Tribe
- Tuolumne Band of Me-Wuk Indians
- Wuksache Indian Tribe, Eshom Valley Band

There were no comments received from the contacted tribes.

National Historic Preservation Act: The National Historic Preservation Act was adopted in 1966 to preserve historic and archeological sites in the United States. The Act created the National Register of Historic Places, the list of National Historic Landmarks, and the State Historic Preservation offices.

California Historic Register: The California Historic Register was developed as a program to identify, evaluate, register, and protect Historical Resources in California. California Historical Landmarks are sites, buildings, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific, religious, experimental, or other value. For a resource to be designated as a historical landmark, it must meet the following criteria:

- The first, last, only, or most significant of its type in the state or within a large geographic region (Northern, Central, or Southern California).
- Associated with an individual or group having a profound influence on the history of California.
- A prototype of, or an outstanding example of, a period, style, architectural movement or construction or is one of the more notable works or the best surviving work in a region of a pioneer architect, designer or master builder.

Health and Safety Code, Section 7050.5: Section 7050.5 of the California Health and Safety Code requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the California Native American Heritage Commission (NAHC). CEQA Guidelines (Public Resources Code Section 5097) specify the procedures to be followed in case of the discovery of human remains on non-federal land. The disposition of Native American burials falls within the jurisdiction of the NAHC.

City of Madera General Plan: The *Historic and Cultural Resources Element* of the City of Madera General Plan includes the following goals and policies pertaining to cultural and historic resources:

Goal HC-1 Protection and preservation of Madera's significant historical, archaeological, cultural, and fossil resources.

- HC-1 The City encourages the preservation and enhancement of existing historical and archaeological resources in the City.

- HC-9 The City will endeavor to protect and preserve prehistoric and historic archaeological resources, cultural resources (particularly those of importance to existing tribes), and fossils.
    - HC-9.1 In areas identified with a significant potential for containing archaeological artifacts, require completion of a detailed on-site study as part of the environmental review process. Implement all feasible mitigation measures.
    - HC-9.2 Impose the following conditions on all discretionary projects which may cause ground disturbance:
        - "The Planning Department shall be notified immediately if any prehistoric, archaeologic, or fossil artifact or resource is uncovered during construction. All construction must stop and an archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to evaluate the finds and recommend appropriate action."
        - "All construction must stop if any human remains are uncovered, and the County Coroner must be notified according to Section 7050.5 of California's Health and Safety Code. If the remains are determined to be Native American, the procedures outlined in CEQA Section 15064.5 (d) and (e) shall be followed."
    - HC-9.3 The City will work with area tribes to develop updated standards for cultural resource surveys, as well as a process for obtaining the input of tribes in the development review process when cultural resources are involved.

4.5.2 Impact Assessment

a) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to in §15064.5?

Less Than Significant Impact with Mitigation: A Cultural Resources Record Search was prepared by SSJVIC in November 2022. The Cultural Resources Records Search also examined the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historical Interest, California Inventory of Historic Resources, for the California State Historic Landmarks.

The records search results indicated that there has been one previous cultural resource studies conducted within the Project area, and that five additional cultural resource studies were conducted within 0.5-mile radius of the project site. According to the records search, there is one recorded cultural resource within the project site (a historic canal) and there are no recorded resources within the 0.5-mile radius of the project site.

On January 30, 2023, Taylored Archaeology completed an additional records search to investigate the historic canal within the project site. The records search identified one recorded cultural resource (P-20-002308) within the Project boundary. However, a review of SSJVIC records, including P-20-002308, and of historical topographic maps, historical aerial photographs, and other archival sources as discussed in the Archival Research section below showed no evidence of any Madera Canal segment presently or historically located within or adjacent to the Project site.

A review of available UISGS 7.5-minute topographic maps of the Madera, CA quadrangle from 1922, 1947, 1963, 1963 photorevised 1981, 2012, 2015, 2018, and 2021 revealed no evidence of any

ditches or canals within the Project boundary (USGS). The 2018 topographic map showed an unnamed blue line ditch feature on the Project site corresponding to the recorded segment of the Madera Canal (P-20-002308) within the Project site. However, subsequent review of available historic aerials from 1946 to present day and Google Street View photographs from 2011 to present day reveal no evidence of any ditches or canals within the Project boundary (NETROnline 2023; Google Earth Pro 2023; Google 2022). Additionally, the 2021 USGS topographic map of the site does not show the blue line feature that was present in the 2018 topographic map (USGS). Finally, the blue line feature noted in the 2018 topographic map appears to correspond with the dark outline of the windbreak trees lining the northeastern boundary of the Project site along Road 26 ½. Therefore, a review of historical topographic maps, historic aerial imagery, and other sources indicates that the recording of the segment of the Madera Canal (P-20-002308) within the Project boundary may have been an error corresponding with the erroneous blue line feature shown only on the 2018 USGS topographic map.

Based on the results of the SSJVIC records search and subsequent archival research, it appears the single recorded cultural resource within the Project boundary (P-20-002308, a segment of the Madera Canal) is not located within or adjacent to the Project site. No other evidence of cultural resources within the Project boundary was found during this investigation. Based upon the limited information available, the chance of encountering subsurface archaeological or historical resources within the Project boundary is undetermined. Although no historical resources were identified, the presence of remains or unanticipated cultural resources under the ground surface is possible. Implementation of Mitigation Measures CUL-1 and CUL-2 will ensure that impacts to this checklist item will be *less than significant with mitigation incorporation*.

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Less Than Significant Impact with Mitigation: There are no known archaeological resources located within the project area. Implementation of Mitigation Measures CUL-1 and CUL-2 will ensure that potential impact will be *less than significant with mitigation incorporation.*

c) Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

Less Than Significant Impact with Mitigation: There are no known human remains buried in the project vicinity. If human remains are unearthed during development, there is a potential for a significant impact. As such, implementation of Mitigation Measure CUL-2 will ensure that impacts remain *less than significant with mitigation incorporation.*

Mitigation Measures for Cultural Resources

Mitigation Measure CUL-1: If previously unknown resources are encountered before or during grading, excavation or other ground disturbance activities, construction shall stop in the immediate vicinity of the find (within a 100-foot radius) and a qualified historical resources specialist shall be consulted to determine whether the resource requires further study. The qualified historical resources specialist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines and the City's Historic Preservation Ordinance. If the

resources are determined to be unique historical resources as defined under Section 15064.5 of the CEQA Guidelines, measures shall be identified by the monitor and recommended to the Lead Agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any historical artifacts recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study.

Mitigation Measure CUL-2: If human remains are uncovered during construction, the Madera County Coroner is to be notified to investigate the remains and arrange proper treatment and disposition. If the remains are identified on the basis of archaeological context, age, cultural associations, or biological traits to be those of a Native American, California Health and Safety Code 7050.5 and PRC 5097.98 require that the coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendent who will be afforded an opportunity to make recommendations regarding the treatment and disposition of the remains.

4.6 Energy

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

4.6.1 Environmental Setting

Pacific Gas and Electric Company (PG&E) provides electricity services to the region. PG&E serves approximately 16 million people throughout a 70,000 square-mile service area in northern and central California. PG&E supplies electricity to its customers through a variety of renewable and nonrenewable sources. The Table 4-3 below shows the proportion of each energy resource sold to California consumers by PG&E in 2020 as compared to the statewide average.

Table 4-3. 2020 PG&E and State average power resources; Source: PG&E

Fuel Type		PG&E Power Mix	California Power Mix
Coal		0%	2.7%
Large Hydroelectric		10.1%	12.2%
Natural Gas		16.4%	37.1%
Nuclear		42.8%	9.3%
Other (Oil/Petroleum Coke/Waste Heat)		0%	0.2%
Unspecified Sources of Power[1]		0%	5.4%
Eligible Renewables	Biomass	2.6%	2.5%
	Geothermal	2.6%	4.9%
	Small Hydro	1.2%	1.4%
	Solar	15.9%	13.2%
	Wind	8.3%	11.1%
	Total Eligible Renewable	**30.6%**	**33.1%**

1. "Unspecified sources of power" means electricity from transactions that are not traceable to specific generation sources.

PG&E also offers options for 50% or 100% solar plans, which allow consumers to indirectly purchase up to 100% of their energy from solar sources. To accomplish this, PG&E purchases the renewable energy necessary to meet the needs of Solar Choice participants from solar renewable developers.

PG&E also provides natural gas services to the project area. Natural gas is an energy source developed from fossil fuels composed primarily of methane (CH4). Approximately 45% of the natural gas burned in California is used for electricity generation, while 21% is consumed by the residential sector, 25% is consumed by the industrial sector, and 9% is consumed by the commercial sector.

California Code of Regulations, Title 20: Title 20 of the California Code of Regulations establishes standards and requirements for appliance energy efficiency. The standards apply to a broad range of appliances sold in California.

California Code of Regulations, Title 24: Title 24 of the California Code of Regulations is a broad set of standards designed to address the energy efficiency of new and altered homes and commercial buildings. These standards regulate energy consumed for heating, cooling, ventilation, water heating, and lighting.

California Green Building Standards Code (CALGreen): The purpose of the CALGreen Code is to "improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) planning and design; (2) energy efficiency; (3) water efficiency and conservation; (4) material conservation and resource efficiency; and (5) environmental air quality." The CALGreen Code is not intended to substitute or be identified as meeting the certification requirements of any green building program that is not established and adopted by the California Building Standards Commission (CBSC).

SB 100: SB 100, passed in 2018, set a deadline in 2045 for 100% of energy to be renewable. Additionally, by 2030, 60% of all energy must be renewable. California is targeting this goal through solar and other renewable sources.

AB 178: For California to meet its renewable goals, AB 178 was passed in 2018. AB 178 states that starting in 2020 all new low-rise residential buildings must be built with solar power.

City of Madera General Plan: The City of Madera General Plan establishes the following Goals and Policies related to energy efficiency and conservation:

Goal CON-13 Safe and reliable energy—including energy from renewable sources—to meet Madera's needs and enable continued economic growth.

- Policy CON-40 All public and private development—including homes, commercial, and industrial—should be designed to be energy-efficient.
    - CON-40.1 Work with the local energy providers and developers on voluntary incentive based programs to encourage the use of energy efficient designs and equipment.
    - CON-40.2 Promote enhanced energy conservation standards for new construction through informational handouts, outreach to the construction industry, or other methods.

- Policy CON-41 The City will allow renewable energy projects in areas zoned for open space, where significant environmental impacts can be avoided or mitigated to the greatest extent feasible, where consistent with all of the elements of this General Plan, and other uses and values.
    - CON-41.1 Update the City's Building and Zoning codes as needed to establish standards (such as, but not limited to, height and size) for renewable energy projects.
- Policy CON-42 The City will promote and encourage co-generation projects for commercial, industrial, and municipal facilities, provided they meet all applicable air quality standards and provide a net reduction in GHG emissions associated with energy production.

4.6.2 Impact Assessment

a) Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less Than Significant Impact: The proposed project includes the construction and operation of single-family housing. During project construction, there would be an increase in energy consumption related to worker trips and the operation of construction equipment. This increase in energy use would be temporary and limited to the greatest extent possible through compliance with local, state, and federal regulations. Vehicle fuel consumption during project construction was estimated based on the assumed construction schedule, vehicle trip lengths, and the number of workers per construction phase as provided by CalEEMod, and Year 2023 gasoline/diesel MPG factors provided by the EMFAC2021. To simplify the estimation process, it was assumed that all worker vehicles used gasoline as a fuel source and all vendor vehicles used diesel as a fuel source. Table 4-4, below, provides gasoline and diesel fuel used by construction and on-road sources during each phase of project construction.

Table 4-4. On-Road Mobile Fuel Use Generated by Construction Activities. Source: CalEEMod

Construction Phase	# of Days	Daily Worker Trips[1]	Daily Vendor Trips[1]	Daily Hauling Trips[1]	Total Gasoline Fuel Use (Gallons)[2]	Total Diesel Fuel Use (Gallons)[2]
Demolition	70	15	0	0	388.0	0
Site Preparation	40	18	0	0	266.0	0
Grading	110	20	0	0	812.9	0
Building Construction	1110	182	60	0	74643.0	57672.6
Paving	75	15	0	0	415.7	0
Architectural Coating	75	36	0	0	997.6	0
Total	**1480**	**286**	**60**	**0**	**77523.2**	**57672.6**

1. Data provided by CalEEMod (Appendix A)
2. See Appendix D

During project construction there would be an increase in energy consumption related to worker trips and operation of construction equipment (Table 4-4). This energy use would be limited to the greatest extent possible through compliance with local, state, and federal regulations.

Table 4-5. Energy Use Generated by Operational Activities. Source CalEEMod

Energy Type		Units
Natural Gas Use (kBTU/yr)[1]		7,643,940
Electricity Use (kWh/yr) [1]		2,535,720
Total Annual Operation VMT 1 : 5,520,395	Annual Fuel Use	Gal/yr
	Gasoline [2]	213,509
	Diesel [2]	46,346

1. Data provided by CalEEMod
2. Data provided by EMFAC
3. MBTU Calculated for comparison purposes. Assumed 1 gallon of gasoline = 0.116090 MBTU and 1 gallon of diesel = 0.139 MBTU

Annual energy use is expected to decrease over time as a result of improvements in vehicle fuel efficiency standards. The proposed Project will be subject to energy conservation requirements in the California Energy Code (24 CCR Part 6, California's Energy Efficiency Standards for Residential and Nonresidential Buildings) and the California Green Building Standards Code (CALGreen) (24 CCR Part 11). Adherence to Title 24 requirements would ensure that the project would not result in wasteful or inefficient use of non-renewable resources due to building operation or vehicle trips. Therefore, potential impacts would *be less than significant.*

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No Impact: The proposed project will not conflict with or obstruct any state or local plans for renewable energy or energy efficiency. The proposed project will comply with all state and local policies related to energy efficiency and there is *no impact*.

4.7 Geology and Soils

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Directly or indirectly cause 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?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
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?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994) creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	☐	☒	☐	☐

4.7.1 Environmental Setting

Geologic Stability and Seismic Activity

- Seismicity: Madera County has no major fault systems within its boundaries. The San Andreas Fault is the longest and most significant fault zone in California and is approximately 60 miles west of the Madera County Boundary. There are no active faults located inside of Madera County. Section 4 of the 2017 Madera County Local Hazard Mitigation Plan (LHMP) identifies the project site as likely to experience low to moderate risk of earthquake occurrence. Earthquakes can result in geological impacts, including liquefaction, landslides, lateral spreading, subsidence, or collapse. Damage from earthquakes typically occurs at peak accelerations of 30% or greater. The LHMP identifies the peak acceleration in Madera County to be only 10% over the next 50 years.

- Liquefaction: Liquefaction is a phenomenon whereby unconsolidated and/or near-saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in temporary, fluid-like behavior of the soil, which can result in landslides and lateral spreading. The 2017 Madera County Multi-Jurisdictional Local Hazard Mitigation Plan identifies the risk of liquefaction within the county as low because the soil types in the area are either too coarse or too high in clay content to be suitable for liquefaction.

- Landslides: Landslides refer to a wide variety of processes that result in the downward and outward movement of soil, rock, and vegetation under gravitational influence. Landslides can be caused by both natural and human-induced changes in slope stability and often accompany other natural hazard events, such as floods, wildfire, or earthquake. Eastern portions of the County are considered to be at a higher risk of landslides where steep slopes are present. However, the majority of the County, including the proposed project site, is considered to be at low risk of landslides and mudslides because of its flat topography. The 2017 Madera Multi-Jurisdictional Local Hazard Mitigation Plan states that occurrence of landslide events within populated areas of Madera County is unlikely.

- Subsidence: Land Subsidence refers to the vertical sinking of land as a result of either manmade or natural underground voids. Subsidence has occurred throughout the Central Valley at differing rates since the 1920's as a result of groundwater, oil, and gas withdrawal. During drought years, Madera County is prone to accelerated subsidence, with some areas sinking up to 28 feet. Although western portions of the County show signs of deep and shallow subsidence, the majority of the County, including the proposed project site, is not considered to be at risk of subsidence related hazards.

Soils Involved in Project: The proposed project involves construction on two soil types. The properties of this soil is described below:

- Gallman Loam, 0 to 2 percent slopes: The Gallman series consists of very deep, well drained soils formed in poorly sorted outwash with a high content of shale of fine gravel size. The potential for surface runoff is negligible to medium. Saturated hydraulic

conductivity is high in the solum and high or very high in the substratum. Permeability is moderately rapid in the solum and moderately rapid or rapid in the substratum.

- Tunitas clay laom: The Tunitas series consists of very deep, moderately well drained soils. They have formed from fine textured alluvium from mixed basic igneous and sedimentary rock sources. Moderately well drained; runoff is slow to medium; permeability is slow.

California Building Code: The California Building Code contains general building design and construction requirements relating to fire and life safety, structural safety, and access compliance. CBC provisions provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings and structures and certain equipment.

City of Madera General Plan: The Health and Safety Element of the City of Madera General Plan includes the following policies regarding soils and geology.

- Policy HS-7: The City supports efforts by federal, state, and other local organizations to investigate local seismic and geological hazards and support those programs that effectively mitigate these hazards.
- Policy HS-8: The City shall seek to ensure that new structures are protected from damage caused by earthquakes, geologic conditions, or soil conditions.

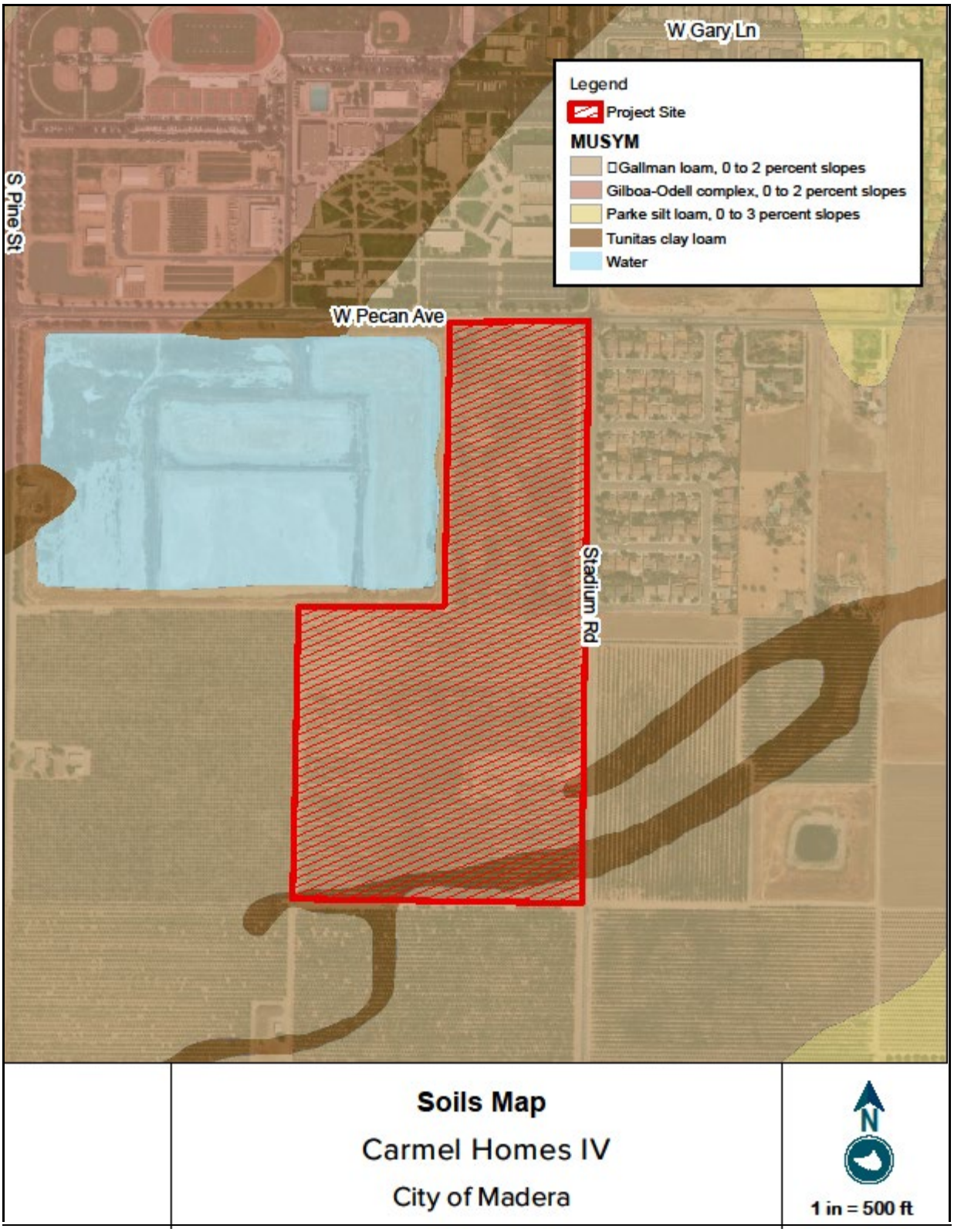

Figure 4-1 Soils Map

4.7.2 Impact Assessment

a) Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

a-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.

Less than Significant Impact: According to the Madera County Local Hazard Mitigation Plan, Madera County is in the Central Valley, Foothill, and Sierra Nevada regions of California, and in an area crossed by very few faults. One fault does cross through the southeastern portion of Madera County; this is an unnamed fault that is part of the Hartley Springs Fault Zone. Although, no active faults underlay the project site. Although the project is in an area of relatively low seismic activity, the project could be affected by ground shaking from nearby faults. The potential for strong seismic ground shaking on the project site is not a significant environmental concern due to the infrequent seismic activity of the area and distance to the faults. The project has no potential to cause the rupture of an earthquake fault indirectly or directly. Therefore, the risk of loss, injury or death involving a rupture of a known earthquake fault would be *less than significant.*

a-ii) Strong seismic ground shaking?

No Impact: According to the Madera County Local Hazard Mitigation Plan, the project site is in an area of relatively low seismic activity. The proposed project does not include any activities or components which could feasibly cause strong seismic ground shaking, either directly or indirectly. There is *no impact.*

a-iii) Seismic-related ground failure, including liquefaction?

No Impact: No specific countywide assessment of liquefaction has been performed; however the Madera County Local Hazard Mitigation Plan states that soil types in the area are not conducive to liquefaction because they are either too coarse in texture or too high in clay content. In other words, the soil types mitigate against the potential for liquefaction. According to state soils maps, the project site consists mostly of Tunitas clay laom and Gallman loam and does not contain soils suitable for liquefaction. There is *no impact.*

a-iv) Landslides?

No Impact: The proposed project site is generally flat and there are no hill slopes in the area. As a result, there is almost no potential for landslides. No geologic landforms exist on or near the site that would result in a landslide event. There is *no impact.*

b) Would the project result in substantial soil erosion or the loss of topsoil?

Less Than Significant Impact: Because the project site is relatively flat, the potential for erosion is low. However, construction-related activities and increased impermeable surfaces can increase the probability for erosion to occur. Construction-related impacts related to erosion will be temporary

and subject to best management practices (BMPs) required by SWPPP, which are developed to prevent significant impacts related to erosion from construction. Because impacts related to erosion would be temporary and limited to construction, and because required best management practices would prevent significant impacts related to erosion, the impact will remain *less than significant.*

c) Would the project 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?

No Impact: The soils associated with the project site are considered stable and have a low capacity for landslides, lateral spreading, subsidence, liquefaction or collapse. Because the project area is considered to be stable, and this project would not result in a substantial grade change to the topography to the point that it would increase the risk of landslides, lateral spreading, subsidence, liquefaction or collapse, there is *no impact.*

d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

No Impact: Expansive soils contain large amounts of clay, which absorb water and cause the soil to increase in volume. Conversely, the soils associated with the proposed project site are granular, well-draining, and therefore have a limited ability to absorb water or exhibit expansive behavior. Because the soils associated with the project are not suitable for expansion, implementation of the project will pose no direct or indirect risk to life or property caused by expansive soils and there is *no impact.*

e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact: The proposed project will have access to existing City wastewater infrastructure and would not require the use of septic tanks or alternative wastewater disposal systems. There is *no impact.*

f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?

Less Than Significant Impact with Mitigation Incorporation: There are no unique geologic features and no known paleontological resources located within the project area and no excavation proposed in undisturbed soils, particularly to a depth with a potential to unearth paleontological resources. With the implementation of Mitigation Measures GEO-1 and GEO-2, potential impacts resulting from project implementation would be *less than significant with mitigation incorporation*.

Mitigation Measures for Soils and Geology

Mitigation Measure GEO-1: In the event of accidental discovery of unidentified paleontological resources during development or ground-moving activities in the Project area, all work should be halted in the immediate vicinity (within a 100-foot radius) until a qualified paleontologist can identify the discovery and assess its significance. The qualified paleontologist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with Section 15064.5 of the CEQA

Guidelines and the City's Historic Preservation Ordinance. If the resources are determined to be unique paleontological resources, measures shall be identified by the monitor and recommended to the Lead Agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any paleontological artifacts recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study.

Mitigation Measure GEO-2: Should the construction crew or paleontologist uncover any bones or teeth, all construction-related activities in the immediate vicinity would be stopped until the paleontologist has assessed the find and, if deemed significant, salvaged it for deposition in a repository such as University of California Museum of Paleontology where it would be properly curated and preserved for scientific study. Any period in which construction is halted shall be kept to the minimum amount of time feasible under the circumstances. To avoid any unnecessary loss of time during construction, the City shall require the paleontologist to assess the significance of the affected resources as soon as is feasible under the circumstances. Following the completion of the above tasks, the paleontologist shall prepare a report documenting the absence or discovery of fossil resources on-site. If fossils are found, the report shall summarize the results of the inspection program, identify those fossils encountered, recovery and curation efforts, and the methods used in these efforts, as well as describe the fossils collected and their significance. A copy of the report shall be provided to the Madera Community Development Department and to the Natural History Museum of Los Angeles County.

4.8 Greenhouse Gas Emissions

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

4.8.1 Environmental Setting

Natural processes and human activities emit greenhouse gases. The presence of GHGs in the atmosphere affects the earth's temperature. Without the natural heat-trapping effect of GHGs, the earth's surface would be about 34ºC cooler. However, it is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations.

The effect of greenhouse gasses on earth's temperature is equivalent to the way a greenhouse retains heat. Common GHGs include water vapor, carbon dioxide, methane, nitrous oxide, ozone, chlorofluorocarbons, hydro chlorofluorocarbons, and hydro fluorocarbons, per fluorocarbons, sulfur and hexafluoride. Some gases are more effective than others. The Global Warming Potential (GWP) has been calculated for each greenhouse gas to reflect how long it remains in the atmosphere, on average, and how strongly it absorbs energy. Gases with a higher GWP absorb more energy, per pound, than gases with a lower GWP, and thus contribute more to global warming. For example, one pound of methane is equivalent to twenty-one pounds of carbon dioxide.

GHGs as defined by AB 32 include the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. GHGs as defined by AB 32 are summarized in Table 4-6. Each gas's effect on climate change depends on three main factors. The first being the quantity of these gases are in the atmosphere, followed by how long they stay in the atmosphere and finally how strongly they impact global temperatures.

Table 4-6. Greenhouse Gasses; Source: EPA, Intergovernmental Panel on Climate Change

Greenhouse Gas	Description and Physical Properties	Lifetime	GWP	Sources
Methane (CH4)	Is a flammable gas and is the main component of natural gas	12 years	21	Emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

Greenhouse Gas	Description and Physical Properties	Lifetime	GWP	Sources
Carbon dioxide (CO2)	An odorless, colorless, natural greenhouse gas.	30-95 years	1	Enters the atmosphere through burning fossil fuels (coal, natural gas and oil), solid waste, trees and wood products, and also as a result of certain chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
Chloro-fluorocarbons	Gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. They are non-toxic nonflammable, insoluble and chemically unreactive in the troposphere (the level of air at the earth's surface).	55-140 years	3,800 to 8,100	Were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone.
Hydro-fluorocarbons	A man-made greenhouse gas. It was developed to replace ozone-depleting gases found in a variety of appliances. Composed of a group of greenhouse gases containing carbon, chlorine an at least one hydrogen atom.	14 years	140 to 11,700	Powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for stratospheric ozone-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases.
Nitrous oxide (N2O)	Commonly known as laughing gas, is a chemical compound with the formula N2O. It is an oxide of nitrogen. At room temperature, it is a colorless, non-flammable gas, with a slightly sweet odor and taste. It is used in surgery and dentistry for its anesthetic and analgesic effects.	120 years	310	Emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
Pre-fluorocarbons	Has a stable molecular structure and only breaks down by ultraviolet rays about 60 kilometers above Earth's surface.	50,000 years	6,500 to 9,200	Two main sources of pre-fluorocarbons are primary aluminum production and semiconductor manufacturing.

Greenhouse Gas	Description and Physical Properties	Lifetime	GWP	Sources
Sulfur hexafluoride	An inorganic, odorless, colorless, and nontoxic nonflammable gas.	3,200 years	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.

In regards to the quantity these gases are in the atmosphere, we first must establish the amount of particular gas in the air, known as Concentration, or abundance, which are measured in parts per million, parts per billion and even parts per trillion. To put these measurements in more relatable terms, one part per million is equivalent to one drop of water diluted into about 13 gallons of water, roughly a full tank of gas in a compact car. Therefore, it can be assumed larger emission of greenhouse gases lead to a higher concentration in the atmosphere.

Each of the designated gases described above can reside in the atmosphere for different amounts of time, ranging from a few years to thousands of years. All of these gases remain in the atmosphere long enough to become well mixed, meaning that the amount that is measured in the atmosphere is roughly the same all over the world regardless of the source of the emission.

AB 32 and SB 32: AB 32 set the 2020 greenhouse gas emissions reduction goal into law. It directed the California Air Resources Board (CARB) to begin developing discrete early actions to reduce greenhouse gases while also preparing a scoping plan to identify how best to reach the 2020 limit. The reduction measures to meet the 2020 target are to be adopted by the start of 2011.

SB 32 is a California Senate bill that expands on AB 32 to reduce greenhouse gas emissions. SB 32 requires CARB to reduce greenhouse gas emissions to 40% below the 1990 levels by 2030. The most recent CARB Scoping Plan, adopted in December 2022, assesses progress toward the statutory 2030 target, while laying out a path to achieving carbon neutrality no later than 2045. The 2022 Scoping Plan Update focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities.

SB 1078, SB 107 and Executive Order S-14-08: SB 1078, SB 107, and Executive Order S-14-08 require California to generate 20% of its electricity from renewable energy by 2017. SB 107 then changes the 2017 deadline to 2010. Executive Order S-14-08 required that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020.

City of Madera Climate Action Plan (CAP): The City of Madera Climate Action Plan identifies the following goals and policies to reduce GHG emissions related to new development:

> **E-1 Energy Efficiency and Conservation in Existing Buildings: Increase energy efficiency and conservation within the community.**

- E-1.1: Continue to coordinate with PG&E to promote use of utility financial incentives to improve energy efficiency, such as by using on-bill financing, rebates and tax credits, building audit and retrofit programs, and demand management programs.
- E-1.2: Conduct additional outreach and promotional activities, either individually or in collaboration with PG&E and/or local organizations, targeting specific groups within the community (e.g., homeowners, renters, businesses, income-qualified households, etc.).
- E-1.3: Designate one week per year to conduct an energy efficiency outreach campaign. The campaign week may also be used to recognize and encourage programs and educational outreach conducted by industry organizations, non-government entities, government agencies, and other community groups.
- E-1.4: Collaborate with PG&E to hold an educational workshop in Madera regarding measures that individuals can take to reduce energy usage.
- E-1.5: Participate in and promote a residential and commercial energy efficiency financing program (e.g., through Energy Upgrade California, CaliforniaFIRST, a joint powers authority with other local agencies, or other mechanisms) allowing residential and commercial property owners to voluntarily invest in energy efficient upgrades for their buildings.
- E-1.6: Promote existing income-qualified weatherization programs (e.g., Energy Upgrade California, PG&E's Middle Income Direct Install Program, etc.), either individually, or in collaboration with an existing organization, to income-qualified households using sources of data available to the local agency, (e.g., water bills, housing records, etc.).

Madera County 2018 Regional Transportation Plan (RTP) and Sustainable Communities Strategy (SCS): The overall vision for the 2018 Regional Transportation Plan (RTP) is: "A sound multimodal transportation system facilitating a vibrant economy, enhancing the physical and cultural environment, and ensuring a high quality of life for citizens in Madera County". This vision can be achieved by promoting the development of an integrated multimodal transportation system that is designed considering land resource management strategies and air quality and greenhouse gas emission reduction goals or targets to address SCS requirements of SB 375.

4.8.2 Impact Assessment

a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Less Than Significant Impact: The analysis below relies on the guidance and expertise of the Air District in addressing GHG emissions and follows the Air District's recommendation for evaluation of potential impacts on GHG emissions as provided in their guidance documents: Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI) and Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Project under CEQA. As previously noted, the Air District has determined that 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.

The Air District does not have a recommendation for lead agencies in assessing the significance of construction related GHG emissions, as emissions from construction would be temporary. As

presented below, maximum short-term annual construction emissions of GHG associated with development of the project are estimated to be 657 MTCO2e. These construction GHG emissions are a one-time release. Cumulatively, these construction emissions would not generate a significant contribution to global climate change over the lifetime of the proposed project.

For long-term operational related GHG emissions, the estimated operational emissions for buildout of the Project incorporates the potential area source and vehicle emissions, and emissions associated with utility and water usage, and wastewater and solid waste generation. As shown in Table 4-7, the annual unmitigated operational GHG emissions associated with buildout of the proposed project would be 3,3485 MTCO2e. Cumulatively, these emissions would not generate a significant contribution to global climate change over the lifetime of the proposed project. Therefore, the impact is *less than significant.*

Table 4-7. Projected Project Construction and Operational Emissions

Annual Emissions	CO2 (MT/year)	CH4 (MT/year)	N2O (MT/year)	CO2e (MT/year)
Construction, Unmitigated (maximum)	649.49	0.14	0.02	657.34
Operational, Unmitigated	3,315.53	4.78	0.17	3,485.66

b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less Than Significant Impact: The SJVAPCD states that individual and cumulative GHG emissions are considered less than significant if a project complies with an approved GHG emission reduction plan or GHG mitigation program within the geographic area in which the project is located. The City of Madera CAP meets the requirements for a Qualified Greenhouse Gas Reduction Strategy. Therefore, the proposed project's GHG emissions would not be considered a significant impact if the proposed Project would be consistent with the City's GHG Reduction Strategy. Table 4-8, below, evaluates the proposed project's consistency with the applicable measures, in the City's CAP.

Table 4-8. Project Compliance with The City of Madera Climate Action Plan

CAP Measure	Project Compliance
E-2 Energy Efficient New Construction Increase the efficient use of energy and conservation of available resources in the design and construction of new buildings.	**Compliant**. Details of the project's demonstrated compliance with the elements of the conservation element can be found in the Energy, Air Quality, GHG, Bio, and Agricultural sections of this study. The analysis contained in this study is demonstrated compliance with these measures.
E-3 On-Site Small-Scale Renewable Energy Facilitate the installation and use of on-site small-scale renewable energy systems, such as solar PV systems and solar water heaters.	**Compliant.** The project will comply will all the 2022 Building Code requirements related to solar PV.

T-1: Infill and Mixed-Use Development Facilitate mixed use, higher density, and infill development near transit stops, in existing community centers/ downtown, and in other designated areas.	**Compliant.** The proposed project involves the development of underdeveloped land within City limits where urban services are available. The proposed project is within proximity to various land use types including public, commercial, and residential. The Project site is designated for Low Density Residential under the City of Madera General Plan which allows for residential development at a density of 2.1 to 7 dwelling units per acre, with a Target Density of 5.25 dwelling units per acre. The Project proposes 318 single family lots with a residential density of 5.09 dwelling units per acre, which is allowed within the Low-Density Residential land use designation.
T-2 Bicycle and Pedestrian Environment Continue to expand and improve the City's bicycle and pedestrian network.	**Compliant.** The Project would include on-site circulation-related infrastructure improvements, including interior sidewalks. All improvements, including those related to bicycle and pedestrian facilities are subject to City review and approval to ensure compliance with all plans, ordinances, and policies related to circulation. The proposed project will not conflict with the City's circulation plan and standards.
T-3 Transit Travel Continue to expand and improve the transit network and its accessibility within the City of Madera.	**Compliant.** There are four existing transit stops located within a quarter mile of the Project Site. The project will provide sidewalks along major streets and improve access to transit stops within the vicinity of the Project site.
T-4 Commute Trip Reduction Facilitate programs that give commuters and employers resources and incentives to reduce their single-occupancy vehicle trips.	**Compliant.** The proposed Project will be consistent with all applicable policies of the Community Development Element of the General Plan and is located within close proximity to transit stops which allow access for commuters to reduce their single-occupancy vehicle trips.
T-5: Traffic Flow and Vehicle Idling Implement improvements to smooth traffic flow, reduce idling, and eliminate bottlenecks within Madera.	**Compliant.** The Project would include on-site circulation-related infrastructure improvements, including interior drive aisles. All improvements, including those related to roadway facilities are subject to City review and approval to ensure compliance with all plans, ordinances, and policies related to circulation. The proposed project will not conflict with the City's circulation plan and standards.
T-7 Construction and Off-Road Equipment Reduce GHG emissions associated with construction equipment and off-road vehicles.	**Compliant**. Project will comply with all requirements of the San Joaquin Valley Air Pollution Control District and MWELO standards.
W-1 Exceed SB X7-7 Water Conservation Target Adopt a water conservation target that exceeds the SB X7-7 (Water Conservation Act of 2009) target and identify and implement	**Compliant**. Project will comply with MWELO standards.

additional water efficiency and conservation measures to meet those targets by 2020 and 2030.	
U-1 Trees and Vegetation Facilitate planting of drought-tolerant, low-maintenance native trees and vegetation in Madera.	**Compliant.** The project proposes to plant hundreds of shade trees that are consistent with applicable policies of the Community Design Element of the General Plan.

As discussed above, the project demonstrates compliance with the measures set forth in the City of Madera's adopted Climate Action Plan. By complying with all applicable measures, the Project is consistent with SB 32, a California Senate bill that expands on AB 32 to reduce greenhouse gas emissions. SB 32 requires CARB to reduce greenhouse gas emissions to 40% below the 1990 levels by 2030. The City of Madera's CAP established a longer-term target of 20 percent below 2007 levels by 2030 to support California's larger effort to reduce statewide emissions under Executive Orders S-3-05 and B-30-15. The most recent CARB Scoping Plan, adopted in December 2022, assesses progress toward the statutory 2030 target, while laying out a path to achieving carbon neutrality no later than 2045. The Project will follow all policies and procedures required by the San Juaquin Valley Air District that ensure consistency with CARB's Scoping Plan.

Additionally, the project will not conflict with any of the strategies in Madera County's 2018 Regional Transportation Plan (RTP) or Sustainable Communities Strategy (SCS). A major strategy of the RTP/SCS is to "enhance the environment," which means to improve the environment through energy conservation, improving the quality of life, and promoting consistency between transportation improvements, planned growth, economic development, and environmental justice issues. As stated before, the proposed Project is consistent with the City's Climate Action Plan, and Project emissions would not contribute substantially to the generation of greenhouse gases. The Project contains features that would reduce GHG emissions. And these features are in accordance with several measures from CARB's Scoping Plan and the City of Madera's CAP. As such, the Project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and therefore the impact would be *less than significant.*

4.9 Hazards and Hazardous Materials

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
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?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
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?	☐	☐	☐	☒
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 or excessive noise for people residing or working in the project area?	☐	☐	☒	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☒

4.9.1 Environmental Setting

The proposed project site is located approximately 400 ft south of the nearest school (Madera South High School), and 3.75 miles southeast of the nearest public airport (Madera Municipal Airport).

The Department of Toxic Substances Control's (DTSC's) Envirostor was used to identify any sites known to be associated with releases of hazardous materials or wastes within the project area. This research confirmed that the project would not be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 U.S. Code [U.S.C.] §9601 et seq.). The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or the Superfund Act) authorizes the President to respond to releases or threatened releases of hazardous substances into the environment.

Occupational Safety and Health Administration. The Occupational Safety and Health Administration (OSHA) sets and enforces Occupational Safety and Health Standards to assure safe working conditions. OSHA provides training, outreach, education, and compliance assistance to promote safe workplaces. The proposed Project would be subject to OSHA requirements during construction, operation, and maintenance.

Toxic Substances Control Act of 1976 (15 U.S.C. §2601 et seq.). The Toxic Substance Control Act was enacted by Congress in 1976 and authorizes the EPA to regulate any chemical substances determined to cause an unreasonable risk to public health or the environment.

Hazardous Waste Control Law, Title 26. The Hazardous Waste Control Law creates hazardous waste management program requirements. The law is implemented by regulations contained in Title 26 of the California Code of Regulations (CCR), which contains requirements for the following aspects of hazardous waste management:

- Identification and classification;
- Generation and transportation;
- Design and permitting of recycling, treatment, storage, and disposal facilities;
- Treatment standards;
- Operation of facilities and staff training; and
- Closure of facilities and liability requirements.

California Code of Regulations, Title 22, Chapter 11. Title 22 of the California Code of Regulations contains regulations for the identification and classification of hazardous wastes. The CCR defines a waste as hazardous if it has any of the following characteristics: ignitability, corrosivity, reactivity, and/or toxicity.

California Emergency Services Act. The California Emergency Services Act created a multi-agency emergency response plan for the state of California. The Act coordinates various agencies, including CalEPA, Caltrans, the California Highway Patrol, regional water quality control boards, air quality management districts, and county disaster response offices.

Hazardous Materials Release Response Plans and Inventory Law of 1985. Pursuant to the Hazardous Materials Release Response Plans and Inventory Law of 1985, local agencies are required to develop "area plans" for response to releases of hazardous materials and wastes. Madera County maintains a Hazardous Material Incident Response Plan to coordinate emergency response agencies for incidents and requires the submittal of business plans by persons who handle hazardous materials.

City of Madera General Plan: The City of Madera General Plan includes the following goals and policies pertaining to hazards and hazardous materials:

Policy HS-9: The City of Madera will work with responsible agencies to identify and prevent potential hazardous waste releases.
Policy HS-17: The City shall seek to avoid and minimize exposure of sensitive land uses to potentially hazardous emissions along truck routes and rail lines which may be used by surface vehicles and rail cars carrying hazardous or toxic substances.

4.9.2 Impact Assessment

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than Significant Impact: Project construction activities would involve the use and transport of hazardous materials, including gasoline, diesel fuel, oils, lubricants, solvents, detergents, degreasers, paints, welding and soldering supplies, pressurized gases, etc. Potential impacts related to the use and transport of hazardous materials during construction would be addressed through implementation of the Storm Water Pollution Prevention Plan (SWPPP). SWPPPs are required to include BMPs to control potential discharges of hazardous pollutants. The Central Valley Regional Water Quality Control Board is responsible for the implementation and enforcement of the SWPPP and would conduct inspections of the project site to ensure effective implementation of the BMPs specified in the SWPPP.

In summary, the implementation of a SWPPPs required for the project would ensure that hazardous materials used in project construction and operation are handled, stored, and disposed of in accordance with the specified BMPs and plan measures. The potential for impacts to the public and the environment from routine transport, use, and disposal of hazardous materials during project construction and operation would be *less than significant.*

b) Would the project 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?

Less Than Significant Impact: As discussed above, the project would be required to implement a SWPPP during project construction. The SWPPP would include procedures that are specifically developed to prevent significant risk to the public or environment in the event of accident conditions involving the release of hazardous materials. Implementation of the SWPPP will ensure that accident conditions involving the release of hazardous materials would not pose a significant hazard to the public or the environment. As such, impacts are considered *less than significant.*

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Less than Significant Impact: The proposed project site is approximately 400 ft from the nearest school (Madera South High School). As discussed above, the project would be required to implement a SWPPP during project construction. The SWPPP would include procedures that are specifically developed to prevent significant risk to the public or environment in the event of accident conditions

involving the release of hazardous materials. The potential for hazardous materials releases within 400 ft of an existing or proposed school is *less than significant.*

d) Would the project 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?

No Impact: The project site is not listed as a hazardous materials site pursuant to Government Code Section 65962.5 and is not included on a list compiled by the Department of Toxic Substances Control (DTSC). Therefore, there is *no impact.*

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 or excessive noise for people residing or working in the project area?

Less than Significant Impact: While the project site is within 3.75 miles of a public airport (Madera Municipal Airport) the Airport is not within an Airport Land Use Compatibility Zone as identified in the City's General Plan. Because the project is outside of the Airport Land Use Compatibility Zone, it can be assumed that implementation of the proposed project would not result in a safety hazard or excessive noise for people residing or working in the project area. The impact is *less than significant.*

f) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact: The City's site plan review procedures ensure compliance with emergency response and evacuation plans. In addition, the site plan will be reviewed by the Fire Department per standard City procedure to ensure consistency with emergency response and evacuation needs. Therefore, the proposed project would have *no impact* on emergency evacuation.

g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

No Impact: The land surrounding the project site is developed with urban, suburban, and agricultural uses and are not considered to be wildlands. Additionally, the 2017 Madera County Local Hazard Mitigation Plan finds that fire hazards within the City of Madera, including the proposed project site, have low frequency, limited extent, limited magnitude, and low significance. The proposed project would not expose people or structures to significant risk of loss, injury or death involving wildland fires and there is *no impact.*

4.10 Hydrology and Water Quality

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i) result in substantial erosion or siltation on- or off-site;	☐	☒	☐	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☒	☐	☐
iii) 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; or	☐	☒	☐	☐
iv) impede or redirect flood flows?	☐	☒	☐	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

4.10.1 Environmental Setting

Water Supply System: The City of Madera Water Division manages and operates the City of Madera's water supply system. Groundwater is the sole source of water supply through 19 active wells that pump from the Madera Subbasin of the San Joaquin groundwater basin directly into the City's distribution system. The distribution system consists of 200 miles of water mains that are maintained as a single pressure zone. The system also contains a one (1) million-gallon storage reservoir. The system's connections are primarily "looped," which provides increased capacity and reliability.

Clean Water Act: The Clean Water Act (CWA) is enforced by the U.S. EPA and was developed in 1972 to regulate discharges of pollutants into the waters of the United States. The Act made it unlawful to discharge any pollutant from a point source into navigable waters unless a National Pollution Discharge Elimination System (NPDES) Permit is obtained.

Central Valley RWQCB: The proposed project site is within the jurisdiction of the Central Valley Regional Water Quality Control Board (RWQCB). The Central Valley RWQCB requires a National Pollution Discharge Elimination System (NPDES) Permit and Stormwater Pollution Prevention Plan (SWPPP) for projects disturbing more than one acre of total land area. Because the project is greater than one acre, a NPDES Permit and SWPPP will be required.

City of Madera General Plan: The City of Madera General Plan Conservation Element contains the following goals and policies related to water resources:

> **Goal CON-1.** Manage water supplies as limited, valuable, and shared natural resources to meet the demands of all Maderans and ensure the ecological health of watersheds and natural systems.
>
> **Goal CON-3.** Water use that corresponds to the scarcity of the resource and its value for the City.
>
> > **Policy CON-8.** The City encourages Low Impact Development practices in all residential, commercial, office, and mixed-use discretionary projects and land division projects to reduce, treat, infiltrate, and manage runoff flows caused by storms, urban runoff, and impervious surfaces. Low impact development practices may include:
> >
> > - Use of small-scale stormwater controls such as bioretention, grass swales and channels, vegetated rooftops, rain barrels and cisterns.
> > - Reduction of impervious surfaces through site design and use of pervious paving materials.
> > - Retention of natural features such as trees and ponds on site.
> > - The use of drought tolerant plant materials and/or water-conserving irrigation system

4.10.2 Impact Assessment

a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less than Significant with Mitigation: The project will result in less than significant impacts to water quality due to potentially polluted runoff generated during construction activities. Construction may include excavation, grading, and other earthwork across most of the 58-acre project site. During storm events, exposed construction areas across the project site may cause runoff to carry

pollutants, such as chemicals, oils, sediment, and debris. Implementation of a Stormwater Pollution Prevention Plan (SWPPP) will be required for the project. A SWPPP identifies all potential sources of pollution that could affect stormwater discharges from the project site and identifies best management practices (BMPs) related to stormwater runoff. As such, implementation of Mitigation Measures HYD-1, HYD-2, and HYD-3 will ensure impacts remain *less than significant with mitigation.*

b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Less than Significant Impact: Water services will be provided by the City of Madera upon development. The City's water supply source is comprised of 19 active wells and a one-million-gallon storage reservoir that pump water directly into the City's distribution system. According to City's Urban Water Management Plan (2020), the projected water supply for Madera in year 2025 is 14,870 AFY.

The total water demand of the proposed project was estimated using the City's Urban Water Management Plan, which states that water demand for single-family residential uses is approximately 3,000 gallons/day/acre. The most water-intensive aspect of the Project (the medium density residences) is consistent with the City's General Plan land use designation. As such, the Project would not affect groundwater supplies beyond what has already been analyzed in the most current Program EIR.

The project would result in nearly full development of the site, which would convert approximately 58 acres from pervious surfaces to impervious surfaces. However, this would not significantly interfere with groundwater recharge because all stormwater would be collected and diverted to an existing retention basin located directly east of the project site for groundwater recharge.

Because the addition of impervious surfaces would not interfere substantially with groundwater recharge and the project would not utilize groundwater resources beyond what has been analyzed in the Program EIR, no further analysis is required pursuant to CEQA Guidelines, section 15168(c). The impact would be *less than significant.*

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i) result in substantial erosion or siltation on- or off-site;

Less than Significant Impact with Mitigation: The proposed project would result in the addition of impervious surfaces and alter existing drainage patterns on the 58-acre project site which would have the potential to result in erosion or siltation on- or off-site. The disturbance of soils during construction could cause erosion, resulting in temporary construction impacts. However, this impact would be appropriately mitigated through implementation of a Stormwater Pollution Prevention Plan (SWPPP) which include mandated erosion control measures, which are developed to prevent significant impacts related to erosion caused by runoff during construction (Mitigation Measure HYD-1). The Project proponent will also be required to prepare drainage plans (Mitigation Measure HYD-2) and a Development Maintenance Manual (Mitigation Measure HYD-3) to ensure

that existing drainage patterns are maintained during project operations and that the project would not result in substantial erosion or siltation on- or off-site. The impact is *less than significant with implementation of these mitigation measures.*

ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

Less than Significant Impact with Mitigation: The proposed project would result in the addition of impervious surfaces on the 58-acre project site which would have the potential to increase surface runoff resulting in flooding on- or off-site. This impact would be appropriately mitigated through implementation of Mitigation Measure HYD-2, which requires the project to submit drainage plans to the City Engineer prior to the issuance of grading permits. The drainage plans will include BMPs to ensure runoff from the project will not result in flooding on- or off-site. Therefore, impacts are *less than significant with mitigation.*

iii) 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; or

Less than Significant with Mitigation: The proposed project would result in the addition of impervious surfaces and alter existing drainage patterns on the 58-acre project site which would have the potential to impact existing stormwater drainage systems or provide additional sources of polluted runoff. The disturbance of soils during construction could cause erosion, resulting in temporary construction impacts. However, this impact would be appropriately mitigated through implementation of a Stormwater Pollution Prevention Plan (SWPPP) which include mandated erosion control measures, which are developed to prevent significant impacts related to erosion caused by runoff during construction (Mitigation Measure HYD-1).

During project operations, the proposed impervious surfaces, including roads, building pads, and parking areas, would collect automobile derived pollutants such as oils, greases, rubber and heavy metals. This could contribute to point source and non-point source pollution if these pollutants were transported into waterways during storm events. The Project proponent will be required to prepare drainage plans (Mitigation Measure HYD-2) and a Development Maintenance Manual (Mitigation Measure HYD-3) to ensure that the project would not overwhelm existing or planned stormwater drainage systems or result in discharges of polluted runoff into local waterways. The impact is *less than significant with implementation of these mitigation measures.*

iv) impede or redirect flood flows?

Less than Significant with Mitigation: The proposed project would result in the addition of impervious surfaces on the 58-acre project site which could effect drainage and flood patterns. This impact would be appropriately mitigated through implementation of Mitigation Measure HYD-2, which requires the project to submit drainage plans to the City Engineer prior to the issuance of grading permits. The drainage plans will include BMPs to ensure the project would not impede or redirect flood flows. Therefore, impacts are *less than significant with mitigation.*

d) Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundations?

No Impact: The proposed project is located inland and not within a flood hazard zone, ocean, or large body of water. The proposed project is located on a relatively flat area and would not be impacted by inundation related to mudflow. Since the project is located on an area that is not susceptible to inundation, the project would not risk release of pollutants due to project inundation. As such, there is *no impact.*

e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No Impact: The proposed project will not conflict with or obstruct implementation of a water quality control plan. The proposed project will be subject to the requirements of the NPDES Stormwater Program and will be required to comply with a SWPPP, which will identify all potential sources of pollution that could affect stormwater discharges from the project site and identify BMPs to prevent significant impacts related to stormwater runoff.

The proposed project site is within the jurisdiction of the Madera Groundwater Sustainability Agency (GSA). The Groundwater Sustainability Plan (GSP) was updated by the Madera GSA in April 2022. The plan was reviewed for consistency with the proposed project, and it was determined that the proposed project does not conflict with and would not obstruct implementation of the GSP. There is *no impact.*

Mitigation Measures for Hydrology and Water Quality

Mitigation Measure HYD-1: Prior to issuance of grading permits, the Project proponent shall submit a NOI and SWPPP to the RWQCB to obtain coverage under the General Permit for Discharges of Stormwater Associated with Construction Activity. The SWPPP shall specify and require the implementation BMPs, with the intent of keeping all products of erosion from moving offsite and into receiving waters during construction. The requirements of the SWPPP shall be incorporated into design specifications and construction contracts. Recommended BMPs for the construction phase shall include, but are not limited to, the following:

- Stockpiling and disposing of demolition debris, concrete, and soil properly;
- Protecting existing storm drain inlets and stabilizing disturbed areas;
- Implementing erosion controls;
- Properly managing construction materials; and
- Managing waste, aggressively controlling litter, and implementing sediment controls.

The developer shall provide the City of Madera Engineering Division with evidence of an approved SWPPP prior to issuance of grading permits.

Mitigation Measure HYD-2: Prior to issuance of grading permits, the Project proponent shall prepare a drainage plan for the Project for approval by the City Engineer that identifies postconstruction treatment, control, and design measures that minimize surface water runoff, erosion, siltation, and pollution. The drainage plan shall be prepared in accordance with the City's SWMP and California Stormwater Quality Association's Storm Water Best Management Practices Handbook as well as the City Engineer's Technical Specifications and Public Improvement Standards. During final design of the Project, the Project proponent shall implement a suite of post-construction stormwater treatment and control BMPs designed to address

the most likely sources of stormwater pollutants resulting from operation and maintenance of the Project. These measures shall account for the proposed 58 acres of residential use. Stormwater infrastructure will be designed adhering to methods and standards described in Section E.12.e.ii.c of the SWRCB Phase II Small MS4, General Permit (Order No. 2013-0001-DWQ).

The City Engineer may also require other necessary BMPs and design features. Incorporation of City Engineer-approved BMPs and design features into the Project design and construction documents shall ensure that operational water quality exceeds applicable water quality standards. The Project proponent shall also prepare and submit an Operation and Maintenance Agreement to the City of Madera for its approval identifying appropriate procedures to ensure that stormwater quality control measures work properly during operations.

Mitigation Measure HYD-3: A Development Maintenance Manual for the Project shall include comprehensive procedures for maintenance and operations of any stormwater facilities to ensure long-term operation and maintenance of post-construction stormwater controls. The maintenance manual shall require that stormwater BMP devices be inspected, cleaned and maintained in accordance with the manufacturer's maintenance conditions. The manual shall require that devices be cleaned prior to the onset of the rainy season (i.e., mid-October) and immediately after the end of the rainy season (i.e., mid-May). The manual shall also require that all devices be checked after major storm events. The Development Maintenance Manual shall include the following:

- Runoff shall be directed away from trash and loading dock areas;
- Bins shall be lined or otherwise constructed to reduce leaking of liquid wastes;
- Trash areas shall be screened or walled to minimize offsite transport of trash; and,
- Impervious berms, trench catch basin, drop inlets, or overflow containment structures nearby docks and trash areas shall be installed to minimize the potential for leaks, spills or wash down water to enter the drainage system.

4.11 Land Use and Planning

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐

4.11.1 Environmental Setting

The proposed project site is located in the southern portion of the City of Madera. The site is currently vacant and designated for Low Density Residential under the City of Madera General Plan and R-1 under the City of Madera Zoning Ordinance. The proposed project will include a Zone change from R-1 to PD-4500 (Planned Development). The site is bordered by a high school to the north, residential land uses to the east, and agricultural uses to the south and west.

City of Madera General Plan: The Low Density Residential category represents the traditional single-family neighborhood with a majority of single-family detached homes. This is the predominant land use category of the City's residential areas. The following goals and policies in the City of Madera General Plan are applicable to the project site's low density residential land use designation:

GOAL LU-1: Madera is a well-planned city prepared for growth through comprehensive planning which balances growth demands with resources and infrastructure, to facilitate high quality development.

Policy LU-20: New residential development should be designed to avoid continuous blocks or clusters of dwellings that are connected only by streets, sidewalks, and hardscape. New development shall incorporate amenities which establish a sense of identity at the project or neighborhood level, create opportunities for community interaction, and enhance the visual appeal of the area. Features which accomplish these goals may include pathways, paseos, parks, community gardens, and other semi-public gathering places.

Policy LU-22: Single family developments need to provide functional outdoor recreational space. The space can be provided either on individual lots or more efficiently as aggregated local public spaces, creating features such as those described in Policy LU-20.

4.11.2 Impact Assessment

a) Would the project physically divide an established community?

No Impact: The project proposes the development of a residential project on a property that is planned for residential uses. The project would provide pedestrian and vehicular connectivity and would not act as a physical barrier within a community. There is *no impact.*

b) Would the project cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Less than Significant Impact: The project site is located on land designated for residential use. The proposed project will be filing a Rezone application from R-1 to PD-4500. Although this is not consistent with the current land use plan, the potential environmental impacts of this are not significant considering the proposed project will remain designated for residential use. The impact is *less than significant.*

4.12 Mineral Resources

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

4.12.1 Environmental Setting

There are no mineral resource zones in Madera County and there is no mineral extraction occurring on or adjacent to the proposed project site. Historical mines within the County include mineral deposits of gold, copper, and granite, however most of these mines are now closed – leaving only 51 active mining operations. There are no active mining operations within the City of Madera.

California State Surface Mining and Reclamation Act: The California State Surface Mining and Reclamation Act was adopted in 1975 to regulate surface mining to prevent adverse environmental impacts and to preserve the state's mineral resources. The Act is enforced by the California Department of Conservation's Division of Mine Reclamation.

4.12.2 Impact Assessment

a) Would the project 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?

No Impact: The project site has no known mineral resources that would be of a value to the region and the residents of the state, therefore the proposed project would not result in the loss of, or impede, the mining of regionally or locally important mineral resources. There is *no impact.*

b) Would the project 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?

No Impact: There are no known mineral resources of importance to the region and the project site is not designated under the City's or County's General Plan as an important mineral resource recovery site. For that reason, the proposed project would not result in the loss of availability of known regionally or locally important mineral resources. There is *no impact.*

4.13 Noise

Would the project result in:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Generation of excessive ground borne vibration or ground borne noise levels?	☐	☐	☐	☒
c) For a project located within the vicinity of a private airstrip or 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?	☐	☐	☐	☒

4.13.1 Environmental Setting

Noise is often described as unwanted sound. Sound is the variation in air pressure that the human ear can detect. If the pressure variations occur at least 20 times per second, they can be detected by the human ear. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called Hertz (Hz).

Ambient noise is the "background" noise of an environment. Ambient noise levels on the proposed project site are primarily due to agricultural activities and traffic. Construction activities usually result in an increase in sound above ambient noise levels.

City of Madera General Plan: The Noise Element of the City of Madera General Plan is responsible for establishing noise standards within the City and includes the following goals and policies related to noise that may be applicable to the project.

> GOAL N-1: To protect residents from the harmful effects of exposure to excessive noise, and to protect the economic base of the City by preventing the encroachment of incompatible land uses near roadways, industries, railroads, and other sources of noise.

- Policy N-1 The City will protect residential areas and other noise-sensitive uses from excessive noise by doing the following:

  - Requiring that land uses, roadways, and other sources do not create incompatible noise levels on adjacent parcels.
  - Allowing homes or noise-sensitive uses to be developed only in places where existing and projected noise levels will meet the exterior noise guidelines and standards shown in Policies N-5 and N-6.
  - Requiring that City decisions which would cause or allow an increase in noise created by stationary or mobile sources (such as development of noise-generating land uses or the construction of new or wider roadways) be informed by a noise analysis and accompanied by noise reduction measures to keep noise at acceptable levels.
- Policy N-2 To implement Policy N-1, the following shall apply:
  - No use regulated by the City shall be permitted to generate noise that would cause the ambient noise on any adjacent parcel to exceed the "completely compatible" 24-hour guidelines shown in Policy N-5 or 30-minute noise standards in Policy N-6.
  - The City shall ensure that noise mitigation to achieve a "completely compatible" 24-hour exterior noise level and conformance with the 30-minute exterior noise standard is provided in conjunction with any decision it makes that would cause a violation of the item above.
  - Developers of new residential or other noise-sensitive uses which are placed in environments subject to existing or projected noise that exceeds the "completely compatible" guidelines in Policy N-5 shall be responsible for ensuring that acceptable exterior and interior noise levels will be achieved.
- Action Item N-2.1 Apply the State Noise Insulation Standards, zoning and building controls, buffers, sound barriers, traffic controls, and other effective measures to reduce exposure to noise that exceeds the standards contained in this General Plan.
- Policy N-5 The following are the maximum 24-hour exterior noise levels for land designated by this General Plan for residential, commercial/retail, and public parks.
  - These guidelines apply to land designated by this General Plan for these uses. Residential, retail, or public parks which have been
  - developed on land designated for other uses shall be subject to the exterior noise guidelines for the land on which they are located.
  - Non-residential uses located on residentially designated land shall be subject to the exterior noise guidelines for residential lands.
- Policy N-6 The following are the City's standards for maximum exterior non transportation noise levels to which land designated for residential land uses may be exposed for any 30-minute period on any day.
  - Where existing ambient noise levels exceed these standards, the ambient noise level shall be highest allowable noise level as measured in dBA Leq (30 minutes).

4.13.2 Impact Assessment

a) Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than Significant Impact with Mitigation: The Project would result in increased ambient noise level at the Project site and will comply with the General Plan and Chapter 11 of the Madera

Municipal Code requirements with applicable standards. The Project would result in both temporary, short-term noise from construction, and long-term noise from operation.

The single-family homes to the East and the High School to the North are the nearest sensitive receptors to the Project Site. The nearest residence is approximately 155 feet from the Project Site and the High School is approximately 350 feet from the Project site. Project construction is anticipated to last approximately two years and will involve temporary noise sources from construction equipment, including rollers, pavers, dozers, and graders. According to the City of Madera Municipal Code, Noise sources associated with operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration, remodeling, paving, or grading of any real property or demolition is prohibited between the hours of 8:00 p.m. and 6:00 a.m. of the following day. Noise-producing construction activities will be limited to daytime hours between 6:00 a.m. and 8:00 p.m. and the project will comply with all City ordinances regarding construction-related noise levels and noise-generating equipment.

The City's General Plan requires that noise created by stationary sources, such as construction, include noise reduction measures to keep noise at acceptable levels. Given that there is a sensitive receptor (High School) within close proximity to the Project site, Mitigation Measure NOISE-1 shall be implemented.

Long-term noise levels resulting from the project would include single family residential homes, which are not normally associated with high operational noise levels. Long-term noise levels would include those generated from traffic and onsite operations. Because noise generated from construction would be temporary, construction activities would comply with all measures established by the City to limit construction related noise impacts to sensitive receptors, and operational noise would not exceed existing ambient noise levels, the impact is *less than significant.*

b) Would the project result in generation of excessive ground borne vibration or ground borne noise levels?

No Impact: The City of Madera General Plan states that projects that use vibration-intensive construction activities, such as pile drivers, jack hammers, and vibratory rollers, near sensitive receptors must be evaluated for potential vibration. Because the proposed project would not use this type of equipment, the project would not generate excessive ground-borne vibration or ground-borne noise levels and there is *no impact.*

c) For a project located within the vicinity of a private airstrip or 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?

No Impact: Madera Municipal Airport is a public use airport and is 3.75 miles north of the project site. Because the Project Site is not within 2 miles of the public airport, the airport land use plan does not extend to the project area. Therefore, the project would not expose people residing or working in the project area to excessive noise levels. There is *no impact.*

Mitigation Measures for Impacts to Noise:

Mitigation Measure NOISE-1: To mitigate noise created by stationary sounds, such as construction, the following best practices shall be implemented to reduce noise to acceptable levels:

- All construction equipment shall be properly maintained and muffled as to minimize noise generation at the source.
- Noise-producing equipment shall not be operating, running, or idling while not in immediate use by a construction contractor.
- All noise-producing construction equipment shall be located and operated, to the extent possible, at the greatest possible distance from any noise-sensitive land uses.
- Locate construction staging areas, to the extent possible, at the greatest possible distances from any noise-sensitive land uses.
- Signs shall be posted at the construction site and near adjacent sensitive receptors displaying hours of construction activities and providing the contact phone number of a designated noise disturbance coordinator.

4.14 Population and Housing

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Induce substantial unplanned 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)?	☐	☐	☒	☐
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

4.14.1 Environmental Setting

The United States Census Bureau estimated the population in the City of Madera to be 67,944 persons in 2021. This is an increase from the 2010 census, which counted the population in the City of Madera to be 61,416. Factors that influence population growth include job availability, housing availability, and the capacity of existing infrastructure.

The size of the population in the City of Madera is controlled by the development code and Land Use Element of the General Plan. These documents regulate the number of dwelling units per acre allowed on various land uses and establish minimum and maximum lot sizes. These factors have a direct impact on the City's population size.

The project is designated as Low Density Residential which is considered Residential development at a density of 2.1 to 7 units per acre, with a Target Density of 5.25 units per acre. The Low Density Residential category represents the traditional single-family neighborhood with a majority of single-family detached homes. This is the predominant land use category of the City's residential areas.

Madera County General Plan: The following housing resource goals and policies in the Land Use Element section of the Madera General Plan are potentially applicable to the proposed project:

- Policy LU-42 The City will seek to ensure that sufficient land in all employment generating categories is available at all times to provide jobs that match the needs of workers in Madera.
- Policy LU-43 The City supports jobs/housing balance programs at the local and regional scale intended to reduce the need for workers to commute outside their communities.

4.14.2 Impact Assessment

a) Would the project induce substantial unplanned 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)?

Less than Significant Impact: The United States Census Bureau estimated the population in the City of Madera to be 67,944 persons in 2021. The proposed Project would provide 318 single-family dwelling units on the 58-acre project site. The Census Bureau states that the City's household size was 3.76 between 2017 and 2021. Based on this average household size, the anticipated population increase because of the proposed project is 1,196 persons. This would be a 1.8% population increase beyond existing conditions. The construction of housing at this location would not be unplanned, as the City's General Plan designates the proposed project site for residential uses. The proposed project would fall within the City's density range of 2.1 to 7 units per acre for Low Density Residential and would have a density of 5.09 units per acre. Therefore, the proposed Project would not result in substantial increase in growth and population beyond what was already planned for in the City's General Plan. The impact is *less than significant.*

b) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact: There project does not involve the removal of existing residences and would not displace any people. There is *no impact.*

4.15 Public Services

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) 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?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☒	☐
Parks?	☐	☐	☒	☐
Other public facilities?	☐	☐	☒	☐

4.15.1 Environmental Setting

Fire: The project site is served by the City of Madera Fire Department. The City of Madera Fire Department will continue to provide fire protection services to the proposed project site upon development.

Police: Law enforcement services are provided to the project site via the Madera Police Department. The City of Madera will continue to provide police protection services to the proposed project site upon development.

Schools: The proposed project site is located within the Madera Unified School District. The nearest school, Madera South High School, is located 400 ft north of the project site.

School Districts in the City of Madera are regulated by the California Department of Education, and the Madera Police Department is regulated by the California Department of Justice. Objectives and Policies relating to Law Enforcement, Fire Protection, Parkland, and School Facilities are included in the Parks and Recreation Element and the Health and Safety Element of Madera's General Plan. The Goals and Policies potentially applicable to the proposed project are as follows:

- Policy PR-1 The City shall endeavor to develop and maintain a complete system of public parks distributed throughout the City that provides opportunities for passive and active recreation at a minimum of 3 (three) acres per 1,000 (one thousand) residents.
- Policy PR-7 The development of parks in new growth areas of the City, where residential projects trigger the need for a new park(s), shall be phased and/or timed with the goal of meeting the standards of this Element and the Parks and Recreation Master Plan at all times. New development should be phased or timed in such a way as to avoid situations where insufficient park or other facilities are provided either permanently or temporarily. The City recognizes that this may require the development of parks or other facilities larger than will be needed at the time in order to ensure that standards will be maintained as future residential development occurs.
- Policy HS-2 The City will encourage Madera's schools to promote community health and well-being.
- Policy HS-35 The City shall ensure the safety and protection of Madera and its community members by providing appropriate first response to emergencies and ensure that sufficient resources are available to expand protection as the community grows.
- Policy HS-37 The City will seek to maintain and enhance communications between community residents and the police through regular meetings and a visible community policing program.

4.15.2 Impact Assessment

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:

No Impact: The City of Madera Fire Department will provide fire protection services to the proposed development. The closest City fire station is Station #57, located 1.3 miles northwest of the project site at 200 S Schnoor Ave. The addition of 318 residential units will increase the demand for fire protection services. According to Madera's Municipal Service Review (2018), the current facilities were not identified as having any deficiencies.

Although the City of Madera Fire Department currently has no deficiencies, the city has planned three projects that would provide some upgrades to the existing facilities as well as construct a new facility in the northwest portion of town. The City of Madera will have more than sufficient fire protection that will accommodate the proposed development. Therefore, there is *no impact.*

Police Protection

No Impact: The Madera Police Department will provide services to the proposed development. The Madera Police Department is located approximately 1.8 miles northeast of the proposed project site. According to Madera's Municipal Service Review (2018), the Madera Police Department currently has 70 sworn officers, 23 non-sworn, 14 volunteers and seven chaplains. The Department will make the following additions: One Police Lieutenant, Two Police Sergeants, Eight Officers, One Public Safety

Dispatcher, One Records Clerk, One Network Administrator, Six Police vehicles and Safety equipment. The current police facility was not identified as having any deficiencies during the last MSR cycle that reviewed the Police Department infrastructure. New police service facilities would not be required to accommodate the proposed development Therefore, there is *no impact.*

Schools

Less than Significant Impact: The proposed project is within the Madera City Elementary School District and Madera Joint Union High School District. Since the proposed project includes the addition of 318 single-family residential units, the number of students in the school district will increase. Madera South High School, which is located approximately 0.2 miles north of the project site, will likely see an increase of students as a result of the proposed project. In addition to the goals and policies of the City's General Plan, future development is required by state law to pay development impact fees to the school districts at the time of building permit issuance. These impact fees are used by the school districts to maintain existing and develop new facilities, as needed. Therefore, the impact is *less than significant.*

Parks

Less than Significant Impact: The addition of 318 new residential units would result in more use at existing parks. Almond Park is located within a half-mile radius of the project site and would service the proposed development. The City's 2025 General Plan Policy states that new residential development may be required to provide additional parkland. The proposed project is already planned to have approximately 29,500 sq. ft. of open space/pocket parks which will be utilized by residents, decreasing the amount of people going to Almond Park. Since the project would not lower the existing level of services for parks, and the proposed project would contribute its fair share to parks facilities through new development, the impact is *less than significant.*

Landfills

Less than Significant Impact: The Project would not induce the use of other public facilities such as libraries, courts, and other City services beyond what is planned. The proposed Project would not result in substantial impacts resulting in the need for new governmental facilities to maintain acceptable service ratios for any of the public services beyond what was previously planned for in the City's General Plan. Therefore, the Project would have a less than significant impact.

4.16 Recreation

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) 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?	☐	☐	☒	☐
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?	☐	☐	☒	☐

4.16.1 Environmental Setting

There are 27 parks that are owned and operated by The City of Madera. Almond Park is the closest recreational area to the project site and is located approximately 0.8 miles north of the project site.

City of Madera General Plan: The Parks and Recreation Element of the City of Madera General Plan contains the following recreational resource goals and policies potentially applicable to the project.

> Goal PR-1 Park Facility Goal: A system of parks and recreation facilities and programs that enhance quality of life; improve public health and safety; are distributed throughout the city; and are responsive to the needs and interests of the people who live and work in Madera.
>
> Goal PR-2 Recreation Goal: Recreation programs and community services that respond to resident needs, promote community, strengthen neighborhoods, and encourage healthy lifestyles.

- Policy PR-1 The City shall endeavor to develop and maintain a complete system of public parks distributed throughout the City that provides opportunities for passive and active recreation at a minimum of 3 (three) acres per 1,000 (one thousand) residents.
- Policy PR-4 The City shall acquire, develop, and maintain parks and recreation facilities in accordance with the City's Park and Recreation Master Plan, and with the City's Park Classifications and the Park and Recreation Facility Service Level Standards. All lands offered for dedication must be of size, orientation, location, and suitability to provide park and recreation facilities consistent with this General Plan and the Park and Recreation Master Plan.
- Policy PR-6 The City encourages the integration of parks and other facilities in the master-planning of development projects. Proposed parks on remnant parcels or otherwise unusable land which do not meet the City's standards will not be accepted by the City as a park by the City and do not count toward the City's parkland standard in Policy PR-1. They may become Non-

Public Park facilities if there is a permanent maintenance mechanism provided, such as a landscape maintenance district.

- Policy PR-7 The development of parks in new growth areas of the City, where residential projects trigger the need for a new park(s), shall be phased and/or timed with the goal of meeting the standards of this Element and the Parks and Recreation Master Plan at all times. New development should be phased or timed in such a way as to avoid situations where insufficient park or other facilities are provided either permanently or temporarily. The City recognizes that this may require the development of parks or other facilities larger than will be needed at the time in order to ensure that standards will be maintained as future residential development occurs.
- Policy PR-8 The City shall endeavor to acquire new parklands, expand existing parks, or otherwise make available local parkland and open spaces in sufficient quantity to meet community demand for facilities and programs identified in the Park and Recreation Master Plan.
- Policy PR-10 The City shall require new residential development projects, including mixed-use projects with residential components, to dedicate land and/or pay in-lieu fees to contribute to the acquisition and development of parks or recreation facilities. The determination of which method (land dedication and/or payment of in-lieu fees) is appropriate shall be made at the City's sole discretion.

4.16.2 Impact Assessment

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?

Less than Significant Impact: Implementation of the proposed project could result in increased use of existing parks and other recreational facilities; however, the proposed project will contribute to park facilities with the dedication of park space throughout the project site. There will be two open space/pocket parks totaling approximately 29,500 sq. ft. of land. The impact is *less than significant.*

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?

Less than Significant Impact: The proposed project includes recreational facilities such as a park with a children's play area. It is not anticipated that these features would have a significant adverse physical effect on the environment. Additionally, provision of these features will reduce increased demand on other City park facilities. The impact is *less than significant.*

4.17 Transportation

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	☐	☐	☐	☒
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)??	☐	☐	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d) Result in inadequate emergency access?	☐	☐	☐	☒

4.17.1 Environmental Setting

Vehicular Access: Vehicular access to the project is available from Stadium Road, Avenue 12 ½, and Pecan Avenue. The City of Madera is the primary authority for major arterial and local streets. Other transportation facilities include a network of local roads within the proposed project site property. These will provide full access to residential lots.

Parking: During construction, workers will utilize temporary construction staging areas for parking of vehicles and equipment.

Pedestrian and Cyclist Connectivity: The Project will create new roads and sidewalks just south of Pecan Avenue. These new additions will connect to existing sidewalks on the north and east side of the project site.

CA OPR Technical Advisory on Evaluating Transportation Impacts in CEQA: The State of California Governor's Office of Planning and Research document entitled Technical Advisory on Evaluating Transportation Impacts in CEQA dated December 2018 (Technical Advisory) provides guidance for determining a project's transportation impacts based on VMT.

For residential projects, the Technical Advisory states: "A proposed project exceeding a level of 15 percent below existing VMT per capita may indicate a significant transportation impact. Existing VMT per capita may be measured as regional VMT per capita or as city VMT per capita."

City of Madera Improvement Standards: The City of Madera's Improvement Standards are developed and enforced by the City of Madera's Engineering Division to guide the development and maintenance of City

Roads. The cross-section drawings contained in the City Improvement Standards dictate the development of roads within the City.

Madera City General Plan: The Circulation and Infrastructure Element of the City of Madera General Plan contains the acceptable Level of Service (LOS) for roadways.

Goal CI-3 A roadway system that accommodates land uses at the City's desired level of service, provides multiple options for travel routes, protects residential areas from excessive traffic, coexists with other travel modes, and contributes to the quality of the City's residential, commercial, office, and industrial areas.

- Policy CI-22 The City shall seek to maintain Level of Service (LOS) C at all times on all roadways and intersections in Madera, with the following exceptions:
    - On arterial roadways or roadways with at-grade railroad crossings that were experiencing congestion exceeding LOS C during peak hour travel times as of the date this General Plan Update is adopted the City shall seek to maintain LOS D or better.
    - This policy does not extend to freeways (where Caltrans policies apply) or to private roadways.
    - In the Downtown District (as defined in the Land Use Element of this General Plan), the City shall seek to maintain LOS D.
- Policy CI-22.1 Consider, during the review of proposed development projects, how to shift travel demand away from the peak period, especially in those situations where peak traffic problems result from a few major generators (e.g. outlying employment locations).
- Policy CI-22.2 Perform routine, ongoing evaluation of the efficiency of the urban street traffic control system, with emphasis on traffic signal timing, phasing and coordination to optimize traffic flow along arterial corridors. Use traffic control systems to balance arterial street utilization (e.g., timing and phasing for turn movements, peak period and off-peak signal timing plans).
- Policy CI-22.3 As funding allows, expand traffic signal timing and synchronization programs where emission reduction benefits can be demonstrated.
- Policy CI-23 Projects contributing traffic to roadways exceeding the desired level of service per Policy CI-22 may be required to fund system wide traffic improvements, including cumulative traffic mitigation at off-site locations (as applicable), and to assist in promoting non-vehicular transportation as a condition of project approval.

4.17.2 Impact Assessment

a) Would the project conflict with a plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

No Impact: The project consists of a 58-acre single-family residential development that would include on-site circulation-related infrastructure improvements, including interior sidewalks and drive aisles. All improvements, including those related to transit, roadway, bicycle, and pedestrian facilities are subject to City review and approval to ensure compliance with all plans, ordinances, and policies related to circulation. The proposed project will not conflict with the City's circulation plan and standards. Therefore, there is *no impact.*

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)?

Less than Significant Impact: The VMT modeling results provided by LSA indicate a total VMT of 1,586,940 miles in the Madera County region with a population of 158,328, yielding a per-capita VMT of 10.02 The significance criteria indicate that a significant impact would occur if the Project-specific residential VMT exceeds 85 percent of 10.02. Therefore, a significant impact would occur if the Project-specific residential VMT per capita exceeds 8.517.

The LSA output indicates that the Project residences will generate a total homebased VMT of 8,859. The total population of the Project is estimated to be 1,104 persons and the Project VMT per capita would be 8,859 / 1,104 = 8.02. Since 8.02 is less than 8.517, the Project-specific VMT is less than the significance threshold and the Project will cause a *less-than-significant impact.*

c) Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact: No public roadway design features or incompatible uses are included in the proposed project. All equipment will remain on-site and outside of public right-of-way (R-O-W). There is *no impact.*

d) Would the project result in inadequate emergency access?

No Impact: This project would not result in inadequate emergency access. Emergency access to the site would be via Pecan Avenue and Stadium Road. A network of drive aisles within the proposed project property provides full access to all buildings within the mixed-use development. The Project would have *no impact* on emergency access.

4.18 Tribal Cultural Resources

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) 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:	☐	☒	☐	☐
i) Listed or eligible for listing in the California Register of Historical Resources, or in the local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☐
ii) 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.	☐	☒	☐	☐

4.18.1 Environmental Setting

The Southern San Joaquin Valley Information Center (SSJVIC) provided the results of the records search in a letter dated November 29, 2022 (Records Search File No. 22-446; Appendix C). The results letter indicated that there has been one cultural resource study that has been conducted within the northern border of the Project site. There have also been five studies within a 0.5-mile radius of the Project area. The SSJVIC reported that there is one cultural resource previously recorded within the Project area that was identified as a historic era canal (P-20-002308). There are no further recorded cultural resources in a 0.5-mile radius.

4Creeks reached out to Taylored Archaeology to complete an in-depth investigation into the historic era canal identified on site by the SSHVIC. The Cultural Resources Assessment also identified that there are no 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, for the California State Historic Landmarks. The full Cultural Resources Technical Memorandum is available in Appendix C.

Native American Heritage Commission and Native American Outreach

On November 16, 2022, The City of Madera sent an email to 4Creeks containing a list of Native American tribes and individuals culturally affiliated with the Project area to be contacted for consultation. The consultation request letters were sent to each individual dated November 28, 2022. The letters included a description of the proposed project and a map of the location. The tribes had 30 days to respond with a request for consultation. Of the 18 tribal representatives who were contacted, 18 did not respond with a request for consultation.

National Historic Preservation Act: The National Historic Preservation Act was adopted in 1966 to preserve historic and archeological sites in the United States. The Act created the National Register of Historic Places, the list of National Historic Landmarks, and the State Historic Preservation offices.

California Historic Register: The California Historic Register was developed as a program to identify, evaluate, register, and protect Historical Resources in California. California Historical Landmarks are sites, buildings, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific, religious, experimental, or other value. In order for a resource to be designated as a historical landmark, it must meet the following criteria:

- The first, last, only, or most significant of its type in the state or within a large geographic region (Northern, Central, or Southern California).
- Associated with an individual or group having a profound influence on the history of California.
- A prototype of, or an outstanding example of, a period, style, architectural movement or construction or is one of the more notable works or the best surviving work in a region of a pioneer architect, designer or master builder.

City of Madera General Plan: The City of Madera General Plan includes the following goals and policies pertaining to tribal cultural resources:

Goal HC-1 Protection and preservation of Madera's significant historical, archaeological, cultural, and fossil resources.

- Policy HC-1 The City encourages the preservation and enhancement of existing historical and archaeological resources in the City.
    - HC-1.1 Seek grant or alternative funding to develop and update an inventory of locally significant historic resources using the National Register, the California Register, California Historical Landmarks, California Points of Historical Interest, and other available sources to identify structures or properties the City Council determines to have historic value. The Inventory should contain a map that shows the location of all of the structures with a historically significant designation, and a list of all of the historically significant structures in Madera.
    - HC-1.2 Provide information to the public on historic preservation efforts and financial incentive programs. This may include:
        - Creating a historic preservation page on the City's website with links to federal and state historic preservation programs and financial incentive programs.

        - Creating pamphlets that outline and discuss the City's historic preservation program.
- Policy HC-2 The City supports the goals and objectives for the Comprehensive Statewide Historic Preservation Plan for California 2000-2005.
- Policy HC-9 The City will endeavor to protect and preserve prehistoric and historic archaeological resources, cultural resources (particularly those of importance to existing tribes), and fossils.
    - HC-9.1 In areas identified with a significant potential for containing archaeological artifacts, require completion of a detailed on-site study as part of the environmental review process. Implement all feasible mitigation measures.
    - HC-9.2 Impose the following conditions on all discretionary projects which may cause ground disturbance:
        - "The Planning Department shall be notified immediately if any prehistoric, archaeologic, or fossil artifact or resource is uncovered during construction. All construction must stop and an archaeologist that meets the Secretary of the Interior's Professional Qualifications Standards in prehistoric or historical archaeology shall be retained to evaluate the finds and recommend appropriate action."
        - "All construction must stop if any human remains are uncovered, and the County Coroner must be notified according to Section 7050.5 of California's Health and Safety Code. If the remains are determined to be Native American, the procedures outlined in CEQA Section 15064.5 (d) and (e) shall be followed."
    - HC-9.3 The City will work with area tribes to develop updated standards for cultural resource surveys, as well as a process for obtaining the input of tribes in the development review process when cultural resources are involved.

4.18.2 Impact Assessment

a) 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:

i) Listed or eligible for listing in the California Register of Historical Resources, or in the local register of historical resources as defined in Public Resources Code section 5020.1(k), or

Less Than Significant Impact with Mitigation: A Cultural Resources Record Search was prepared by SSJVIC in November 2022. The Cultural Resources Records Search also examined the National Register of Historic Places, the California Register of Historical Resources, the California Points of Historical Interest, California Inventory of Historic Resources, for the California State Historic Landmarks. The records search results indicated that there have been one previous cultural resource study conducted within the Project area, and that five additional cultural resource studies were conducted within 0.5-mile radius of the project site. According to the records search, there is one recorded cultural resource within the project site (a historic canal) and there are no recorded resources within the 0.5-mile radius of the project site.

On January 30, 2023, Taylored Archaeology completed an additional records search to investigate the historic canal within the project site. The records search identified one recorded cultural resource (P-20-002308) within the Project boundary. However, a review of SSJVIC records, including P-20-002308, and of historical topographic maps, historical aerial photographs, and other archival sources as discussed in the Archival Research section below showed no evidence of any Madera Canal segment presently or historically located within or adjacent to the Project site.

Based on the results of the SSJVIC records search and subsequent archival research, it appears the single recorded cultural resource within the Project boundary (P-20-002308, a segment of the Madera Canal) is not located within or adjacent to the Project site. No other evidence of cultural resources within the Project boundary was found during this investigation. Based upon the limited information available, the chance of encountering subsurface archaeological or historical resources within the Project boundary is undetermined.

Therefore, the project would not cause a substantial adverse change in the significance of a tribal cultural resource, nor is it listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources. Although no tribal cultural resources were identified, the presence of remains or unanticipated cultural resources under the ground surface is possible. Implementation of Mitigation Measures CUL-1 and CUL-2 will ensure that impacts to this checklist item will be *less than significant with mitigation incorporation*.

ii) 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.

Less Than Significant Impact with Mitigation: The lead agency has not determined there to be any known tribal cultural resources located within the project area. Additionally, there are not believed to be any human remains buried within the project area's vicinity. However, if resources were found 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 resources to a California Native American Tribe. Implementation of Mitigation Measures CUL-1 and CUL-2 will ensure that any impacts resulting from project implementation remain *less than significant with mitigation incorporation.*

Mitigation Measures for Impacts to Cultural Resources:

Mitigation Measure CUL-1: In the event of accidental discovery of unidentified archaeological remains during development or ground-moving activities in the Project area, all work should be halted in the immediate vicinity (within a 100-foot radius) until a qualified archaeologist can identify the discovery and assess its significance.

Mitigation Measure CUL-2: If human remains are uncovered during construction, the Madera County Coroner is to be notified to investigate the remains and arrange proper treatment and disposition. If the remains are identified on the basis of archaeological context, age, cultural associations, or biological traits

to be those of a Native American, California Health and Safety Code 7050.5 and PRC 5097.98 require that the coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendent who will be afforded an opportunity to make recommendations regarding the treatment and disposition of the remains.

4.19 Utilities and Service Systems

Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☒	☐
c) 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?	☐	☐	☒	☐
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

4.19.1 Environmental Setting

According to the Madera Municipal Service Review (2018), the City would be able to provide the necessary infrastructure services and utility systems required for new development. Utilities and service systems include wastewater treatment, storm water facilities, water supply, landfill capacity, and solid waste disposal.

Wastewater: Wastewater will be collected and treated at the City's wastewater treatment facility, which is located at the intersection Avenue 13 and Rd 21 ½. The City of Madera Waste Water Treatment Facility provides primary and secondary treatment with a capacity of 10.1 million gallons per day. The plant has 320 acres of land for effluent incidental recharge and evaporation. The City of Madera storm water system also drains flows to rivers and creeks and detention and retention basins.

Solid Waste: Solid waste collection and disposal services are provided by Mid Valley Disposal.

Water: Water for the proposed development will be provided by the City of Madera. The City's primary water source is groundwater. The City's municipal water system now consists of 19 groundwater wells, a one-million-gallon storage reservoir, distribution mains, and fire hydrants.

Storm Drainage: Stormwater drainage in the City of Madera is typically directed to gutters along the City's streets which then flow into the City's storm drain pipeline and retention basin system. The City's municipal storm drainage system services residential and non-residential lands within the city limits. This service area includes 7,730 acres of developed lands inside the city limits and 1,921 acres of undeveloped lands inside the city limits. At ultimate development of the General Plan, the City's storm drainage system is anticipated to service approximately 11,908 acres of residential land use, 12,324 acres of non-residential land use, and 38,442 of other land use, for a total of 62,673 acres inside the planning area, and not including Madera Acres.

CalRecycle: California Code of Regulations, Title 14, Natural Resources – Division 7 contains all current CalRecycle regulations regarding nonhazardous waste management in the state. These regulations include standards for the handling of solid waste, standards for the handling of compostable materials, design standards for disposal facilities, and disposal standards for specific types of waste.

Central Valley RWQCB: The Central Valley RWQCB requires a Stormwater Pollution Prevention Plan (SWPPP) for projects disturbing more than one acre of total land area. Because the project is greater than one acre, a SWPPP to manage stormwater generated during project construction will be required.

The Central Valley RWQCB regulates Wastewater Discharges to Land by establishing thresholds for discharged pollutants and implementing monitoring programs to evaluate program compliance. This program regulates approximately 1500 dischargers in the region.

The Central Valley RWQCB is also responsible for implementing the federal program, the National Pollutant Discharge Elimination System (NPDES). The NPDES Program is the federal permitting program that regulates discharges of pollutants to surface waters of the U.S. Under this program, a NPDES permit is required to discharge pollutants into Water's of the U.S. There are 350 permitted facilities within the Central Valley Region.

4.19.2 Impact Assessment

a) Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less than Significant Impact: The proposed project will require the extension of existing utility services into the project area. This is not anticipated to cause a significant environmental effect because extension/relocation would occur within the right-of-way prior to street construction to minimize environmental impacts. In addition to connections to water, stormwater, solid waste, and wastewater services, the Project will be served by PG&E for natural gas and electricity and by the appropriate telecommunications provider for the Project area.

The proposed Project would tie into the City's stormwater system. All stormwaters will be collected and diverted to the City's retention basin system. All wastewater will be directed to the City of Madera Wastewater Treatment Plant which has a capacity of 10.1 million gallons per day.

It is not anticipated that the proposed project would result in the relocation or construction of new or expanded wastewater treatment facilities, power plants, natural gas extraction facilities or telecommunication facilities. If any of these facilities become required, they would be required to serve more than just the proposed project and would be subject to separate environmental review and approval. The impact is *less than significant.*

b) Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

Less than Significant Impact: Water services will be provided by the City of Madera upon development. The City's water supply source is comprised of 20 groundwater wells and a one-million-gallon storage reservoir. The Water System Master Plan proposed a Capital Improvement Program that includes approximately 114 miles of pipeline improvements, 24 new wells (22 of which are planned from 2020 through 2050), two new storage reservoirs, and two new booster stations that will convey water from the west side of the City to the east through 2050. The expected increase in future water supply to supplier is expected to be 53,200 AFY. According to City's Urban Water Management Plan (2020), the projected water supply for Madera in year 2025 is 14,870 AF.

The City has sufficient water supplies available to serve the Project and its existing commitments during normal, dry, and multiple dry years. The project must comply with the requirements of the Engineering Department for the construction of water, wastewater, and storm water drainage infrastructure.

The proposed 318-lot subdivision is within the City's water service area. According to the 2020 Urban Water Management Plan (UWMP), each person uses an average of 183 gallons of water each day. With an average of 3.62 persons per household (1,152 persons), the Project would be expected to use approximately 210,662 gallons of water per day under normal operation. This equates to approximately 236-acre feet per year (AFY). With a 2025 projected population of 69,210 per the California Department of Finance, water consumption without the Project is estimated to be approximately 14,197 AFY. The 2020 UWMP anticipated having a 2025 minimum supply of 14,870 AFY. Therefore, the Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge. Since the proposed Project is consistent with the City's General Plan land use designation and the Project would not affect water supplies beyond what has been analyzed in the Program EIR, no further analysis is required pursuant to CEQA Guidelines, section 15168(c). The impact would be *less than significant.*.

c) Would the project 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?

Less Than Significant Impact: As previously discussed above for item a) in this section, wastewater generated by the project would be collected and treated at the City's wastewater treatment plant (WWTP), which has a capacity of 10.1 million gallons/day (MGD) but currently treats approximately 5.6 MGD. Based on calculations from the City of Madera Environmental Impact Report Table 4.12.4-

2, the proposed Project is estimated to generate approximately 156,600 gallons of wastewater per day, which would be approximately 3.5% of the remaining capacity. Although the proposed project will increase wastewater generation due to the new medium-density residential development, the project is consistent with the City's General Plan Land Use Designation and the City's WWTP was designed to accommodate this planned growth. Therefore, the project would not exceed the City's WWTF capacity of 10.1 MGD and would not impact wastewater treatment facilities beyond what has already been analyzed in the most current General Plan EIR. The impact is *less than significant*.

d) Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less Than Significant Impact: Solid waste collection service will be provided by the City of Madera and waste disposal will be provided by the County. Solid waste is anticipated as a result of project implementation; however, the project does not include any components that would generate excessive waste and the existing landfills have sufficient permitted capacity to accommodate the project's solid waste disposal needs. The impact is *less than significant.*

e) Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

No Impact: This proposed project conforms to all applicable management and reduction statutes and regulations related to solid waste disposal. The development will comply with the adopted policies related to solid waste, and will comply with all applicable federal, state, and local statutes and regulations pertaining to disposal of solid waste, including recycling. Therefore, the proposed project would have *no impact* on solid waste regulations.

4.20 Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrollable spread of wildfire?	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☒

4.20.1 Environmental Setting

Definitions:

Fire hazard severity zones: geographical areas designated pursuant to California Public Resources Codes Sections 4201 through 4204 and classified as Very High, High, or Moderate in State Responsibility Areas or as Local Agency Very High Fire Hazard Severity Zones designated pursuant to California Government Code, Sections 51175 through 51189.

Madera Unit Strategic Fire Plan Key Objectives:

- *Collect, analyze, and prepare data to assess communities at risk and in need of fuel reduction or other projects.*
- *Work with grant writers and stakeholders to secure funds to implement projects.*
- *Utilize CAL FIRE personnel and resources in cooperation with other public and private efforts to assist with work projects on the ground.*
- *Educate the public on fire prevention practices that would incorporate fire landscaping and construction to reduce their threat from wildfire along with hazardous fuels reduction projects to keep lives, homes, property, and natural resources safe from catastrophic wildfires.*

4.20.2 Impact Assessment

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

No Impact: The project is not located in an area classified as a Fire Hazard Severity Zone and would not substantially impair an adopted emergency response plan or emergency evacuation plan including the Madera Unit Strategic Fire Plan. There is *no impact.*

b) Due to slope, prevailing winds, and other factors exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

No Impact: The project is located on a flat area of land with little risk of fire. The Madera County Local Hazard Mitigation Plan identifies the risk of fire within the City of Madera as having unlikely frequency, limited extent, limited magnitude, and low significance. The project would not exacerbate wildfire risks and expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of wildfire. There is *no impact.*

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

No Impact: The construction of the project involves extending utility services to the project site. Utilities such as emergency water sources and power lines would be included as part of the proposed development, however all improvements would be subject to City standards and fire chief approval. The project is not located in an area classified as a Fire Hazard Severity Zone and the proposed project would not exacerbate fire risk. There is *no impact.*

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

No Impact: The project site is not located in an area designated as a Fire Hazard Severity Zone and lands associated with the Project site are relatively flat. Therefore, the project would not be susceptible to downslope or downstream flooding or landslides as a result of post-fire instability or drainage changes. There is *no impact.*

4.21 CEQA Mandatory Findings of Significance

Does the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have 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 a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) 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)?	☐	☐	☒	☐
c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

4.21.1 Impact Assessment

a) Does the project have 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 a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less Than Significant Impact with Mitigation: This initial study/mitigated negative declaration found the project could have significant impacts on biological, cultural, water quality, and Tribal cultural resources. However, implementation of the identified mitigation measures for each respective section would ensure that impacts are *less than significant with mitigation incorporation.*

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)?

Less Than Significant Impact: CEQA Guidelines Section 15064(i) states that a Lead Agency shall consider whether the cumulative impact of a project is significant and whether the effects of the project are cumulatively considerable. The assessment of the significance of the cumulative effects of a project must, therefore, be conducted in connection with the effects of past projects, other current projects, and probable future projects. Due to the nature of the project and consistency with environmental policies, incremental contributions to impacts are considered less than cumulatively considerable. The proposed project would not contribute substantially to adverse cumulative conditions, or create any substantial indirect impacts (i.e., increase in population could lead to an increase in needs for housing, increase in traffic, air pollutants, etc). Impacts would be *less than significant*.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant Impact: The analyses of environmental issues contained in this Initial Study indicate that the project is not expected to have substantial impact on human beings, either directly or indirectly. Mitigation measures have been incorporated in the project design to reduce all potentially significant impacts to less than significant, which results in a *less than significant* impact to this checklist item.

Chapter 5 Mitigation Monitoring and Reporting Program

This Mitigation Monitoring and Reporting Program (MMRP) has been formulated based upon the findings of the Initial Study/Mitigated Negative Declaration (IS/MND) for the Carmel Homes II & IV in the City of Madera. The MMRP lists mitigation measures recommended in the IS/MND for the Project and identifies monitoring and reporting requirements.

Table 5-1 presents the mitigation measures identified for the proposed Project. Each mitigation measure is numbered with a symbol indicating the topical section to which it pertains, a hyphen, and the impact number. For example, AIR-2 would be the second mitigation measure identified in the Air Quality analysis of the IS/MND.

The first column of Table 5-1 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 of the mitigation measure. 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 4Creeks to ensure that individual mitigation measures have been complied with and monitored.

Table 5-1 Mitigation Monitoring and Reporting Program

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	**When Monitoring is to Occur**	**Frequency of Monitoring**	**Agency Responsible for Monitoring**	**Method to Verify Compliance**	**Verification of Compliance**
Biological Resources					
Mitigation Measure BIO-1a: *(Pre-construction Surveys and Construction Timing). If construction is to occur between February 1 and August 31, a qualified biologist will conduct pre-construction surveys for active bird nests within 10 days prior to the start of ground disturbing activities should work commence during the nesting season (February 15 to September 15). The survey area will encompass the site and accessible surrounding lands within 250 feet for nesting migratory birds and 500 feet for raptors (i.e., birds of prey).*	10 Days Prior Construction	Prior to and During Project Construction	City of Madera	Review of Documentation Submittal	
Mitigation Measure BIO-1b: *(Avoidance of Active Nests*). Should any active nests be discovered in or near proposed construction zones, the biologist will identify a suitable construction-free buffer around the nest. This buffer will be identified on the ground with flagging or fencing and will be maintained until the biologist has determined that the young have fledged and are capable of foraging independently.	Prior and During Project Construction	Ongoing During Construction	City of Madera	Review of Documentation Submittal	
Cultural Resources					
Mitigation Measure CUL-1: If previously unknown resources are encountered before or during grading activities, construction shall stop in the immediate vicinity of the find (within a 100-foot radius) and a qualified historical resources specialist shall be consulted to determine whether the resource requires further study. The qualified historical resources specialist shall make recommendations to the City on	During Construction	Ongoing During Construction	City of Madera	Review of Documentation Submittal	

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines and the City's Historic Preservation Ordinance. If the resources are determined to be unique historical resources as defined under Section 15064.5 of the CEQA Guidelines, measures shall be identified by the monitor and recommended to the Lead Agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any historical artifacts recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study.					
Mitigation Measure CUL-2: If human remains are uncovered during construction, the Madera County Coroner is to be notified to investigate the remains and arrange proper treatment and disposition. If the remains are identified on the basis of archaeological context, age, cultural associations, or biological traits to be those of a Native American, California Health and Safety Code 7050.5 and PRC 5097.98 require that the coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendent who will be afforded an opportunity to make recommendations regarding the treatment and disposition of the remains.	During Construction	Ongoing During Construction	City of Madera	Review of Documentation Submittal	

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
Geology and Soils					
Mitigation Measure GEO-1: In the event of accidental discovery of unidentified paleontological resources during development or ground-moving activities in the Project area, all work should be halted in the immediate vicinity (within a 100-foot radius) until a qualified paleontologist can identify the discovery and assess its significance. The qualified paleontologist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines and the City's Historic Preservation Ordinance. If the resources are determined to be unique paleontological resources, measures shall be identified by the monitor and recommended to the Lead Agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any paleontological artifacts recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study.	During Construction	Ongoing During Construction	City of Madera	Review of Documentation Submittal	
Mitigation Measure GEO-2: Should the construction crew or paleontologist uncover any bones or teeth, all construction-related activities in the immediate vicinity would be stopped until the paleontologist has assessed the find and, if deemed significant, salvaged it for	During Construction	Ongoing During Construction	City of Madera	Review of Documentation Submittal	

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
deposition in a repository such as University of California Museum of Paleontology where it would be properly curated and preserved for scientific study. Any period in which construction is halted shall be kept to the minimum amount of time feasible under the circumstances. To avoid any unnecessary loss of time during construction, the City shall require the paleontologist to assess the significance of the affected resources as soon as is feasible under the circumstances. Following the completion of the above tasks, the paleontologist shall prepare a report documenting the absence or discovery of fossil resources on-site. If fossils are found, the report shall summarize the results of the inspection program, identify those fossils encountered, recovery and curation efforts, and the methods used in these efforts, as well as describe the fossils collected and their significance. A copy of the report shall be provided to the Madera Community Development Department and to the Natural History Museum of Los Angeles County.					
Hydrology and Water Quality					
Mitigation Measure HYD-1: Prior to issuance of grading permits, the Project proponent shall submit a NOI and SWPPP to the RWQCB to obtain coverage under the General Permit for Discharges of Stormwater Associated with Construction Activity. The SWPPP shall specify and require the implementation BMPs, with the intent of keeping all products of erosion from moving offsite and into receiving waters during construction. The requirements of the SWPPP shall be incorporated into design specifications and construction contracts. Recommended BMPs for the construction phase shall	Prior to issuance of grading permits.	Prior to Project Construction	City of Madera	Review of Documentation Submittal	

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
include, but are not limited to, the following: • Stockpiling and disposing of demolition debris, concrete, and soil properly; • Protecting existing storm drain inlets and stabilizing disturbed areas; • Implementing erosion controls; • Properly managing construction materials; and • Managing waste, aggressively controlling litter, and implementing sediment controls. The developer shall provide the City of Madera Engineering Division with evidence of an approved SWPPP prior to issuance of grading permits.					
Mitigation Measure HYD-2: Prior to issuance of grading permits, the Project proponent shall prepare a drainage plan for the Project for approval by the City Engineer that identifies postconstruction treatment, control, and design measures that minimize surface water runoff, erosion, siltation, and pollution. The drainage plan shall be prepared in accordance with the City's SWMP and California Stormwater Quality Association's Storm Water Best Management Practices Handbook as well as the City Engineer's Technical Specifications and Public Improvement Standards. During final design of the Project, the Project proponent shall implement a suite of post-construction stormwater treatment and control BMPs designed to address the most likely sources of stormwater pollutants resulting from operation and maintenance of the Project. These measures shall account for the proposed 21 acres of commercial development at the Project site. Stormwater	Prior to issuance of grading permits.	Prior to Project Construction	City of Madera	Review of Documentation Submittal	

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
infrastructure will be designed adhering to methods and standards described in Section E.12.e.ii.c of the SWRCB Phase II Small MS4, General Permit (Order No. 2013-0001-DWQ). The City Engineer may also require other necessary BMPs and design features. Incorporation of City Engineer-approved BMPs and design features into the Project design and construction documents shall ensure that operational water quality exceeds applicable water quality standards. The Project proponent shall also prepare and submit an Operations and Maintenance Agreement to the City of Madera for its approval identifying appropriate procedures to ensure that stormwater quality control measures work properly during operations.					
Mitigation Measure HYD-3: A Development Maintenance Manual for the Project shall include comprehensive procedures for maintenance and operations of any stormwater facilities to ensure long-term operation and maintenance of post-construction stormwater controls. The maintenance manual shall require that stormwater BMP devices be inspected, cleaned and maintained in accordance with the manufacturer's maintenance conditions. The manual shall require that devices be cleaned prior to the onset of the rainy season (i.e., mid-October) and immediately after the end of the rainy season (i.e., mid-May). The manual shall also require that all devices be checked after major storm events. The Development Maintenance Manual shall include the following:	Prior to issuance of grading permits.	Prior to Project Construction	City of Madera	Review of Documentation Submittal	

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
• Runoff shall be directed away from trash and loading dock areas; • Bins shall be lined or otherwise constructed to reduce leaking of liquid wastes; • Trash and loading dock areas shall be screened or walled to minimize offsite transport of trash; and, Impervious berms, trench catch basin, drop inlets, or overflow containment structures nearby docks and trash areas shall be installed to minimize the potential for leaks, spills or wash down water to enter the drainage system.					
Noise					
Mitigation Measure NOISE-1: To mitigate noise created by stationary sounds, such as construction, the following best practices shall be implemented to reduce noise to acceptable levels: • All construction equipment shall be properly maintained and muffled as to minimize noise generation at the source. • Noise-producing equipment shall not be operating, running, or idling while not in immediate use by a construction contractor. • All noise-producing construction equipment shall be located and operated, to the extent possible, at the greatest possible distance from any noise-sensitive land uses. • Locate construction staging areas, to the extent possible, at the greatest possible	During Construction	Ongoing During Construction	City of Madera	Review of Conditions	

Mitigation Monitoring and Reporting Program					
Mitigation Measure/Condition of Approval	When Monitoring is to Occur	Frequency of Monitoring	Agency Responsible for Monitoring	Method to Verify Compliance	Verification of Compliance
distances from any noise-sensitive land uses. • Signs shall be posted at the construction site and near adjacent sensitive receptors displaying hours of construction activities and providing the contact phone number of a designated noise disturbance coordinator.					

Chapter 6 List of Preparers

4-Creeks Inc.

- David Duda, AICP
- Ellie Krantz, Associate Planner
- Jared Dunning, Planning Intern

Persons and Agencies Consulted

The following individuals and agencies contributed to this Initial Study/Mitigated Negative Declaration:

City of Madera

- Robert Smith, Senior Planner
- Will Tackett, Community Development Director

Taylored Archaeology

- Consuelo Y. Sauls, Archaeologist

LSA Associates Inc.

- Ambarish Mukherjee, P.E., AICP

Peters Engineering Group

- John Rowland, PE, TE

Live Oak Associates Inc.

- Rebekah Jensen, Senior Project Manager, Staff Ecologist
- Colleen Del Vecchio, Project Manager/Staff Ecologist and Arborist

Appendix A

Air Quality and Greenhouse Gas Emissions Evaluation Report

Carmel Homes II & IV - Madera County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Carmel Homes II & IV

Madera County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	318.00	Dwelling Unit	54.32	572,400.00	909
City Park	0.68	Acre	0.68	29,620.80	0
Other Asphalt Surfaces	3.00	Acre	3.00	130,680.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	51
Climate Zone	3			**Operational Year**	2032
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - - Project size is approximately 58 acres

Mobile Land Use Mitigation -

Woodstoves - Per Section 5.4.2.1 of Rule 4901, no wood burning fireplace, low mass fireplace, masonry heater, or wood burning heater shall be installed at elevations below 3,000 ft. where natural gas service is available.

Area Mitigation -

Table Name	Column Name	Default Value	New Value
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	174.90	0.00
tblFireplaces	NumberNoFireplace	143.10	318.00
tblLandUse	LotAcreage	103.25	54.32
tblWoodstoves	NumberCatalytic	54.32	0.00
tblWoodstoves	NumberNoncatalytic	54.32	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

Carmel Homes II & IV - Madera County, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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					
2025	0.1240	1.1655	1.0500	2.1600e-003	0.3911	0.0511	0.4422	0.1989	0.0473	0.2462	0.0000	189.7153	189.7153	0.0545	1.5000e-004	191.1219
2026	0.3084	2.7051	3.0609	7.3200e-003	0.6944	0.1043	0.7986	0.2492	0.0968	0.3460	0.0000	649.4899	649.4899	0.1411	0.0145	657.3438
2027	0.2468	2.0016	2.7100	6.5500e-003	0.2410	0.0721	0.3130	0.0653	0.0678	0.1331	0.0000	586.5235	586.5235	0.0752	0.0243	595.6386
2028	0.2414	1.9892	2.6695	6.4500e-003	0.2400	0.0717	0.3118	0.0650	0.0675	0.1325	0.0000	577.6385	577.6385	0.0746	0.0236	586.5272
2029	0.2382	1.9923	2.6538	6.4100e-003	0.2410	0.0719	0.3129	0.0653	0.0677	0.1329	0.0000	573.6889	573.6889	0.0746	0.0231	582.4340
2030	0.7884	1.2238	2.4160	5.7900e-003	0.1700	0.0277	0.1977	0.0460	0.0276	0.0736	0.0000	510.2796	510.2796	0.0159	0.0155	515.2941
2031	4.8304	0.0299	0.0814	1.7000e-004	9.6100e-003	7.2000e-004	0.0103	2.5500e-003	7.2000e-004	3.2700e-003	0.0000	15.0375	15.0375	4.8000e-004	1.5000e-004	15.0949
Maximum	**4.8304**	**2.7051**	**3.0609**	**7.3200e-003**	**0.6944**	**0.1043**	**0.7986**	**0.2492**	**0.0968**	**0.3460**	**0.0000**	**649.4899**	**649.4899**	**0.1411**	**0.0243**	**657.3438**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction

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					
2025	0.1240	1.1655	1.0500	2.1600e-003	0.3911	0.0511	0.4422	0.1989	0.0473	0.2462	0.0000	189.7151	189.7151	0.0545	1.5000e-004	191.1217
2026	0.3084	2.7050	3.0609	7.3200e-003	0.6944	0.1043	0.7986	0.2492	0.0968	0.3460	0.0000	649.4893	649.4893	0.1411	0.0145	657.3432
2027	0.2468	2.0016	2.7100	6.5500e-003	0.2410	0.0721	0.3130	0.0653	0.0678	0.1331	0.0000	586.5232	586.5232	0.0752	0.0243	595.6383
2028	0.2414	1.9892	2.6695	6.4500e-003	0.2400	0.0717	0.3118	0.0650	0.0675	0.1325	0.0000	577.6382	577.6382	0.0746	0.0236	586.5269
2029	0.2382	1.9923	2.6538	6.4100e-003	0.2410	0.0719	0.3129	0.0653	0.0677	0.1329	0.0000	573.6885	573.6885	0.0746	0.0231	582.4336
2030	0.7884	1.2238	2.4160	5.7900e-003	0.1700	0.0277	0.1977	0.0460	0.0276	0.0736	0.0000	510.2792	510.2792	0.0159	0.0155	515.2937
2031	4.8304	0.0299	0.0814	1.7000e-004	9.6100e-003	7.2000e-004	0.0103	2.5500e-003	7.2000e-004	3.2700e-003	0.0000	15.0375	15.0375	4.8000e-004	1.5000e-004	15.0949
Maximum	**4.8304**	**2.7050**	**3.0609**	**7.3200e-003**	**0.6944**	**0.1043**	**0.7986**	**0.2492**	**0.0968**	**0.3460**	**0.0000**	**649.4893**	**649.4893**	**0.1411**	**0.0243**	**657.3432**

	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	**8-1-2025**	**10-31-2025**	0.7020	0.7020
2	**11-1-2025**	**1-31-2026**	0.9331	0.9331
3	**2-1-2026**	**4-30-2026**	0.9833	0.9833
4	**5-1-2026**	**7-31-2026**	0.7380	0.7380

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5	**8-1-2026**	**10-31-2026**	0.5688	0.5688
6	**11-1-2026**	**1-31-2027**	0.5714	0.5714
7	**2-1-2027**	**4-30-2027**	0.5492	0.5492
8	**5-1-2027**	**7-31-2027**	0.5643	0.5643
9	**8-1-2027**	**10-31-2027**	0.5660	0.5660
10	**11-1-2027**	**1-31-2028**	0.5687	0.5687
11	**2-1-2028**	**4-30-2028**	0.5530	0.5530
12	**5-1-2028**	**7-31-2028**	0.5618	0.5618
13	**8-1-2028**	**10-31-2028**	0.5636	0.5636
14	**11-1-2028**	**1-31-2029**	0.5663	0.5663
15	**2-1-2029**	**4-30-2029**	0.5446	0.5446
16	**5-1-2029**	**7-31-2029**	0.5596	0.5596
17	**8-1-2029**	**10-31-2029**	0.5613	0.5613
18	**11-1-2029**	**1-31-2030**	0.5132	0.5132
19	**2-1-2030**	**4-30-2030**	0.3967	0.3967
20	**5-1-2030**	**7-31-2030**	0.4067	0.4067
21	**8-1-2030**	**10-31-2030**	0.3323	0.3323
22	**11-1-2030**	**1-31-2031**	2.3797	2.3797
23	**2-1-2031**	**4-30-2031**	3.2127	3.2127
		Highest	3.2127	3.2127

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	2.8552	0.0272	2.3550	1.2000e-004		0.0131	0.0131		0.0131	0.0131	0.0000	3.8570	3.8570	3.6700e-003	0.0000	3.9489
Energy	0.0412	0.3522	0.1499	2.2500e-003		0.0285	0.0285		0.0285	0.0285	0.0000	642.5241	642.5241	0.0458	0.0121	647.2680
Mobile	1.2140	2.0392	11.3510	0.0279	3.1741	0.0243	3.1984	0.8495	0.0228	0.8724	0.0000	2,581.2698	2,581.2698	0.1293	0.1414	2,626.6261
Waste						0.0000	0.0000		0.0000	0.0000	66.4389	0.0000	66.4389	3.9264	0.0000	164.5997
Water						0.0000	0.0000		0.0000	0.0000	6.5732	14.8652	21.4383	0.6775	0.0162	43.2140
Total	**4.1104**	**2.4185**	**13.8558**	**0.0303**	**3.1741**	**0.0659**	**3.2400**	**0.8495**	**0.0644**	**0.9140**	**73.0121**	**3,242.5161**	**3,315.5282**	**4.7827**	**0.1697**	**3,485.6567**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	2.8552	0.0272	2.3550	1.2000e-004		0.0131	0.0131		0.0131	0.0131	0.0000	3.8570	3.8570	3.6700e-003	0.0000	3.9489
Energy	0.0412	0.3522	0.1499	2.2500e-003		0.0285	0.0285		0.0285	0.0285	0.0000	642.5241	642.5241	0.0458	0.0121	647.2680
Mobile	0.9877	1.4975	8.2586	0.0185	2.0640	0.0163	2.0803	0.5524	0.0153	0.5678	0.0000	1,707.0970	1,707.0970	0.0979	0.1012	1,739.6879
Waste						0.0000	0.0000		0.0000	0.0000	66.4389	0.0000	66.4389	3.9264	0.0000	164.5997
Water						0.0000	0.0000		0.0000	0.0000	6.5732	14.8652	21.4383	0.6775	0.0162	43.2140
Total	**3.8841**	**1.8769**	**10.7634**	**0.0208**	**2.0640**	**0.0579**	**2.1219**	**0.5524**	**0.0569**	**0.6093**	**73.0121**	**2,368.3432**	**2,441.3553**	**4.7513**	**0.1295**	**2,598.7185**

	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	**5.51**	**22.40**	**22.32**	**31.24**	**34.97**	**12.10**	**34.51**	**34.97**	**11.64**	**33.33**	**0.00**	**26.96**	**26.37**	**0.66**	**23.69**	**25.45**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	8/1/2025	11/6/2025	5	70	
2	Site Preparation	Site Preparation	11/7/2025	1/1/2026	5	40	
3	Grading	Grading	1/2/2026	6/4/2026	5	110	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4	Building Construction	Building Construction	6/5/2026	9/5/2030	5	1110	
5	Paving	Paving	9/6/2030	12/19/2030	5	75	
6	Architectural Coating	Architectural Coating	12/20/2030	4/3/2031	5	75	

Acres of Grading (Site Preparation Phase): 60

Acres of Grading (Grading Phase): 330

Acres of Paving: 3

Residential Indoor: 1,159,110; Residential Outdoor: 386,370; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 7,841 (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
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
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37

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	36.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	182.00	60.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2025

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	0.0732	0.6719	0.6796	1.3600e-003		0.0299	0.0299		0.0277	0.0277	0.0000	118.9918	118.9918	0.0332	0.0000	119.8224
Total	**0.0732**	**0.6719**	**0.6796**	**1.3600e-003**		**0.0299**	**0.0299**		**0.0277**	**0.0277**	**0.0000**	**118.9918**	**118.9918**	**0.0332**	**0.0000**	**119.8224**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition - 2025

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	1.5300e-003	9.2000e-004	0.0126	4.0000e-005	4.1800e-003	2.0000e-005	4.2100e-003	1.1100e-003	2.0000e-005	1.1300e-003	0.0000	3.2740	3.2740	1.0000e-004	9.0000e-005	3.3029
Total	**1.5300e-003**	**9.2000e-004**	**0.0126**	**4.0000e-005**	**4.1800e-003**	**2.0000e-005**	**4.2100e-003**	**1.1100e-003**	**2.0000e-005**	**1.1300e-003**	**0.0000**	**3.2740**	**3.2740**	**1.0000e-004**	**9.0000e-005**	**3.3029**

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	0.0732	0.6719	0.6796	1.3600e-003		0.0299	0.0299		0.0277	0.0277	0.0000	118.9916	118.9916	0.0332	0.0000	119.8223
Total	**0.0732**	**0.6719**	**0.6796**	**1.3600e-003**		**0.0299**	**0.0299**		**0.0277**	**0.0277**	**0.0000**	**118.9916**	**118.9916**	**0.0332**	**0.0000**	**119.8223**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Demolition - 2025

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	1.5300e-003	9.2000e-004	0.0126	4.0000e-005	4.1800e-003	2.0000e-005	4.2100e-003	1.1100e-003	2.0000e-005	1.1300e-003	0.0000	3.2740	3.2740	1.0000e-004	9.0000e-005	3.3029
Total	**1.5300e-003**	**9.2000e-004**	**0.0126**	**4.0000e-005**	**4.1800e-003**	**2.0000e-005**	**4.2100e-003**	**1.1100e-003**	**2.0000e-005**	**1.1300e-003**	**0.0000**	**3.2740**	**3.2740**	**1.0000e-004**	**9.0000e-005**	**3.3029**

3.3 Site Preparation - 2025

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					0.3841	0.0000	0.3841	0.1971	0.0000	0.1971	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0482	0.4921	0.3493	7.4000e-004		0.0212	0.0212		0.0195	0.0195	0.0000	65.2606	65.2606	0.0211	0.0000	65.7883
Total	**0.0482**	**0.4921**	**0.3493**	**7.4000e-004**	**0.3841**	**0.0212**	**0.4053**	**0.1971**	**0.0195**	**0.2166**	**0.0000**	**65.2606**	**65.2606**	**0.0211**	**0.0000**	**65.7883**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Site Preparation - 2025

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	1.0200e-003	6.2000e-004	8.4400e-003	2.0000e-005	2.8000e-003	2.0000e-005	2.8100e-003	7.4000e-004	1.0000e-005	7.6000e-004	0.0000	2.1889	2.1889	6.0000e-005	6.0000e-005	2.2082
Total	**1.0200e-003**	**6.2000e-004**	**8.4400e-003**	**2.0000e-005**	**2.8000e-003**	**2.0000e-005**	**2.8100e-003**	**7.4000e-004**	**1.0000e-005**	**7.6000e-004**	**0.0000**	**2.1889**	**2.1889**	**6.0000e-005**	**6.0000e-005**	**2.2082**

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					0.3841	0.0000	0.3841	0.1971	0.0000	0.1971	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0482	0.4921	0.3493	7.4000e-004		0.0212	0.0212		0.0195	0.0195	0.0000	65.2606	65.2606	0.0211	0.0000	65.7882
Total	**0.0482**	**0.4921**	**0.3493**	**7.4000e-004**	**0.3841**	**0.0212**	**0.4053**	**0.1971**	**0.0195**	**0.2166**	**0.0000**	**65.2606**	**65.2606**	**0.0211**	**0.0000**	**65.7882**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Site Preparation - 2025

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	1.0200e-003	6.2000e-004	8.4400e-003	2.0000e-005	2.8000e-003	2.0000e-005	2.8100e-003	7.4000e-004	1.0000e-005	7.6000e-004	0.0000	2.1889	2.1889	6.0000e-005	6.0000e-005	2.2082
Total	**1.0200e-003**	**6.2000e-004**	**8.4400e-003**	**2.0000e-005**	**2.8000e-003**	**2.0000e-005**	**2.8100e-003**	**7.4000e-004**	**1.0000e-005**	**7.6000e-004**	**0.0000**	**2.1889**	**2.1889**	**6.0000e-005**	**6.0000e-005**	**2.2082**

3.3 Site Preparation - 2026

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					0.0409	0.0000	0.0409	8.4000e-003	0.0000	8.4000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2400e-003	0.0126	8.9600e-003	2.0000e-005		5.4000e-004	5.4000e-004		5.0000e-004	5.0000e-004	0.0000	1.6734	1.6734	5.4000e-004	0.0000	1.6869
Total	**1.2400e-003**	**0.0126**	**8.9600e-003**	**2.0000e-005**	**0.0409**	**5.4000e-004**	**0.0414**	**8.4000e-003**	**5.0000e-004**	**8.9000e-003**	**0.0000**	**1.6734**	**1.6734**	**5.4000e-004**	**0.0000**	**1.6869**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Site Preparation - 2026

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	2.0000e-005	1.0000e-005	2.1000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0552	0.0552	0.0000	0.0000	0.0556
Total	**2.0000e-005**	**1.0000e-005**	**2.1000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0552**	**0.0552**	**0.0000**	**0.0000**	**0.0556**

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					0.0409	0.0000	0.0409	8.4000e-003	0.0000	8.4000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.2400e-003	0.0126	8.9600e-003	2.0000e-005		5.4000e-004	5.4000e-004		5.0000e-004	5.0000e-004	0.0000	1.6734	1.6734	5.4000e-004	0.0000	1.6869
Total	**1.2400e-003**	**0.0126**	**8.9600e-003**	**2.0000e-005**	**0.0409**	**5.4000e-004**	**0.0414**	**8.4000e-003**	**5.0000e-004**	**8.9000e-003**	**0.0000**	**1.6734**	**1.6734**	**5.4000e-004**	**0.0000**	**1.6869**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Site Preparation - 2026

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	2.0000e-005	1.0000e-005	2.1000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0552	0.0552	0.0000	0.0000	0.0556
Total	**2.0000e-005**	**1.0000e-005**	**2.1000e-004**	**0.0000**	**7.0000e-005**	**0.0000**	**7.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0552**	**0.0552**	**0.0000**	**0.0000**	**0.0556**

3.4 Grading - 2026

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					0.5062	0.0000	0.5062	0.2010	0.0000	0.2010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1596	1.5369	1.4482	3.4100e-003		0.0622	0.0622		0.0572	0.0572	0.0000	299.7842	299.7842	0.0970	0.0000	302.2081
Total	**0.1596**	**1.5369**	**1.4482**	**3.4100e-003**	**0.5062**	**0.0622**	**0.5684**	**0.2010**	**0.0572**	**0.2582**	**0.0000**	**299.7842**	**299.7842**	**0.0970**	**0.0000**	**302.2081**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Grading - 2026

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	2.9900e-003	1.7500e-003	0.0251	7.0000e-005	8.7600e-003	5.0000e-005	8.8100e-003	2.3300e-003	4.0000e-005	2.3700e-003	0.0000	6.7408	6.7408	1.8000e-004	1.8000e-004	6.7977
Total	**2.9900e-003**	**1.7500e-003**	**0.0251**	**7.0000e-005**	**8.7600e-003**	**5.0000e-005**	**8.8100e-003**	**2.3300e-003**	**4.0000e-005**	**2.3700e-003**	**0.0000**	**6.7408**	**6.7408**	**1.8000e-004**	**1.8000e-004**	**6.7977**

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					0.5062	0.0000	0.5062	0.2010	0.0000	0.2010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1596	1.5369	1.4482	3.4100e-003		0.0622	0.0622		0.0572	0.0572	0.0000	299.7838	299.7838	0.0970	0.0000	302.2077
Total	**0.1596**	**1.5369**	**1.4482**	**3.4100e-003**	**0.5062**	**0.0622**	**0.5684**	**0.2010**	**0.0572**	**0.2582**	**0.0000**	**299.7838**	**299.7838**	**0.0970**	**0.0000**	**302.2077**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Grading - 2026

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	2.9900e-003	1.7500e-003	0.0251	7.0000e-005	8.7600e-003	5.0000e-005	8.8100e-003	2.3300e-003	4.0000e-005	2.3700e-003	0.0000	6.7408	6.7408	1.8000e-004	1.8000e-004	6.7977
Total	**2.9900e-003**	**1.7500e-003**	**0.0251**	**7.0000e-005**	**8.7600e-003**	**5.0000e-005**	**8.8100e-003**	**2.3300e-003**	**4.0000e-005**	**2.3700e-003**	**0.0000**	**6.7408**	**6.7408**	**1.8000e-004**	**1.8000e-004**	**6.7977**

3.5 Building Construction - 2026

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	0.1026	0.9352	1.2064	2.0200e-003		0.0396	0.0396		0.0372	0.0372	0.0000	173.9396	173.9396	0.0409	0.0000	174.9618
Total	**0.1026**	**0.9352**	**1.2064**	**2.0200e-003**		**0.0396**	**0.0396**		**0.0372**	**0.0372**	**0.0000**	**173.9396**	**173.9396**	**0.0409**	**0.0000**	**174.9618**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2026

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	4.8900e-003	0.1969	0.0608	8.7000e-004	0.0298	1.3000e-003	0.0311	8.6000e-003	1.2400e-003	9.8400e-003	0.0000	83.6498	83.6498	2.8000e-004	0.0122	87.2798
Worker	0.0371	0.0217	0.3113	9.1000e-004	0.1087	6.0000e-004	0.1093	0.0289	5.5000e-004	0.0295	0.0000	83.6471	83.6471	2.2700e-003	2.1800e-003	84.3538
Total	**0.0420**	**0.2186**	**0.3721**	**1.7800e-003**	**0.1385**	**1.9000e-003**	**0.1404**	**0.0375**	**1.7900e-003**	**0.0393**	**0.0000**	**167.2968**	**167.2968**	**2.5500e-003**	**0.0143**	**171.6337**

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	0.1026	0.9352	1.2064	2.0200e-003		0.0396	0.0396		0.0372	0.0372	0.0000	173.9394	173.9394	0.0409	0.0000	174.9616
Total	**0.1026**	**0.9352**	**1.2064**	**2.0200e-003**		**0.0396**	**0.0396**		**0.0372**	**0.0372**	**0.0000**	**173.9394**	**173.9394**	**0.0409**	**0.0000**	**174.9616**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2026

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	4.8900e-003	0.1969	0.0608	8.7000e-004	0.0298	1.3000e-003	0.0311	8.6000e-003	1.2400e-003	9.8400e-003	0.0000	83.6498	83.6498	2.8000e-004	0.0122	87.2798
Worker	0.0371	0.0217	0.3113	9.1000e-004	0.1087	6.0000e-004	0.1093	0.0289	5.5000e-004	0.0295	0.0000	83.6471	83.6471	2.2700e-003	2.1800e-003	84.3538
Total	**0.0420**	**0.2186**	**0.3721**	**1.7800e-003**	**0.1385**	**1.9000e-003**	**0.1404**	**0.0375**	**1.7900e-003**	**0.0393**	**0.0000**	**167.2968**	**167.2968**	**2.5500e-003**	**0.0143**	**171.6337**

3.5 Building Construction - 2027

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	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2027

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	8.3200e-003	0.3403	0.1036	1.4900e-003	0.0518	2.2400e-003	0.0540	0.0150	2.1500e-003	0.0171	0.0000	142.7094	142.7094	4.8000e-004	0.0207	148.8905
Worker	0.0601	0.0340	0.5074	1.5400e-003	0.1892	9.9000e-004	0.1902	0.0503	9.1000e-004	0.0512	0.0000	141.1592	141.1592	3.5800e-003	3.5800e-003	142.3146
Total	**0.0684**	**0.3743**	**0.6110**	**3.0300e-003**	**0.2410**	**3.2300e-003**	**0.2442**	**0.0653**	**3.0600e-003**	**0.0683**	**0.0000**	**283.8686**	**283.8686**	**4.0600e-003**	**0.0243**	**291.2051**

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	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2027

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	8.3200e-003	0.3403	0.1036	1.4900e-003	0.0518	2.2400e-003	0.0540	0.0150	2.1500e-003	0.0171	0.0000	142.7094	142.7094	4.8000e-004	0.0207	148.8905
Worker	0.0601	0.0340	0.5074	1.5400e-003	0.1892	9.9000e-004	0.1902	0.0503	9.1000e-004	0.0512	0.0000	141.1592	141.1592	3.5800e-003	3.5800e-003	142.3146
Total	**0.0684**	**0.3743**	**0.6110**	**3.0300e-003**	**0.2410**	**3.2300e-003**	**0.2442**	**0.0653**	**3.0600e-003**	**0.0683**	**0.0000**	**283.8686**	**283.8686**	**4.0600e-003**	**0.0243**	**291.2051**

3.5 Building Construction - 2028

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	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4953	301.4953	0.0709	0.0000	303.2671
Total	**0.1778**	**1.6211**	**2.0910**	**3.5000e-003**		**0.0686**	**0.0686**		**0.0645**	**0.0645**	**0.0000**	**301.4953**	**301.4953**	**0.0709**	**0.0000**	**303.2671**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2028

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	8.1300e-003	0.3373	0.1013	1.4600e-003	0.0516	2.2200e-003	0.0538	0.0149	2.1200e-003	0.0170	0.0000	139.4583	139.4583	4.7000e-004	0.0202	145.4861
Worker	0.0556	0.0308	0.4771	1.4900e-003	0.1885	9.2000e-004	0.1894	0.0501	8.5000e-004	0.0510	0.0000	136.6849	136.6849	3.2600e-003	3.3800e-003	137.7741
Total	**0.0637**	**0.3681**	**0.5785**	**2.9500e-003**	**0.2400**	**3.1400e-003**	**0.2432**	**0.0650**	**2.9700e-003**	**0.0680**	**0.0000**	**276.1433**	**276.1433**	**3.7300e-003**	**0.0236**	**283.2601**

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	0.1778	1.6211	2.0910	3.5000e-003		0.0686	0.0686		0.0645	0.0645	0.0000	301.4949	301.4949	0.0709	0.0000	303.2667
Total	**0.1778**	**1.6211**	**2.0910**	**3.5000e-003**		**0.0686**	**0.0686**		**0.0645**	**0.0645**	**0.0000**	**301.4949**	**301.4949**	**0.0709**	**0.0000**	**303.2667**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2028

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	8.1300e-003	0.3373	0.1013	1.4600e-003	0.0516	2.2200e-003	0.0538	0.0149	2.1200e-003	0.0170	0.0000	139.4583	139.4583	4.7000e-004	0.0202	145.4861
Worker	0.0556	0.0308	0.4771	1.4900e-003	0.1885	9.2000e-004	0.1894	0.0501	8.5000e-004	0.0510	0.0000	136.6849	136.6849	3.2600e-003	3.3800e-003	137.7741
Total	**0.0637**	**0.3681**	**0.5785**	**2.9500e-003**	**0.2400**	**3.1400e-003**	**0.2432**	**0.0650**	**2.9700e-003**	**0.0680**	**0.0000**	**276.1433**	**276.1433**	**3.7300e-003**	**0.0236**	**283.2601**

3.5 Building Construction - 2029

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	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	**0.1785**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6549**	**302.6549**	**0.0711**	**0.0000**	**304.4335**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2029

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	8.0100e-003	0.3367	0.1002	1.4400e-003	0.0518	2.2100e-003	0.0540	0.0150	2.1100e-003	0.0171	0.0000	137.3638	137.3638	4.6000e-004	0.0198	143.2889
Worker	0.0518	0.0283	0.4546	1.4600e-003	0.1892	8.6000e-004	0.1901	0.0503	8.0000e-004	0.0511	0.0000	133.6703	133.6703	3.0000e-003	3.2400e-003	134.7116
Total	**0.0598**	**0.3650**	**0.5548**	**2.9000e-003**	**0.2410**	**3.0700e-003**	**0.2440**	**0.0653**	**2.9100e-003**	**0.0682**	**0.0000**	**271.0340**	**271.0340**	**3.4600e-003**	**0.0231**	**278.0005**

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	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	**0.1784**	**1.6273**	**2.0991**	**3.5200e-003**		**0.0689**	**0.0689**		**0.0648**	**0.0648**	**0.0000**	**302.6545**	**302.6545**	**0.0711**	**0.0000**	**304.4331**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2029

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	8.0100e-003	0.3367	0.1002	1.4400e-003	0.0518	2.2100e-003	0.0540	0.0150	2.1100e-003	0.0171	0.0000	137.3638	137.3638	4.6000e-004	0.0198	143.2889
Worker	0.0518	0.0283	0.4546	1.4600e-003	0.1892	8.6000e-004	0.1901	0.0503	8.0000e-004	0.0511	0.0000	133.6703	133.6703	3.0000e-003	3.2400e-003	134.7116
Total	**0.0598**	**0.3650**	**0.5548**	**2.9000e-003**	**0.2410**	**3.0700e-003**	**0.2440**	**0.0653**	**2.9100e-003**	**0.0682**	**0.0000**	**271.0340**	**271.0340**	**3.4600e-003**	**0.0231**	**278.0005**

3.5 Building Construction - 2030

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	0.1165	0.7062	1.4380	2.7600e-003		0.0132	0.0132		0.0132	0.0132	0.0000	233.9463	233.9463	9.3900e-003	0.0000	234.1810
Total	**0.1165**	**0.7062**	**1.4380**	**2.7600e-003**		**0.0132**	**0.0132**		**0.0132**	**0.0132**	**0.0000**	**233.9463**	**233.9463**	**9.3900e-003**	**0.0000**	**234.1810**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2030

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	5.3900e-003	0.2286	0.0675	9.6000e-004	0.0353	1.5000e-003	0.0368	0.0102	1.4300e-003	0.0116	0.0000	92.0492	92.0492	3.1000e-004	0.0133	96.0121
Worker	0.0328	0.0178	0.2961	9.7000e-004	0.1290	5.5000e-004	0.1296	0.0343	5.1000e-004	0.0348	0.0000	89.0074	89.0074	1.8800e-003	2.1300e-003	89.6877
Total	**0.0382**	**0.2464**	**0.3636**	**1.9300e-003**	**0.1643**	**2.0500e-003**	**0.1664**	**0.0445**	**1.9400e-003**	**0.0465**	**0.0000**	**181.0566**	**181.0566**	**2.1900e-003**	**0.0154**	**185.6998**

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	0.1165	0.7062	1.4380	2.7600e-003		0.0132	0.0132		0.0132	0.0132	0.0000	233.9460	233.9460	9.3900e-003	0.0000	234.1807
Total	**0.1165**	**0.7062**	**1.4380**	**2.7600e-003**		**0.0132**	**0.0132**		**0.0132**	**0.0132**	**0.0000**	**233.9460**	**233.9460**	**9.3900e-003**	**0.0000**	**234.1807**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Building Construction - 2030

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	5.3900e-003	0.2286	0.0675	9.6000e-004	0.0353	1.5000e-003	0.0368	0.0102	1.4300e-003	0.0116	0.0000	92.0492	92.0492	3.1000e-004	0.0133	96.0121
Worker	0.0328	0.0178	0.2961	9.7000e-004	0.1290	5.5000e-004	0.1296	0.0343	5.1000e-004	0.0348	0.0000	89.0074	89.0074	1.8800e-003	2.1300e-003	89.6877
Total	**0.0382**	**0.2464**	**0.3636**	**1.9300e-003**	**0.1643**	**2.0500e-003**	**0.1664**	**0.0445**	**1.9400e-003**	**0.0465**	**0.0000**	**181.0566**	**181.0566**	**2.1900e-003**	**0.0154**	**185.6998**

3.6 Paving - 2030

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	0.0519	0.2670	0.5944	1.0500e-003		0.0124	0.0124		0.0124	0.0124	0.0000	90.3732	90.3732	4.2400e-003	0.0000	90.4791
Paving	3.9300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0559**	**0.2670**	**0.5944**	**1.0500e-003**		**0.0124**	**0.0124**		**0.0124**	**0.0124**	**0.0000**	**90.3732**	**90.3732**	**4.2400e-003**	**0.0000**	**90.4791**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Paving - 2030

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	1.1400e-003	6.2000e-004	0.0103	3.0000e-005	4.4800e-003	2.0000e-005	4.5000e-003	1.1900e-003	2.0000e-005	1.2100e-003	0.0000	3.0909	3.0909	7.0000e-005	7.0000e-005	3.1145
Total	**1.1400e-003**	**6.2000e-004**	**0.0103**	**3.0000e-005**	**4.4800e-003**	**2.0000e-005**	**4.5000e-003**	**1.1900e-003**	**2.0000e-005**	**1.2100e-003**	**0.0000**	**3.0909**	**3.0909**	**7.0000e-005**	**7.0000e-005**	**3.1145**

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	0.0519	0.2670	0.5944	1.0500e-003		0.0124	0.0124		0.0124	0.0124	0.0000	90.3731	90.3731	4.2400e-003	0.0000	90.4790
Paving	3.9300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0559**	**0.2670**	**0.5944**	**1.0500e-003**		**0.0124**	**0.0124**		**0.0124**	**0.0124**	**0.0000**	**90.3731**	**90.3731**	**4.2400e-003**	**0.0000**	**90.4790**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Paving - 2030

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	1.1400e-003	6.2000e-004	0.0103	3.0000e-005	4.4800e-003	2.0000e-005	4.5000e-003	1.1900e-003	2.0000e-005	1.2100e-003	0.0000	3.0909	3.0909	7.0000e-005	7.0000e-005	3.1145
Total	**1.1400e-003**	**6.2000e-004**	**0.0103**	**3.0000e-005**	**4.4800e-003**	**2.0000e-005**	**4.5000e-003**	**1.1900e-003**	**2.0000e-005**	**1.2100e-003**	**0.0000**	**3.0909**	**3.0909**	**7.0000e-005**	**7.0000e-005**	**3.1145**

3.7 Architectural Coating - 2030

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	0.5760					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2000e-004	3.4300e-003	7.1900e-003	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.0213	1.0213	4.0000e-005	0.0000	1.0223
Total	**0.5765**	**3.4300e-003**	**7.1900e-003**	**1.0000e-005**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**1.0213**	**1.0213**	**4.0000e-005**	**0.0000**	**1.0223**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Architectural Coating - 2030

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	1.6000e-004	2.6300e-003	1.0000e-005	1.1500e-003	0.0000	1.1500e-003	3.0000e-004	0.0000	3.1000e-004	0.0000	0.7913	0.7913	2.0000e-005	2.0000e-005	0.7973
Total	**2.9000e-004**	**1.6000e-004**	**2.6300e-003**	**1.0000e-005**	**1.1500e-003**	**0.0000**	**1.1500e-003**	**3.0000e-004**	**0.0000**	**3.1000e-004**	**0.0000**	**0.7913**	**0.7913**	**2.0000e-005**	**2.0000e-005**	**0.7973**

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	0.5760					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2000e-004	3.4300e-003	7.1900e-003	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.0213	1.0213	4.0000e-005	0.0000	1.0223
Total	**0.5765**	**3.4300e-003**	**7.1900e-003**	**1.0000e-005**		**8.0000e-005**	**8.0000e-005**		**8.0000e-005**	**8.0000e-005**	**0.0000**	**1.0213**	**1.0213**	**4.0000e-005**	**0.0000**	**1.0223**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Architectural Coating - 2030

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	1.6000e-004	2.6300e-003	1.0000e-005	1.1500e-003	0.0000	1.1500e-003	3.0000e-004	0.0000	3.1000e-004	0.0000	0.7913	0.7913	2.0000e-005	2.0000e-005	0.7973
Total	**2.9000e-004**	**1.6000e-004**	**2.6300e-003**	**1.0000e-005**	**1.1500e-003**	**0.0000**	**1.1500e-003**	**3.0000e-004**	**0.0000**	**3.1000e-004**	**0.0000**	**0.7913**	**0.7913**	**2.0000e-005**	**2.0000e-005**	**0.7973**

3.7 Architectural Coating - 2031

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	4.8238					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3800e-003	0.0287	0.0602	1.0000e-004		6.8000e-004	6.8000e-004		6.8000e-004	6.8000e-004	0.0000	8.5534	8.5534	3.5000e-004	0.0000	8.5621
Total	**4.8281**	**0.0287**	**0.0602**	**1.0000e-004**		**6.8000e-004**	**6.8000e-004**		**6.8000e-004**	**6.8000e-004**	**0.0000**	**8.5534**	**8.5534**	**3.5000e-004**	**0.0000**	**8.5621**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Architectural Coating - 2031

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	2.2500e-003	1.2300e-003	0.0211	7.0000e-005	9.6100e-003	4.0000e-005	9.6400e-003	2.5500e-003	4.0000e-005	2.5900e-003	0.0000	6.4841	6.4841	1.3000e-004	1.5000e-004	6.5329
Total	**2.2500e-003**	**1.2300e-003**	**0.0211**	**7.0000e-005**	**9.6100e-003**	**4.0000e-005**	**9.6400e-003**	**2.5500e-003**	**4.0000e-005**	**2.5900e-003**	**0.0000**	**6.4841**	**6.4841**	**1.3000e-004**	**1.5000e-004**	**6.5329**

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	4.8238					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3800e-003	0.0287	0.0602	1.0000e-004		6.8000e-004	6.8000e-004		6.8000e-004	6.8000e-004	0.0000	8.5534	8.5534	3.5000e-004	0.0000	8.5620
Total	**4.8281**	**0.0287**	**0.0602**	**1.0000e-004**		**6.8000e-004**	**6.8000e-004**		**6.8000e-004**	**6.8000e-004**	**0.0000**	**8.5534**	**8.5534**	**3.5000e-004**	**0.0000**	**8.5620**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.7 Architectural Coating - 2031

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	2.2500e-003	1.2300e-003	0.0211	7.0000e-005	9.6100e-003	4.0000e-005	9.6400e-003	2.5500e-003	4.0000e-005	2.5900e-003	0.0000	6.4841	6.4841	1.3000e-004	1.5000e-004	6.5329
Total	**2.2500e-003**	**1.2300e-003**	**0.0211**	**7.0000e-005**	**9.6100e-003**	**4.0000e-005**	**9.6400e-003**	**2.5500e-003**	**4.0000e-005**	**2.5900e-003**	**0.0000**	**6.4841**	**6.4841**	**1.3000e-004**	**1.5000e-004**	**6.5329**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Improve Destination Accessibility

Increase Transit Accessibility

Improve Pedestrian Network

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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	0.9877	1.4975	8.2586	0.0185	2.0640	0.0163	2.0803	0.5524	0.0153	0.5678	0.0000	1,707.0970	1,707.0970	0.0979	0.1012	1,739.6879
Unmitigated	1.2140	2.0392	11.3510	0.0279	3.1741	0.0243	3.1984	0.8495	0.0228	0.8724	0.0000	2,581.2698	2,581.2698	0.1293	0.1414	2,626.6261

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	3,001.92	3,033.72	2718.90	8,489,520	5,520,395
City Park	0.53	1.33	1.49	1,669	1,086
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	3,002.45	3,035.05	2,720.39	8,491,190	5,521,480

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	10.80	7.30	7.50	42.30	19.60	38.10	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.550489	0.053367	0.169417	0.127478	0.023832	0.006624	0.011004	0.028934	0.000852	0.000210	0.022899	0.001806	0.003088
City Park	0.550489	0.053367	0.169417	0.127478	0.023832	0.006624	0.011004	0.028934	0.000852	0.000210	0.022899	0.001806	0.003088

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Other Asphalt Surfaces	0.550489	0.053367	0.169417	0.127478	0.023832	0.006624	0.011004	0.028934	0.000852	0.000210	0.022899	0.001806	0.003088

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	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	234.6143	234.6143	0.0380	4.6000e-003	236.9342
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	234.6143	234.6143	0.0380	4.6000e-003	236.9342
NaturalGas Mitigated	0.0412	0.3522	0.1499	2.2500e-003		0.0285	0.0285		0.0285	0.0285	0.0000	407.9098	407.9098	7.8200e-003	7.4800e-003	410.3338
NaturalGas Unmitigated	0.0412	0.3522	0.1499	2.2500e-003		0.0285	0.0285		0.0285	0.0285	0.0000	407.9098	407.9098	7.8200e-003	7.4800e-003	410.3338

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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
Other Asphalt Surfaces	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
Single Family Housing	7.64394e+006	0.0412	0.3522	0.1499	2.2500e-003		0.0285	0.0285		0.0285	0.0285	0.0000	407.9098	407.9098	7.8200e-003	7.4800e-003	410.3338
Total		**0.0412**	**0.3522**	**0.1499**	**2.2500e-003**		**0.0285**	**0.0285**		**0.0285**	**0.0285**	**0.0000**	**407.9098**	**407.9098**	**7.8200e-003**	**7.4800e-003**	**410.3338**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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
Other Asphalt Surfaces	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
Single Family Housing	7.64394e+006	0.0412	0.3522	0.1499	2.2500e-003		0.0285	0.0285		0.0285	0.0285	0.0000	407.9098	407.9098	7.8200e-003	7.4800e-003	410.3338
Total		**0.0412**	**0.3522**	**0.1499**	**2.2500e-003**		**0.0285**	**0.0285**		**0.0285**	**0.0285**	**0.0000**	**407.9098**	**407.9098**	**7.8200e-003**	**7.4800e-003**	**410.3338**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	2.53572e+006	234.6143	0.0380	4.6000e-003	236.9342
Total		**234.6143**	**0.0380**	**4.6000e-003**	**236.9342**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	2.53572e+006	234.6143	0.0380	4.6000e-003	236.9342
Total		**234.6143**	**0.0380**	**4.6000e-003**	**236.9342**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	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	2.8552	0.0272	2.3550	1.2000e-004		0.0131	0.0131		0.0131	0.0131	0.0000	3.8570	3.8570	3.6700e-003	0.0000	3.9489
Unmitigated	2.8552	0.0272	2.3550	1.2000e-004		0.0131	0.0131		0.0131	0.0131	0.0000	3.8570	3.8570	3.6700e-003	0.0000	3.9489

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	0.5400					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.2447					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0704	0.0272	2.3550	1.2000e-004		0.0131	0.0131		0.0131	0.0131	0.0000	3.8570	3.8570	3.6700e-003	0.0000	3.9489
Total	**2.8552**	**0.0272**	**2.3550**	**1.2000e-004**		**0.0131**	**0.0131**		**0.0131**	**0.0131**	**0.0000**	**3.8570**	**3.8570**	**3.6700e-003**	**0.0000**	**3.9489**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.5400					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.2447					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0704	0.0272	2.3550	1.2000e-004		0.0131	0.0131		0.0131	0.0131	0.0000	3.8570	3.8570	3.6700e-003	0.0000	3.9489
Total	**2.8552**	**0.0272**	**2.3550**	**1.2000e-004**		**0.0131**	**0.0131**		**0.0131**	**0.0131**	**0.0000**	**3.8570**	**3.8570**	**3.6700e-003**	**0.0000**	**3.9489**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	21.4383	0.6775	0.0162	43.2140
Unmitigated	21.4383	0.6775	0.0162	43.2140

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0.810207	0.2624	4.0000e-005	1.0000e-005	0.2650
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	20.719 / 13.062	21.1760	0.6775	0.0162	42.9490
Total		**21.4383**	**0.6775**	**0.0162**	**43.2140**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 0.810207	0.2624	4.0000e-005	1.0000e-005	0.2650
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	20.719 / 13.062	21.1760	0.6775	0.0162	42.9490
Total		**21.4383**	**0.6775**	**0.0162**	**43.2140**

8.0 Waste Detail

8.1 Mitigation Measures Waste

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	66.4389	3.9264	0.0000	164.5997
Unmitigated	66.4389	3.9264	0.0000	164.5997

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.06	0.0122	7.2000e-004	0.0000	0.0302
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	327.24	66.4268	3.9257	0.0000	164.5695
Total		**66.4389**	**3.9264**	**0.0000**	**164.5997**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.06	0.0122	7.2000e-004	0.0000	0.0302
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	327.24	66.4268	3.9257	0.0000	164.5695
Total		**66.4389**	**3.9264**	**0.0000**	**164.5997**

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

11.0 Vegetation

Appendix B

Biological Evaluation

LIVE OAK
ASSOCIATES, INC.

BIOLOGICAL EVALUATION
CARMEL HOMES IV TENTATIVE TRACT MAP
MADERA, MADERA COUNTY, CA

By:

LIVE OAK ASSOCIATES, INC.

Austin Pearson, Vice President
Rebekah Jensen, Senior Project Manager, Staff Ecologist
Colleen Del Vecchio, Project Manager/Staff Ecologist and Arborist

For:

Molly Baumeister
4-Creeks, Inc.
324 South Santa Fe Street, Suite A
Visalia, CA 93292

EXECUTIVE SUMMARY

Live Oak Associates, Inc. (LOA) conducted an investigation of the biotic resources of an approximately 58-acre property ("project site") planned for subdivision and future buildout of a 318-unit housing development, and evaluated potential impacts to such resources resulting from project implementation. The project site is located just within the southern limits of the City of Madera in Madera County, California.

The site has experienced decades of agricultural disturbance, and has been in almond production since 2014. The site's orchard habitat has the potential to support various native wildlife species, but is generally unsuitable for special status animals and entirely unsuitable for special status plants. One special status animal, the loggerhead shrike, may occasionally forage within the site's orchards but would not breed on or near the site.

Future site buildout will invariably impact some biotic resources. One potential impact, construction-related mortality or disturbance of nesting birds and raptors, would be considered significant as defined by the California Environmental Quality Act. This impact can be avoided or minimized by: (1) timing site buildout to avoid the avian nesting season; (2) conducting surveys for active raptor and migratory bird nests in advance of any construction that must take place during the nesting season; and (3) avoiding such nests during the nesting season with appropriate buffers for each species, as determined by a qualified biologist.

The project is not expected to significantly impact any special status plant or animal species, sensitive natural communities or designated critical habitat, wildlife movement corridors, or jurisdictional waters, and appears to be consistent with the City of Madera General Plan.

TABLE OF CONTENTS

1.0 INTRODUCTION

The following technical report, prepared by Live Oak Associates, Inc. (LOA) in support of California Environmental Quality Act (CEQA) review, describes the biotic resources of an approximately 58-acre parcel ("project site" or "site") that may be impacted by proposed development of tract housing ("project"), and evaluates potential impacts to those resources that could result from the project.

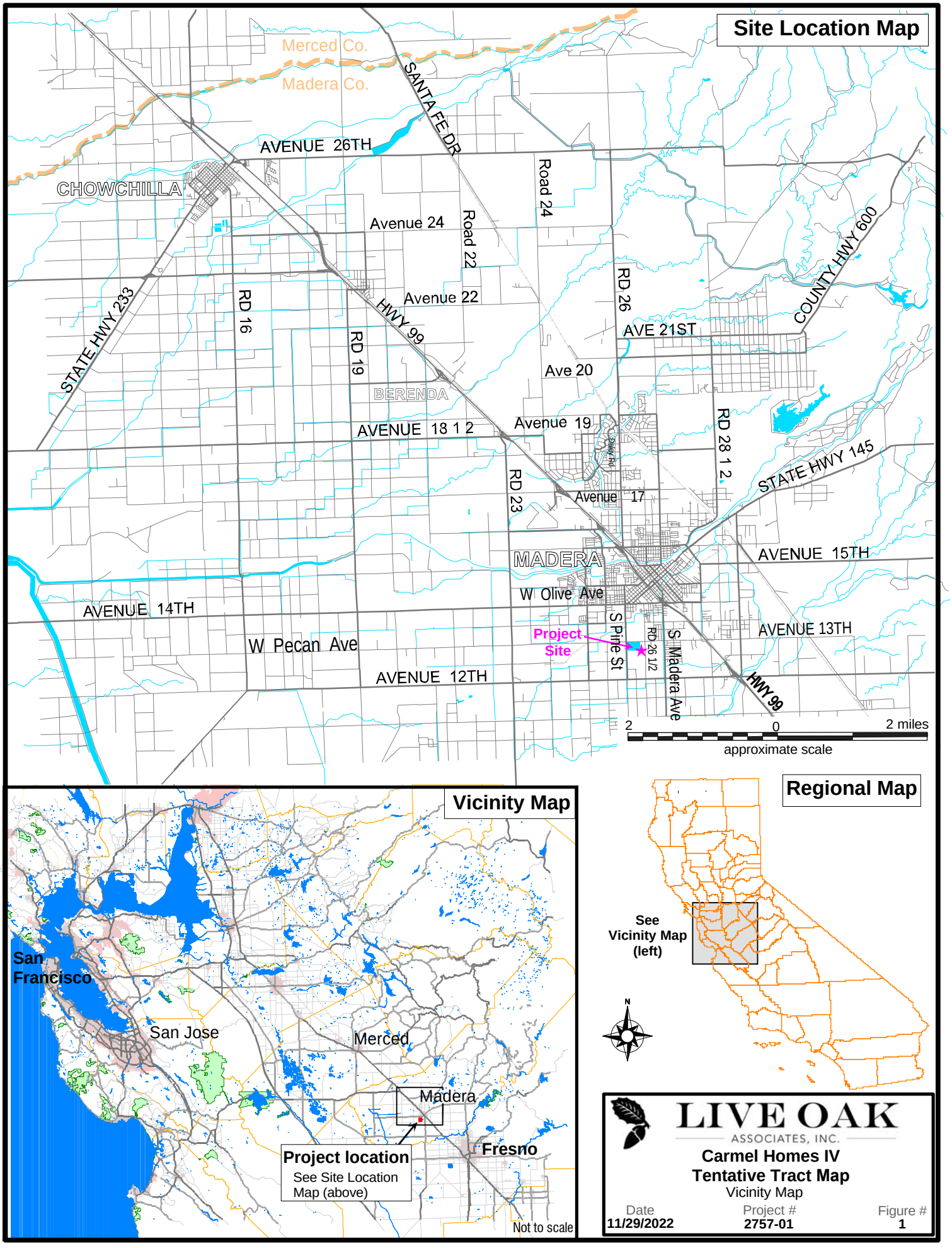
The site is located at the northeast intersection of Stadium Road and West Pecan Avenue, in the south central area of the City of Madera, Madera County, California (Figure 1). The site may be found entirely on the *Madera* U.S. Geological Survey (USGS) 7.5-minute quadrangle in Section 36, Township 11 South, Range 17 East (Figure 2).

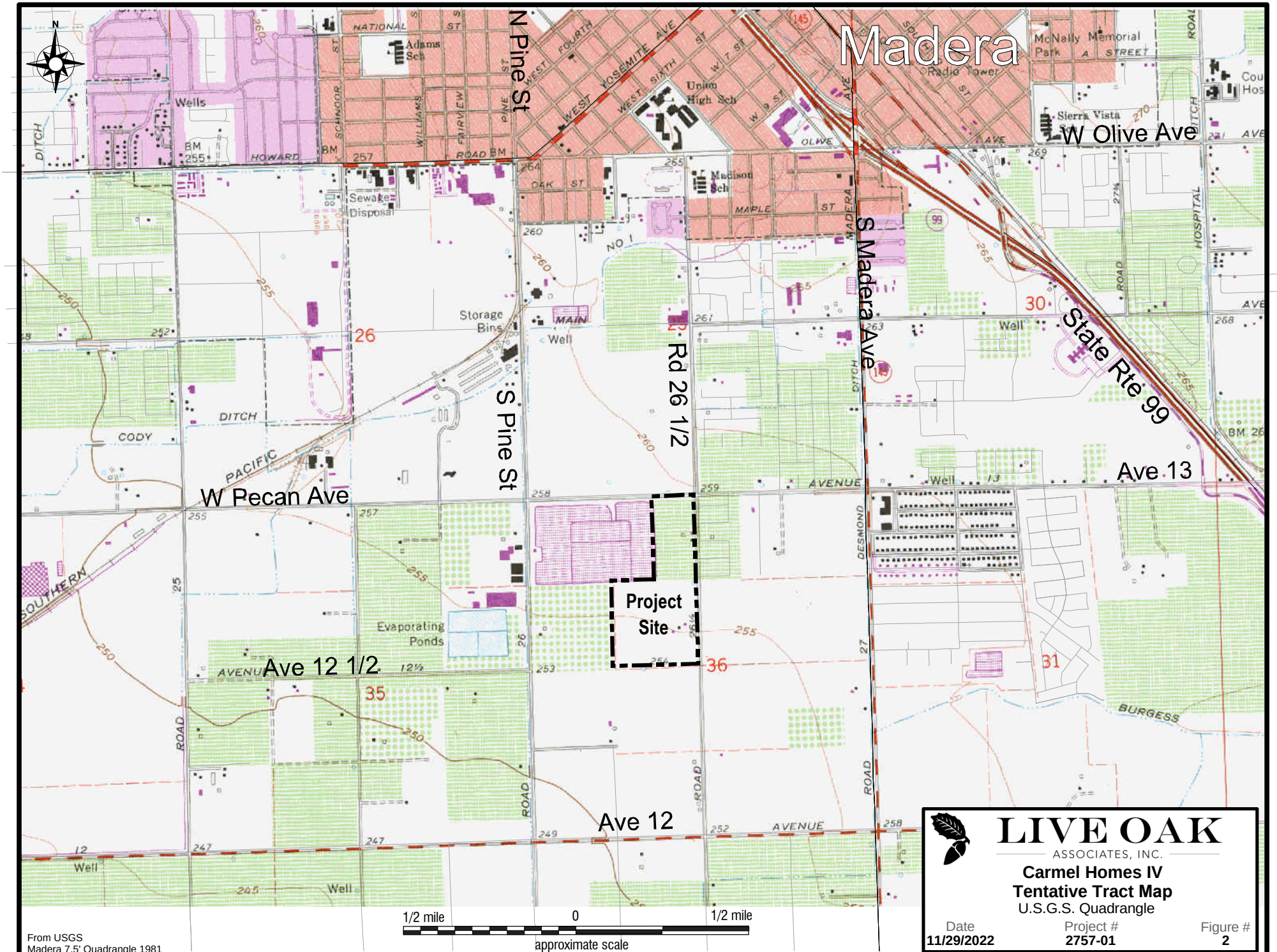
1.1 PROJECT DESCRIPTION

DMP Development Corporation, Inc. is seeking approval of the Carmel Homes IV Tentative Tract Map, a proposed 58-acre tract housing development. This housing development will include 318 units, two parks, and associated road and utility infrastructure. The lot sizes for each unit range from 5,000 square feet to 11,210 square feet. The tentative map is included as Appendix A.

1.2 REPORT OBJECTIVES

Development projects such as that proposed by the project partners may damage or modify biotic habitats used by sensitive plant and wildlife species. In such cases, site development may be regulated by state or federal agencies, subject to review under CEQA and/or subject to local policies and ordinances. This report addresses issues related to: 1) sensitive biotic resources occurring within the project site; 2) the federal, state, and local laws regulating such resources; and 3) mitigation measures that may be required to reduce the magnitude of anticipated impacts and/or comply with permit requirements of state and federal resource agencies. As such, the objectives of this report are to:


Site Location Map
Merced Co.
Madera Co.
SANTA FE DR
AVENUE 26TH
CHOWCHILLA
Avenue 24
Road 22
Road 24
RD 26
COUNTY HWY 600
AVE 21ST
STATE HWY 233
RD 16
RD 19
HWY 99
Avenue 22
Ave 20
BERENDA
AVENUE 18 1 2
Avenue 19
RD 28 1 2
STATE HWY 145
RD 23
Avenue 17
MADERA
AVENUE 15TH
W Olive Ave
AVENUE 14TH
W Pecan Ave
Project Site
S Pine St
RD 26 1/2
S Madera Ave
AVENUE 13TH
AVENUE 12TH
HWY 99
2 0 2 miles
approximate scale
Vicinity Map
San Francisco
San Jose
Merced
Madera
Fresno
Project location
See Site Location Map (above)
Not to scale
Regional Map
See Vicinity Map (left)
N
LIVE OAK
ASSOCIATES, INC.
Carmel Homes IV
Tentative Tract Map
Vicinity Map
Date
11/29/2022
Project #
2757-01
Figure #
1



From USGS
Madera 7.5' Quadrangle 1981

LIVE OAK
ASSOCIATES, INC.

Carmel Homes IV
Tentative Tract Map
U.S.G.S. Quadrangle

Date	Project #	Figure #
11/29/2022	**2757-01**	**2**

- Summarize all site-specific information related to existing biological resources.
- Make reasonable inferences about the biological resources that could occur onsite based on habitat suitability and the proximity of the site to a species' known range.
- Summarize all state and federal natural resource protection laws that may be relevant to possible future site development.
- Identify and discuss project impacts to biological resources that may occur within the project site within the context of CEQA guidelines and relevant state and federal laws.
- Identify avoidance and mitigation measures that would reduce the magnitude of project impacts in a manner consistent with the requirements of CEQA and that are generally consistent with recommendations of the resource agencies regulating affected biological resources.

1.3 STUDY METHODOLOGY

Prior to any field investigations, a background review of the project site and region was conducted. Sources of information used included: (1) the *California Natural Diversity Database* (CDFW 2022), (2) the *Online Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2022), and (3) manuals, reports, and references related to plants and animals of the San Joaquin Valley region.

A reconnaissance-level field survey of the project site was conducted on November 23, 2022 by LOA ecologist Colleen Del Vecchio. The survey consisted of walking the project site while identifying its principal land uses and the constituent plants and animals of each land use. The field survey conducted for this study was sufficient to assess the significance of possible biological impacts associated with the development plans for the project site.

LOA's field investigation did not include an aquatic resources delineation or focused surveys for special status species. The field survey was sufficient to generally describe any aquatic features of the project site that could be subject to the jurisdiction of the U.S. Army Corps of Engineers

(USACE), California Department of Fish and Wildlife (CDFW), and/or the Regional Water Quality Control Board (RWQCB), and to assess the significance of possible biological impacts associated with development of the project site.

Following the field survey, LOA conducted an analysis of potential project impacts based on the known and potential biotic resources of the project site discussed in Section 2.0.

2.0 EXISTING CONDITIONS

2.1 REGIONAL SETTING

The project site is located on the east side of California's San Joaquin Valley. The San Joaquin Valley is bordered by the Sierra Nevada to the east, the Tehachapi Mountains to the south, and the California coastal ranges to the west, and the Sacramento-San Joaquin Delta to the north.

Like most of California, the San Joaquin Valley has a Mediterranean climate. Warm dry summers are followed by cool moist winters. Summer temperatures commonly exceed 100 degrees Fahrenheit, and the relative humidity is generally very low. Winter temperatures rarely rise much above 70 degrees Fahrenheit, with daytime highs often below 60 degrees Fahrenheit. Annual precipitation within the project site is about 11 inches, almost 85% of which falls between the months of October and March. Nearly all precipitation falls in the form of rain. Stormwater readily infiltrates the soils of and surrounding the project site.

The principal drainage in the project vicinity is the Fresno River, which passes within 2 miles of the project site at its closest point. The Fresno River originates in the Oakhurst area at the confluence of Lewis and Nelder Creeks. It flows generally southwest until it reaches the valley floor, then flows west across the valley before entering the Eastside Bypass and ultimately the San Joaquin River.

The site is situated in a portion of the San Joaquin Valley that has experienced intensive agricultural disturbances and, more recently, intensive urban development associated with the City of Madera. Native plant and animal species once abundant in the region have experienced large reductions in their populations due to conversion of upland, riparian, and aquatic habitats to agricultural and urban uses. Remaining native habitats are particularly valuable to native wildlife species including special status species that still persist in the region.

Land use surrounding the project site is best described as Madera South High School to the north, tract housing and almond orchards to the east, almond orchards and farm residences to the south,

and a complex of ponding basins and pistachio groves to the west. The project site is near the south central city limits and beyond this the land use is dominated by agriculture.

2.2 PHYSICAL CONDITIONS OF PROJECT SITE

The overall topography of the project site is flat with an approximate elevation of 260 feet National Geodetic Vertical Datum (NGVD). Two soil-mapping units were identified within the site: Grangeville fine sandy loam, 0 to 1 percent slope, MLRA 17; and Tujunga loamy sand, 0 to 3 percent slope (NRCS 2022). The Grangeville fine sandy loam is classified as somewhat poorly drained with a high runoff class, and a hydric soil rating, meaning that it has the propensity to pond water in depressions and form vernal pools. The Tujunga loamy sand is classified as somewhat excessively drained with a very low runoff class and no hydric soil rating.

2.3 BIOTIC HABITAT

One biotic habitat was identified on the project site during the site visit: agricultural orchard (Figure 3). A comprehensive list of the vascular plants observed on the project site is provided in Appendix B. A list of the terrestrial vertebrates observed and those that likely use habitats on and adjacent to the project site is provided in Appendix C. Photos taken during the site visit are presented in Appendix D.

2.3.1 Agricultural Orchard

The project site is best described as an active agricultural orchard, specifically for almond production. Historic aerial imagery dating to 1946 indicates that the parcel was formerly used for row crop cultivation and at one time contained two farm residences. In 2006, the farm residence in the northern area of the parcel was demolished and the area surrounding the house was graded. In 2014, the almond orchard was planted. In 2017, the second farm residence in the southern area of the parcel was demolished, and the home site was then graded and planted with almond trees. Since that time, no grading appears to have taken place, only typical agricultural practices.

LIVE OAK
ASSOCIATES, INC.

Carmel Homes IV
Tentative Tract Map
Biotic Habitats / Land Use

Date	Project #	Figure #
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At the time of the survey, the understory of the almond trees was generally kept vegetation-free, except between the rows where irrigation caused ruderal vegetation to grow. The dominant grass species was non-native jungle rice (*Echinochloa colona*), with some alkali sacaton (*Sporobolus airoides*). The dominant herb was whitestem filaree (*Erodium moschatum*), with some cheeseweed (*Malva parviflora*). Other plant species observed included Russian thistle (*Salsola tragus*), flax-leaved horseweed (*Erigeron bonariensis*), and London rocket (*Sisymbrium irio*). There is a small gap (approximately 8,000 square feet) along the eastern boundary of the orchard that contains irrigation and electrical infrastructure. At the time of the survey, this gap was characterized by compacted dirt soils and was almost entirely barren of vegetation.

Some amphibian use is expected in the site's orchard habitat due to the presence of irrigated land year-round. While not expected to breed on the site itself, common amphibians such as the Sierra treefrog (*Pseudacris sierra*) or western toad (*Bufo boreas*) could breed in urban and agricultural basins in the project vicinity and subsequently disperse through the site's orchards. Reptile species common to agriculture and anthropogenic areas of the San Joaquin Valley are likely to occur in the site's agricultural orchard. Lizard species may include San Joaquin fence lizards (*Sceloporus occidentalis biseriatus*), western side-blotched lizards (*Uta stansburiana elegans*), and California whiptail (*Aspidoscelis tigris munda*). Snake species may include California kingsnake (*Lampropeltis californiae*), Pacific gophersnake (*Pituophis catenifer catenifer*), and northern Pacific rattlesnake (*Crotalus oreganus oreganus*). None of these species were observed here but would be reasonably attracted to this habitat based on the prey species observed during the field survey and those species anticipated in agricultural areas.

The agricultural orchard provides habitat for many avian species. Mourning doves (*Zenaida macroura*), Eurasian collared doves (*Streptopelia decaocto*), American crows (*Corvus brachyrhynchos*), house finches (*Carpodacus mexicanus*), and white-crowned sparrows (*Zonotrichia leucophrys*) were observed foraging, soaring, or perching in/over this habitat at the time of the field survey, and northern mockingbirds (*Mimus polyglottos*) and Brewer's blackbirds (*Euphagus cyanocephalus*) are also expected to regularly occur here. The almond trees have the potential to support nesting by several native birds including the Anna's hummingbird (*Calypte anna*) and mourning dove; the latter may also nest on the ground. The site's orchard may support

foraging by raptors adapted to hunt within the tree canopy, such as the Cooper's hawk (*Accipiter cooperii*) and sharp-shinned hawk (*Accipiter striatus*). Red-tailed hawks and great horned owls (*Bubo virginianus*) also have a potential to forage in the orchard or to use its trees as perches from which to hunt in adjoining open areas.

Several mammal species are expected to occur in this agricultural orchard. Those species observed or positively identified by their sign (i.e. burrows, scats, and tracks) included the California ground squirrel (*Otospermophilus beecheyi*), domestic or feral dogs (*Canis lupus*), and Botta's pocket gopher (*Thomomys bottae*). Other small mammals that may occur here include California vole (*Microtus californicus*), ornate shrew (*Sorex ornatus*), and several mouse species. These granivorous and herbivorous small mammal species may provide foraging opportunities for predators such as the introduced red fox (*Vulpes vulpes*), domestic or feral cats, coyote (*Canis latrans*), and raccoon (*Procyon lotor*).

2.4 SPECIAL-STATUS PLANTS AND ANIMALS

Many 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. As described more fully in Section 3.0, state and federal laws have provided CDFW 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 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 (i.e., California Rare Plant Ranks, or CRPR) of native plants considered rare, threatened, or endangered (CNPS 2022). Collectively, these plants and animals are referred to as "special status species."

Special status plants and wildlife of the project vicinity and their potential for occurrence on the project site, have been identified in Table 1. The list of species for Table 1 was obtained using the *California Natural Diversity Database* (CDFW 2022) and entailed a records search for the nine 7.5-minute quadrangles containing and surrounding the project site (*Madera, Gregg, Bonita Ranch, Berenda, Kismet, Daulton, Gravelly Ford, Biola,* and *Herndon*). Other sources of information for this table included *The California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2022), iNaturalist (iNaturalist 2022), eBird (eBird 2022), and California Herps (Nafis 2022). Note that only federally and state listed plants listed as 1A, 1B, 2A, 2B, or 3 with threat ranks 0.1, 0.2, and 0.3 by the California Rare Plant Ranking (CRPR) are included in this table. Other special status plants with a CRPR 4 may be considered for CEQA evaluation if they meet the criteria for rare or locally significant, addressed in the *2022 CEQA Statute & Guidelines* Section 15380 and Section 15125(c) (AEP 2022). The locations of documented special status species occurrences in the project vicinity are depicted on Figure 4.

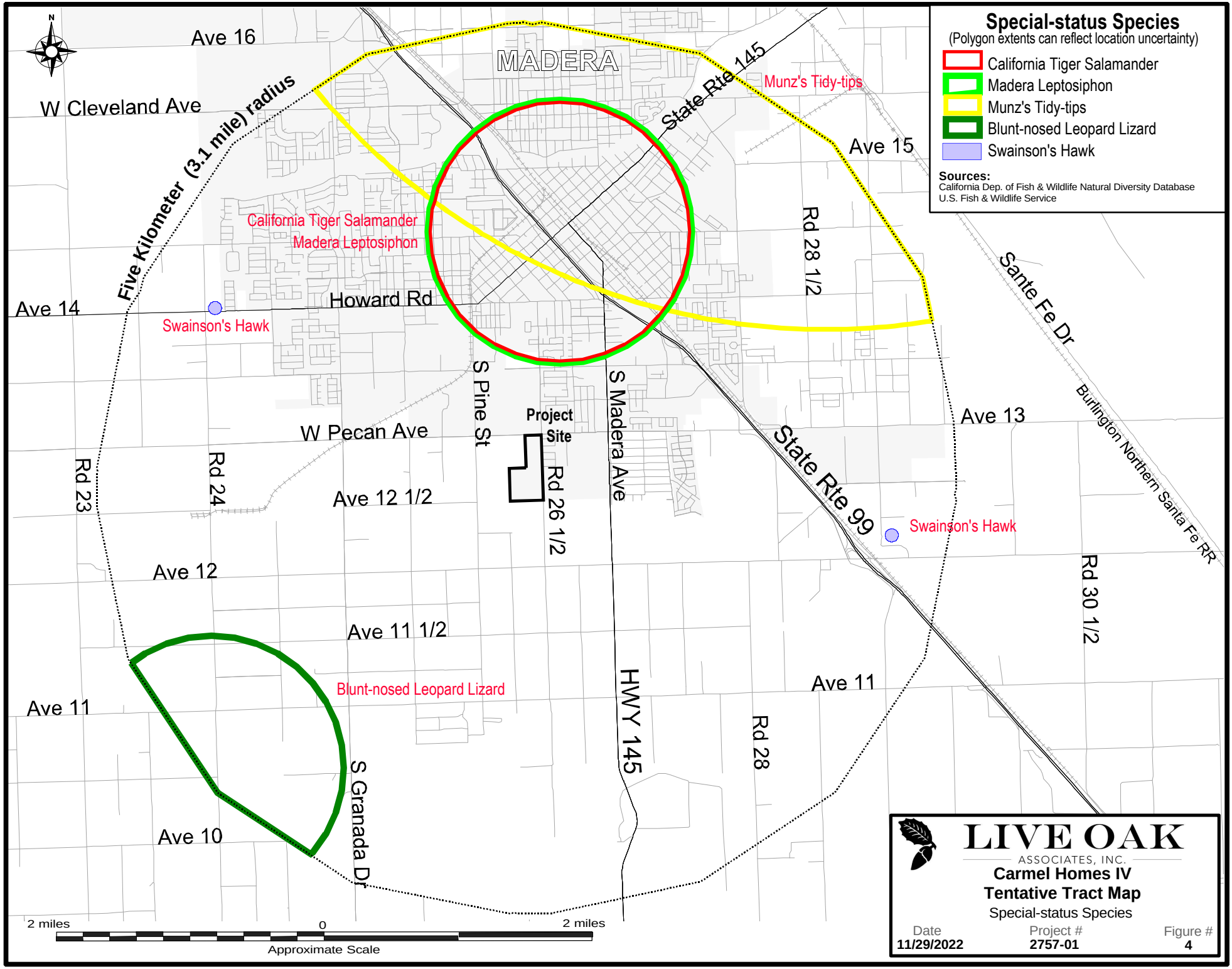
Special-status Species
(Polygon extents can reflect location uncertainty)
California Tiger Salamander
Madera Leptosiphon
Munz's Tidy-tips
Blunt-nosed Leopard Lizard
Swainson's Hawk
Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
U.S. Fish & Wildlife Service
MADERA
Ave 16
W Cleveland Ave
Five Kilometer (3.1 mile) radius
State Rte 145
Munz's Tidy-tips
Ave 15
Rd 28 1/2
Sante Fe Dr
California Tiger Salamander
Madera Leptosiphon
Howard Rd
Ave 14
Swainson's Hawk
S Pine St
S Madera Ave
Project Site
Ave 13
Burlington Northern Santa Fe RR
W Pecan Ave
Rd 23
Rd 24
Rd 26 1/2
State Rte 99
Swainson's Hawk
Ave 12 1/2
Ave 12
Rd 30 1/2
Ave 11 1/2
Blunt-nosed Leopard Lizard
Ave 11
HWY 145
Rd 28
Ave 11
S Granada Dr
Ave 10
2 miles
0
2 miles
Approximate Scale
LIVE OAK
ASSOCIATES, INC.
Carmel Homes IV
Tentative Tract Map
Special-status Species
Date
11/29/2022
Project #
2757-01
Figure #
4

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY.

PLANTS

Special Status Plant Species (CDFW 2022 and CNPS 2022)

Species	Status	Habitat	Occurrence in the Project Site*
Heartscale (*Atriplex cordulata* var. *cordulata*)	CRPR 1B.2	Occurs on saline or alkaline soils in chenopod scrub, meadows, seeps, and grasslands at elevations below 1,230 feet. Blooms April- October.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Lesser saltscale (*Atriplex minuscula*)	CRPR 1B.1	Occurs in cismontane woodland and valley and foothill grasslands of the Central Valley; alkaline/sandy soils at elevations between 50 and 660 feet. Blooms May- October.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Vernal pool smallscale (*Atriplex persistens*)	CRPR 1B.2	Found in alkaline vernal pools at elevations between 10 and 380 feet. Blooms June- October.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Subtle orache (*Atriplex subtilis*)	CRPR 1B.2	Occurs in valley and foothill grasslands of the Central Valley at elevations between 130 and 330 feet. Blooms August-October.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Succulent owl's clover (*Castilleja campestris* var. *succulenta*)	FT, CE, CRPR 1B.2	Occurs in freshwater wetlands, and occasionally in non-wetlands in Valley grassland and foothill woodlands, between 130 and 2,000 ft. in elevation. Blooms April-May.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Recurved larkspur (*Delphinium recurvatum*)	CRPR 1B.2	Occurs in cismontane woodland and valley and foothill grasslands with alkaline soils at. elevations below 2,500 ft. Blooms March-June.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Spiny-sepaled button celery (*Eryngium spinosepalum*)	CRPR 1B.2	Vernal pools and wetland or riparian areas, or some disturbed sites such as swales and roadside ditches, within valley and foothill grasslands, at elevations between 260 and 3,200 feet. Blooms April-July.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Alkali-sink goldfields (*Lasthenia chrysantha*)	CRPR 1B.1	Occurs in vernal pools or wet saline flats of valley grassland, alkali sink, or wetland-riparian habitats at elevations below 330 feet. Blooms February- April.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Munz's tidy-tips (*Layia munzii*)	CRPR 1B.2	Found on hillsides, in white-grey alkaline clay soils, with grasses and chenopod scrub associates, in valley and foothill grasslands at elevations between 145 and 2,500 feet. Blooms March- April.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Madera leptosiphon (*Leptosiphon serrulatus*)	CRPR 1B.2	Found in openings, oak woodland, cismontane woodland, and coniferous forest. Typically, on dry slopes; often on decomposed granite in woodlands at elevations between 1,000 and 4,300 feet. Blooms April- May.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY.

PLANTS
Special Status Plant Species (CDFW 2022 and CNPS 2022)

Species	Status	Habitat	Occurrence in the Project Site*
Shining navarretia (*Navarretia nigelliformis* ssp. *radians*)	CRPR 1B.2	Found in grasslands and not always in vernal pools. Habitats include cismontane woodland, valley and foothill grassland, and vernal pools at elevations between 195 to 3,200 feet in elevation. Blooms April-July.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
San Joaquin Valley orcutt grass (*Orcuttia inaequalis*)	FT, CE, CRPR 1B.1	Occurs in vernal pools of the Central Valley; requires deep pools with prolonged periods of inundation. Found between 30 and 2,500 feet in elevation. Blooms April- September.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Hairy orcutt grass (*Orcuttia pilosa*)	FE, CE, CRPR 1B.1	Found in vernal pools at elevations between 80 and 410 feet in elevation. Blooms April-September.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
California alkali-grass (*Puccinellia simplex*)	CRPR 1B.2	Occurs in saline flats and mineral springs in the Central Valley, San Francisco Bay area, and western Mojave Desert at elevations less than 2,955 feet. Blooms March-May.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Sanford's arrowhead (*Sagittaria sanfordii*)	CRPR 1B.2	Occurs in freshwater emergent marsh habitat in drainage ditches and canals of California's central valley at elevations less than 1,985 feet. Blooms May- October.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.
Greene's tuctoria (*Tuctoria greenei*)	FE, CR, CRPR 1B.1	Found in vernal pools of open grasslands at elevations between 80 and 4,350 feet. Blooms May- July.	**Absent.** Suitable habitat is absent. Moreover, this site has a high amount of historic ground disturbance.

ANIMALS
Special Status Animal Species **(CDFW 2022)**

Species	Status	Habitat	Occurrence in the Project Site*
Vernal pool fairy shrimp (*Branchinecta lynchi*)	FT	Occurs in vernal pools, clear to tea-colored water in grass or mud-bottomed swales, and basalt depression pools.	**Absent.** Suitable habitat is absent from the site and surrounding lands.
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	FT	Lives in mature blue elderberry shrubs (*Sambucus mexicana*) of California's Central Valley and Sierra foothills. Prefers to lay eggs in elderberries 2-8 inches in diameter; some preference shown for "stressed" elderberries.	**Absent.** The USFWS no longer considers Madera County and points south to be part of this species' distribution. Moreover, the project site does not contain any elderberry shrubs.

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY.

ANIMALS (cont'd)

Species	Status	Habitat	Occurrence in the Project Site*
California tiger salamander (*Ambystoma californiense*)	FT, CT	Found primarily in annual grasslands; requires vernal pools or other seasonal ponds for breeding and rodent burrows for aestivation. Although most California tiger salamanders aestivate within 0.4 mile of their breeding pond, outliers may aestivate up to 1.3 miles away (Orloff 2011).	**Absent.** Potential breeding habitat for this species is absent from the site and surrounding lands, and the site is situated in an urban-influenced landscape within which this species would not be able to persist.
Western spadefoot (*Spea hammondii*)	CSC	Ranges throughout the Central Valley and adjacent foothills. Occurs primarily in grassland situations. Reproduction occurs in shallow, temporary ponds.	**Absent.** Potential breeding habitat for this species is absent from the site and surrounding lands, and the site is situated in an urban-influenced landscape within which this species would not be able to persist.
Blunt-nosed leopard lizard (*Gambelia sila*)	FE, CE, CFP	A resident of sparsely vegetated alkali and desert scrub habitats, in areas of low topographic relief. Seeks cover in mammal burrows, under shrubs or structures such as fence posts; they do not excavate their own burrows.	**Absent.** Suitable habitat is absent, and the site is located within an agricultural and urban-influenced landscape that would not support this species.
Coast horned lizard (*Phrynosoma coronatum*)	CSC	Grasslands, scrublands, oak woodlands, etc. of central California. Common in sandy washes with scattered shrubs.	**Absent.** Suitable habitat is absent, and the site is located within an agricultural and urban-influenced landscape that would not support this species.
Tricolored blackbird (*Agelaius tricolor*)	CT	Breeds near fresh water, primarily emergent wetlands, with tall thickets. Forages in many open habitats.	**Absent.** Suitable breeding habitat is absent from the project site. No tricolored blackbird observations are known within the vicinity of the City of Madera (eBird 2022).
Burrowing owl (*Athene cunicularia*)	CSC	Frequents open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Dependent upon burrowing mammals, most notably the California ground squirrel, for nest burrows.	**Absent.** Ground squirrel burrow complexes are present in the banks of the ponding basins along the northwest boundary of the project site. However, due to the site's high levels of human disturbance, incompatible land cover type, and urban setting, burrowing owls have no appreciable potential to occur on site.
Swainson's hawk (*Buteo swainsoni*)	CT	Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands or alfalfa fields supporting rodent populations.	**Unlikely.** The site is situated in a landscape dominated by orchards and urban uses generally not compatible with Swainson's hawk breeding or foraging ecology, and the site itself does not contain suitable habitat for this species. However, Swainson's hawks are occasionally documented foraging or flying over Madera (eBird 2022), and individuals could conceivably pass over the site from time to time. The closest known nesting occurrences are approximately 3 miles east and 2.5 miles west of the site (CNDDB 2022).

TABLE 1. LIST OF SPECIAL STATUS SPECIES THAT COULD OCCUR IN THE PROJECT VICINITY.

ANIMALS (cont'd)

Species	Status	Habitat	Occurrence in the Project Site*
Loggerhead shrike (*Lanius ludovicianus*)	CSC	Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. Can often be found in cropland.	**Possible.** The site is situated in an urban-influenced landscape generally not suitable for loggerhead shrikes. However, shrikes could conceivably pass through the vicinity from time to time, and could forage in the site's orchard habitat.
Fresno kangaroo rat (*Dipodomys nitratoides exilis*)	FE, CE	This species requires bare alkaline clay-based soils subject to seasonal inundation, with more friable soil mounds around shrubs and grasses. It occurs in alkali sink-open grassland habitats in western Fresno County.	**Absent.** The site is located well outside of the current distribution of this species, and suitable habitat is absent..
San Joaquin kit fox (*Vulpes macrotis mutica*)	FE, CT	Found in desert alkali scrub and annual grasslands; may forage in adjacent agricultural habitats. Use underground dens for thermoregulation, cover, and reproduction. Dens are either self-dug or modified rodent burrows.	**Absent.** Due to the site's high levels of anthropogenic disturbance and urban setting, it is highly unlikely to be used by the San Joaquin kit fox. There are no kit fox records within the City of Madera, and no records within 3 miles of the project site (CNDDB 2022).
American badger (*Taxidea taxus*)	CSC	Uncommon resident statewide; most abundant in drier open stages of most shrub, forest, and herbaceous habitats. Needs sufficient food, friable soils, uncultivated ground. Preys on burrowing rodents. Digs its own burrows.	**Absent.** Suitable habitat is absent from the project site since the site is lacking friable soils and open habitat. Moreover, this species can be sensitive to human disturbance and is not likely to burrow within an active agricultural orchard.

OCCURRENCE TERMINOLOGY

Present: Species observed on the site at time of field surveys or during recent past.
Likely: Species not observed on the site, but it may reasonably be expected to occur there on a regular basis.
Possible: Species not observed on the site, but it could occur there from time to time.
Unlikely: Species not observed on the site, and would not be expected to occur there except, perhaps, as a transient.
Absent: Species not observed on the site and precluded from occurring there because habitat requirements not met.

STATUS CODES

FE Federally Endangered
FT Federally Threatened
CE California Endangered
CT California Threatened
CR California Rare
CFP California Fully Protected
CSC California Species of Special Concern

CRPR California Rare Plant Rank
1B Plants Rare, Threatened, or Endangered in California and elsewhere
0.1 Seriously Threatened in California
0.2 Moderately Threatened in California

2.5 JURISDICTIONAL WATERS

Jurisdictional waters are those rivers, creeks, drainages, lakes, ponds, reservoirs, and wetlands that are subject to the authority of the USACE, CDFW, and/or the RWQCB. In general, the USACE

regulates navigable waters, tributaries to navigable waters, and wetlands adjacent to these waters, where wetlands are defined by the presence of hydric soils, hydrophytic vegetation, and wetland hydrology. The CDFW asserts jurisdiction over waters in California that have a defined bed and bank, and the RWQCB has jurisdiction over California surface water and groundwater. The regulation of jurisdictional waters is discussed in more detail in Section 3.9.

The project site does not contain jurisdictional waters or any other type of aquatic resource.

2.6 DESIGNATED CRITICAL HABITAT

USFWS often designates areas of "critical habitat" when it lists species as threatened or endangered. Critical habitat is a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection.

Designated critical habitat is absent from the project site and surrounding lands (USFWS 2022).

2.7 SENSITIVE NATURAL COMMUNITIES

Sensitive natural communities are those that are of limited distribution, distinguished by significant biological diversity, home to special status species, etc. CDFW is responsible for the classification and mapping of all natural communities in California. Natural communities are assigned state and global ranks according to their degree of imperilment. Any natural community with a state rank of 3 (S3) or lower (on a 1 to 5 scale) is considered sensitive. Natural communities with ranks of S1-S3 are considered sensitive natural communities to be addressed in the environmental review processes of CEQA and its equivalents. Examples of sensitive natural communities in the vicinity of the project area include Northern Basalt Flow Vernal Pool and various types of Central Valley Drainage Streams (Sawyer, Keeler-Wolf and Evens 2009).

The project site supports no sensitive natural communities.

2.8 WILDLIFE MOVEMENT CORRIDORS

Wildlife movement corridors are routes that animals regularly and predictably follow during seasonal migration, dispersal from native ranges, daily travel within home ranges, and inter-population movements. Movement corridors in California are typically associated with valleys, ridgelines, and rivers and creeks supporting riparian vegetation.

The project site does not contain any features likely to support regular or predictable wildlife movement.

3.0 RELEVANT GOALS, POLICIES, AND LAWS

3.1 CALIFORNIA ENVIRONMENTAL QUALITY ACT

In California, any project carried out or approved by a public agency that will result in a direct or reasonably foreseeable indirect physical change in the environment must comply with CEQA. The purpose of CEQA is to ensure that a project's potential impacts on the environment are evaluated, and methods for avoiding or reducing these impacts are considered before the project is allowed to move forward. A secondary aim of CEQA is to provide justification to the public for the approval of any projects involving significant impacts on the environment.

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." Although the lead agency may set its own CEQA significance thresholds, project impacts to biological resources are generally considered to be significant if they would meet any of the following criteria established in Appendix G of the CEQA Guidelines:

- 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 CDFW or USFWS.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS.
- Have a substantial adverse effect on state or federally protected wetlands (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, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Furthermore, CEQA Guidelines Section 15065(a) requires the lead agency to make "mandatory findings of significance" if there is substantial evidence that a project may:

- 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, or substantially reduce the number or restrict the range of an endangered, rare or threatened species.
- Achieve short-term environmental goals to the detriment of long-term environmental goals.
- Produce environmental effects that are individually limited but cumulatively considerable, meaning that the incremental effects of the project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects.

3.2 GENERAL PLAN POLICIES OF THE CITY OF MADERA

In compliance with CEQA, the lead agency must consider project conformance with applicable goals and policies of the City of Madera General Plan. The City of Madera General Plan was adopted in 2009 and has a planning horizon through 2025. Goals, policies, and action items related to biological resources may be found in the plan's Conservation element, and express the City's commitment to: (1) protect special status plant and animal species, including their habitats, in compliance with all applicable laws and regulations, (2) conserve and improve native wildlife and plant habitat, (3) require residential, commercial, industrial, and recreational projects to avoid impacts to native wildlife and plant habitat to the extent feasible, (4) require that development-related loss of native wildlife and plant habitat be mitigated through habitat enhancement, the provision of replacement habitat, or payment of in-lieu funds, and (5) require appropriate mitigation for all development projects to be implemented in areas in which special status species are found or likely to occur.

3.3 HABITAT CONSERVATION PLANS AND NATURAL COMMUNITY CONSERVATION PLANS

Section 10 of the federal Endangered Species Act establishes a process by which non-federal projects can obtain authorization to incidentally take listed species, provided take is minimized and thoroughly mitigated. A Habitat Conservation Plan (HCP) developed by the project applicant

in collaboration with the USFWS and/or National Marine Fisheries Service (NMFS) ensures that such minimization and mitigation will occur and is a prerequisite to the issuance of a federal incidental take permit. Similarly, a Natural Community Conservation Plan (NCCP) developed by the project applicant in collaboration with CDFW, provides for the conservation of biodiversity within a project area, and permits limited incidental take of state-listed species.

3.4 THREATENED AND ENDANGERED SPECIES

In California, imperiled plants and animals may be afforded special legal protections under the California Endangered Species Act (CESA) and/or Federal Endangered Species Act (FESA). Species may be listed as "threatened" or "endangered" under one or both Acts, and/or as "rare" under CESA. Under both Acts, "endangered" means a species is in danger of extinction throughout all or a significant portion of its range, and "threatened" means a species is likely to become endangered within the foreseeable future. Under CESA, "rare" means a species may become endangered if their present environment worsens. Both Acts prohibit "take" of listed species, defined under CESA as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill" (California Fish and Game Code, Section 86), and more broadly defined under FESA to include "harm" (16 USC, Section 1532(19), 50 CFR, Section 17.3).

When state and federally listed species have the potential to be impacted by a project, the USFWS and CDFW must be included in the CEQA process. These agencies review the environmental document to determine the adequacy of its treatment of endangered species issues and to make project-specific recommendations for the protection of listed species. Projects that may result in the "take" of listed species must generally enter into consultation with the USFWS and/or CDFW pursuant to FESA and CESA, respectively. In some cases, incidental take authorization(s) from these agencies may be required before the project can be implemented.

3.5 CALIFORNIA FULLY PROTECTED SPECIES

The classification of certain animal species as "fully protected" was the State of California's initial effort in the 1960s, prior to the passage of the California Endangered Species Act, to identify and provide additional protection to those species that were rare or faced possible extinction.

Following CESA enactment in 1970, many fully protected species were also listed as California threatened or endangered. The list of fully protected species are identified, and their protections stipulated, in California Fish and Game Code Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and fish (5515). Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take, except in conjunction with necessary scientific research and protection of livestock.

3.6 MIGRATORY BIRDS

The Federal Migratory Bird Treaty Act (FMBTA: 16 USC 703-712) prohibits killing, possessing, or trading in any bird species covered in one of four international conventions to which the United States is a party, except in accordance with regulations prescribed by the Secretary of the Interior. The name of the act is misleading, as it actually covers almost all birds native to the United States, even those that are non-migratory. The FMBTA encompasses whole birds, parts of birds, and bird nests and eggs.

Native birds are also protected under California state law. The California Fish and Game Code makes it unlawful to take or possess any non-game bird covered by the FMBTA (Section 3513), as well as any other native non-game bird (Section 3800), even if incidental to lawful activities. Moreover, the California Migratory Bird Protection Act, enacted in September 2019, clarifies native bird protection, and increases protections where California law previously deferred to federal law.

3.7 BIRDS OF PREY

Birds of prey are protected in California under provisions of the Fish and Game Code (Section 3503.5), which states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes (hawks and eagles) or Strigiformes (owls), as well as their nests and eggs. The bald eagle and golden eagle are afforded additional protection under the federal Bald and Golden Eagle Protection Act (16 USC 668), which makes it unlawful to kill birds or their eggs.

Additionally, the Bald and Golden Eagle Protection Act (16 U.S.C., scc. 668-668c) prohibits anyone from taking (pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or

disturb) bald or golden eagles, including their parts, nests, or eggs, unless authorized under a federal permit. In addition to immediate acts of take, the act prohibits any disturbance that directly affects an eagle or an active eagle nest as well as any disturbance caused by humans around a previously used nest site during a time when eagles are not present such that it agitates or bothers an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

3.8 NESTING BIRDS

In California, protection is afforded to the nests and eggs of all birds. California Fish and Game Code (Section 3503) states that it is "unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Breeding-season disturbance that causes nest abandonment and/or loss of reproductive effort is considered a form of "take" by the CDFW.

3.9 WETLANDS AND OTHER JURISDICTIONAL WATERS

Section 404 of the federal Clean Water Act (CWA) regulates the discharge of dredged or fill material into "navigable waters" (33 U.S.C. §1344), defined in the CWA as "the waters of the United States, including the territorial seas" (33 U.S.C. §1362(7)). The CWA does not supply a definition for waters of the U.S., and that has been the subject of considerable debate since the CWA's passage in 1972. A variety of regulatory definitions have been promulgated by the two federal agencies responsible for implementing the CWA, the Environmental Protection Agency (EPA) and USACE. These definitions have been interpreted, and in some cases, invalidated, by federal courts.

Most recently, waters of the U.S. were defined by the Navigable Waters Protection Rule (NWPR). The new rule was published in the Federal Register on April 21, 2020 and took effect on June 22, 2020. However, on August 30, 2021, in the case of Pascua Yaqui Tribe v. U.S. Environmental Protection Agency, the U.S. District Court for the District of Arizona vacated and remanded the NWPR. In light of this order, the EPA and USACE have halted implementation of the NWPR

and, until further notice, are interpreting "waters of the United States" consistent with the pre-2015 regulatory regime.

The interpretation of waters of the U.S. prior to 2015 generally included:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.
- All interstate waters including interstate wetlands.
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce.
- All impoundments of waters otherwise defined as waters of the United States under the definition.
- Tributaries of waters identified in the bulleted items above.

As determined by the United States Supreme Court in its 2001 Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers (SWANCC) decision, channels and wetlands isolated from other jurisdictional waters cannot be considered jurisdictional on the basis of their use, hypothetical or observed, by migratory birds. Similarly, in its 2006 consolidated Carabell/Rapanos decision, the U.S. Supreme Court ruled that a significant nexus between a wetland and other navigable waters must exist for the wetland itself to be considered a jurisdictional water.

All activities that involve the discharge of dredge or fill material into waters of the U.S. are subject to the permit requirements of the USACE. Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued until the RWQCB issues a Section 401 Water Quality Certification (or waiver of such certification) verifying that the proposed activity will meet state water quality standards.

Under the Porter-Cologne Water Quality Control Act of 1969, the State Water Resources Control Board has regulatory authority to protect the water quality of all surface water and groundwater in the State of California ("waters of the State"). Nine RWQCBs oversee water quality at the local and regional level. The RWQCB for a given region regulates discharges of fill or pollutants into waters of the State through the issuance of various permits and orders. Discharges into waters of the State that are also waters of the U.S. require a Section 401 Water Quality Certification from the RWQCB as a prerequisite to obtaining certain federal permits, such as a Section 404 Clean Water Act permit. Discharges into all waters of the State, even those that are not also waters of the U.S., require Waste Discharge Requirements (WDRs), or waivers of WDRs, from the RWQCB. The RWQCB also administers the Construction Storm Water Program and the federal National Pollution Discharge Elimination System (NPDES) program. Projects that disturb one or more acres of soil must obtain a Construction General Permit under the Construction Storm Water Program. A prerequisite for this permit is the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Projects that discharge wastewater, storm water, or other pollutants into a water of the U.S. may require a NPDES permit.

CDFW has jurisdiction over the bed and bank of natural drainages and lakes according to provisions of Section 1601 and 1602 of the California Fish and Game Code. Activities that may substantially modify such waters through the diversion or obstruction of their natural flow, change or use of any material from their bed or bank, or the deposition of debris require a Notification of Lake or Streambed Alteration. If CDFW determines that the activity may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. Such an agreement typically stipulates that certain measures will be implemented to protect the habitat values of the lake or drainage in question.

4.0 IMPACTS AND MITIGATIONS

The following discussions assume that the City of Madera's approval of the tentative tract map will result in the project site being converted in its entirety to tract housing and associated infrastructure. Potential project impacts to biological resources and recommended mitigation measures are discussed below.

4.1 POTENTIALLY SIGNIFICANT PROJECT IMPACTS/MITIGATION

4.1.1 Disturbance to Active Raptor and Other Migratory Bird Nests from Construction Activities During Future Site Buildout

Potential Impacts. The project site has the potential to be used for nesting by several native avian species protected by the Migratory Bird Treaty Act and related state laws. If future site buildout takes place during the nesting season (generally February 1-August 31), birds nesting on the site could be injured or killed by construction activities or disturbed such that they would abandon their nests. Significant construction-related disturbance is also a possibility for birds nesting adjacent to the project site. Construction-related injury, mortality, or disturbance of nesting birds that results in nest abandonment are potentially significant adverse environmental effects of the project.

Mitigation. To avoid and minimize the potential for construction-related mortality/disturbance of nesting raptors and migratory birds, the following measures will be implemented:

> ***Measure 4.1.1a (Construction Timing).*** If feasible, site buildout will occur outside of the avian nesting season, typically defined as February 1 to August 31.
>
> ***Measure 4.1.1b (Pre-construction Surveys*)**. If construction is to occur between February 1 and August 31, a qualified biologist will conduct pre-construction surveys for active bird nests within 10 days prior to the start of construction. The survey area will encompass the site and accessible surrounding lands within 250 feet for nesting migratory birds and 500 feet for raptors (i.e., birds of prey).

***Measure 4.1.1c (Avoidance of Active Nests*).** Should any active nests be discovered in or near proposed construction zones, the biologist will identify a suitable construction-free buffer around the nest. This buffer will be identified on the ground with flagging or fencing and will be maintained until the biologist has determined that the young have fledged and are capable of foraging independently.

Implementation of the above measures will reduce potential effects of future site development on nesting raptors and migratory birds to a less than significant level under CEQA and will ensure compliance with state and federal laws protecting nesting birds.

4.2 LESS THAN SIGNIFICANT PROJECT IMPACTS

4.2.1 Project Impacts to Special Status Animal Species

Potential Impacts. Of the 13 special status animal species known from the regional vicinity, 12 are considered absent or unlikely to occur on the project site due to the absence of suitable habitat, the site's urban and/or agricultural setting, and/or the site's being situated outside of the species distribution (see Table 1). These species are the vernal pool fairy shrimp (*Branchinecta lynchi*), Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), California tiger salamander (*Ambystoma californiense*), western spadefoot (*Spea hammondii*), blunt-nosed leopard lizard (*Gambelia sila*), coast horned lizard (*Phrynosoma coronatum*), tricolored blackbird (*Agelaius tricolor*), burrowing owl (*Athene cunicularia*), Swainson's hawk (*Buteo swainsoni*), Fresno kangaroo rat (*Dipodomys nitratoides exilis*), San Joaquin kit fox (*Vulpes macrotis mutica)*, and American badger (*Taxidea taxus*). Since there is little to no likelihood that these species occur on site, they have no appreciable potential to be affected through construction-related injury or mortality or loss of habitat.

The remaining species, the loggerhead shrike (*Lanius ludovicianus*), has some potential to forage on site from time to time, but would not use the site for nesting or other activities in which it is particularly sensitive to disturbance. Loggerhead shrikes are highly mobile while foraging; in the unlikely event that one or more individuals were foraging on site at the time of future site buildout, they would be expected to simply avoid or fly away from active construction zones. The site's

almond orchard is marginal at best for this open country species, and similar or higher quality foraging habitat is regionally abundant.

For these reasons, project impacts to regionally-occurring special status animal species are considered less than significant under CEQA.

Mitigation. Mitigation is not warranted.

4.2.2 Project Impacts to Special Status Plant Species

Potential Impacts. Sixteen special status plant species are known to occur in the region, but have no appreciable potential to occur on the project site following decades of agricultural disturbance and present-day use as an almond orchard (see Table 1). The proposed project is not expected to affect any special status plant species or their habitats, and impacts would be less than significant under CEQA.

Mitigation. Mitigation measures are not warranted.

4.2.3 Project Impact to Sensitive Natural Communities and Designated Critical Habitat

Potential Impacts. Designated critical habitat and sensitive natural communities are absent from the project site. Future site buildout is expected to have no impact on sensitive natural communities or designated critical habitat.

Mitigation. No mitigation is warranted.

4.2.4 Project Impact to Wildlife Movement Corridors

Potential Impacts. The site does not contain or adjoin features likely to support regular and predictable wildlife movement. Future site buildout would not affect wildlife movement corridors, and impacts are considered less than significant under CEQA.

Mitigation. No mitigation is warranted.

4.2.5 Project Impacts to Jurisdictional Waters

Potential Impacts. The project site does not contain wetlands or any other type of jurisdictional waters. Future site buildout would not affect these resources, and impacts are considered less than significant under CEQA.

Mitigation. No mitigation is warranted.

4.2.6 Consistency with Local Policies and Habitat Conservation Plans

Potential Impacts. The project appears to be consistent with those goals and policies of the City of Madera General Plan that pertain to biological resources. There are no known HCPs or NCCPs in effect for the project vicinity.

Mitigation. No mitigation is required.

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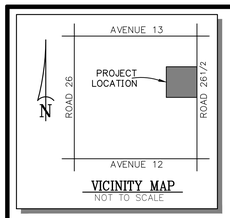
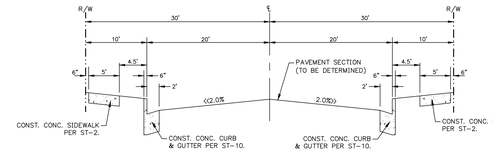
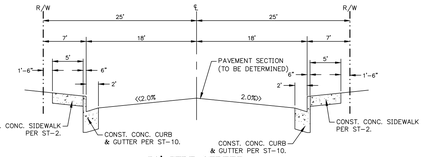
APPENDIX A: TENTATIVE TRACT MAP



VICINITY MAP
NOT TO SCALE



60' WIDE STREET
SCALE HORIZ. 1"=10' VERT. 1"=2'



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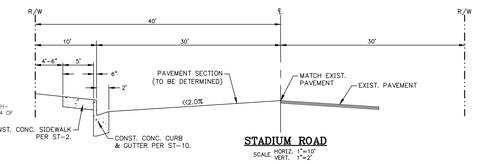
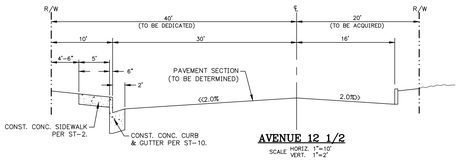
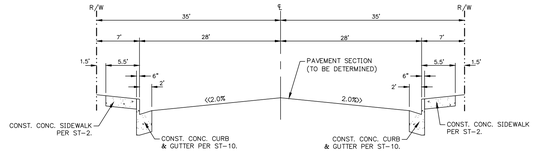


STADIUM ROAD
SCALE HORIZ. 1"=10' VERT. 1"=2'



AVENUE 12 1/2
SCALE HORIZ. 1"=10' VERT. 1"=2'



70' WIDE ENTRANCE
SCALE HORIZ. 1"=10' VERT. 1"=2'

Lot No.	Area (sq. ft.)	Lot No.	Area (sq. ft.)	Lot No.	Area (sq. ft.)	Lot No.	Area (sq. ft.)
1.	5282.6	49.	5169.0	95.	5147.6	141.	5147.6
2.	5282.6	50.	5176.0	96.	5147.6	142.	5147.6
3.	5282.6	51.	5176.0	97.	5147.6	143.	5147.6
4.	5282.6	52.	5176.0	98.	5147.6	144.	5147.6
5.	5282.6	53.	5176.0	99.	5147.6	145.	5147.6
6.	5282.6	54.	5176.0	100.	5571.5	146.	5147.6
7.	5282.6	55.	5176.0	101.	5571.6	147.	5147.6
8.	5282.6	56.	5176.0	102.	5147.6	148.	5147.6
9.	5282.6	57.	5176.0	103.	5147.6	149.	5147.6
10.	5282.6	58.	5176.0	104.	5147.6	150.	5147.6
11.	5282.6	59.	5176.0	105.	5147.6	151.	5147.6
12.	5618.8	60.	5176.0	106.	5147.6	152.	5147.6
13.	5603.4	61.	5176.0	107.	5147.6	153.	5147.6
14.	5250.0	62.	5176.0	108.	5147.6	154.	5147.6
15.	5250.0	63.	5176.0	109.	5147.6	155.	5147.6
16.	5250.0	64.	5755.8	110.	5147.6	156.	5568.6
17.	5250.0	65.	5318.2	111.	5147.6	157.	5755.8
18.	5250.0	66.	5318.2	112.	5147.6	158.	5335.5
19.	6695.0	67.	5318.2	113.	5147.6	159.	5335.5
20.	11210.0	68.	5318.2	114.	5147.6	160.	5335.5
21.	6695.0	69.	5318.2	115.	5147.6	161.	5335.5
22.	5000.0	70.	5318.2	116.	5147.6	162.	5335.5
23.	5238.7	71.	5318.2	117.	5147.6	163.	5335.5
24.	5234.0	72.	5318.2	118.	5147.6	164.	5335.5
25.	5229.3	73.	5318.2	119.	5568.6	165.	5335.5
26.	5224.5	74.	5318.2	120.	5568.6	166.	5755.8
27.	5219.8	75.	5318.2	121.	5147.6	167.	5335.5
28.	5215.0	76.	5318.2	122.	5147.6	168.	5335.5
29.	5210.3	77.	5318.2	123.	5147.6	169.	5335.5
30.	5044.4	78.	5318.2	124.	5147.6	170.	5335.5
31.	5044.8	79.	5318.2	125.	5147.6	171.	5335.5
32.	5188.5	80.	5318.2	126.	5147.6	172.	5335.5
33.	5183.8	81.	5756.9	127.	5147.6	173.	5335.5
34.	5179.0	82.	5568.6	128.	5147.6	174.	5758.5
35.	5174.3	83.	5147.6	129.	5147.6	175.	5335.5
36.	5169.5	84.	5147.6	130.	5147.6	176.	5335.5
37.	5164.8	85.	5147.6	131.	5147.6	177.	5335.5
38.	5113.2	86.	5147.6	132.	5147.6	178.	5335.5
39.	5094.7	87.	5147.6	133.	5147.6	179.	5335.5
40.	10543.3	88.	5147.6	134.	5147.6	180.	5335.5
41.	6888.0	89.	5147.6	135.	5147.6	181.	5335.5
42.	5139.0	90.	5147.6	136.	5147.6	182.	5758.5
43.	5139.0	91.	5147.6	137.	5147.6	183.	5758.5
44.	5139.0	92.	5147.6	138.	5147.6	184.	5335.5
45.	5139.0	93.	5147.6	139.	5147.6	185.	5335.5
46.	5139.0	94.	5147.6	140.	5147.6	186.	5335.5
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						226.	5758.5

Legal Description:

DOCUMENT No. 2004-007458

THE SOUTHEAST QUARTER OF THE NORTHWEST QUARTER (S.E. 1/4 of N.W. 1/4) OF SECTION 36, TOWNSHIP 11 SOUTH, RANGE 17 EAST, MOUNT DIABLO BASE AND MERIDIAN, ACCORDING TO THE OFFICIAL PLAT THEREOF.

APN: 046-030-006

CURRENT ZONING DESIGNATION:

R-1, SINGLE FAMILY (LOW DENSITY)
RESIDENTIAL ZONE DISTRICT

PROPOSED ZONING DESIGNATION:

PD-4500 (PLANNED DEVELOPMENT)
ZONE DISTRICT

AVERAGE LOT SIZE:

MAXIMUM LOT SIZE = 11,210 S.F.
MINIMUM LOT SIZE = 5,139 S.F.

AVERAGE LOT SIZE = 5,365 S.F.

DEVELOPER:

DMP DEVELOPMENT CORPORATION, INC.
2001 HOWARD ROAD, SUITE 211
MADERA, CA 93637
PH. (559)673-7002

LEGAL OWNER:

DMP DEVELOPMENT CORPORATION, INC.
2001 HOWARD ROAD, SUITE 211
MADERA, CA 93637
PH. (559)673-7002

TENTATIVE TRACT MAP No. CARMEL HOMES IV

IN THE CITY OF MADERA, COUNTY OF MADERA, STATE OF CALIFORNIA

PREPARED FOR

DMP DEVELOPMENT CORPORATION, INC.

SCALE: 1"=60'
60 30 0 60 120 180
SCALE IN FEET

REGISTERED LAND SURVEYOR — MARK WAYNE GREENWOOD — No. 6945 — Exp. 09-30-23 — STATE OF CALIFORNIA

MARK W. GREENWOOD LS 6945

REV. 09/15/2022 MGG
PLOT VIEW: PLOT TENTATIVE
ACAD File: \MAPS\21017TM.DWG
FIELD BOOK 223, PAGE 73, RA/gg
re: D-03053 & D-03215

R. W. Greenwood Associates, Inc.
CIVIL ENGINEERING — LAND SURVEYING
2558 E. Olive Ave. Fresno, California 93701 Tel. (559) 268-7831

Date FEBRUARY 16, 2022
Job No. D-21017
Drawn By MGG
Drawing No. 553-G

250	61.	5080
250	62.	5620
250	63.	5600
250	64.	5185
250	65.	5185
250	66.	5185
250	67.	5185
250	68.	5600
250	69.	5600
250	70.	5185
250	71.	5185
520	72.	5185
530	73.	5185
120	74.	5600
120	75.	5600
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120	77.	5185
120	78.	5185
120	79.	5185
120	80.	5600
530	81.	5600
000	82.	5185
000	83.	5185
000	84.	5185
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000	86.	5600
000	87.	5600
000	88.	5185
000	89.	5185
000	90.	5185
000	91.	5185
000	92.	5600
000	93.	5600
000	94.	5185

108.	5185
109.	5185
110.	5600

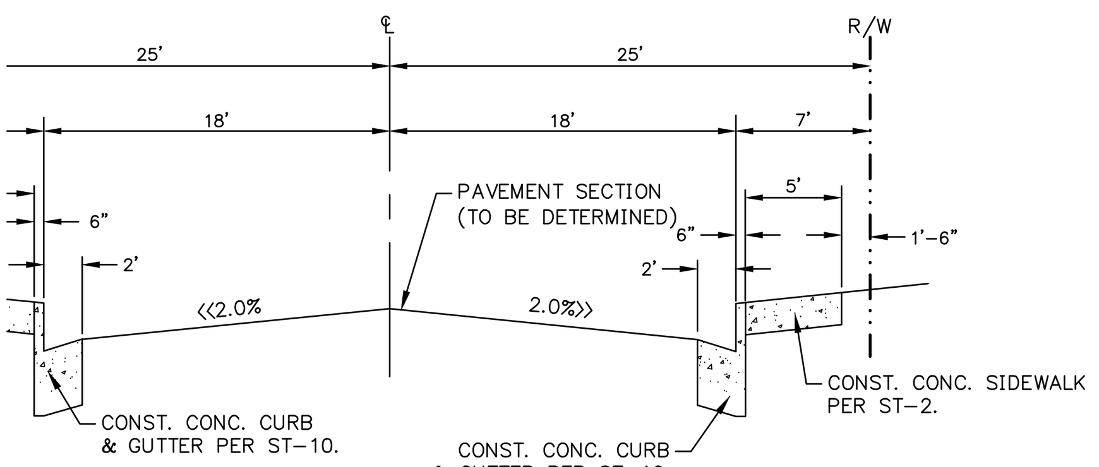
PREPARED FOR

DMP DEVELOPMENT CORPORATION, INC.

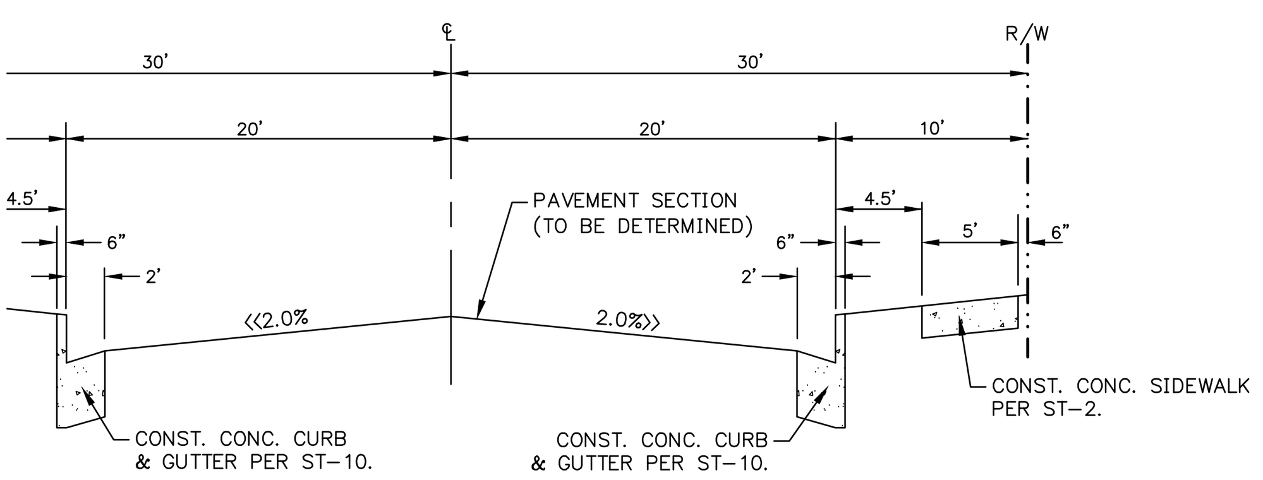
LEGEND

+000.0	EXIST. GROUND ELEV.
+TC=000.00	EXIST. TOP OF CURB ELEV.
+G=000.00	EXIST. GUTTER ELEV.
+C=000.00	EXIST. CONCRETE ELEV.
+P=000.00	EXIST. PAVEMENT ELEV.
+EP=000.00	EXIST. EDGE OF PAVEMENT ELEV.
+CR=000.00	EXIST. CENTERLINE ELEV.
+FL=000.00	EXIST. FLOW-LINE ELEV.
PP	EXIST. POWER POLE
SP	EXIST. SERVICE POLE
WV	EXIST. WATER VALVE
FH	EXIST. FIRE HYDRANT
	EXIST. SANITARY SEWER MANHOLE
<<<==	INDICATES PROPOSED DRAINAGE DIRECTION
F.H.	INDICATES PROPOSED FIRE HYDRANT LOCATION

RESIDENTIAL DEVELOPMENT DENSITY:
PROJECT = 18.09 ACRES (NET)
LOTS = 92 UNITS
DENSITY = 5.09 UNITS PER ACRE
(TARGET DENSITY = 5.25 UNIT PER ACRE)
(ALLOWED DENSITY = 2.1 TO 7 U.P.A.)



50' WIDE STREET
SCALE HORIZ. 1"=10' VERT. 1"=2'



PECAN AVENUE ENTRANCE
60' WIDE STREET
SCALE HORIZ. 1"=10' VERT. 1"=2'

ption:

-048633

THE NORTHEAST QUARTER OF THE NORTHWEST
NE 1/4 of NW 1/4) OF SECTION 36, TOWNSHIP
7 EAST, MOUNT DIABLO BASE AND MERIDIAN,
OFFICIAL PLAT THEREOF.

NING DESIGNATION:

FAMILY (LOW DENSITY)
ZONE DISTRICT

ONING DESIGNATION:

ANNED DEVELOPMENT)
CT

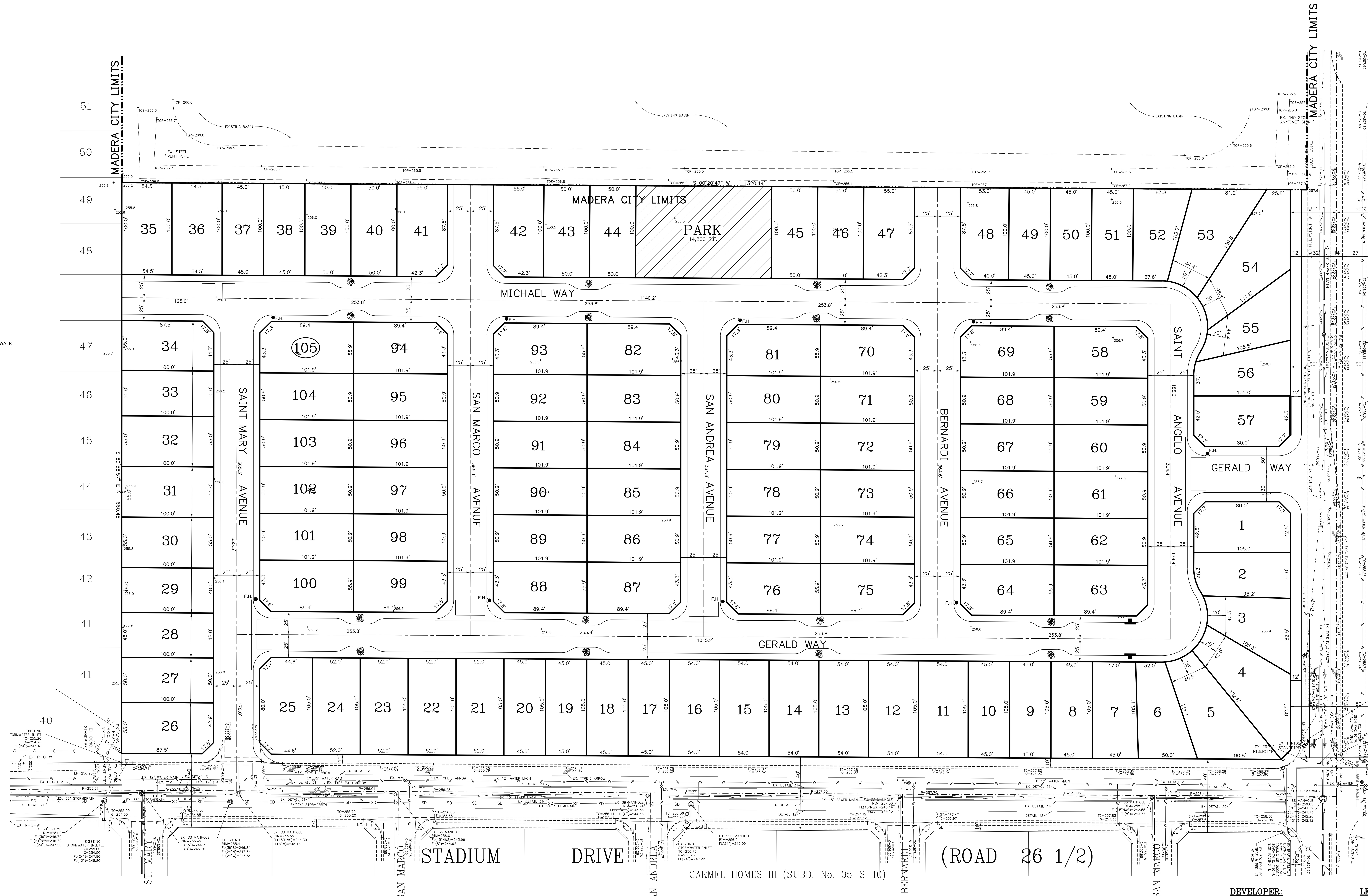
SIZE:

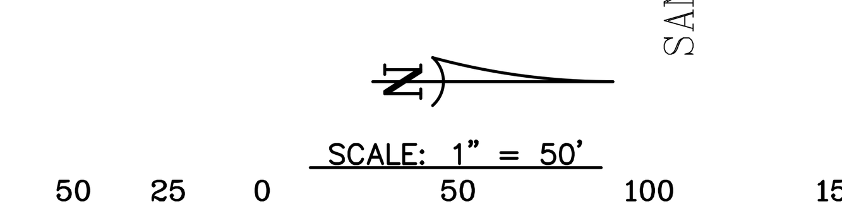
SIZE = 7,780 S.F.
SIZE = 5,000 S.F.

SIZE = 5,245 S.F.

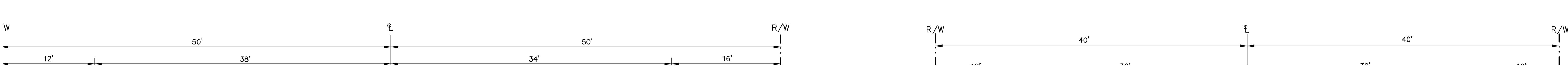
EVATIONS

IE EAST RETURN AT THE
OF AVENUE 13 &





SCALE: 1" = 50'



DEVELOPER:

DMP DEVELOPMENT CORPORATION, INC.
2001 HOWARD ROAD, SUITE 211
MADERA, CA 93637
PH. (559)673-7002

LE

DM
20
MA
PH

APPENDIX B: VASCULAR PLANTS OF THE PROJECT SITE

VASCULAR PLANTS OF THE PROJECT SITE

The plant species listed below were observed on the project site during a survey conducted by Live Oak Associates, Inc. on November 23, 2022. The U.S. Fish and Wildlife Service wetland indicator status of each plant has been shown following its common name.

OBL - Obligate
FACW - Facultative Wetland
FAC - Facultative
FACU - Facultative Upland
UPL - Upland
+/- - Higher/lower end of category
NR - No review
NA - No agreement
NI - No investigation

ASTERACEAE – Daisy Family		
Erigeron bonariensis	Flax-leaved horseweed	FACU
BRASSICACEAE – Mustard Family		
Sisymbrium irio	London rocket	UPL
CHENPODIACEAE – Goosefoot Family		
Salsola tragus	Russian thistle	UPL
GERANIACEAE – Geranium Family		
Erodium cicutarium	Red-stemmed filaree	UPL
Erodium moschatum	Whitestem filaree	UPL
MALVACEAE –Mallow Family		
Malva parviflora	Cheeseweed	UPL
POACEAE – Grass Family		
Echinochloa colona	Jungle rice	FAC
Sporobolus airoides	Alkali sacaton	FAC
ROSACEAE – Rose Family		
Prunus dulcis	Almond	UPL

APPENDIX C: TERRESTRIAL VERTEBRATES OF THE PROJECT SITE

TERRESTRIAL VERTEBRATES OF THE PROJECT SITE

The species listed below are those that may reasonably be expected to use the habitats of the project site routinely or from time to time. The list was not intended to include birds that are vagrants or occasional transients. Terrestrial vertebrate species observed in or adjacent to the project site during the November 23, 2022 survey has been noted with an asterisk.

CLASS: REPTILIA
ORDER: SQUAMATA (Lizards and Snakes)
SUBORDER: SAURIA (Lizards)
FAMILY: PHRYNOSOMATIDAE (Spiny, Side-blotched, Horned, and relatives)
San Joaquin Fence Lizard (*Sceloporus occidentalis biseriatus*)
Western Side-blotched Lizard (*Uta stansburiana elegans*)
FAMILY: TELLIDAE (Whiptails and Racerunners)
California Whiptail (*Aspidoscelis tigris munda*)
SUBORDER: SERPENTES (Snakes)
FAMILY: COLUBRIDAE (Colubrids)
California Kingsnake (*Lampropeltis californiae*)
Pacific Gopher Snake (*Pituophis catenifer catenifer*)
Valley Gartersnake (*Thamnophis sirtalis fitchi*)
FAMILY: VIPERIDAE
Northern Pacific Rattlesnake (*Crotalus oreganus oreganus*)

CLASS: AVES
ORDER: APODIFORMES (Swifts and Hummingbirds)
FAMILY: TROCHILIDAE (Hummingbirds)
*Anna's Hummingbird (*Calypte anna*)
Rufous Hummingbird (*Selasphorus rufus*)
Allen's Hummingbird (*Selasphorus sasin*)
ORDER: CHARADRIIFORMES (Shorebirds and Allies)
FAMILY: CHARADRIIDAE (Plovers and relatives)
*Killdeer (*Charadrius vociferus*)
ORDER: COLUMBIFORMES (Pigeons and Doves)
FAMILY: COLUMBIDAE (Pigeons and Doves)
Rock Pigeon (*Columba livia*)
*Eurasian Collared-dove (*Streptopelia decaocto*)
*Mourning Dove (*Zenaida macroura*)
ORDER: FALCONIFORMES (Vultures, Hawks, and Falcons)
FAMILY: CATHARTIDAE (American Vultures)
*Turkey Vulture (*Cathartes aura*)
FAMILY: ACCIPITRIDAE (Hawks, Eagles, and Kites)
Red-tailed Hawk (*Buteo jamaicensis*)

Cooper's Hawk (*Accipiter cooperii*)
Sharp-shinned Hawk (*Accipiter striatus*)

FAMILY: FALCONIDAE (Caracaras and Falcons)

Merlin (*Falco columbarius*)
American Kestrel (*Falco sparverius*)

ORDER: PICIFORMES (Woodpeckers and Relatives)

FAMILY: PICIDAE (Woodpeckers and Wrynecks)

Acorn Woodpecker (*Melanerpes formicivorous*)

ORDER: STRIGIFORMES (Owls)

FAMILY: TYTONIDAE (Barn Owls)

Barn Owl (*Tyto alba*)

FAMILY: STRIGIDAE (Typical Owls)

Great Horned Owl (*Bubo virginianus*)

ORDER: PASSERIFORMES (Perching Birds)

FAMILY: BOMBYCILLIDAE (Waxwings)

*Cedar Waxwing (*Bombycilla cedrorum*)

FAMILY: CORVIDAE (Jays, Magpies, and Crows)

*American Crow (*Corvus brachyrhynchos*)
Common Raven (*Corvus corax*)

FAMILY: FRINGILLIDAE (Finches)

*House Finch (*Carpodacus mexicanus*)
Lesser Goldfinch (*Carduelis psaltria*)
American Goldfinch (*Spinus tristis*)

FAMILY: ICTERIDAE (Blackbirds, Orioles and Allies)

Brewer's Blackbird (*Euphagus cyanocephalus*)
Brown-headed Cowbird (*Molothrus ater*)

FAMILY: MIMIDAE (Mockingbirds and Thrashers)

Northern Mockingbird (*Mimus polyglottos*)

FAMILY: MOTICILLIDAE (Wagtails, Longclaws, and Pipits)

*American Pipit (*Anthus rubescens*)

FAMILY: PASSERELLIDAE (New World Sparrows)

Lincoln's Sparrow (*Melospiza lincolnii*)
Dark-eyed Junco (*Junco hyemalis*)
House Sparrow (*Passer domesticus*)
Savannah Sparrow (*Passerculus sandwichensis*)
*White-crowned Sparrow (*Zonotrichia leucophrys*)

FAMILY: PARULIDAE (New World Warblers)

*Yellow-rumped Warbler (*Setophaga coronata*)

FAMILY: STURNIDAE (Starlings)

*European Starling (*Sturnus vulgaris*)

FAMILY: TYRANNIDAE (Tyrant Flycatchers)

*Black Phoebe (*Sayornis nigricans*)
Say's Phoebe (*Sayornis saya*)
Western Kingbird (*Tyrannus verticalis*)

CLASS: MAMMALIA

ORDER: CARNIVORA (Carnivores)

FAMILY: CANIDAE (Foxes, Wolves, and Relatives)

Coyote (*Canis latrans*)

*Domestic/Feral Dog (*Canis lupus*)

Red Fox (*Vulpes vulpes*)

FAMILY: PROCYONIDAE (Raccoons and Relatives)

Raccoon (*Procyon lotor*)

FAMILY: MUSTELIDAE (Weasels, Badgers, and Relatives)

Striped Skunk (*Mephitis mephitis*)

FAMILY: FELIDAE (Cats)

Domestic/Feral Cat (*Felis catus*)

ORDER: CHIROPTERA (Bats)

FAMILY: MOLOSSIDAE (Free-tailed Bat)

Brazilian Free-tailed Bat (*Tadarida brasiliensis*)

FAMILY: VESPERTILIONIDAE (Vespertilionid Bats)

Big Brown Bat (*Eptesicus fuscus*)

Yuma Myotis (*Myotis yumanensis*)

Long-eared Myotis (*Myotis evotis*)

Fringed Myotis (*Myotis thysanodes*)

Long-legged Myotis (*Myotis volans*)

California Myotis (*Myotis californicus*)

Small-footed Myotis (*Myotis leibii*)

Western Pipistrelle (*Pipistrellus hesperus*)

ORDER: INSECTIVORA (Shrews and Moles)

FAMILY: SORCIDAE (Shrews)

Ornate shrew (*Sorex ornatus*)

FAMILY: TALPIDAE (Moles)

Broad-footed Mole (*Scapanus latimanus*)

ORDER: MARSUPIALIA (Opossums, Kangaroos, and Relatives)

FAMILY: DIDELPHIDAE (Opossums)

Virginia Opossum (*Didelphis virginiana*)

ORDER: RODENTIA (Squirrels, Rats, Mice, and Relatives)

FAMILY: CRICETIDAE (Deer Mice, Voles, and Relatives)

California Vole (*Microtus californicus*)

Deer Mouse (*Peromyscus maniculatus*)

Western Harvest Mouse (*Reithrodontomys megalotis*)

FAMILY: GEOMYIDAE (Pocket Gophers)

*Botta's Pocket Gopher (*Thomomys bottae*)

FAMILY: MURIDAE (Old World Rats and Mice)

Norway Rat (*Rattus norvegicus*)

House Mouse (*Mus musculus*)

FAMILY: SCIURIDAE (Squirrels, Chipmunks, and Marmots)

*California Ground Squirrel (*Spermophilus beecheyi*)

APPENDIX D: SELECTED PHOTOGRAPHS OF THE PROJECT SITE

Photo 1 (above). The site's almond orchard. **Photo 2 (below).** The site's almond orchard (left) and the banks of one of the ponding basins that adjoin the site to the west (right).

Photo 3 (above). Facing east along the northern boundary of the site. The site's orchard is visible at right, and Pecan Avenue at left. **Photo 4 (below).** A small gap in the orchard with irrigation and electrical infrastructure located along the site's eastern boundary.

Appendix C

Cultural Resources

TECHNICAL MEMORANDUM

Date: February 1, 2023

To: Ellie Krantz, Associate Planner, 4Creeks, Inc.

From: Consuelo Sauls, M.A., RPA, Archaeologist, Taylored Archaeology

Subject: Cultural Resources Technical Memorandum Desktop Review for Carmel Homes IV Project, City of Madera, Madera County, California

Introduction

The Carmel Homes IV Project (Project) consists of a residential subdivision located in the City of Madera, Madera County, California at West Pecan Avenue and Stadium Road (also known as Road 26 ½). The Project site is currently an orchard. The proposed Project will develop a 318-unit housing subdivision. The Project is currently undergoing environmental evaluation under the California Environmental Quality Act (CEQA) with the City of Madera serving as lead agency.

Project Location

The proposed Project is located at West Pecan Avenue and Stadium Road in Madera, California and consists of Madera County Assessor's Parcel Numbers 012-480-008 and 012-480-009 (Figure 1). The Project site is in Township 11 South, Range 17 East, Section 36 on the United States Geological Survey (USGS) 7.5-minute series Madera, California topographic quadrangle map (Figure 2).

Methodology

In order to research potential cultural resources within the Project vicinity, Taylored Archaeology requested a cultural resources records search from the Southern San Joaquin Information Center (SSJVIC) of the California Historical Resources Information System (CHRIS), at California State University, Bakersfield and reviewed said records in relationship to the Project area. The records search covered the Project area and all land within a 0.5-mile radius of the Project and included a review of the following: the Archaeological Determinations of Eligibility, the National Register of Historic Places, the California Registry of Historic Resources, the California Points of Historical Interest, the California Historical Landmarks, the California State Historic Resources Inventory, and a review of cultural resources reports on file with the SSJVIC. Archival research of available historic maps, historic aerial photographs, records, and databases was additionally conducted.

Records Search Results

The SSJVIC provided the results of cultural resources records search (File No. 23-021) for the Project on January 30, 2023 (Attachment B).

Table 1
Previous Recorded Cultural Resource within the Project Area

Resource Number	Age Association	Resource Type	Distance from Project Boundary
P-20-002308	Historic	Structure; canal	On site

The records search identified one recorded cultural resource within the Project boundary as shown on Table 1 (P-20-002308, a Madera Canal segment and associated laterals). However, a review of SSJVIC records, including P-20-002308, and of historical topographic maps, historical aerial photographs, and other archival sources as discussed in the Archival Research section below showed no evidence of any Madera Canal segment presently or historically located within or adjacent to the Project site.

Table 1
Previous Cultural Resource Investigation Reports within the Project Area

Report Number	Author(s)	Date	Report Title	Study
MA-00391	Varner, Dudley M.	1975	Parksdale Sewer System Project	Archaeological Field Survey
MA-00429	Wren, Donald G.	1985	An Archaeological Reconnaissance of the Madera Unified School District South High School Site	Archaeological Field Survey
MA-01201	Meyer, Jack, Young, D. Craig, and Rosenthal, Jeffrey	2010	Volume I: A Geoarchaeological Overview and Assessment of Caltrans Districts 6 and 9 - Cultural Resources Inventory of Caltrans District 6/9 Rural Conventional Highways - EA 06-0A7408 TEA Grant	Archaeological, and Geoarchaeological Literature Review; Desktop review

The three cultural reports listed in Table 2 are prior archaeological studies reported by the SSJVIC as occurring within the Project boundary. Further review of these studies revealed that two studies (MA-00391 and MA-00429) were archaeological field surveys adjacent to, but not within, the Project boundary. Both surveys resulted in negative findings for archaeological resources. The third study (MA-01201) was a desktop literature review only. No archaeological pedestrian surveys in these reports covered the Project site.

Table 3
Previous Cultural Resource Investigation Reports within a 0.5-mile radius of the Project Area

Report Number	Author(s)	Date	Report Title	Study
MA-00313	O'Connor, Denise and Clayton, H. B.	1981	Archaeological Survey Report a Proposed Left-Turn Channelization Project on Route 145	Archaeological field survey
MA-00431	Wren, Donald G.	1986	Archaeological Field Reconnaissance for the Madera Survey	Archaeological field survey
MA-01255	Baloian, Mary, Mirro, Michael, and Jones, Jessica	2017	Cultural Resources Inventory for the Camarena Health School-Based Health Center Project at Madera South High School, Madera County, California	Archaeological field Survey
MA-01259	Hernandez, Hansel and Valentin, Sylvere	2017	Historic Property Survey Report for the Madera 145 ADA Ramps Project, Madera County, California Historic Resources Evaluation Report for the Madera 145 ADA Ramps Project, Madera County, California Archaeological Survey Report for the Install and Upgrade Americans with Disabilities Act (ADA) Ramps Project, Madera County, California	Historic Structures and Buildings Survey and Evaluation and Archaeological Survey Report

Four previous cultural resource studies were conducted within a 0.5-mile radius of the Project area as shown in Table 3. No archaeological pedestrian surveys for these reports overlapped the Project area.

Archival Research

A review of available UISGS 7.5-minute topographic maps of the Madera, CA quadrangle from 1922, 1947, 1963, 1963 photorevised 1981, 2012, 2015, 2018, and 2021 revealed no evidence of any ditches or canals within the Project boundary (USGS). The 2018 topographic map showed an unnamed blue line ditch feature on the Project site corresponding to the recorded segment of the Madera Canal (P-20-002308) within the Project site. However, subsequent review of available historic aerials from 1946 to present day and Google Street View photographs from 2011 to present day reveal no evidence of any ditches or canals within the Project boundary (NETROnline 2023; Google Earth Pro 2023; Google 2022). Additionally, the 2021 USGS topographic map of the site does not show the blue line feature that was present in the 2018 topographic map (USGS). Finally, the blue line feature noted in the 2018 topographic map appears to correspond with the dark outline of the windbreak trees lining the northeastern boundary of the Project site along Road 26 ½. Therefore, a review of historical topographic maps, historic aerial imagery, and other sources indicates that the recording of the segment of the Madera Canal (P-20-002308) within the Project boundary may have been an error corresponding with the erroneous blue line feature shown only on the 2018 USGS topographic map.

Conclusion and Recommendations

Based on the results of the SSJVIC records search and subsequent archival research, it appears the single recorded cultural resource within the Project boundary (P-20-002308, a segment of the Madera Canal) is not located within or adjacent to the Project site. No other evidence of cultural resources within the Project boundary was found during this investigation. Based upon the limited information available, the chance of encountering subsurface archaeological or historical resources within the Project boundary is undetermined. Taylored Archaeology therefore recommends the following:

In the event of accidental discovery of unidentified archaeological remains during development or ground-moving activities in the Project area, all work should be halted in the immediate vicinity (within a 100-foot radius) until a qualified archaeologist can identify the discovery and assess its significance.

If human remains are uncovered during construction, the Madera County Coroner is to be notified to investigate the remains and arrange proper treatment and disposition. If the remains are identified on the basis of archaeological context, age, cultural associations, or biological traits to be those of a Native American, California Health and Safety Code 7050.5 and PRC 5097.98 require that the coroner notify the Native American Heritage Commission within 24 hours of discovery. The Native American Heritage Commission will then identify the Most Likely Descendent who will be afforded an opportunity to make recommendations regarding the treatment and disposition of the remains.

Sincerely,

Consuelo Sauls

Consuelo Sauls, M.A., RPA
Archaeologist

Attachment A: Project Maps
Attachment B: Records Search Results Letter

References

Google

2011 Google Street View. http://maps.google.com. Digital Photograph of 26498 Avenue 13 Madera, California, taken October 2011. Accessed January 31, 2023.

2015 Google Street View. http://maps.google.com. Digital Photograph of 26498 Avenue 13 Madera, California, taken September 2015. Accessed January 31, 2023.

2021 Google Street View. http://maps.google.com. Digital Photograph of 26498 Avenue 13 Madera, California, taken March 2021. Accessed January 31, 2023.

2022 Google Street View. http://maps.google.com. Digital Photograph of 26498 Avenue 13 Madera, California, taken October 2022. Accessed January 31, 2023.

Google Earth Pro.

2022 Google Earth Software, Google, Inc.

NETROnline

2023 "Historic Aerials". https://www.historicaerials.com/ Accessed January 31, 2022.

United States Geological Survey (USGS)

1922 *Madera, California, Quadrangle Map*. 7.5-minute series. U.S. Geological Survey, Denver, Colorado.

1947 *Madera, California, Quadrangle Map*. 7.5-minute series. U.S. Geological Survey, Denver, Colorado.

1963 *Madera, California, Quadrangle Map*. 7.5-minute series. U.S. Geological Survey, Denver, Colorado.

1981 *Madera, California, Quadrangle Map, 1963, photo revised 1981*. 7.5-minute series. U.S. Geological Survey, Denver, Colorado.

2012 *Madera, California, Quadrangle Map*. 7.5-minute series. U.S. Geological Survey, Denver, Colorado.

2015 *Madera, California, Quadrangle Map*. 7.5-minute series. U.S. Geological Survey, Denver, Colorado.

2018 *Madera, California, Quadrangle Map*. 7.5-minute series. U.S. Geological Survey, Denver, Colorado.

2021 *Madera, California, Quadrangle Map*. 7.5-minute series. U.S. Geological Survey, Denver, Colorado.

ATTACHMENT A

Project Maps

6083 N Figarden Dr., Ste. 616, Fresno, CA 93722
559.797.1572 / csaulsarchaeo@gmail.com

Figure 1 **Project vicinity in Madera, California**

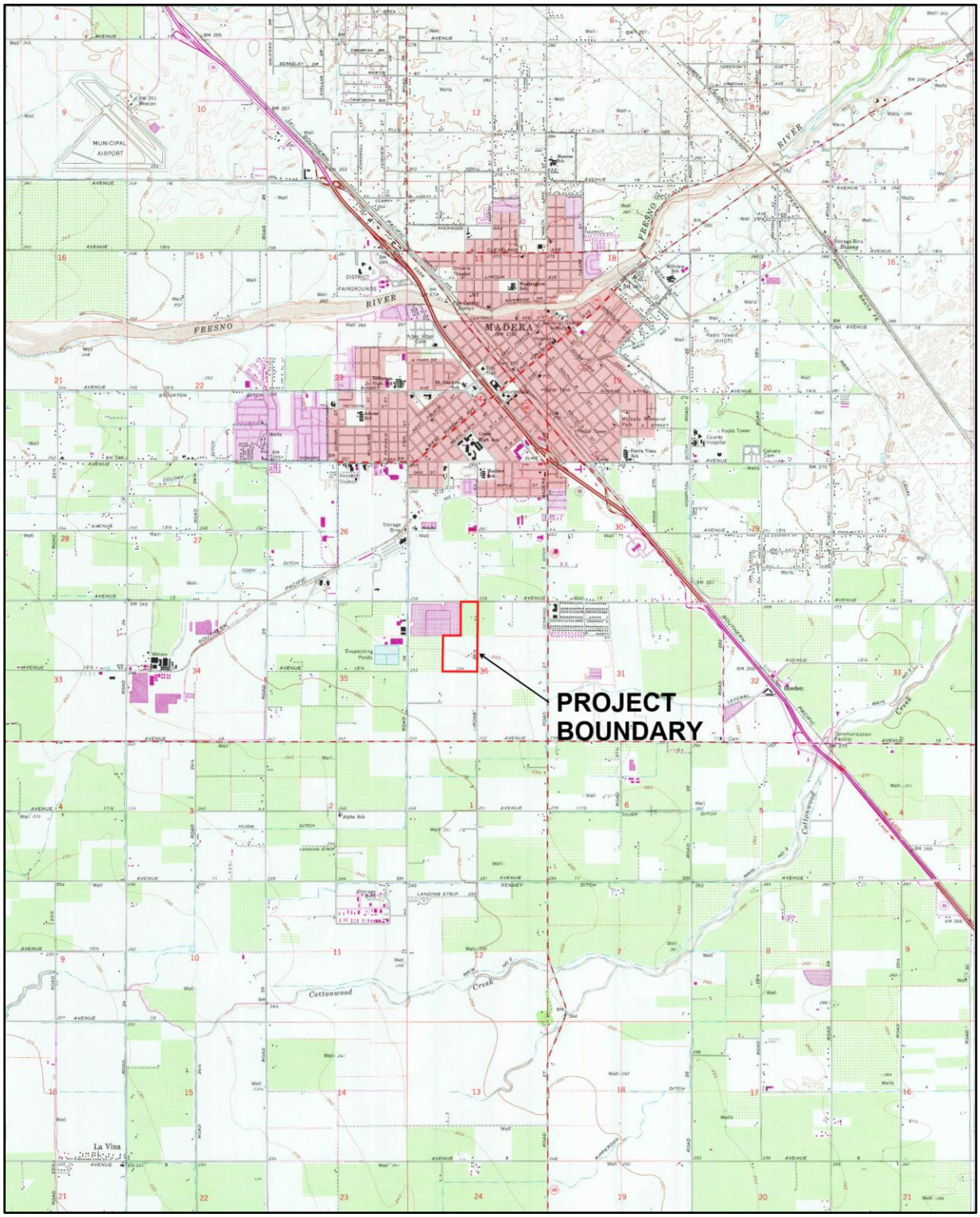


Figure 2 **Project location on the USGS Madera, CA 7.5-minute quadrangle**

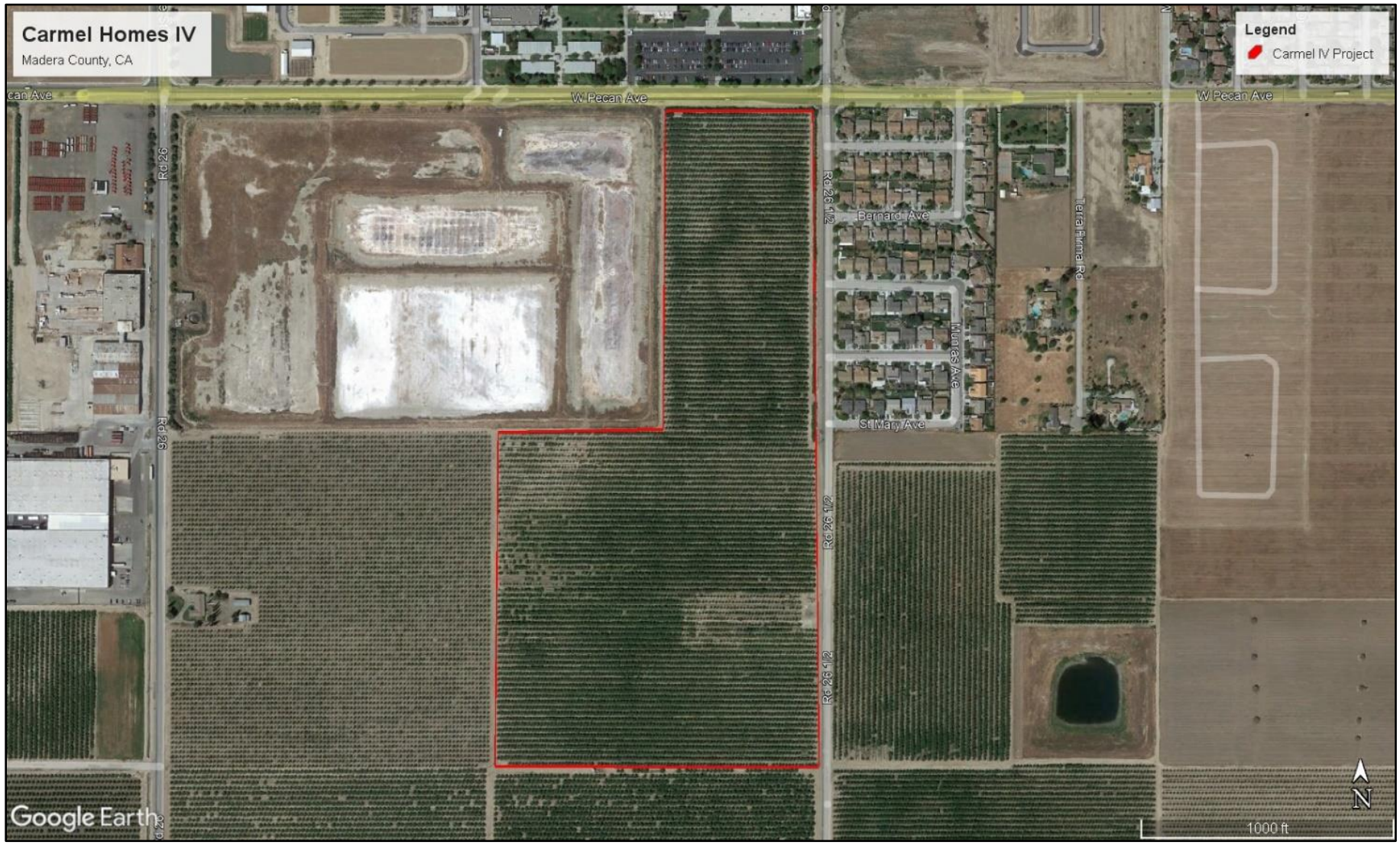


Figure 3 **Aerial view of the Project boundary**

ATTACHMENT B

Records Search Results

6083 N Figarden Dr., Ste. 616, Fresno, CA 93722
559.797.1572 / csaulsarchaeo@gmail.com

California Historical Resources Information System

Fresno
Kern
Kings
Madera
Tulare

Southern San Joaquin Valley Information Center
California State University, Bakersfield
Mail Stop: 72 DOB
9001 Stockdale Highway
Bakersfield, California 93311-1022
(661) 654-2289
E-mail: ssjvic@csub.edu
Website: www.csub.edu/ssjvic

1/30/2023

Consuelo Sauls
Taylored Archaeology
6083 N. Figarden Dr. Ste. 616
Fresno, CA 93722

Re: Carmel Homes IV
Records Search File No.: 23-021

The Southern San Joaquin Valley Information Center received your record search request for the project area referenced above, located on the Madera USGS 7.5' quad. The following reflects the results of the records search for the project area and the 0.5 mile radius:

As indicated on the data request form, the locations of resources and reports are provided in the following format: ☒ custom GIS maps ☐ GIS data

Resources within project area:	P-2-002308
Resources within 0.5 mile radius:	None
Reports within project area:	MA-00391, 00429, 01201
Reports within 0.5 mile radius:	MA-00313, 00431, 01255, 01259

Resource Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Resource Database Printout (details):	☒ enclosed	☐ not requested	☐ nothing listed
Resource Digital Database Records:	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (details):	☒ enclosed	☐ not requested	☐ nothing listed
Report Digital Database Records:	☒ enclosed	☐ not requested	☐ nothing listed
Resource Record Copies:	☒ enclosed	☐ not requested	☐ nothing listed
Report Copies:	☒ enclosed	☐ not requested	☐ nothing listed
OHP Built Environment Resources Directory:	☒ enclosed	☐ not requested	☐ nothing listed
Archaeological Determinations of Eligibility:	☐ enclosed	☐ not requested	☒ nothing listed
CA Inventory of Historic Resources (1976):	☐ enclosed	☐ not requested	☒ nothing listed

Caltrans Bridge Survey: Not available at SSJVIC; please see https://dot.ca.gov/programs/environmental-analysis/cultural-studies/california-historical-bridges-tunnels

Ethnographic Information: Not available at SSJVIC

Historical Literature: Not available at SSJVIC

Historical Maps: Not available at SSJVIC; please see http://historicalmaps.arcgis.com/usgs/

Local Inventories: Not available at SSJVIC

GLO and/or Rancho Plat Maps: Not available at SSJVIC; please see http://www.glorecords.blm.gov/search/default.aspx#searchTabIndex=0&searchByTypeIndex=1 and/or http://www.oac.cdlib.org/view?docId=hb8489p15p;developer=local;style=oac4;doc.view=items

Shipwreck Inventory: Not available at SSJVIC; please see https://www.slc.ca.gov/shipwrecks/

Soil Survey Maps: Not available at SSJVIC; please see http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

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. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Invoices for Information Center services will be sent under separate cover from the California State University, Bakersfield Accounting Office.

Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

Jeremy E David
Assistant Coordinator

Appendix D

Energy Calculations

Construction Equipment Energy Use

Phase Name	Off Road Equipment Type	Off Road Equipment Unit Amount[1]	Usage Hours Per Day[1]	Horse Power (lbs/sec)[1]	Load Factor[1]	Total Operational Hours	BSFC[2]	Fuel Used (gallons)[3]	MBTU[4]
Architectural Coating	Air Compressors	1	6.00	78	0.48	450	0.408	966.94	134.4048
Paving	Cement and Mortar Mixers	4	6.00	9	0.56	1800	0.408	520.66	72.37182
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73	560	0.408	1900.41	264.1571
Building Construction	Cranes	1	4.00	231	0.29	4440	0.367	15355.02	2134.348
Building Construction	Forklifts	2	6.00	89	0.20	13320	0.408	13607.42	1891.432
Grading	Graders	1	6.00	187	0.41	660	0.367	2612.32	363.113
Site Preparation	Graders	1	8.00	187	0.41	320	0.367	1266.58	176.0548
Paving	Pavers	1	7.00	130	0.42	525	0.367	1479.82	205.6953
Paving	Rollers	1	7.00	80	0.38	525	0.408	915.98	127.3208
Demolition	Rubber Tired Dozers	1	1.00	247	0.40	70	0.367	357.04	49.62806
Grading	Rubber Tired Dozers	1	6.00	247	0.40	660	0.367	3366.34	467.9217
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37	17760	0.408	36582.05	5084.905
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37	840	0.408	1730.23	240.5023
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37	770	0.408	1586.05	220.4604
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37	525	0.408	1081.40	150.3139
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37	320	0.408	659.14	91.61992
Total								83987.40	11674.25

Construction Phases

PhaseNumber	Phase Name	Phase Type	Phase Start Date	Phase End Date	Num Days Week	Total Number of Days
1	**Demolition**	**Demolition**	8/1/2025	11/6/2025	5	70
2	Site Preparation	Site Preparation	11/7/2025	1/1/2026	5	40
3	Grading	Grading	1/2/2026	6/4/2026	5	110
4	Building Construction	Building Construction	6/5/2026	9/5/2030	5	1110
5	Paving	Paving	9/6/2030	12/19/2030	5	75
6	Architectural Coating	Architectural Coating	12/20/2030	4/3/2031	5	75
						1480

Notes

1. CalEEMod Default Values Used
2. BSFC - Brake Specific Fuel Consumption (pounds per horsepower-hour) – If less than 100 Horsepower = 0.408, if greater than 100 Horsepower = 0.367
3. Fuel Used = Load Factor x Horsepower x Total Operational Hours x BSFC / Unit Conversion
4. MBTU calculated for comparison purposes. Assumed 1 gallon of diesel = 0.139 MBTU

Mobile Energy Use (Construction)

Worker Trips

	Daily Worker Trips[1]	Worker Trip Length[1]	VMT/Day	MPG Factor (EMFAC2017)	Gallons of Gas/Day	# of Days	Total Gallons of Gas	MBTU
Demolition	15	10.8	162	29.23	5.5	70	388.0	45.038
Site Preparation	18	10.8	194.4	29.23	6.7	40	266.0	30.8832
Grading	20	10.8	216	29.23	7.4	110	812.9	94.36532
Building Construction	182	10.8	1965.6	29.23	67.2	1110	74643.0	8665.31
Paving	15	10.8	162	29.23	5.5	75	415.7	48.25499
Architectural Coating	36	10.8	388.8	29.23	13.3	75	997.6	115.812
Total	**286**	**64.8**	**3088.8**	**175.38**	**105.7**	**1480**	**77523.2**	**8999.664**

Vendor Trips

	Daily Vendor Trips	Vendor Trip Length	VMT/Day	MPG Factor	Gallons of Diesel/Day	# of Days	Total Gallons of Diesel	MBTU
Building Construction	60	7.3	438	8.43	52.0	1110	57672.59786	8016.491

Hauling Trips

	Daily Hauling Trips	Hauling Trip Length	VMT/Day	MPG Factor	Gallons of Gas/Day	# of Days	Total Gallons of Diesel	MBTU
Demolition	0	20	0	8.43	0.0	70	0	0

Fleet Characteristics

	Vehicle Class	Fleet Mix	2024 MPG Factor (EMFAC2017)	Average MPG Factor
Assumed Vehicle Fleet for Workers	LDA	33%	33.24	
	LDT1	33%	28.07	
	LDT2	33%	26.38	29.23
Assumed Vehicle Fleet for Vendor Trips	MHD	50%	9.74	
	HHD	50%	7.12	8.43

Notes

1. CalEEMod Default values used
2. MBTU calculated for comparison purposes. Assumed 1 gallon of gasoline = 0.11609 MBTU

Mobile Energy Use (Operations)

Total Annual VMT from Project (CalEEMod)	**5,521,480**

Fleet Mix & Fuel Calculations

Vehicle Class	Proportion of Fleet Mix[1]	Annual VMT by Vehicle Class	Proportion of vehicle class using gas or diesel (EMFAC2021)[2]		Annual VMT by Vehicle Class and Fuel Type		Fuel Efficiency (MPG) by Vehicle Class and Fuel Type (EMFAC2021)		Annual Fuel Use from Project (gallons)		MBTU/Year[3]
			Gas	Diesel	Gas	Diesel	Gas	Diesel	Gas	Diesel	
LDA	50.44%	2784841.3	100%	0%	2779734.31	5106.95	28.92	42.70	96105.5	119.6	11173.5
LDT1	5.14%	283936.6	100%	0%	283831.60	104.99	23.79	24.66	11933.1	4.3	1385.9
LDT2	16.85%	930612.3	100%	0%	927609.80	3002.53	23.27	32.65	39870.9	91.9	4641.4
MDV	16.40%	905484.1	98%	2%	891160.23	14323.84	18.87	23.72	47232.4	603.8	5567.1
LHD1	2.99%	164816.2	50%	50%	82239.74	82576.44	9.67	15.77	8501.8	5235.7	1714.7
LHD2	0.67%	37242.4	27%	73%	10081.27	27161.11	8.58	13.15	1174.8	2066.2	423.6
MHD	0.83%	45657.1	18%	82%	8150.36	37506.76	4.80	8.78	1698.0	4271.4	790.8
HHD	3.67%	202378.8	0%	100%	44.48	202334.33	3.37	6.22	13.2	32547.1	4525.6
OBUS	0.06%	3423.3	63%	37%	2168.29	1255.03	4.79	6.96	452.7	180.4	77.6
UBUS	0.02%	1043.6	64%	36%	672.70	370.86	8.41	12.12	80.0	30.6	13.5
MCY	2.47%	136242.5	100%	0%	136242.52	0.00	40.47	NA	3366.8	0.0	390.9
SBUS	0.12%	6360.7	38%	62%	2414.60	3946.15	9.83	8.13	245.6	485.7	96.0
MH	0.35%	19435.6	65%	35%	12692.64	6742.97	4.41	9.39	2875.7	717.9	433.6
Total	**100.00%**	**5521474.5**			**5137042.54**	**384431.94**	**14.55**		**213551**	**46355**	**31234.4**

Fleet Characteristics 21.2

Source: EMFAC 2021 (v1.0.1) Emissions Inventory
Region Type: County
Region: Tulare County
Calendar Year: 2028
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/year for VMT, trips/year for Trips, tons/year for Emissions, 1000 gallons/year for Fuel Consumption

GASOLINE

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT (Annual)	Trips (Annual)	Fuel Consumption (1000 gal/year)	Annual Fuel Consumption (gallons)	MPG
Tulare County	2025	HHDT	Aggregated	Aggregated	GAS	2	164	36	0.0486	49	3.37
Tulare County	2025	LDA	Aggregated	Aggregated	GAS	62800	2580000	292000	89.2	89200	28.92
Tulare County	2025	LDT1	Aggregated	Aggregated	GAS	5590	186000	24100	7.82	7820	23.79
Tulare County	2025	LDT2	Aggregated	Aggregated	GAS	29000	1140000	135000	49	49000	23.27
Tulare County	2025	LHDT1	Aggregated	Aggregated	GAS	2670	97700	39800	10.1	10100	9.67
Tulare County	2025	LHDT2	Aggregated	Aggregated	GAS	336	12100	5010	1.41	1410	8.58
Tulare County	2025	MCY	Aggregated	Aggregated	GAS	3370	19100	6750	0.472	472	40.47
Tulare County	2025	MDV	Aggregated	Aggregated	GAS	27500	983000	125000	52.1	52100	18.87
Tulare County	2025	MH	Aggregated	Aggregated	GAS	356	3200	36	0.725	725	4.41
Tulare County	2025	MHDT	Aggregated	Aggregated	GAS	176	10800	3520	2.25	2250	4.80
Tulare County	2025	OBUS	Aggregated	Aggregated	GAS	73	3870	1460	0.808	808	4.79
Tulare County	2025	SBUS	Aggregated	Aggregated	GAS	28	1750	110	0.178	178	9.83
Tulare County	2025	UBUS	Aggregated	Aggregated	GAS	12	497	47	0.0591	59	8.41

DIESEL

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	VMT	Trips	Fuel Consumption (1000 gal/year)	Annual Fuel Consumption (gallons)	MPG
Tulare County	2025	HHDT	Aggregated	Aggregated	DSL	4890	746000	88700	120	120000	6.22
Tulare County	2025	LDA	Aggregated	Aggregated	DSL	159	4740	658	0.111	111	42.70
Tulare County	2025	LDT1	Aggregated	Aggregated	DSL	4	69	12	0.00279	3	24.66
Tulare County	2025	LDT2	Aggregated	Aggregated	DSL	88	3690	422	0.113	113	32.65
Tulare County	2025	LHDT1	Aggregated	Aggregated	DSL	2760	98100	34700	6.22	6220	15.77
Tulare County	2025	LHDT2	Aggregated	Aggregated	DSL	871	32600	11000	2.48	2480	13.15
Tulare County	2025	MDV	Aggregated	Aggregated	DSL	424	15800	1950	0.666	666	23.72
Tulare County	2025	MH	Aggregated	Aggregated	DSL	196	1700	20	0.181	181	9.39
Tulare County	2025	MHDT	Aggregated	Aggregated	DSL	1060	49700	12400	5.66	5660	8.78
Tulare County	2025	OBUS	Aggregated	Aggregated	DSL	32	2240	390	0.322	322	6.96
Tulare County	2025	SBUS	Aggregated	Aggregated	DSL	135	2860	1950	0.352	352	8.13
Tulare County	2025	UBUS	Aggregated	Aggregated	DSL	3	274	14	0.0226	23	12.12

Notes

1. Fleet Mix Provided by CalEEMod
2. Proportion of diesel vs. gasoline vehicles calculated based on total annual VMT for each vehicle class
3. MBTU Calculated for comparison purposes. Assumed 1 gallon of gasoline = 0.116090 MBTU and 1 gallong of diesel = 0.139 MBTU

Summary of Energy Use (Operation)

Mobile Fuel Use	**Gal/Year**		**MMBTU**
	Gasoline	213,551	256871
	Diesel	46355	6368
Electricity Use	**kWh/Year**		**MMBTU**
	2535720		8652
Natural Gas Use	**kBTU/Year**		**MMBTU**
	7643940		7644
			MMBTU
Total Operational Energy Use			**279535**

Appendix E

VMT Assessment

CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: November 15, 2022

TO: Michael Pistoresi, DMP Development Corp.

FROM: Ambarish Mukherjee, P.E., AICP

SUBJECT: Carmel Homes II and Carmel Homes IV Residential Project Vehicle Miles Traveled (VMT) Analysis Memorandum

LSA has prepared a Vehicle Miles Traveled (VMT) Analysis Memorandum (Memo) for the proposed Carmel II and Carmel IV Homes Residential Development (project) in the City of Madera (City). Carmel II includes development of 110 single family residential units and Carmel IV proposes construction of 226 single family residential units. Both developments will be located on the southwest corner of Avenue 13 and Road 26 ½ in the City of Madera. Based on LSA's understanding, it is anticipated that one development application will be submitted to the City for the project. Hence both parcels are included in the VMT analysis using same model run, however, both parcels are modeled in separate traffic analysis zones (TAZs). Therefore, VMT metrics are estimated and presented separately for both parcels.

BACKGROUND

On December 28, 2018, the California Office of Administrative Law cleared the revised California Environmental Quality Act (CEQA) guidelines for use. Among the changes to the guidelines was removal of vehicle delay and level of service from consideration under CEQA. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled (VMT).

The project is located within the jurisdiction of City of Madera. The City has yet to adopt Senate Bill 743 (SB 743) guidelines, and therefore, the VMT analysis has been based upon the methodology and significant threshold criteria identified in the Governor's Office of Research and Planning (OPR) Technical Advisory (TA), dated December 2018.

The OPR TA includes multiple screening criteria for small land use projects to be screened out of a detailed VMT analysis. The project doesn't meet any of the screening criteria identified in the TA and so a detailed VMT analysis was conducted to evaluate the project VMT impact.

VMT Metrics and Thresholds

The project consists of residential land uses only and the TA recommends use of VMT per capita to evaluate residential land uses. Also, as per the OPR TA, a region should be defined based on where majority of the project trips are contained. As such, majority of the project trips are estimated to be start or end within the region defined for VMT analysis purposes. Typically, it is the city or county

boundary within which majority of those trips are contained. Given the project is located on the boundary of the City, it was determined that the county would be an appropriate definition for the region.

Based on OPR TA recommendations, the threshold for determining VMT impacts has been considered as 15 percent below the region's current baseline VMT per capita for residential projects. Therefore, the project would constitute a significant VMT impact if the project VMT per capita is greater than 85% of the regional/countywide VMT per capita.

The OPR TA recommends using regional travel demand model for detailed VMT analysis. The Madera County Transportation Commission (MCTC) travel demand model is the regional travel demand model. Most recent version of the travel model was requested from the county and was used to conduct the project VMT analysis.

Project Traffic Analysis Zone Update

To calculate the project VMT, the first step was to update the TAZs in the model that include the project area. The project should be isolated in the travel model to estimate project VMT. MCTC travel model includes ability to add new TAZs. Two new TAZs (one for Carmel II and one for Carmel IV) were used to model the project residential units. The project land uses were converted into model socioeconomic data and were included in the newly created zones for modeling purposes. No project specific network modifications were conducted. Model run was conducted for existing/base year scenario with updated model inputs. The outputs from this updated model run were utilized to estimate project specific VMT metrics.

VMT ANALYSIS

As mentioned above, the outputs from the updated model run were used to estimate project VMT per capita separately for the two parcels (Carmel II and Carmel IV). Table A shows the VMT analysis results using the county as the region. As shown in Table A, VMT per capita metric for both Carmel II and Carmel IV is 5.9% lower than the regional threshold. The regional/countywide average VMT per capita was obtained from "Chapter 17 – SB743 VMT Tool" section of the "Madera County Travel Demand Model – 2019 Model Update, September 23, 2020" (page 116 of the document).

Table A: Project and Threshold VMT per Capita

Parcel	Project VMT per Capita	Threshold VMT per capita *	Difference	Percentage Difference
Carmel II	8	8.5	-0.5	-5.9%
Carmel IV	8	8.5	-0.5	-5.9%

Source: Madera County Transportation Commission (MCTC) Travel Demand Model
** Threshold obtained from Madera County Travel Demand Model - 2019 Model Update, September 2020*

Conclusion

As mentioned before, the project consists of residential land uses only. The OPR TA recommends use of VMT per capita to evaluate residential projects. Also, based on OPR TA the project would constitute a significant VMT impact if the project VMT per capita is greater than 85% of the baseline regional VMT per capita. Madera County was considered as the region for evaluation of this project. As shown in Table A, the project VMT per capita is lower than the threshold and hence the project doesn't have a significant VMT impact.

Detailed VMT calculation for the project is included in Appendix A.

ATTACHMENT

Appendix A –VMT Calculation Worksheet

LSA

Appendix A - VMT Calculation Worksheet
Carmel II and Carmel IV Residential Project VMT Analysis

2018	Carmel II (project)	Madera County *
Households	110	
Population	361	158,328
Total Homebased (HB) VMT	2,901	1,586,940
HB VMT per capita	8.04	10.02

2018	Carmel IV (project)	Madera County *
Households	226	
Population	743	158,328
Total Homebased (HB) VMT	5,958	1,586,940
HB VMT per capita	8.02	10.02

** Obtained from Madera County Travel Demand Model - 2019 Model Update Document, September 2020*

Appendix F

Traffic Impact Study

TRAFFIC STUDY

Proposed Carmel II and Carmel IV Subdivisions

Southwest of the Intersection of Stadium Road and Pecan Avenue
Madera, California

Prepared For:

DMP Development Corporation, Inc.
2001 Howard Road, Suite 211
Madera, California 93637

Date:

January 23, 2023

Job No.:

22-041.01

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION

Mr. Michael Pistoresi
DMP Development Corporation, Inc.
2001 Howard Road, Suite 211
Madera, California 93637

January 23, 2023

Subject: Traffic Study
Proposed Carmel II and Carmel IV Subdivisions
Southwest of the Intersection of Stadium Road and Pecan Avenue
Madera, California

Dear Mr. Pistoresi:

1.0 INTRODUCTION

This report presents the results of a traffic study for the subject project in Madera, California. This analysis focuses on the anticipated effect of vehicle traffic resulting from the project. The scope of work is based on comments provided on August 23, 2022 by the City of Madera on a pdf of the traffic study scoping letter dated August 17, 2022.

2.0 PROJECT DESCRIPTION

The proposed Carmel II subdivision is located southwest of the intersection of Stadium Road and Pecan Avenue (APN 046-030-005) and will include 110 single-family residential lots. Site access will be via one local road connecting to Stadium Road between San Marco Avenue and St. Mary Avenue and one local road connecting to Pecan Avenue. There will also be an internal connection to Carmel IV at the south end of the project site.

The proposed Carmel IV subdivision is located northwest of the intersection of Stadium Road and the Avenue 12½ alignment (APN 046-030-006) and will include 226 single-family residential lots. Site access will be via one local road connecting to Stadium Road and one local road connecting to Avenue 12½. There will also be an internal connection to Carmel II at the north end of the project site.

A vicinity map is presented in the attached Figure 1, Site Vicinity Map, following the text of this report. Site plans area presented in Figure 2A, Carmel II Site Plan, and Figure 2B, Carmel IV Site Plan.

3.0 STUDY AREA AND TIME PERIOD

This report includes analyses of the following intersections:

- Stadium Road / Pecan Avenue
- Madera Avenue (State Route 145) / Pecan Avenue

The study time periods include the weekday a.m. and p.m. peak hours determined between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. The peak hours were analyzed for the following conditions:

- Existing Conditions;
- Existing-Plus-Project Conditions (includes both Carmel II and IV);
- Near-Term With-Project Conditions (includes both Carmel II and IV);
- Cumulative (Year 2043) Conditions With Project (includes both Carmel II and IV).

4.0 LANE CONFIGURATIONS AND INTERSECTION CONTROL

The existing lane configurations and intersection control at the study intersections are presented in Figure 3, Existing Lane Configurations and Intersection Control.

5.0 EXISTING TRAFFIC VOLUMES

Existing traffic volumes were determined by performing manual turning movement counts at the study intersections between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. on a weekday while schools were in session. The traffic count data sheets are presented in Appendix A. The existing peak-hour turning movement volumes are presented in Figure 4, Existing Peak-Hour Traffic Volumes.

6.0 PROJECT TRIP GENERATION

Data provided in the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 11th Edition*, are typically used to estimate the number of trips anticipated to be generated by proposed projects. Table 1 presents the trip generation estimates for the Project.

Table 1
Trip Generation Estimate

Project	Units	Daily		A.M. Peak Hour (Occurs Between 7:00 and 9:00 a.m.)					P.M. Peak Hour (Occurs Between 4:00 and 6:00 p.m.)				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Carmel II	110	9.43	1,038	0.70	26:74	20	57	77	0.94	63:37	65	38	103
Carmel IV	226	9.43	2,132	0.70	26:74	41	117	158	0.94	63:37	133	79	212
TOTALS			**3,170**			**61**	**174**	**235**			**198**	**117**	**315**

Reference: *Trip Generation Manual, 11th Edition*, Institute of Transportation Engineers 2021
Rates are reported in trips per unit. In:Out are percentages of the total.

7.0 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The regional distribution of Project trips was estimated using engineering judgment based on our knowledge of the area, available traffic counts, the location and configuration of site access points, available travel routes, and Project-specific travel modeling. The estimated percentage distribution of Project trips is presented in Figure 5, Peak-Hour Project Traffic Distribution Percentages. The peak-hour Project trips presented in Table 1 were assigned to the adjacent road network in accordance with the trip distribution percentages in Figure 5. The peak-hour Project traffic volumes at the study intersections are presented in Figure 6, Peak-Hour Project Traffic Volumes.

8.0 EXISTING-PLUS-PROJECT TRAFFIC VOLUMES

Existing-plus-Project traffic volumes are presented in Figure 7 and were determined by adding the values in Figures 4 and 6.

9.0 NEAR-TERM WITH-PROJECT TRAFFIC VOLUMES

Projects that are pending but are not yet complete are included in the analyses to assess near-term cumulative impacts. The following projects are included as near-term projects:

- Pecan Square Development - 110 single-family residences southwest of the intersection of Pecan Avenue and State Route (SR) 145
- 120 single-family residential lots on approximately 25.76 acres located northeast of the intersection of Stadium Road and Pecan Avenue
- The Villages at Almond Grove (formerly Village D)

Near-term with-Project traffic volumes are presented in Figure 8.

10.0 CUMULATIVE YEAR 2043 TRAFFIC VOLUMES

Cumulative year 2043 traffic volumes were projected based on information obtained from the Madera County Transportation Commission (MCTC) travel model. A minimum growth rate of 2.0 percent per year was applied to the existing volumes. The projected 2043 cumulative-with-Project traffic volumes are presented in Figure 9.

11.0 LEVEL OF SERVICE

11.1 Level of Service

The Transportation Research Board *Highway Capacity Manual*, *6th Edition*, (HCM) defines level of service (LOS) as, "A quantitative stratification of a performance measure or measures that represent quality of service, measured on an A-F scale, with LOS A representing the best operating conditions from the traveler's perspective and LOS F the worst." Automobile mode LOS characteristics for both unsignalized and signalized intersections are presented in Tables 2 and 3.

Table 2
Level of Service Characteristics for Unsignalized Intersections

Level of Service	Average Vehicle Delay (seconds)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

Table 3
Level of Service Characteristics for Signalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Volume-to-capacity ratio is no greater than 1.0. Progression is exceptionally favorable or the cycle length is very short.	<10
B	Volume-to-capacity ratio is no greater than 1.0. Progression is highly favorable or the cycle length is very short.	>10-20
C	Volume-to-capacity ratio is no greater than 1.0. Progression is favorable or cycle length is moderate.	>20-35
D	Volume-to-capacity ratio is high but no greater than 1.0. Progression is ineffective or cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	>35-55
E	Volume-to-capacity ratio is high but no greater than 1.0. Progression is unfavorable and cycle length is long. Individual cycle failures are frequent.	>55-80
F	Volume-to-capacity ratio is greater than 1.0. Progression is very poor and cycle length is long. Most cycles fail to clear the queue.	>80

Reference for Tables 2 and 3: *Highway Capacity Manual, 6th Edition,* Transportation Research Board, 2016

11.2 City of Madera Criteria

Policy CI-22 of the City of Madera General Plan states:

> The City shall seek to maintain Level of Service (LOS) C at all times on all roadways and intersections in Madera, with the following exceptions:
>
> a) On arterial roadways or roadways with at-grade railroad crossings that were experiencing congestion exceeding LOS C during peak hour travel times as of the date this General Plan Update is adopted the City shall seek to maintain LOS D or better.
>
> b) This policy does not extend to freeways (where Caltrans policies apply) or to private roadways.
>
> c) In the Downtown District (as defined in the Land Use Element of this General Plan), the City shall seek to maintain LOS D.

For purposes of this study, a traffic issue may be recognized at City intersections if:

- the Project will cause the LOS to decrease below C at a study intersection;
- the Project will cause the LOS to drop from D to E, from D to F, or from E to F at a study intersection; or
- the Project will exacerbate the delay at a study intersection already operating below the minimum acceptable LOS by increasing the average delay by 5.0 seconds or more.

11.3 State Highways

Caltrans has traditionally endeavored to maintain a target LOS at the transition between LOS C and LOS D, but does not currently identify a specific LOS goal. For purposes of this

study, a traffic issue will be recognized at State facilities if the analyses identify LOS E or F at an intersection. LOS E and F can be indicative of delays that may lead to safety concerns at unsignalized intersections.

12.0 INTERSECTION ANALYSES

The levels of service at the study intersections were determined using the computer program Synchro 11, which is based on the HCM procedures for calculating levels of service. The intersection analysis sheets are presented in Appendix B. The results of the intersection operational analyses are presented in Tables 4 through 7. Levels of service and delays worse than the target LOS are indicated in bold type and are underlined.

Table 4
Intersection LOS Summary – Existing Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Stadium / Pecan	Signals	23.2	C	17.8	B
SR 145 (Madera) / Pecan	Signals	22.2	C	22.0	C

Table 5
Intersection LOS Summary – Existing-Plus-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Stadium / Pecan	Signals	25.2	C	20.1	C
SR 145 (Madera) / Pecan	Signals	24.3	C	23.2	C

Table 6
Intersection LOS Summary – Near-Term With-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Stadium / Pecan	Signals	26.1	C	20.8	C
SR 145 (Madera) / Pecan	Signals	28.6	C	27.4	C

Table 7
Intersection LOS Summary – Year 2043 Cumulative With-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Stadium / Pecan	Signals	**54.5**	**D**	25.0	C
SR 145 (Madera) / Pecan	Signals	**64.5**	**E**	**63.6**	**E**

The results of the intersection operational analyses include an estimate of the 95th-percentile queue lengths at the study intersection. The calculated 95th-percentile queue lengths are presented in Tables 8 and 9. Calculated 95th-percentile queue lengths that exceed the storage capacity or are judged to be excessive are indicated in bold type and are underlined.

Table 8
Queuing Summary – Existing and Existing-Plus-Project Conditions

Intersection / Approach	Storage Capacity (feet)	95th-Percentile Queue Length (feet)			
		Existing		Existing Plus Project	
		A.M.	P.M.	A.M.	P.M.
Stadium / Pecan					
Eastbound L	250	122	67	133	75
Eastbound TR	*	62	72	71	79
Westbound L	195	16	17	38	77
Westbound TR	*	325	149	337	172
Northbound L	120+	75	17	77	28
Northbound T	*	53	48	58	55
Northbound R	120	0	0	39	0
Southbound L	105	**166**	71	**167**	72
Southbound T	*	44	39	48	51
Southbound R	*	55	29	56	30
SR 99 145 (Madera) / Pecan					
Eastbound L	115	**154**	100	**217**	**147**
Eastbound T	*	215	221	215	222
Eastbound R	30	12	24	17	28
Westbound L	135	56	69	57	68
Westbound T	*	152	104	156	110
Westbound R	130	67	56	69	57
Northbound L	210+	126	111	129	120
Northbound TR	*	308	325	316	330
Southbound L	205+	130	178	132	180
Southbound T	*	184	252	191	264
Southbound R	200	12	11	30	36

L: Left-turn lane T: Through lane R: Right-turn lane
Combinations of letters indicated a shared lane allowing the movements shown.
\+ Left-turn lane connects to a two-way left-turn lane that provides additional storage capacity.
* Storage capacity exceeds 1,000 feet.

Table 9
Intersection Queuing Summary – Near-Term and Year 2043 Conditions

Intersection	Storage Capacity (feet)	95th-Percentile Queue Length (feet)			
Approach		Near Term		Year 2043	
		A.M.	P.M.	A.M.	P.M.
Stadium / Pecan					
Eastbound L	250	134	81	**276**	149
Eastbound TR	*	71	82	127	143
Westbound L	195	40	69	61	85
Westbound TR	*	346	177	763	359
Northbound L	120+	78	28	174	40
Northbound T	*	61	58	110	91
Northbound R	120	41	0	42	10
Southbound L	105	**170**	77	**366**	**150**
Southbound T	*	52	54	90	78
Southbound R	*	56	30	134	53
SR 99 145 (Madera) / Pecan					
Eastbound L	115	**267**	**185**	**383**	**276**
Eastbound T	*	248	244	448	457
Eastbound R	30	31	63	61	93
Westbound L	135	102	126	**212**	**253**
Westbound T	*	165	121	300	174
Westbound R	130	70	58	**168**	80
Northbound L	210+	135	136	195	221
Northbound TR	*	352	374	656	700
Southbound L	205+	191	221	299	390
Southbound T	*	196	277	315	452
Southbound R	200	35	39	50	45

L: Left-turn lane T: Through lane R: Right-turn lane
Combinations of letters indicated a shared lane allowing the movements shown.
\+ Left-turn lane connects to a two-way left-turn lane that provides additional storage capacity.
* Storage capacity exceeds 1,000 feet.

13.0 DISCUSSION

13.1 Existing Conditions

The results of the intersection analyses indicate that the study intersections are currently operating at acceptable LOS with calculated 95th-percentile queues typically contained within the available storage lanes, with the following exceptions:

- the calculated 95th-percentile queue of 166 feet during the a.m. peak hour in the left-turn on the southbound approach at the intersection of Stadium Road and Pecan Avenue exceeds the storge capacity of 105 feet by the length of approximately two to three vehicles.
- the calculated 95th-percentile queue of 154 feet during the a.m. peak hour in the left-turn on the eastbound approach at the intersection of SR 145 (Madera Avenue) and Pecan Avenue exceeds the storge capacity of 115 feet by the length of approximately one to two vehicles.

13.2 Existing-Plus-Project Conditions

The existing-plus-Project conditions analyses represent conditions that would occur after construction of the Project in the absence of other pending projects and regional growth. This scenario isolates the specific effects of the Project. The existing-plus-Project conditions analyses indicate that the study intersections will continue to operate at acceptable LOS.

The Project's effect on the calculated 95th-percentile queues at the intersection of Stadium Road and Pecan Avenue is negligible. However, at the intersection of SR 145 (Madera Avenue) and Pecan Avenue the Project trips increase the calculated 95th-percentile queues in the left-turn lane on the eastbound approach by approximately two to three vehicles. In order to accommodate the calculated queues, the bay taper in the median island on the eastbound approach would need to be removed to provide additional storage capacity.

13.3 Near-Term With-Project Conditions

The near-term with-Project conditions analyses represent conditions that are expected after construction of the Project and other the pending and approved projects. This scenario isolates the near-term cumulative effects of the Project and other known projects. The near-term with-Project conditions analyses indicate that the study intersections will continue to operate at acceptable LOS.

The effect of the near-term projects on the calculated 95th-percentile queues at the intersection of Stadium Road and Pecan Avenue is negligible. However, at the intersection of SR 145 (Madera Avenue) and Pecan Avenue the trips generated by the near-term projects increase the calculated 95th-percentile queues in the left-turn lane on the eastbound approach by approximately four to five vehicles as compared to the existing conditions. In order to accommodate the calculated queues, the bay taper in the median island on the eastbound approach would need to be removed to provide additional storage capacity.

13.4 Year 2043 With-Project Conditions

The year 2043 With-Project conditions analyses are intended to forecast the conditions that will occur after construction of the Project, the pending projects, and 20 years of regional growth. The analyses indicate the study intersections are expected to operate worse than the target LOS with calculated 95th-percentile queues exceeding storage capacities in some locations.

The intersection of Stadium Road and Pecan Avenue is expected to operate at LOS D during the a.m. peak hour, which is worse than the City's target LOS of C. The calculated 95th-percentile queues exceed the existing storage capacity in the left-turn lanes on the eastbound and southbound approaches. In order to operate at acceptable LOS, a second westbound through lane should be added to the intersection. The improved conditions are summarized in Tables 10 and 11. Turn lanes should be designed accommodate the queue lengths presented in Table 11. The intersection analysis sheets for the improved conditions are presented in Appendix C.

The intersection of SR 145 (Madera Avenue) and Pecan Avenue is expected to operate at LOS E during both the a.m. and p.m. peak hours. The calculated 95th-percentile queues exceed the existing storage capacity in the left-turn lanes on the eastbound and westbound

approaches, and in the right-turn lane on the westbound approach. In order to operate at acceptable LOS, the intersection should be widened.

The following lane configurations would provide acceptable levels of service at the intersection of SR 145 (Madera Avenue) and Pecan Avenue:

Eastbound approach: one left-turn lane, two through lanes, and one right-turn lane.
Westbound approach: one left-turn lane, two through lanes, and one right-turn lane.
Northbound approach: one left-turn lane and two through lanes with a shared right turn.
Southbound approach: one left-turn lane, two through lanes, and one right-turn lane.

The improved conditions are summarized in Tables 10 and 11. Turn lanes should be designed accommodate the queue lengths presented in Table 11. The intersection analysis sheets for the improved conditions are presented in Appendix C.

Table 10
Improved Conditions LOS Summary – Year 2043

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Stadium / Pecan	Signals	27.9	C	19.9	B
SR 145 (Madera) / Pecan	Signals	33.7	C	31.8	C

Table 11
Improved Conditions Queuing Summary – Year 2043

Intersection	95th-Percentile Queue Length (feet)	
Approach	A.M.	P.M.
Stadium / Pecan		
Eastbound L	195	127
Eastbound TR	135	168
Westbound L	58	96
Westbound TR	284	165
Northbound L	146	45
Northbound T	109	104
Northbound R	42	0
Southbound L	260	129
Southbound T	82	80
Southbound R	72	51
SR 99 145 (Madera) / Pecan		
Eastbound L	328	225
Eastbound T	182	192
Eastbound R	67	110
Westbound L	166	197
Westbound T	270	192
Westbound R	172	103
Northbound L	206	198
Northbound TR	295	305
Southbound L	268	314
Southbound T	173	224
Southbound R	60	52

L: Left-turn lane T: Through lane R: Right-turn lane
Combinations of letters indicated a shared lane allowing the movements shown.

14.0 EQUITABLE SHARE CALCULATIONS

Where required future improvements are not included in established development fees and are not the sole responsibility of a particular project, but rather a cumulative result of regional growth, the responsibility for the improvement may be determined based on equitable share calculations such as those presented in the Caltrans *Guide for the Preparation of Traffic Impact Studies* dated December 2002. The following equation was used to determine the project's equitable share percentage at the study intersections:

$$P = \frac{T}{T_B - T_E}$$

where:

P = The equitable share of the project's traffic responsibility;
T = The project trips generated during the peak hour of the adjacent facility;
T_B = The forecasted (future with project) traffic volume on the affected facility;
T_E = The existing traffic on the facility.

Table 12 presents equitable share responsibility calculations for the project.

Table 12
Equitable Share Responsibility Calculations – A.M. Peak Hour

Location	T	T_E	T_B	P
Stadium / Pecan	157	1,350	2,235	17.7%
SR 145 (Madera) / Pecan	118	1,849	3,077	9.6%

15.0 CEQA TRANSPORTATION IMPACT ANALYSIS

Project-specific traffic modeling was performed to determine whether the Project would cause a significant transportation impact based on vehicle miles traveled (VMT). The Project-specific modeling is discussed in the memorandum included in Appendix D and indicates that the Project will not cause a significant transportation impact.

16.0 CONCLUSIONS AND RECOMMENDATIONS

Generally-accepted traffic engineering principles and methods were employed to estimate the number of trips expected to be generated by the Project, to analyze the existing traffic conditions, and to analyze the traffic conditions projected to occur in the future.

The Project-specific VMT modeling indicates that the Project will not cause a significant transportation impact.

The study intersections are currently operating at acceptable LOS and will continue to operate at acceptable LOS after construction of the Project and the known pending projects.

The calculated 95th-percentile queues for the existing conditions are generally contained within the available storage lanes, with the following exceptions:

- the left-turn on the southbound approach at the intersection of Stadium Road and Pecan Avenue.
- the left-turn on the eastbound approach at the intersection of SR 145 (Madera Avenue) and Pecan Avenue.

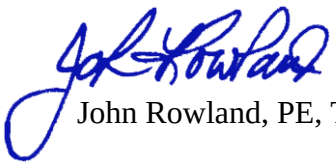
The effect of the near-term projects on the calculated 95th-percentile queues at the intersection of Stadium Road and Pecan Avenue is negligible. However, at the intersection of SR 145 (Madera Avenue) and Pecan Avenue the trips generated by the near-term projects increase the calculated 95th-percentile queues in the left-turn lane on the eastbound approach by approximately four to five vehicles as compared to the existing conditions. In order to accommodate the calculated queues, the bay taper in the median island on the eastbound approach would need to be removed to provide additional storage capacity.

The year 2043 analyses indicate the study intersections are expected to operate worse than the target LOS with calculated 95th-percentile queues exceeding storage capacities in some locations. The intersection of Stadium Road and Pecan Avenue is expected to operate at LOS D during the a.m. peak hour, which is worse than the City's target LOS of C. In order to operate at acceptable LOS, a second westbound through lane should be added to the intersection. The intersection of SR 145 (Madera Avenue) and Pecan Avenue is expected to operate at LOS E during both the a.m. and p.m. peak hours. In order to operate at acceptable LOS, the intersection should be widened as described in the report.

If the improvements needed to operate at acceptable LOS are not included in City of Madera fee programs, the Project may be required to contribute an equitable share of the cost of the future construction.

Thank you for the opportunity to perform this traffic study. Please feel free to contact our office if you have any questions.

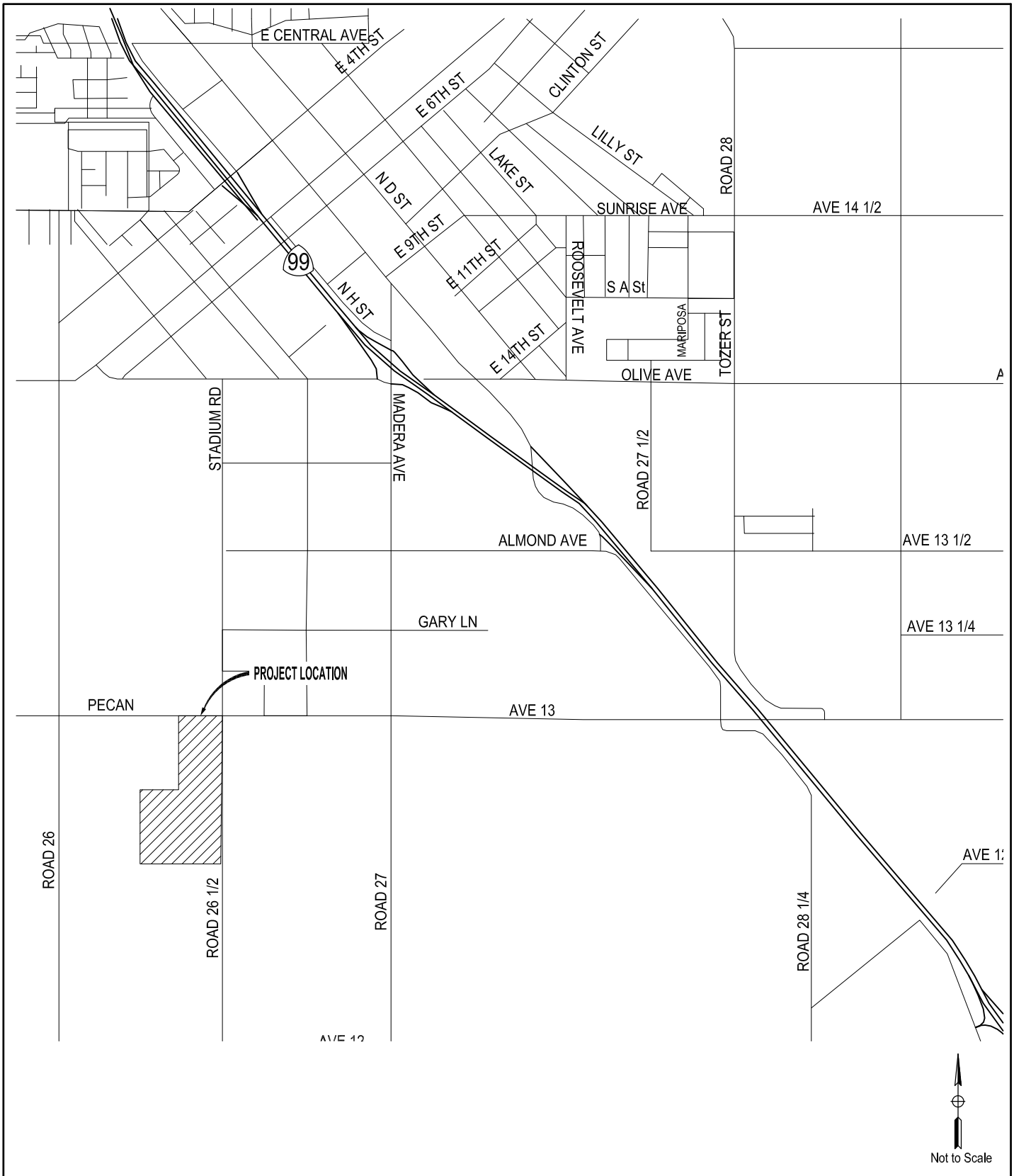
PETERS ENGINEERING GROUP



John Rowland, PE, TE

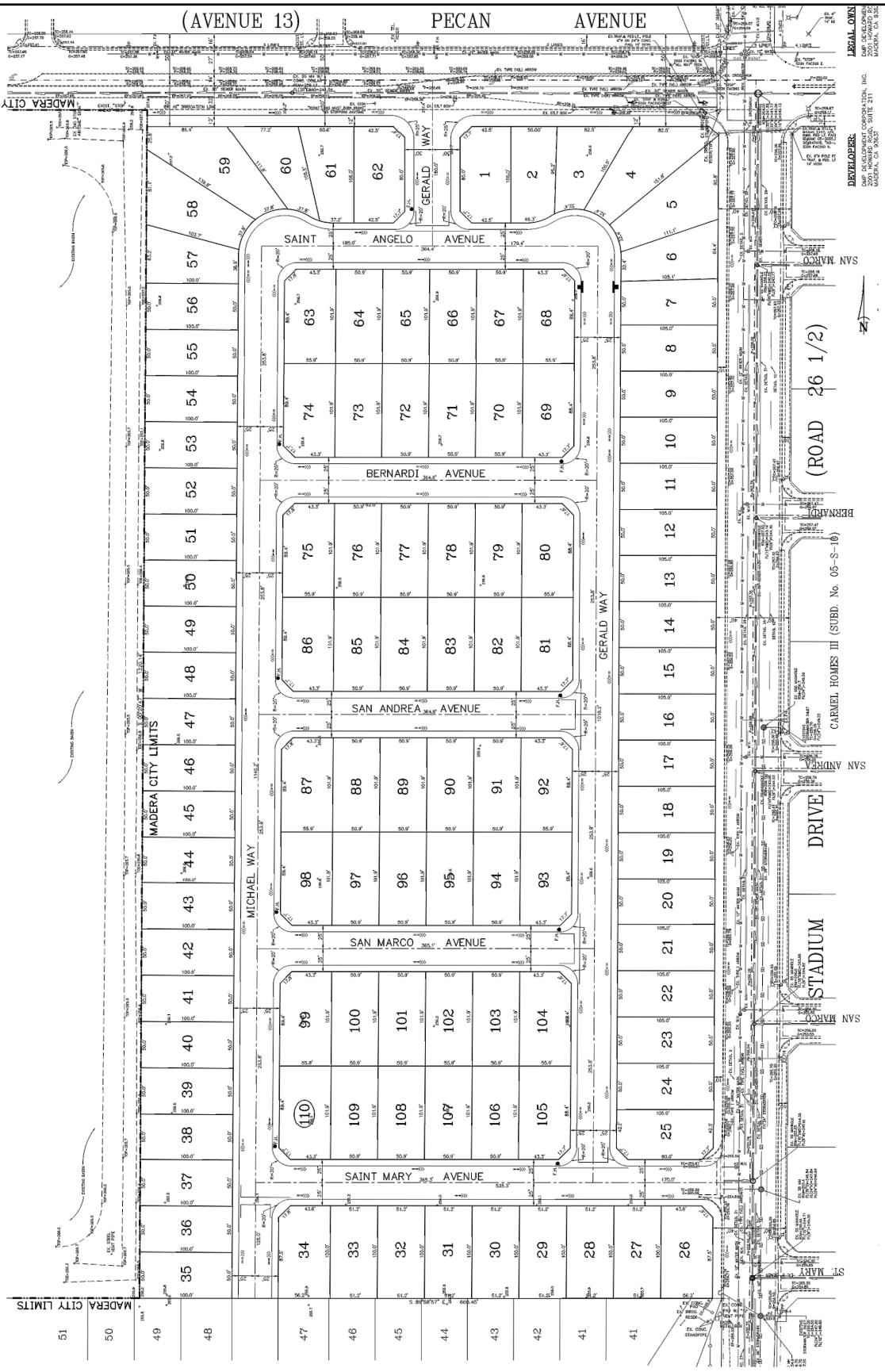
Attachments: Figures 1 through 9
Appendix A – Traffic Count Data Sheets
Appendix B – Intersection Analyses
Appendix C – Improved Intersection Analyses
Appendix D – VMT Analysis

FIGURES



Proposed Carmel II and Carmel IV Subdivisions
Madera, California

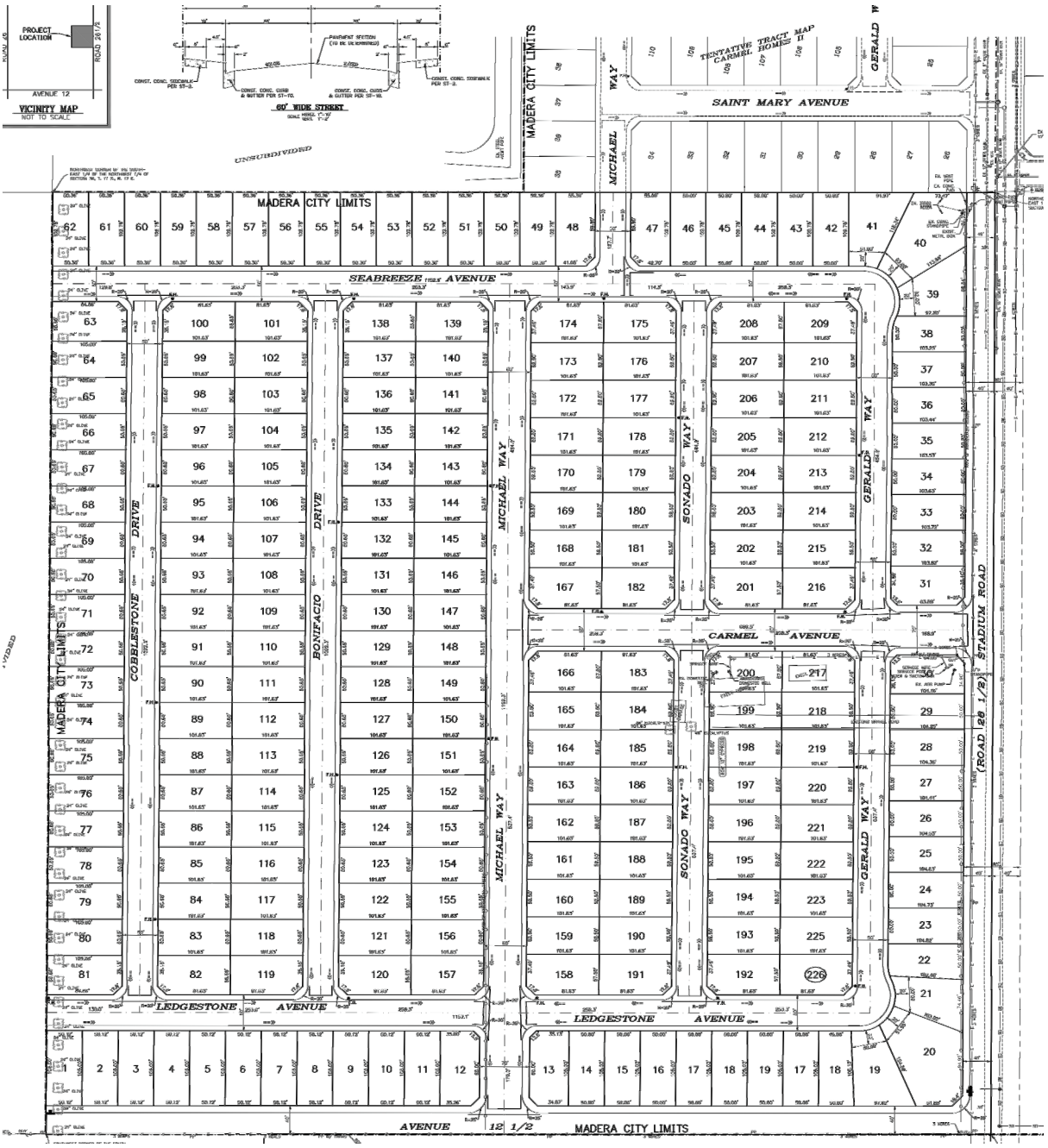
SITE VICINITY MAP



Proposed Carmel II and Carmel IV Subdivisions
Madera, California

CARMEL II SITE PLAN

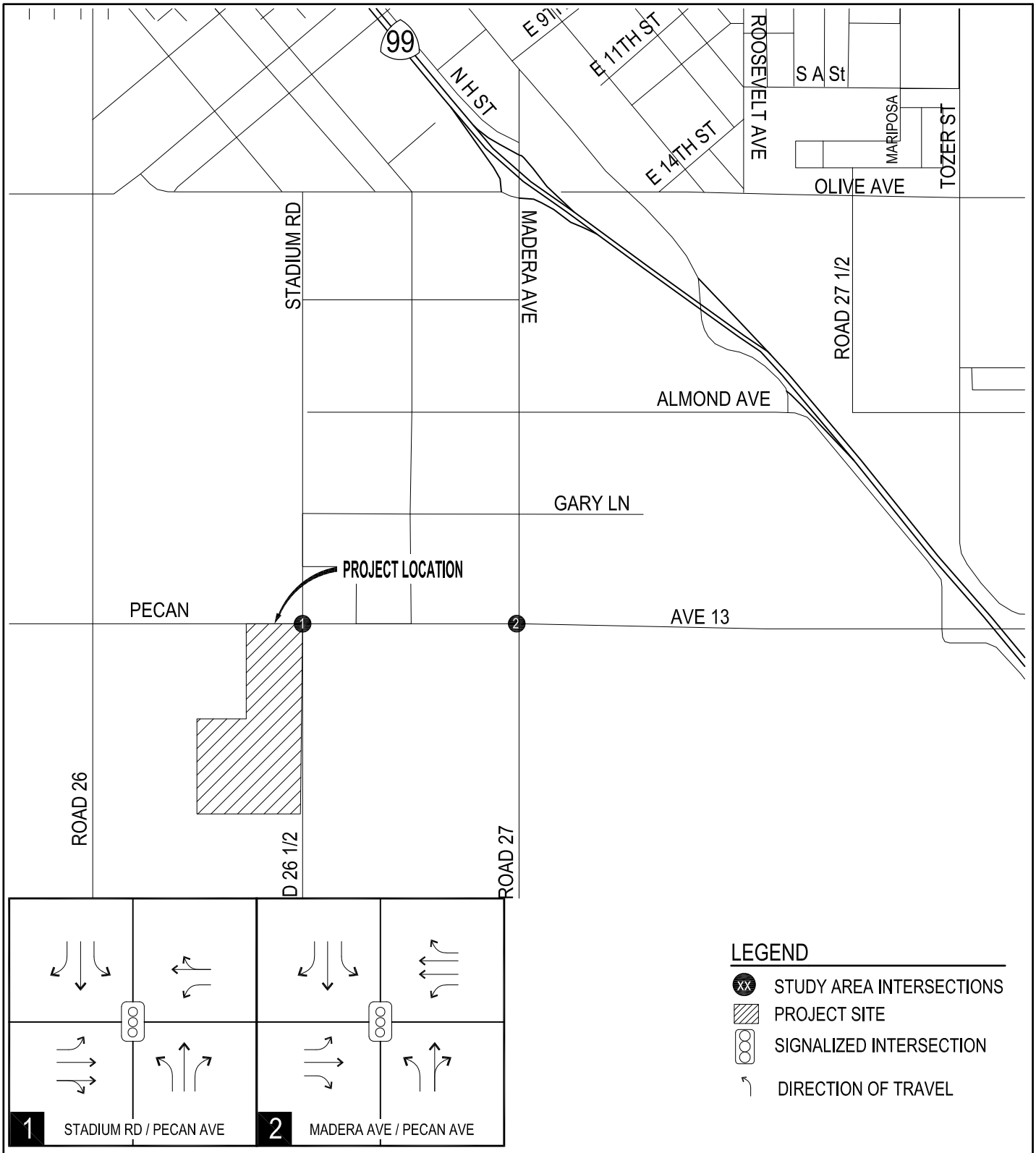
Not to Scale



Proposed Carmel II and Carmel IV Subdivisions
Madera, California

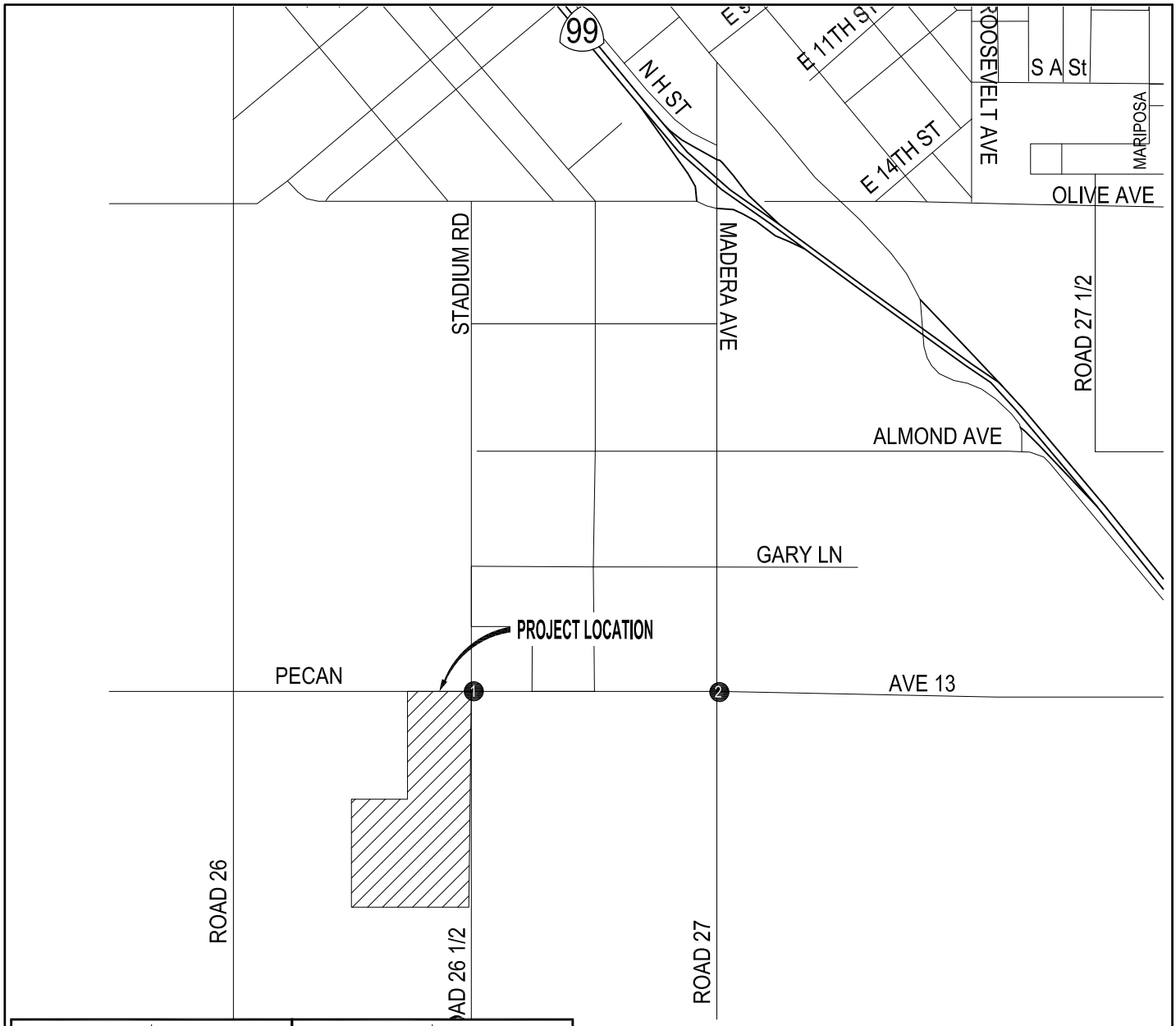
CARMEL IV SITE PLAN

Not to Scale



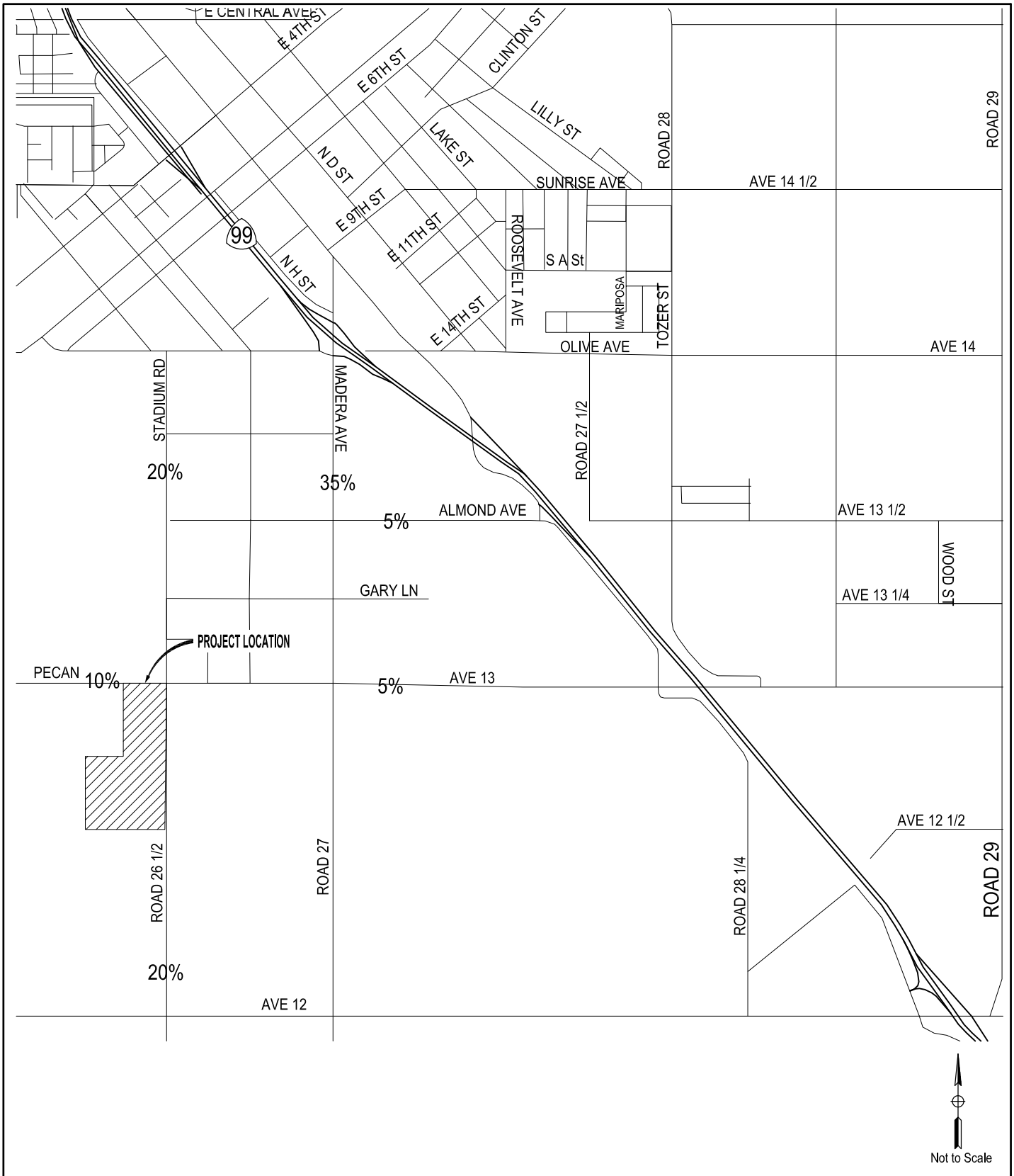
Proposed Carmel II and Carmel IV Subdivisions
Madera, California

EXISTING LANE CONFIGURATIONS AND INTERSECTION STOP CONTROL



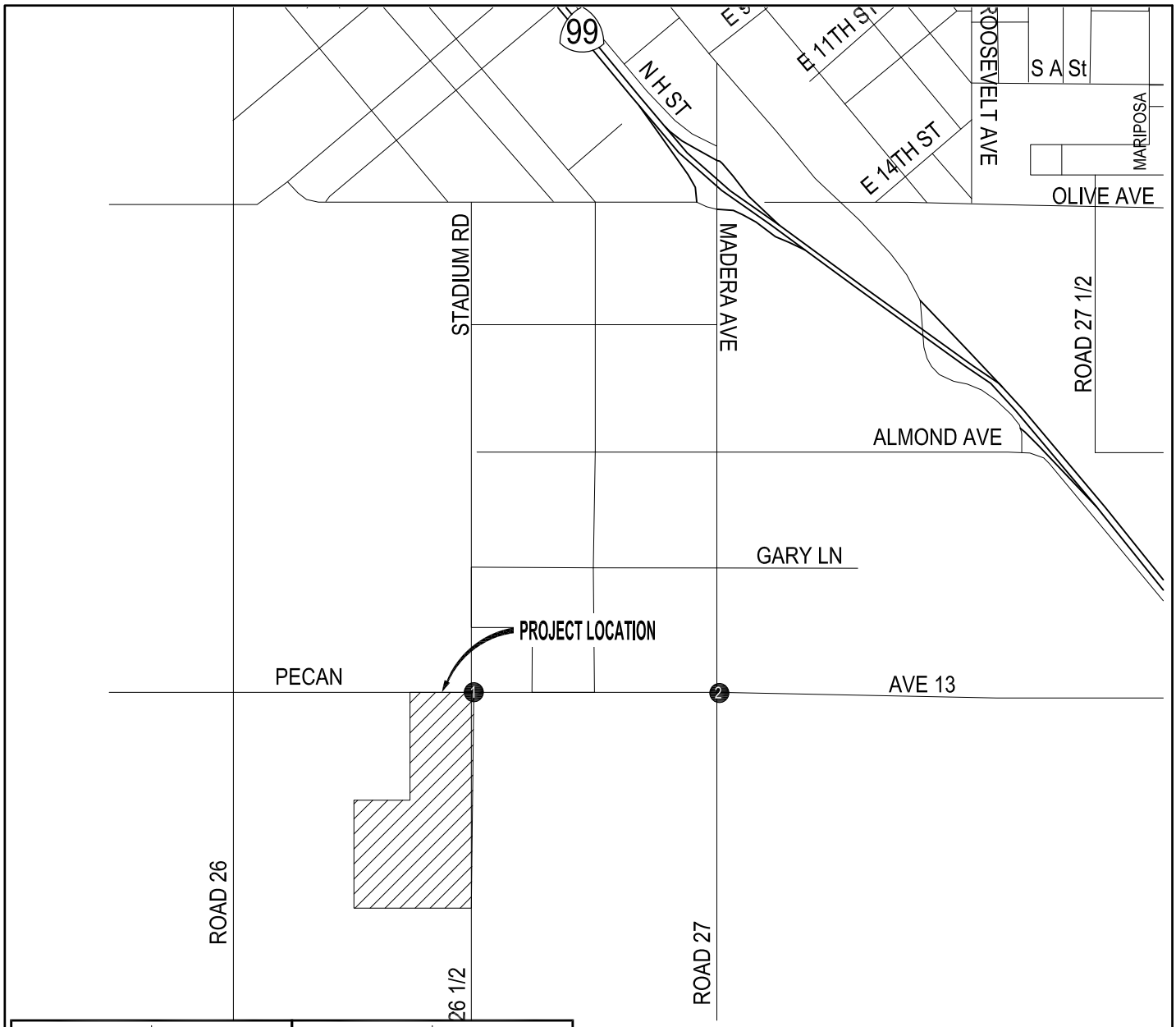
Proposed Carmel II and Carmel IV Subdivisions
Madera, California

EXISTING PEAK HOUR TRAFFIC VOLUMES



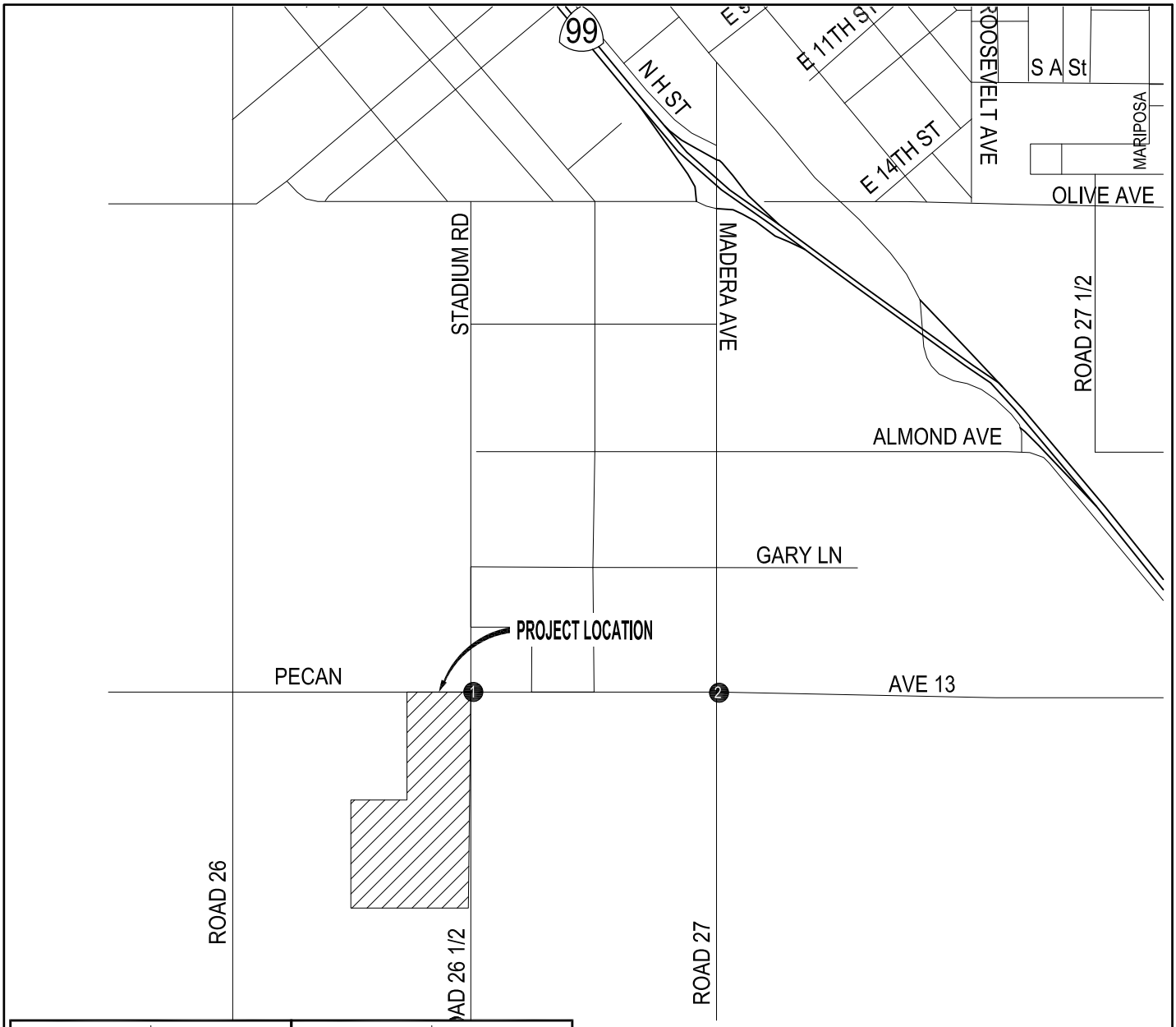
Proposed Carmel II and Carmel IV Subdivisions
Madera, California

PEAK HOUR PROJECT TRAFFIC DISTRIBUTION PERCENTAGES



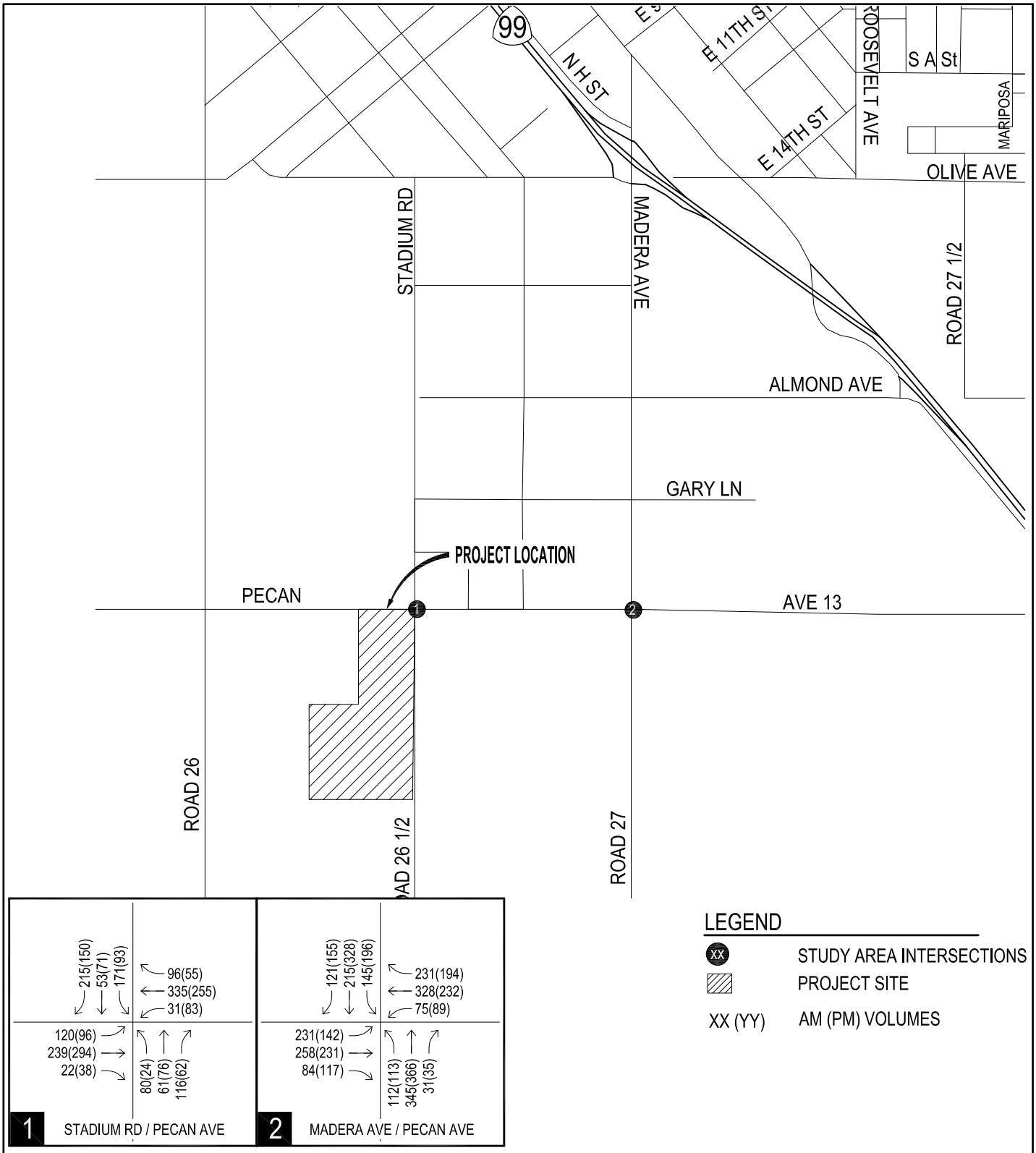
Proposed Carmel II and Carmel IV Subdivisions
Madera, California

PEAK HOUR PROJECT TRAFFIC VOLUMES



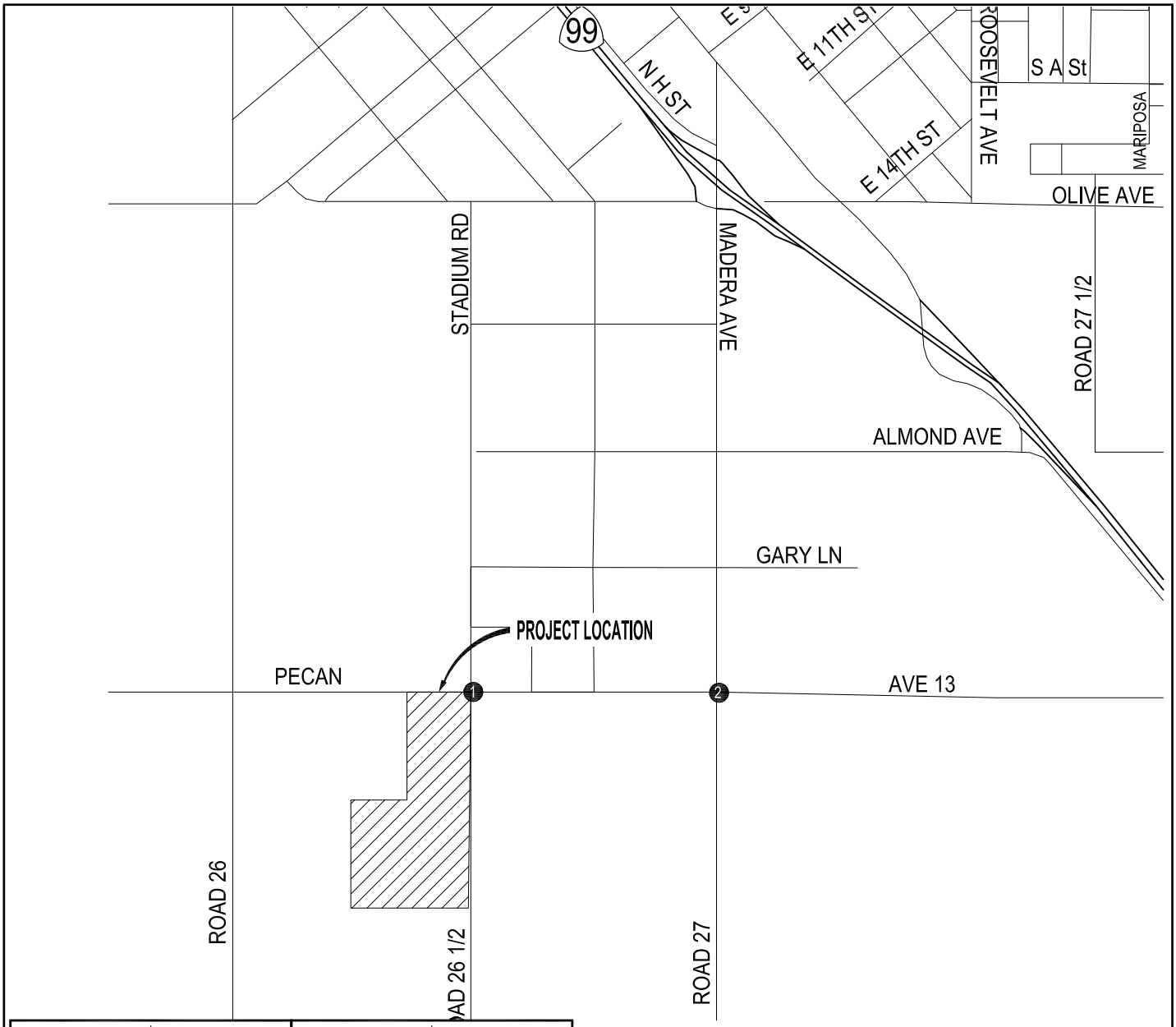
Proposed Carmel II and Carmel IV Subdivisions
Madera, California

EXISTING PLUS PROJECT PEAK HOUR TRAFFIC VOLUMES



Proposed Carmel II and Carmel IV Subdivisions
Madera, California

NEAR-TERM WITH PROJECT PEAK HOUR TRAFFIC VOLUMES



Proposed Carmel II and Carmel IV Subdivisions
Madera, California

CUMULATIVE YEAR 2043 WITH PROJECT PEAK HOUR TRAFFIC VOLUMES

APPENDIX A

TRAFFIC COUNT DATA SHEETS

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:

Peters Engineering Group
862 Pollasky Ave
Clovis, CA 93612

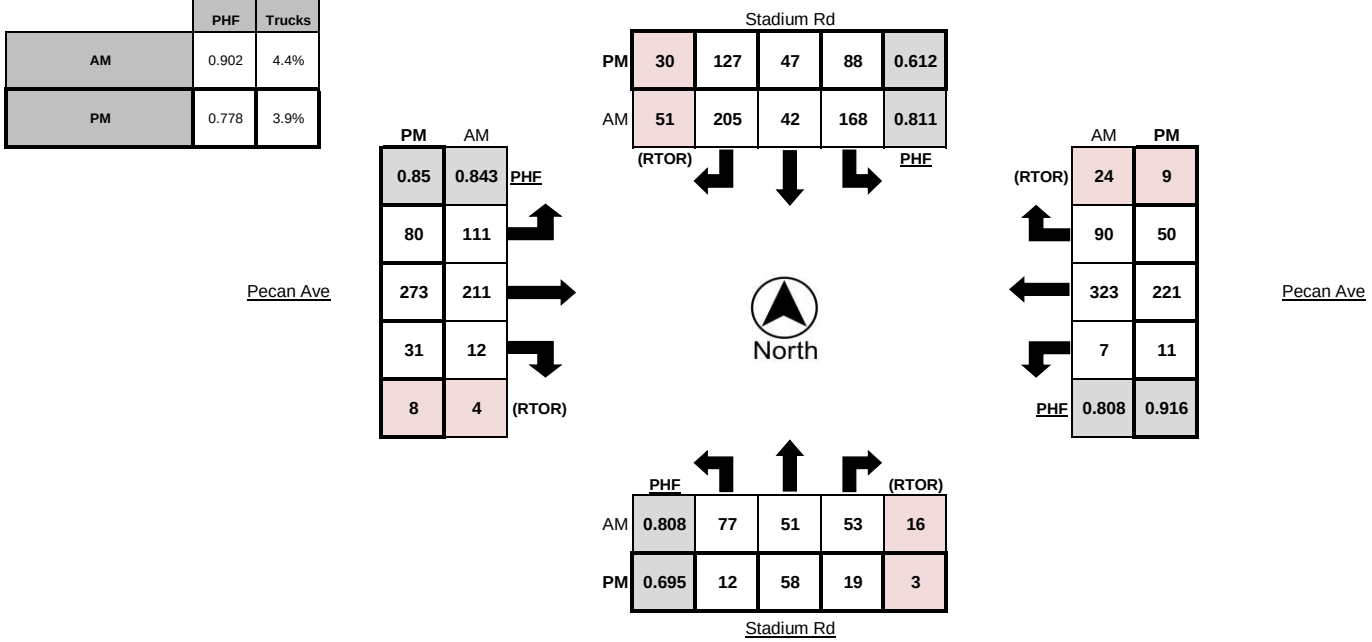
LOCATION Stadium Rd @ Pecan Ave
LATITUDE 36.9383
COUNTY Madera
LONGITUDE -120.0651
COLLECTION DATE Tuesday, October 4, 2022
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:00 AM - 7:15 AM	6	8	5	2	1	7	11	16	3	0	14	35	3	1	3	3	34	4	0	2
7:15 AM - 7:30 AM	6	13	10	2	3	12	10	22	6	0	8	34	3	1	5	1	44	6	0	1
7:30 AM - 7:45 AM	29	16	11	3	2	20	12	41	7	3	34	51	4	1	3	2	70	3	1	0
7:45 AM - 8:00 AM	24	11	17	7	6	28	9	55	19	3	43	55	1	0	1	1	85	20	4	5
8:00 AM - 8:15 AM	16	12	12	4	1	50	11	67	14	2	20	52	4	2	5	2	85	43	14	4
8:15 AM - 8:30 AM	8	12	13	2	5	70	10	42	11	6	14	53	3	1	4	2	83	24	5	9
8:30 AM - 8:45 AM	2	5	8	4	1	29	10	33	9	7	8	43	4	1	1	1	43	7	2	5
8:45 AM - 9:00 AM	4	3	8	1	0	6	2	24	4	2	5	39	1	0	2	2	53	1	0	1
TOTAL	**95**	**80**	**84**	**25**	**19**	**222**	**75**	**300**	**73**	**23**	**146**	**362**	**23**	**7**	**24**	**14**	**497**	**108**	**26**	**27**

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
4:00 PM - 4:15 PM	7	17	8	1	3	41	20	46	10	5	29	74	10	3	2	5	56	14	2	3
4:15 PM - 4:30 PM	0	12	7	2	1	21	10	22	8	5	15	76	8	2	3	2	52	13	4	5
4:30 PM - 4:45 PM	1	13	1	0	0	17	7	33	8	4	20	71	3	1	3	2	56	19	3	4
4:45 PM - 5:00 PM	4	16	3	0	0	9	10	26	4	0	16	52	10	2	2	2	57	4	0	0
5:00 PM - 5:15 PM	6	7	1	1	0	8	8	30	2	2	17	88	9	1	0	2	59	6	0	1
5:15 PM - 5:30 PM	2	15	1	0	0	16	7	32	5	4	12	53	3	0	1	5	68	15	1	0
5:30 PM - 5:45 PM	4	17	5	3	0	16	6	20	1	2	17	54	10	3	0	2	56	11	0	2
5:45 PM - 6:00 PM	3	14	2	2	0	12	6	16	3	0	11	56	5	1	1	2	65	11	0	2
TOTAL	**27**	**111**	**28**	**9**	**4**	**140**	**74**	**225**	**41**	**22**	**137**	**524**	**58**	**13**	**12**	**22**	**469**	**93**	**10**	**17**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:30 AM - 8:30 AM	77	51	53	16	14	168	42	205	51	14	111	211	12	4	13	7	323	90	24	18
4:00 PM - 5:00 PM	12	58	19	3	4	88	47	127	30	14	80	273	31	8	10	11	221	50	9	12

	PHF	Trucks
AM	0.902	4.4%
PM	0.778	3.9%



Metro Traffic Data Inc.
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Hanford, CA 93230

800-975-6938 Phone/Fax
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Turning Movement Report

Prepared For:

Peters Engineering Group
862 Pollasky Ave
Clovis, CA 93612

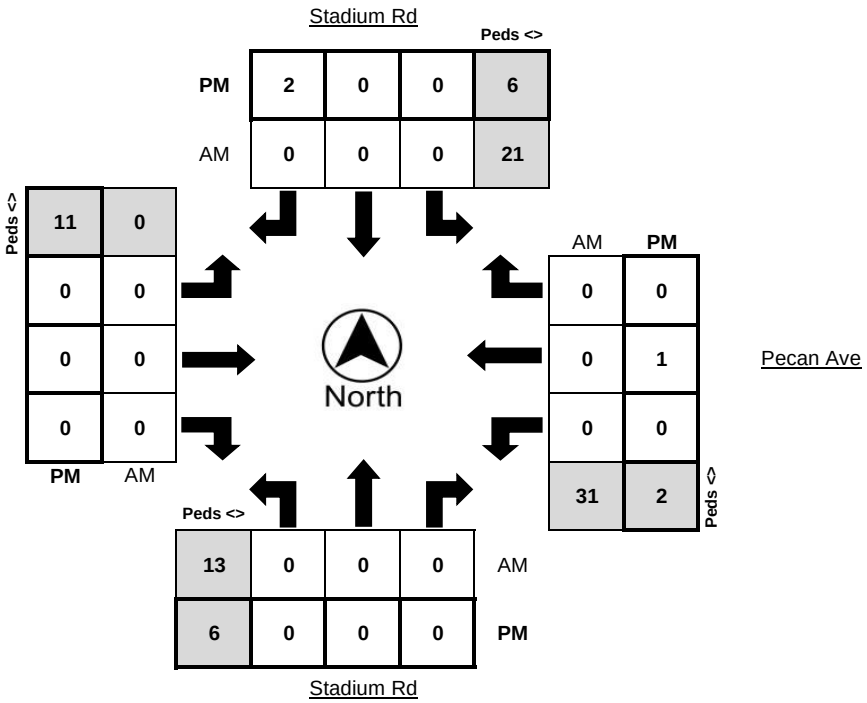
LOCATION Stadium Rd @ Pecan Ave
LATITUDE 36.9383
COUNTY Madera
LONGITUDE -120.0651
COLLECTION DATE Tuesday, October 4, 2022
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	12	0	0	0	0	0	0	0	12	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	1	0	0	0	3	0	0	0	7	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	3	0	0	0	5	0	0	0	4	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	5	0	0	0	5	0	0	0	8	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	1	0	0	1	2	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
TOTAL	**0**	**0**	**0**	**22**	**0**	**0**	**1**	**16**	**1**	**0**	**0**	**32**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	5	0	0	1	6	0	0	0	0	0	1	0	9
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	1	0	0	1	0	0	0	0	2	0	0	0	2
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**6**	**0**	**0**	**2**	**7**	**0**	**1**	**0**	**3**	**0**	**1**	**0**	**12**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:30 AM - 8:30 AM	0	0	0	21	0	0	0	13	0	0	0	31	0	0	0	0
4:00 PM - 5:00 PM	0	0	0	6	0	0	2	6	0	0	0	2	0	1	0	11

	Bikes	Peds
AM Peak Total	0	65
PM Peak Total	**3**	**25**



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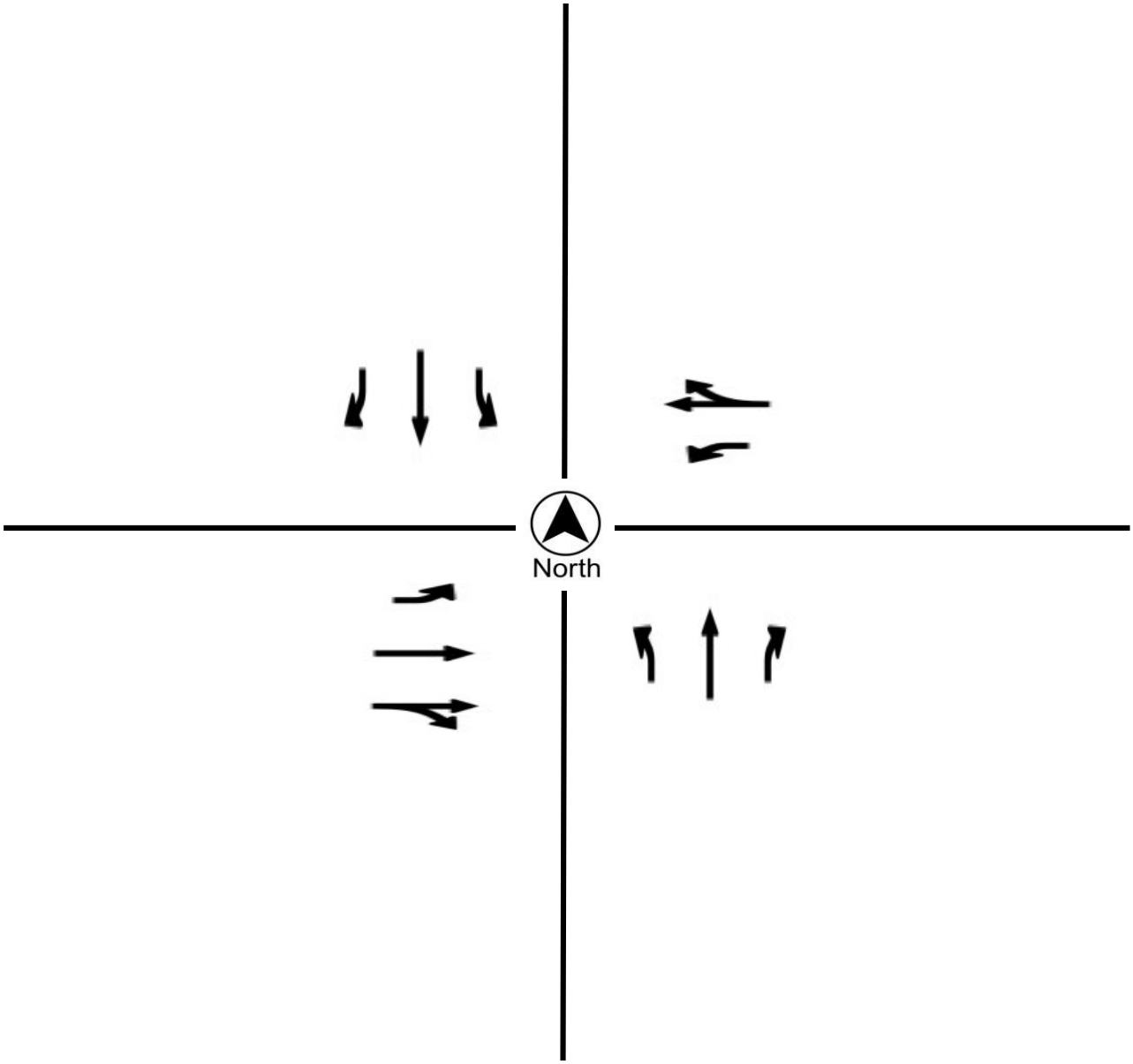
Turning Movement Report

Prepared For:

Peters Engineering Group
862 Pollasky Ave
Clovis, CA 93612

LOCATION	Stadium Rd @ Pecan Ave	**N/S STREET**	Stadium Rd
COUNTY	Madera	**E/W STREET**	Pecan Ave
COLLECTION DATE	Tuesday, October 4, 2022	**WEATHER**	Clear
CYCLE TIME	43 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns.



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Turning Movement Report

Prepared For:
Peters Engineering Group
862 Pollasky Ave
Clovis, CA 93612

LOCATION Madera Ave @ Pecan Ave
COUNTY Madera
COLLECTION DATE Tuesday, October 4, 2022

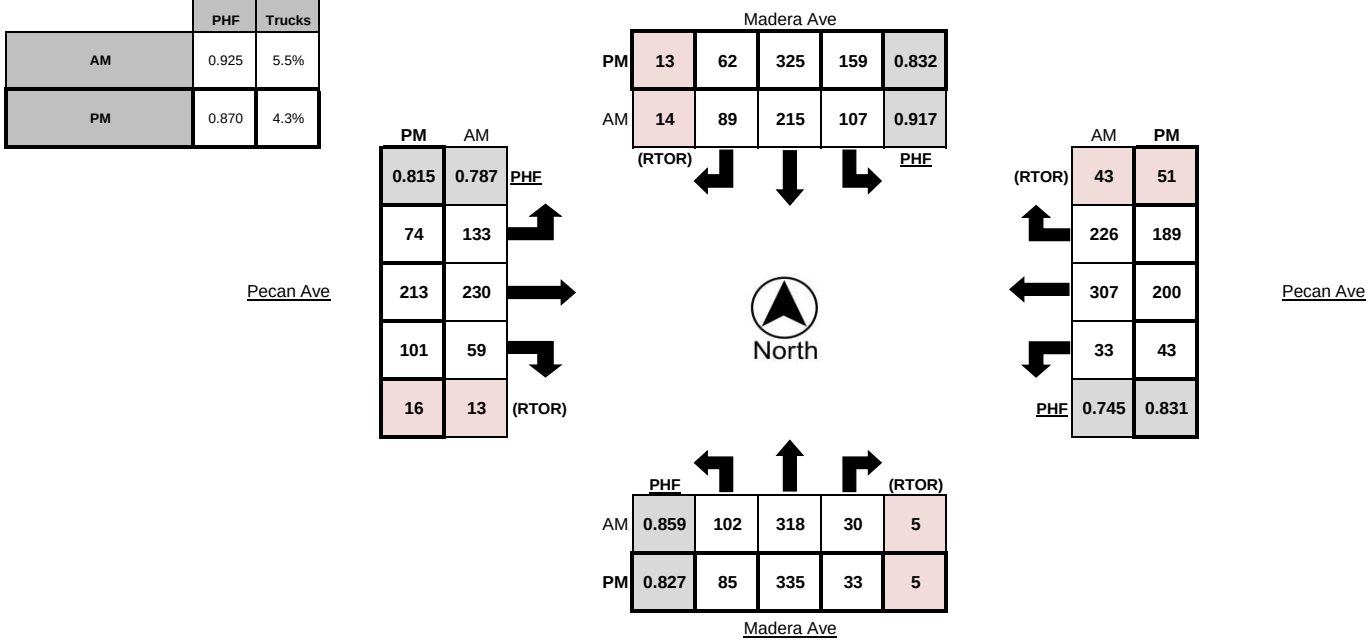
LATITUDE 36.9384
LONGITUDE -120.0560
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:00 AM - 7:15 AM	7	51	7	2	2	14	46	8	3	7	11	22	10	2	5	17	31	25	4	1
7:15 AM - 7:30 AM	9	77	5	2	7	12	46	9	2	6	14	43	8	2	9	9	34	42	10	2
7:30 AM - 7:45 AM	25	78	6	1	7	30	59	23	3	7	19	51	22	8	6	10	44	50	2	2
7:45 AM - 8:00 AM	23	101	7	2	6	31	48	27	5	9	29	55	4	1	6	13	76	68	11	3
8:00 AM - 8:15 AM	35	67	6	0	8	22	53	19	3	4	38	53	17	2	6	4	110	76	26	6
8:15 AM - 8:30 AM	19	72	11	2	7	24	55	20	3	8	47	71	16	2	9	6	77	32	4	7
8:30 AM - 8:45 AM	14	57	4	1	6	16	55	16	7	5	21	61	7	0	10	11	33	43	11	5
8:45 AM - 9:00 AM	12	39	1	0	7	18	41	12	2	8	10	22	13	4	3	11	34	27	9	5
TOTAL	**144**	**542**	**47**	**10**	**50**	**167**	**403**	**134**	**28**	**54**	**189**	**378**	**97**	**21**	**54**	**81**	**439**	**363**	**77**	**31**

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
4:00 PM - 4:15 PM	19	86	5	1	9	64	85	15	4	6	21	66	32	5	12	18	61	51	12	5
4:15 PM - 4:30 PM	20	67	9	1	9	39	80	9	1	5	25	65	24	7	4	8	50	41	11	1
4:30 PM - 4:45 PM	31	95	11	2	11	27	74	21	5	1	17	51	30	3	2	13	45	46	12	2
4:45 PM - 5:00 PM	15	87	8	1	3	29	86	17	3	5	11	31	15	1	2	4	44	51	16	2
5:00 PM - 5:15 PM	16	60	19	3	3	36	76	20	4	1	17	47	49	14	2	11	53	59	23	1
5:15 PM - 5:30 PM	18	80	12	3	6	33	68	27	8	3	21	40	28	10	4	11	57	58	22	1
5:30 PM - 5:45 PM	26	78	10	2	3	26	70	10	1	4	15	36	24	7	1	7	51	47	12	1
5:45 PM - 6:00 PM	24	59	7	2	1	32	69	12	0	4	12	49	16	5	1	8	58	41	10	1
TOTAL	**169**	**612**	**81**	**15**	**45**	**286**	**608**	**131**	**26**	**29**	**139**	**385**	**218**	**52**	**28**	**80**	**419**	**394**	**118**	**14**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:30 AM - 8:30 AM	102	318	30	5	28	107	215	89	14	28	133	230	59	13	27	33	307	226	43	18
4:00 PM - 5:00 PM	85	335	33	5	32	159	325	62	13	17	74	213	101	16	20	43	200	189	51	10

	PHF	Trucks
AM	0.925	5.5%
PM	0.870	4.3%



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Turning Movement Report

Prepared For:

Peters Engineering Group
862 Pollasky Ave
Clovis, CA 93612

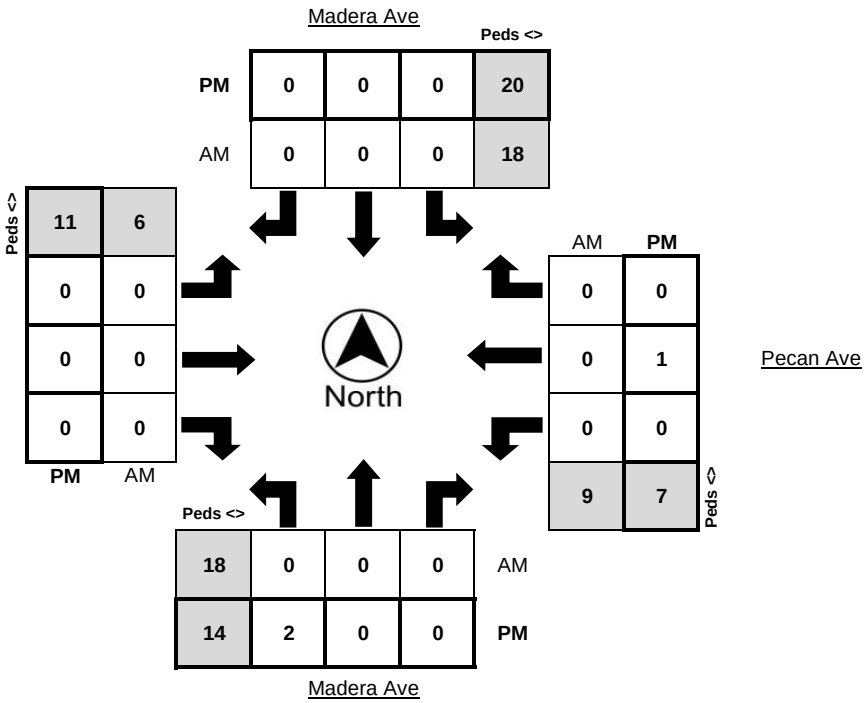
LOCATION Madera Ave @ Pecan Ave
LATITUDE 36.9384
COUNTY Madera
LONGITUDE -120.0560
COLLECTION DATE Tuesday, October 4, 2022
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	1
7:30 AM - 7:45 AM	0	0	0	4	0	0	0	3	0	0	0	3	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	7	0	0	0	1	0	0	0	4	0	0	0	3
8:00 AM - 8:15 AM	0	0	0	4	0	0	0	12	0	0	0	1	0	0	0	3
8:15 AM - 8:30 AM	0	0	0	3	0	0	0	2	0	0	0	1	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**21**	**0**	**0**	**0**	**18**	**0**	**2**	**0**	**13**	**0**	**0**	**0**	**7**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
4:00 PM - 4:15 PM	0	0	0	16	0	0	0	10	0	0	0	7	0	1	0	6
4:15 PM - 4:30 PM	1	0	0	4	0	0	0	2	0	0	0	0	0	0	0	2
4:30 PM - 4:45 PM	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	2
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
TOTAL	**2**	**0**	**1**	**20**	**0**	**0**	**0**	**17**	**0**	**1**	**0**	**10**	**1**	**1**	**0**	**13**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**	**Left**	**Thru**	**Right**	**Peds**
7:30 AM - 8:30 AM	0	0	0	18	0	0	0	18	0	0	0	9	0	0	0	6
4:00 PM - 5:00 PM	2	0	0	20	0	0	0	14	0	0	0	7	0	1	0	11

	Bikes	Peds
AM Peak Total	0	51
PM Peak Total	**3**	**52**



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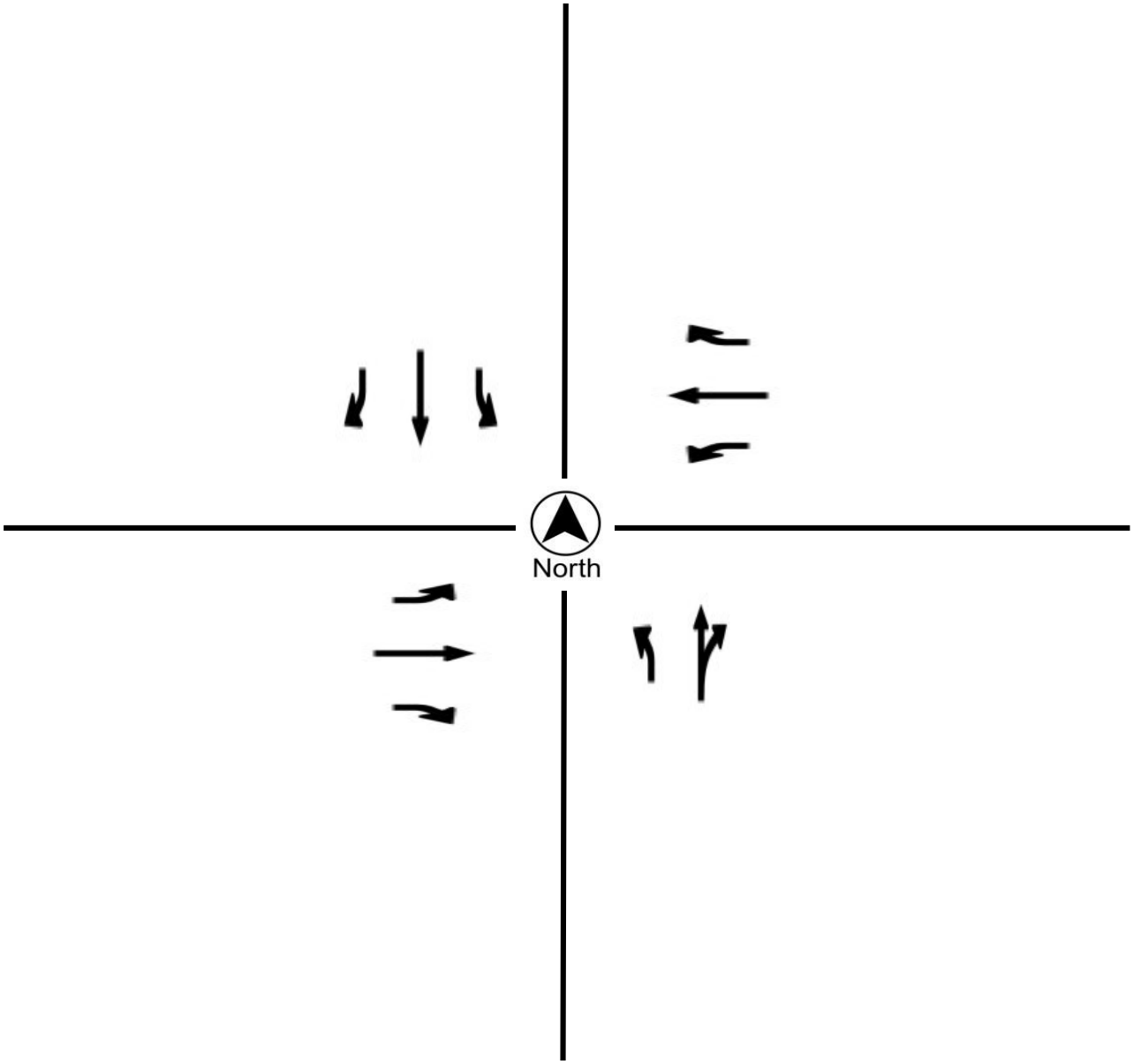
Turning Movement Report

Prepared For:

Peters Engineering Group
862 Pollasky Ave
Clovis, CA 93612

LOCATION	Madera Ave @ Pecan Ave	**N/S STREET**	Madera Ave
COUNTY	Madera	**E/W STREET**	Pecan Ave
COLLECTION DATE	Tuesday, October 4, 2022	**WEATHER**	Clear
CYCLE TIME	104 Seconds	**CONTROL TYPE**	Signal

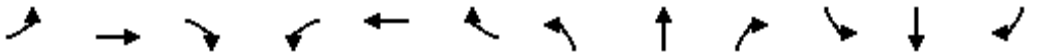
COMMENTS All approaches have protected left turns.



APPENDIX B

INTERSECTION ANALYSIS SHEETS

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	111	211	12	7	323	90	77	51	53	168	42	205
Future Volume (veh/h)	111	211	12	7	323	90	77	51	53	168	42	205
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.92	1.00		0.90	1.00		0.93
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	123	234	9	8	359	73	86	57	41	187	47	171
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	157	1310	50	18	443	90	115	285	218	235	411	322
Arrive On Green	0.09	0.38	0.38	0.01	0.30	0.30	0.07	0.16	0.16	0.13	0.22	0.22
Sat Flow, veh/h	1753	3424	131	1753	1461	297	1753	1841	1408	1753	1841	1444
Grp Volume(v), veh/h	123	119	124	8	0	432	86	57	41	187	47	171
Grp Sat Flow(s),veh/h/ln	1753	1749	1807	1753	0	1758	1753	1841	1408	1753	1841	1444
Q Serve(g_s), s	3.8	2.5	2.6	0.3	0.0	12.7	2.7	1.5	1.4	5.8	1.1	5.8
Cycle Q Clear(g_c), s	3.8	2.5	2.6	0.3	0.0	12.7	2.7	1.5	1.4	5.8	1.1	5.8
Prop In Lane	1.00		0.07	1.00		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	669	691	18	0	533	115	285	218	235	411	322
V/C Ratio(X)	0.78	0.18	0.18	0.44	0.00	0.81	0.74	0.20	0.19	0.80	0.11	0.53
Avail Cap(c_a), veh/h	250	787	813	185	0	725	297	661	505	344	710	557
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.9	11.5	11.5	27.5	0.0	18.0	25.7	20.6	20.6	23.5	17.3	19.2
Incr Delay (d2), s/veh	8.2	0.1	0.1	15.5	0.0	5.0	9.1	0.3	0.4	7.8	0.1	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	1.8	0.8	0.9	0.2	0.0	5.0	1.3	0.6	0.4	2.6	0.4	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	11.6	11.6	43.1	0.0	23.0	34.8	21.0	21.0	31.3	17.5	20.5
LnGrp LOS	C	B	B	D	A	C	C	C	C	C	B	C
Approach Vol, veh/h		366			440			184			405	
Approach Delay, s/veh		18.8			23.4			27.4			25.2	
Approach LOS		B			C			C			C	

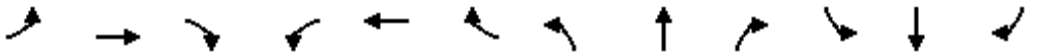
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	13.6	4.6	26.3	7.7	17.4	9.0	21.9
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	11.0	20.1	5.9	25.2	9.5	21.6	8.0	23.1
Max Q Clear Time (g_c+I1), s	7.8	3.5	2.3	4.6	4.7	7.8	5.8	14.7
Green Ext Time (p_c), s	0.1	0.3	0.0	1.2	0.1	0.6	0.1	1.6

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	123	247	8	459	86	57	59	187	47	228
v/c Ratio	0.56	0.16	0.05	0.77	0.39	0.25	0.20	0.64	0.12	0.47
Control Delay	40.9	11.1	30.3	30.1	33.0	29.8	1.5	38.9	26.0	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.9	11.1	30.3	30.1	33.0	29.8	1.5	38.9	26.0	8.1
Queue Length 50th (ft)	49	24	3	159	33	22	0	73	17	0
Queue Length 95th (ft)	#122	62	16	#325	75	53	0	#166	44	55
Internal Link Dist (ft)		2552		2573		1348			1231	
Turn Bay Length (ft)	260		200		120			100		
Base Capacity (vph)	228	1702	167	667	270	602	565	313	647	657
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.15	0.05	0.69	0.32	0.09	0.10	0.60	0.07	0.35

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



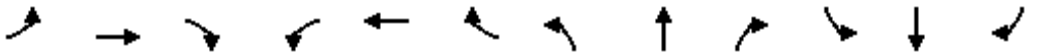
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	230	59	33	307	226	102	318	30	107	215	89
Future Volume (veh/h)	133	230	59	33	307	226	102	318	30	107	215	89
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.94	1.00		0.94
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	145	250	50	36	334	199	111	346	28	116	234	82
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, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	188	507	412	66	720	307	144	459	37	150	512	409
Arrive On Green	0.11	0.28	0.28	0.04	0.21	0.21	0.08	0.28	0.28	0.09	0.28	0.28
Sat Flow, veh/h	1725	1811	1470	1725	3441	1469	1725	1644	133	1725	1811	1446
Grp Volume(v), veh/h	145	250	50	36	334	199	111	0	374	116	234	82
Grp Sat Flow(s),veh/h/ln	1725	1811	1470	1725	1721	1469	1725	0	1777	1725	1811	1446
Q Serve(g_s), s	4.6	6.5	1.4	1.2	4.8	7.0	3.6	0.0	10.8	3.7	6.0	2.4
Cycle Q Clear(g_c), s	4.6	6.5	1.4	1.2	4.8	7.0	3.6	0.0	10.8	3.7	6.0	2.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	188	507	412	66	720	307	144	0	496	150	512	409
V/C Ratio(X)	0.77	0.49	0.12	0.55	0.46	0.65	0.77	0.00	0.75	0.77	0.46	0.20
Avail Cap(c_a), veh/h	520	954	775	205	1185	506	428	0	1129	428	1151	919
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.4	16.9	15.1	26.6	19.5	20.4	25.3	0.0	18.6	25.2	16.7	15.4
Incr Delay (d2), s/veh	6.6	0.7	0.1	6.9	0.5	2.3	8.5	0.0	2.4	8.1	0.6	0.2
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	2.0	2.4	0.4	0.6	1.7	2.3	1.6	0.0	4.1	1.7	2.2	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	17.7	15.3	33.5	20.0	22.7	33.8	0.0	20.9	33.3	17.3	15.6
LnGrp LOS	C	B	B	C	B	C	C	A	C	C	B	B
Approach Vol, veh/h		445			569			485			432	
Approach Delay, s/veh		21.7			21.8			23.9			21.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	20.6	6.2	20.7	8.7	20.8	10.1	16.7
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	14.0	35.8	6.7	29.7	14.0	35.8	17.0	19.4
Max Q Clear Time (g_c+I1), s	5.7	12.8	3.2	8.5	5.6	8.0	6.6	9.0
Green Ext Time (p_c), s	0.2	2.1	0.0	1.4	0.1	1.6	0.2	2.0

Intersection Summary	
HCM 6th Ctrl Delay	22.2
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	145	250	64	36	334	246	111	379	116	234	97
v/c Ratio	0.53	0.42	0.12	0.24	0.53	0.52	0.46	0.71	0.48	0.43	0.18
Control Delay	42.0	27.9	2.2	44.6	34.6	9.5	42.7	33.9	42.9	26.4	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	27.9	2.2	44.6	34.6	9.5	42.7	33.9	42.9	26.4	2.0
Queue Length 50th (ft)	65	104	0	17	77	0	50	162	52	91	0
Queue Length 95th (ft)	154	215	12	56	152	67	126	308	130	184	12
Internal Link Dist (ft)		2573			1323			1461		1228	
Turn Bay Length (ft)	115		65	100		100	220		230		230
Base Capacity (vph)	421	774	683	166	961	586	347	918	347	933	803
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.32	0.09	0.22	0.35	0.42	0.32	0.41	0.33	0.25	0.12

Intersection Summary



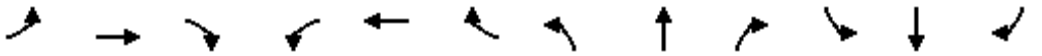
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	273	31	11	221	50	12	58	19	88	47	127
Future Volume (veh/h)	80	273	31	11	221	50	12	58	19	88	47	127
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.90	1.00		0.92
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	103	350	30	14	283	52	15	74	20	113	60	125
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	139	1032	88	31	384	71	33	366	279	145	483	376
Arrive On Green	0.08	0.32	0.32	0.02	0.26	0.26	0.02	0.20	0.20	0.08	0.26	0.26
Sat Flow, veh/h	1753	3250	277	1753	1500	276	1753	1841	1400	1753	1841	1431
Grp Volume(v), veh/h	103	187	193	14	0	335	15	74	20	113	60	125
Grp Sat Flow(s),veh/h/ln	1753	1749	1778	1753	0	1776	1753	1841	1400	1753	1841	1431
Q Serve(g_s), s	2.7	3.8	3.9	0.4	0.0	8.0	0.4	1.6	0.5	2.9	1.2	3.3
Cycle Q Clear(g_c), s	2.7	3.8	3.9	0.4	0.0	8.0	0.4	1.6	0.5	2.9	1.2	3.3
Prop In Lane	1.00		0.16	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	139	555	564	31	0	455	33	366	279	145	483	376
V/C Ratio(X)	0.74	0.34	0.34	0.45	0.00	0.74	0.45	0.20	0.07	0.78	0.12	0.33
Avail Cap(c_a), veh/h	264	723	735	223	0	692	223	781	594	279	840	653
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	12.1	12.1	22.6	0.0	15.8	22.5	15.5	15.1	20.9	13.1	13.8
Incr Delay (d2), s/veh	7.6	0.4	0.4	9.8	0.0	2.3	9.3	0.3	0.1	8.8	0.1	0.5
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	1.2	1.2	1.2	0.2	0.0	2.9	0.2	0.6	0.1	1.4	0.4	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.5	12.5	12.5	32.4	0.0	18.2	31.8	15.8	15.2	29.7	13.2	14.4
LnGrp LOS	C	B	B	C	A	B	C	B	B	C	B	B
Approach Vol, veh/h		483			349			109			298	
Approach Delay, s/veh		15.9			18.8			17.9			19.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	14.1	4.8	19.6	4.9	17.1	7.7	16.8
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	7.4	19.7	5.9	19.2	5.9	21.2	7.0	18.1
Max Q Clear Time (g_c+I1), s	4.9	3.6	2.4	5.9	2.4	5.3	4.7	10.0
Green Ext Time (p_c), s	0.1	0.3	0.0	1.7	0.0	0.6	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	17.8
HCM 6th LOS	B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	390	14	347	15	74	24	113	60	163
v/c Ratio	0.40	0.27	0.06	0.65	0.07	0.25	0.07	0.42	0.11	0.31
Control Delay	29.4	10.9	25.2	23.2	25.2	24.3	0.4	29.6	16.9	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.4	10.9	25.2	23.2	25.2	24.3	0.4	29.6	16.9	5.9
Queue Length 50th (ft)	33	35	4	96	5	23	0	36	13	0
Queue Length 95th (ft)	67	72	17	149	17	48	0	71	39	29
Internal Link Dist (ft)		2552		2573		1348			1231	
Turn Bay Length (ft)	260		200		120			100		
Base Capacity (vph)	276	1771	233	735	233	819	723	292	881	771
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.22	0.06	0.47	0.06	0.09	0.03	0.39	0.07	0.21

Intersection Summary



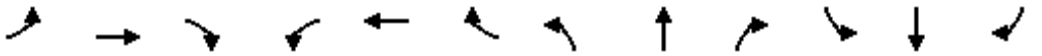
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	213	101	43	200	189	85	335	33	159	325	62
Future Volume (veh/h)	74	213	101	43	200	189	85	335	33	159	325	62
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.94	1.00		0.94	1.00		0.96
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	85	245	98	49	230	158	98	385	32	183	374	56
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	115	371	300	84	642	269	127	496	41	236	663	537
Arrive On Green	0.07	0.20	0.20	0.05	0.18	0.18	0.07	0.30	0.30	0.13	0.36	0.36
Sat Flow, veh/h	1753	1841	1488	1753	3497	1468	1753	1667	139	1753	1841	1491
Grp Volume(v), veh/h	85	245	98	49	230	158	98	0	417	183	374	56
Grp Sat Flow(s),veh/h/ln	1753	1841	1488	1753	1749	1468	1753	0	1806	1753	1841	1491
Q Serve(g_s), s	2.7	6.9	3.1	1.5	3.2	5.5	3.1	0.0	11.8	5.6	9.1	1.4
Cycle Q Clear(g_c), s	2.7	6.9	3.1	1.5	3.2	5.5	3.1	0.0	11.8	5.6	9.1	1.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	115	371	300	84	642	269	127	0	538	236	663	537
V/C Ratio(X)	0.74	0.66	0.33	0.59	0.36	0.59	0.77	0.00	0.78	0.78	0.56	0.10
Avail Cap(c_a), veh/h	339	761	615	220	1208	507	395	0	1199	596	1433	1161
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.6	20.6	19.1	26.1	19.9	20.9	25.5	0.0	17.9	23.4	14.4	11.9
Incr Delay (d2), s/veh	8.9	2.0	0.6	6.4	0.3	2.0	9.5	0.0	2.4	5.4	0.8	0.1
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	1.3	2.8	1.0	0.7	1.2	1.8	1.5	0.0	4.5	2.4	3.2	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	22.6	19.7	32.4	20.3	22.9	34.9	0.0	20.4	28.8	15.1	12.0
LnGrp LOS	C	C	B	C	C	C	C	A	C	C	B	B
Approach Vol, veh/h		428			437			515			613	
Approach Delay, s/veh		24.3			22.6			23.1			18.9	
Approach LOS		C			C			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	21.5	6.7	16.2	8.0	25.0	7.7	15.2
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	19.0	37.1	7.0	23.1	12.6	43.5	10.8	19.3
Max Q Clear Time (g_c+I1), s	7.6	13.8	3.5	8.9	5.1	11.1	4.7	7.5
Green Ext Time (p_c), s	0.4	2.4	0.0	1.4	0.1	2.4	0.1	1.5

Intersection Summary	
HCM 6th Ctrl Delay	22.0
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	85	245	116	49	230	217	98	423	183	374	71
v/c Ratio	0.41	0.57	0.25	0.31	0.38	0.50	0.43	0.75	0.59	0.50	0.11
Control Delay	44.4	36.2	4.7	46.2	33.8	9.7	43.5	34.3	41.8	22.8	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	36.2	4.7	46.2	33.8	9.7	43.5	34.3	41.8	22.8	2.0
Queue Length 50th (ft)	40	112	0	23	53	0	46	187	84	148	0
Queue Length 95th (ft)	100	221	24	69	104	56	111	325	178	252	11
Internal Link Dist (ft)		2573			1323			1461		1228	
Turn Bay Length (ft)	115		65	100		100	220		230		230
Base Capacity (vph)	270	608	589	175	965	562	315	959	475	1134	941
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.40	0.20	0.28	0.24	0.39	0.31	0.44	0.39	0.33	0.08

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	237	22	29	332	90	80	58	114	168	48	211
Future Volume (veh/h)	118	237	22	29	332	90	80	58	114	168	48	211
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.92	1.00		0.91	1.00		0.93
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	131	263	20	32	369	73	89	64	109	187	53	177
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	167	1180	89	61	440	87	114	312	240	233	437	344
Arrive On Green	0.10	0.36	0.36	0.03	0.30	0.30	0.07	0.17	0.17	0.13	0.24	0.24
Sat Flow, veh/h	1753	3277	247	1753	1469	291	1753	1841	1418	1753	1841	1449
Grp Volume(v), veh/h	131	139	144	32	0	442	89	64	109	187	53	177
Grp Sat Flow(s),veh/h/ln	1753	1749	1775	1753	0	1760	1753	1841	1418	1753	1841	1449
Q Serve(g_s), s	4.3	3.3	3.3	1.1	0.0	13.8	2.9	1.8	4.1	6.1	1.3	6.2
Cycle Q Clear(g_c), s	4.3	3.3	3.3	1.1	0.0	13.8	2.9	1.8	4.1	6.1	1.3	6.2
Prop In Lane	1.00		0.14	1.00		0.17	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	167	630	639	61	0	527	114	312	240	233	437	344
V/C Ratio(X)	0.78	0.22	0.23	0.53	0.00	0.84	0.78	0.21	0.45	0.80	0.12	0.51
Avail Cap(c_a), veh/h	239	750	761	176	0	692	283	629	485	328	676	533
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	13.1	13.1	27.9	0.0	19.3	27.1	21.0	22.0	24.7	17.6	19.5
Incr Delay (d2), s/veh	10.4	0.2	0.2	6.9	0.0	7.0	10.8	0.3	1.3	9.2	0.1	1.2
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	2.1	1.1	1.1	0.5	0.0	5.8	1.5	0.7	1.3	2.9	0.5	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.4	13.3	13.3	34.8	0.0	26.3	37.9	21.3	23.3	33.9	17.7	20.7
LnGrp LOS	D	B	B	C	A	C	D	C	C	C	B	C
Approach Vol, veh/h		414			474			262			417	
Approach Delay, s/veh		20.6			26.9			27.8			26.2	
Approach LOS		C			C			C			C	

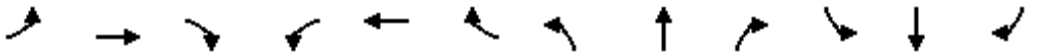
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.8	14.9	6.0	26.1	7.8	18.9	9.6	22.5
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	11.0	20.1	5.9	25.2	9.5	21.6	8.0	23.1
Max Q Clear Time (g_c+I1), s	8.1	6.1	3.1	5.3	4.9	8.2	6.3	15.8
Green Ext Time (p_c), s	0.1	0.5	0.0	1.4	0.1	0.7	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	131	287	32	469	89	64	127	187	53	234
v/c Ratio	0.63	0.19	0.21	0.81	0.42	0.29	0.44	0.68	0.15	0.50
Control Delay	45.0	12.5	33.3	33.2	34.1	30.7	10.3	41.6	26.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	12.5	33.3	33.2	34.1	30.7	10.3	41.6	26.4	8.4
Queue Length 50th (ft)	53	28	13	165	34	25	0	74	20	0
Queue Length 95th (ft)	#133	71	38	#337	77	58	39	#167	48	56
Internal Link Dist (ft)		2552		2573		1348			1231	
Turn Bay Length (ft)	260		200		120			100		
Base Capacity (vph)	212	1545	156	621	251	560	535	291	602	631
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.19	0.21	0.76	0.35	0.11	0.24	0.64	0.09	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



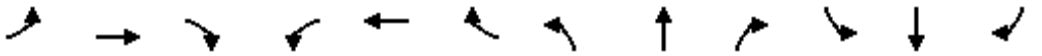
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	239	68	33	310	226	105	318	30	107	215	114
Future Volume (veh/h)	202	239	68	33	310	226	105	318	30	107	215	114
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.94	1.00		0.94
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	220	260	60	36	337	199	114	346	28	116	234	109
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, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	274	581	473	64	686	293	147	441	36	149	488	389
Arrive On Green	0.16	0.32	0.32	0.04	0.20	0.20	0.09	0.27	0.27	0.09	0.27	0.27
Sat Flow, veh/h	1725	1811	1474	1725	3441	1467	1725	1644	133	1725	1811	1444
Grp Volume(v), veh/h	220	260	60	36	337	199	114	0	374	116	234	109
Grp Sat Flow(s),veh/h/ln	1725	1811	1474	1725	1721	1467	1725	0	1777	1725	1811	1444
Q Serve(g_s), s	7.6	7.1	1.8	1.3	5.4	7.8	4.0	0.0	12.1	4.1	6.7	3.7
Cycle Q Clear(g_c), s	7.6	7.1	1.8	1.3	5.4	7.8	4.0	0.0	12.1	4.1	6.7	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	274	581	473	64	686	293	147	0	477	149	488	389
V/C Ratio(X)	0.80	0.45	0.13	0.56	0.49	0.68	0.77	0.00	0.78	0.78	0.48	0.28
Avail Cap(c_a), veh/h	584	949	772	183	1004	428	384	0	977	361	972	775
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.2	16.7	14.9	29.4	22.0	23.0	27.8	0.0	21.0	27.7	19.0	17.9
Incr Delay (d2), s/veh	5.5	0.5	0.1	7.4	0.5	2.8	8.4	0.0	2.9	8.3	0.7	0.4
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	3.2	2.6	0.5	0.6	2.0	2.6	1.9	0.0	4.8	1.9	2.6	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.6	17.2	15.0	36.8	22.6	25.8	36.2	0.0	23.9	36.1	19.7	18.3
LnGrp LOS	C	B	B	D	C	C	D	A	C	D	B	B
Approach Vol, veh/h		540			572			488			459	
Approach Delay, s/veh		22.4			24.6			26.8			23.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.4	21.5	6.3	24.8	9.3	21.6	13.9	17.3
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	13.0	34.1	6.6	32.5	13.8	33.3	21.0	18.1
Max Q Clear Time (g_c+I1), s	6.1	14.1	3.3	9.1	6.0	8.7	9.6	9.8
Green Ext Time (p_c), s	0.1	2.0	0.0	1.6	0.1	1.6	0.4	1.8

Intersection Summary	
HCM 6th Ctrl Delay	24.3
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	220	260	74	36	337	246	114	379	116	234	124
v/c Ratio	0.65	0.40	0.12	0.25	0.56	0.53	0.49	0.73	0.51	0.45	0.24
Control Delay	43.3	26.3	2.9	47.3	37.3	9.9	45.6	36.8	46.7	29.0	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.3	26.3	2.9	47.3	37.3	9.9	45.6	36.8	46.7	29.0	4.4
Queue Length 50th (ft)	108	113	0	18	86	0	57	180	58	101	0
Queue Length 95th (ft)	217	215	17	57	156	69	129	316	132	191	30
Internal Link Dist (ft)		2573			1323			1461		1228	
Turn Bay Length (ft)	115		65	100		100	220		230		230
Base Capacity (vph)	489	797	700	153	843	544	321	822	303	816	720
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.33	0.11	0.24	0.40	0.45	0.36	0.46	0.38	0.29	0.17

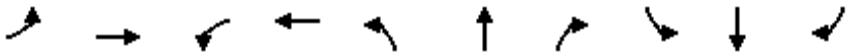
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	291	38	80	251	50	24	70	60	88	67	147
Future Volume (veh/h)	91	291	38	80	251	50	24	70	60	88	67	147
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.90	1.00		0.91
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	117	373	39	103	322	52	31	90	73	113	86	150
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	150	888	92	136	416	67	62	357	271	145	444	343
Arrive On Green	0.09	0.28	0.28	0.08	0.27	0.27	0.04	0.19	0.19	0.08	0.24	0.24
Sat Flow, veh/h	1753	3183	330	1753	1535	248	1753	1841	1397	1753	1841	1422
Grp Volume(v), veh/h	117	204	208	103	0	374	31	90	73	113	86	150
Grp Sat Flow(s),veh/h/ln	1753	1749	1765	1753	0	1783	1753	1841	1397	1753	1841	1422
Q Serve(g_s), s	3.2	4.6	4.7	2.8	0.0	9.4	0.8	2.0	2.2	3.1	1.8	4.3
Cycle Q Clear(g_c), s	3.2	4.6	4.7	2.8	0.0	9.4	0.8	2.0	2.2	3.1	1.8	4.3
Prop In Lane	1.00		0.19	1.00		0.14	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	150	488	492	136	0	483	62	357	271	145	444	343
V/C Ratio(X)	0.78	0.42	0.42	0.76	0.00	0.77	0.50	0.25	0.27	0.78	0.19	0.44
Avail Cap(c_a), veh/h	253	693	699	213	0	666	213	748	568	268	805	622
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.7	14.3	14.3	21.9	0.0	16.3	23.0	16.6	16.6	21.8	14.6	15.6
Incr Delay (d2), s/veh	8.6	0.6	0.6	8.4	0.0	3.8	6.2	0.4	0.5	8.8	0.2	0.9
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	1.5	1.5	1.6	1.3	0.0	3.6	0.4	0.7	0.6	1.4	0.6	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.3	14.8	14.9	30.3	0.0	20.1	29.1	16.9	17.1	30.6	14.8	16.5
LnGrp LOS	C	B	B	C	A	C	C	B	B	C	B	B
Approach Vol, veh/h		529			477			194			349	
Approach Delay, s/veh		18.3			22.3			19.0			20.7	
Approach LOS		B			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	14.3	7.7	18.4	5.7	16.6	8.1	18.0
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	7.4	19.7	5.9	19.2	5.9	21.2	7.0	18.1
Max Q Clear Time (g_c+I1), s	5.1	4.2	4.8	6.7	2.8	6.3	5.2	11.4
Green Ext Time (p_c), s	0.1	0.5	0.0	1.8	0.0	0.8	0.0	1.2

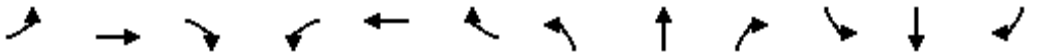
Intersection Summary	
HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	117	422	103	386	31	90	77	113	86	188
v/c Ratio	0.46	0.38	0.46	0.69	0.14	0.30	0.21	0.43	0.18	0.37
Control Delay	33.0	15.5	35.2	25.4	26.8	25.1	1.8	30.8	19.7	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	15.5	35.2	25.4	26.8	25.1	1.8	30.8	19.7	6.6
Queue Length 50th (ft)	40	55	35	113	10	29	0	38	21	0
Queue Length 95th (ft)	75	79	#77	172	28	55	0	72	51	30
Internal Link Dist (ft)		2552		2573		1348			1231	
Turn Bay Length (ft)	260		200		120			100		
Base Capacity (vph)	266	1439	224	709	224	788	701	281	848	761
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.29	0.46	0.54	0.14	0.11	0.11	0.40	0.10	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



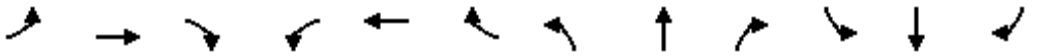
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	219	107	43	210	189	95	335	33	159	325	141
Future Volume (veh/h)	121	219	107	43	210	189	95	335	33	159	325	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.94	1.00		0.94	1.00		0.95
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	139	252	105	49	241	158	109	385	32	183	374	147
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	180	429	348	82	619	259	142	483	40	234	630	510
Arrive On Green	0.10	0.23	0.23	0.05	0.18	0.18	0.08	0.29	0.29	0.13	0.34	0.34
Sat Flow, veh/h	1753	1841	1494	1753	3497	1465	1753	1667	139	1753	1841	1489
Grp Volume(v), veh/h	139	252	105	49	241	158	109	0	417	183	374	147
Grp Sat Flow(s),veh/h/ln	1753	1841	1494	1753	1749	1465	1753	0	1805	1753	1841	1489
Q Serve(g_s), s	4.6	7.3	3.5	1.6	3.6	6.0	3.6	0.0	12.8	6.0	10.0	4.3
Cycle Q Clear(g_c), s	4.6	7.3	3.5	1.6	3.6	6.0	3.6	0.0	12.8	6.0	10.0	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	180	429	348	82	619	259	142	0	524	234	630	510
V/C Ratio(X)	0.77	0.59	0.30	0.60	0.39	0.61	0.77	0.00	0.80	0.78	0.59	0.29
Avail Cap(c_a), veh/h	410	766	621	211	1058	443	387	0	1089	527	1258	1018
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.2	20.4	18.9	28.0	21.8	22.7	27.0	0.0	19.6	25.1	16.2	14.4
Incr Delay (d2), s/veh	6.9	1.3	0.5	6.9	0.4	2.3	8.5	0.0	2.8	5.7	0.9	0.3
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	2.1	2.9	1.1	0.8	1.4	2.0	1.7	0.0	5.0	2.6	3.7	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	21.7	19.4	34.9	22.2	25.0	35.5	0.0	22.4	30.8	17.1	14.7
LnGrp LOS	C	C	B	C	C	C	D	A	C	C	B	B
Approach Vol, veh/h		496			448			526			704	
Approach Delay, s/veh		24.4			24.6			25.1			20.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	22.3	6.8	18.8	8.8	25.4	10.1	15.5
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	18.0	36.1	7.2	24.9	13.2	40.9	14.0	18.1
Max Q Clear Time (g_c+I1), s	8.0	14.8	3.6	9.3	5.6	12.0	6.6	8.0
Green Ext Time (p_c), s	0.3	2.4	0.0	1.5	0.1	2.7	0.2	1.4

Intersection Summary	
HCM 6th Ctrl Delay	23.2
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	139	252	123	49	241	217	109	423	183	374	162
v/c Ratio	0.57	0.51	0.24	0.32	0.46	0.54	0.49	0.78	0.62	0.54	0.25
Control Delay	45.9	33.4	5.1	47.1	36.7	10.9	44.9	37.0	43.9	24.8	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	33.4	5.1	47.1	36.7	10.9	44.9	37.0	43.9	24.8	4.5
Queue Length 50th (ft)	65	117	0	23	58	0	51	189	85	151	0
Queue Length 95th (ft)	147	222	28	68	110	57	120	330	180	264	36
Internal Link Dist (ft)		2573			1323			1461		1228	
Turn Bay Length (ft)	115		65	100		100	220		230		230
Base Capacity (vph)	321	600	584	165	830	513	302	856	412	987	859
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.42	0.21	0.30	0.29	0.42	0.36	0.49	0.44	0.38	0.19

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	239	22	31	335	96	80	61	116	171	53	215
Future Volume (veh/h)	120	239	22	31	335	96	80	61	116	171	53	215
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.92	1.00		0.91	1.00		0.93
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	133	266	20	34	372	80	89	68	111	190	59	182
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	169	1186	88	63	435	93	114	312	240	236	440	347
Arrive On Green	0.10	0.36	0.36	0.04	0.30	0.30	0.07	0.17	0.17	0.13	0.24	0.24
Sat Flow, veh/h	1753	3280	244	1753	1444	311	1753	1841	1418	1753	1841	1450
Grp Volume(v), veh/h	133	141	145	34	0	452	89	68	111	190	59	182
Grp Sat Flow(s),veh/h/ln	1753	1749	1776	1753	0	1755	1753	1841	1418	1753	1841	1450
Q Serve(g_s), s	4.4	3.3	3.4	1.1	0.0	14.5	3.0	1.9	4.2	6.3	1.5	6.5
Cycle Q Clear(g_c), s	4.4	3.3	3.4	1.1	0.0	14.5	3.0	1.9	4.2	6.3	1.5	6.5
Prop In Lane	1.00		0.14	1.00		0.18	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	169	632	642	63	0	528	114	312	240	236	440	347
V/C Ratio(X)	0.79	0.22	0.23	0.54	0.00	0.86	0.78	0.22	0.46	0.80	0.13	0.52
Avail Cap(c_a), veh/h	235	738	750	173	0	679	270	620	478	323	675	532
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.4	13.2	13.3	28.3	0.0	19.6	27.5	21.4	22.3	25.1	17.9	19.8
Incr Delay (d2), s/veh	11.2	0.2	0.2	6.9	0.0	8.5	10.8	0.3	1.4	9.9	0.1	1.2
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	2.2	1.1	1.2	0.6	0.0	6.3	1.5	0.8	1.3	3.0	0.6	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	13.4	13.4	35.2	0.0	28.2	38.3	21.7	23.7	35.0	18.0	21.0
LnGrp LOS	D	B	B	D	A	C	D	C	C	D	B	C
Approach Vol, veh/h		419			486			268			431	
Approach Delay, s/veh		21.1			28.6			28.1			26.8	
Approach LOS		C			C			C			C	

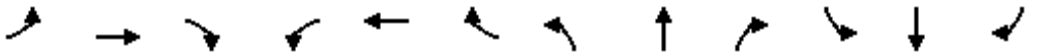
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	15.0	6.2	26.5	7.9	19.2	9.8	22.9
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	11.0	20.1	5.9	25.2	9.2	21.9	8.0	23.1
Max Q Clear Time (g_c+I1), s	8.3	6.2	3.1	5.4	5.0	8.5	6.4	16.5
Green Ext Time (p_c), s	0.1	0.5	0.0	1.4	0.1	0.7	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	133	290	34	479	89	68	129	190	59	239
v/c Ratio	0.65	0.19	0.22	0.82	0.43	0.31	0.44	0.69	0.17	0.51
Control Delay	46.1	12.5	33.6	33.7	34.6	31.1	10.6	42.4	26.5	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	12.5	33.6	33.7	34.6	31.1	10.6	42.4	26.5	8.4
Queue Length 50th (ft)	54	29	14	170	35	27	0	75	22	0
Queue Length 95th (ft)	#134	71	40	#346	78	61	41	#170	52	56
Internal Link Dist (ft)		2552		2573		1348			1231	
Turn Bay Length (ft)	260		200		120			100		
Base Capacity (vph)	209	1557	154	614	241	554	531	288	604	636
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.19	0.22	0.78	0.37	0.12	0.24	0.66	0.10	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	231	258	84	75	328	231	112	345	31	145	215	121
Future Volume (veh/h)	231	258	84	75	328	231	112	345	31	145	215	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.94	1.00		0.94
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	251	280	77	82	357	204	122	375	29	158	234	117
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, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	300	552	449	105	659	281	156	447	35	198	534	427
Arrive On Green	0.17	0.30	0.30	0.06	0.19	0.19	0.09	0.27	0.27	0.11	0.29	0.29
Sat Flow, veh/h	1725	1811	1473	1725	3441	1466	1725	1651	128	1725	1811	1449
Grp Volume(v), veh/h	251	280	77	82	357	204	122	0	404	158	234	117
Grp Sat Flow(s),veh/h/ln	1725	1811	1473	1725	1721	1466	1725	0	1779	1725	1811	1449
Q Serve(g_s), s	10.1	9.1	2.7	3.4	6.7	9.3	4.9	0.0	15.3	6.4	7.5	4.4
Cycle Q Clear(g_c), s	10.1	9.1	2.7	3.4	6.7	9.3	4.9	0.0	15.3	6.4	7.5	4.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	300	552	449	105	659	281	156	0	482	198	534	427
V/C Ratio(X)	0.84	0.51	0.17	0.78	0.54	0.73	0.78	0.00	0.84	0.80	0.44	0.27
Avail Cap(c_a), veh/h	507	717	583	260	871	371	367	0	823	338	808	646
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.6	20.5	18.2	33.1	26.1	27.1	31.8	0.0	24.6	30.9	20.4	19.3
Incr Delay (d2), s/veh	6.1	0.7	0.2	11.8	0.7	4.8	8.2	0.0	4.0	7.3	0.6	0.3
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	4.3	3.6	0.9	1.7	2.6	3.4	2.3	0.0	6.4	2.9	3.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	21.2	18.4	44.9	26.8	32.0	40.0	0.0	28.6	38.1	21.0	19.7
LnGrp LOS	C	C	B	D	C	C	D	A	C	D	C	B
Approach Vol, veh/h		608			643			526			509	
Approach Delay, s/veh		26.4			30.7			31.2			26.0	
Approach LOS		C			C			C			C	

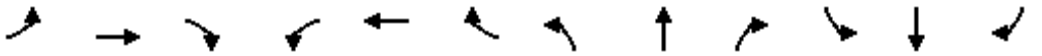
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.2	24.3	8.4	26.7	10.5	26.0	16.4	18.6
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	14.0	33.1	10.8	28.3	15.2	31.9	21.0	18.1
Max Q Clear Time (g_c+I1), s	8.4	17.3	5.4	11.1	6.9	9.5	12.1	11.3
Green Ext Time (p_c), s	0.2	2.1	0.1	1.6	0.2	1.6	0.5	1.6

Intersection Summary	
HCM 6th Ctrl Delay	28.6
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	251	280	91	82	357	251	122	409	158	234	132
v/c Ratio	0.75	0.53	0.18	0.47	0.63	0.56	0.55	0.81	0.66	0.40	0.24
Control Delay	50.5	33.8	5.8	51.1	41.4	10.2	49.1	43.8	54.0	28.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	33.8	5.8	51.1	41.4	10.2	49.1	43.8	54.0	28.6	4.9
Queue Length 50th (ft)	141	144	0	47	105	0	70	224	90	111	0
Queue Length 95th (ft)	#267	248	31	102	165	70	135	352	#191	196	35
Internal Link Dist (ft)		2573			1323			1461		1228	
Turn Bay Length (ft)	115		65	100		100	220		230		230
Base Capacity (vph)	423	599	552	217	729	508	306	692	282	676	621
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.47	0.16	0.38	0.49	0.49	0.40	0.59	0.56	0.35	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	294	38	83	255	55	24	76	62	93	71	150
Future Volume (veh/h)	96	294	38	83	255	55	24	76	62	93	71	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.89	1.00		0.91
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	123	377	39	106	327	59	31	97	75	119	91	154
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	157	916	94	136	414	75	61	351	266	152	446	345
Arrive On Green	0.09	0.29	0.29	0.08	0.27	0.27	0.04	0.19	0.19	0.09	0.24	0.24
Sat Flow, veh/h	1753	3187	327	1753	1506	272	1753	1841	1395	1753	1841	1423
Grp Volume(v), veh/h	123	206	210	106	0	386	31	97	75	119	91	154
Grp Sat Flow(s),veh/h/ln	1753	1749	1766	1753	0	1778	1753	1841	1395	1753	1841	1423
Q Serve(g_s), s	3.4	4.7	4.8	3.0	0.0	10.0	0.9	2.2	2.3	3.3	2.0	4.6
Cycle Q Clear(g_c), s	3.4	4.7	4.8	3.0	0.0	10.0	0.9	2.2	2.3	3.3	2.0	4.6
Prop In Lane	1.00		0.19	1.00		0.15	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	157	502	507	136	0	489	61	351	266	152	446	345
V/C Ratio(X)	0.78	0.41	0.41	0.78	0.00	0.79	0.50	0.28	0.28	0.78	0.20	0.45
Avail Cap(c_a), veh/h	247	640	646	243	0	647	208	744	564	247	785	607
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.2	14.3	14.3	22.5	0.0	16.7	23.6	17.2	17.2	22.2	15.0	16.0
Incr Delay (d2), s/veh	8.2	0.5	0.5	9.4	0.0	4.8	6.3	0.4	0.6	8.5	0.2	0.9
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	1.6	1.6	1.6	1.4	0.0	3.9	0.4	0.8	0.7	1.5	0.7	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.4	14.8	14.9	31.9	0.0	21.5	29.9	17.6	17.8	30.7	15.2	16.9
LnGrp LOS	C	B	B	C	A	C	C	B	B	C	B	B
Approach Vol, veh/h		539			492			203			364	
Approach Delay, s/veh		18.4			23.8			19.5			21.0	
Approach LOS		B			C			B			C	

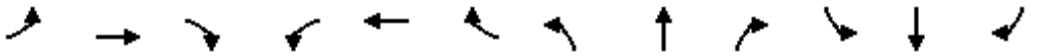
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	14.4	7.8	19.2	5.7	17.0	8.5	18.6
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	7.0	20.1	6.9	18.2	5.9	21.2	7.0	18.1
Max Q Clear Time (g_c+I1), s	5.3	4.3	5.0	6.8	2.9	6.6	5.4	12.0
Green Ext Time (p_c), s	0.0	0.6	0.0	1.7	0.0	0.8	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	20.8
HCM 6th LOS	C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	123	426	106	398	31	97	79	119	91	192
v/c Ratio	0.48	0.39	0.43	0.70	0.14	0.31	0.21	0.47	0.20	0.38
Control Delay	33.8	16.2	31.7	25.7	26.8	25.2	2.0	33.3	19.9	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	16.2	31.7	25.7	26.8	25.2	2.0	33.3	19.9	6.7
Queue Length 50th (ft)	42	57	36	117	10	31	0	40	22	0
Queue Length 95th (ft)	#81	82	69	177	28	58	0	#77	54	30
Internal Link Dist (ft)		2552		2573		1348			1231	
Turn Bay Length (ft)	260		200		120			100		
Base Capacity (vph)	263	1352	260	702	222	796	707	263	840	758
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.32	0.41	0.57	0.14	0.12	0.11	0.45	0.11	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	231	117	89	232	194	113	366	35	196	328	155
Future Volume (veh/h)	142	231	117	89	232	194	113	366	35	196	328	155
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.94	1.00		0.94	1.00		0.96
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	163	266	116	102	267	164	130	421	34	225	377	163
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	205	392	318	131	598	250	167	501	40	274	664	538
Arrive On Green	0.12	0.21	0.21	0.07	0.17	0.17	0.10	0.30	0.30	0.16	0.36	0.36
Sat Flow, veh/h	1753	1841	1490	1753	3497	1463	1753	1672	135	1753	1841	1491
Grp Volume(v), veh/h	163	266	116	102	267	164	130	0	455	225	377	163
Grp Sat Flow(s),veh/h/ln	1753	1841	1490	1753	1749	1463	1753	0	1806	1753	1841	1491
Q Serve(g_s), s	6.3	9.2	4.6	4.0	4.8	7.3	5.0	0.0	16.4	8.6	11.4	5.5
Cycle Q Clear(g_c), s	6.3	9.2	4.6	4.0	4.8	7.3	5.0	0.0	16.4	8.6	11.4	5.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	205	392	318	131	598	250	167	0	541	274	664	538
V/C Ratio(X)	0.80	0.68	0.37	0.78	0.45	0.66	0.78	0.00	0.84	0.82	0.57	0.30
Avail Cap(c_a), veh/h	353	585	474	252	910	381	388	0	912	479	1025	830
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	25.2	23.3	31.6	25.9	26.9	30.7	0.0	22.8	28.4	17.9	16.0
Incr Delay (d2), s/veh	6.9	2.1	0.7	9.5	0.5	2.9	7.6	0.0	3.6	6.0	0.8	0.3
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	2.9	3.9	1.6	1.9	1.9	2.5	2.3	0.0	6.7	3.8	4.4	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	27.2	24.0	41.1	26.4	29.8	38.3	0.0	26.4	34.4	18.6	16.3
LnGrp LOS	D	C	C	D	C	C	D	A	C	C	B	B
Approach Vol, veh/h		545			533			585			765	
Approach Delay, s/veh		29.4			30.2			29.0			22.8	
Approach LOS		C			C			C			C	

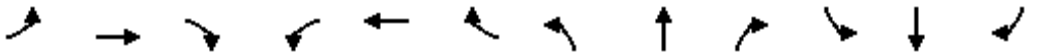
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	25.7	9.2	19.7	10.6	30.0	12.1	16.8
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	19.0	35.1	10.0	22.1	15.4	38.7	14.0	18.1
Max Q Clear Time (g_c+I1), s	10.6	18.4	6.0	11.2	7.0	13.4	8.3	9.3
Green Ext Time (p_c), s	0.4	2.4	0.1	1.4	0.2	2.8	0.2	1.4

Intersection Summary	
HCM 6th Ctrl Delay	27.4
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	163	266	134	102	267	223	130	461	225	377	178
v/c Ratio	0.67	0.63	0.32	0.56	0.48	0.53	0.56	0.83	0.72	0.58	0.28
Control Delay	54.1	42.1	13.4	55.6	38.9	10.5	49.0	42.8	51.2	28.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	42.1	13.4	55.6	38.9	10.5	49.0	42.8	51.2	28.2	4.8
Queue Length 50th (ft)	92	149	15	59	77	0	74	250	126	176	0
Queue Length 95th (ft)	#185	244	63	#126	121	58	136	374	#221	277	39
Internal Link Dist (ft)		2573			1323			1461		1228	
Turn Bay Length (ft)	115		65	100		100	220		230		230
Base Capacity (vph)	287	477	463	205	743	487	316	746	390	837	762
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.56	0.29	0.50	0.36	0.46	0.41	0.62	0.58	0.45	0.23

Intersection Summary

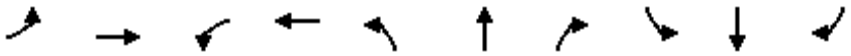
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	348	28	35	502	142	120	87	143	258	75	321
Future Volume (veh/h)	177	348	28	35	502	142	120	87	143	258	75	321
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.94	1.00		0.90	1.00		0.93
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	192	378	26	38	546	128	130	95	138	280	82	294
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	214	1608	110	56	562	132	158	261	198	303	413	324
Arrive On Green	0.12	0.49	0.49	0.03	0.40	0.40	0.09	0.14	0.14	0.17	0.22	0.22
Sat Flow, veh/h	1753	3307	226	1753	1421	333	1753	1841	1397	1753	1841	1445
Grp Volume(v), veh/h	192	199	205	38	0	674	130	95	138	280	82	294
Grp Sat Flow(s),veh/h/ln	1753	1749	1784	1753	0	1754	1753	1841	1397	1753	1841	1445
Q Serve(g_s), s	11.5	7.0	7.1	2.3	0.0	40.1	7.8	5.0	10.0	16.7	3.8	21.1
Cycle Q Clear(g_c), s	11.5	7.0	7.1	2.3	0.0	40.1	7.8	5.0	10.0	16.7	3.8	21.1
Prop In Lane	1.00		0.13	1.00		0.19	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	214	850	868	56	0	694	158	261	198	303	413	324
V/C Ratio(X)	0.90	0.23	0.24	0.68	0.00	0.97	0.82	0.36	0.70	0.92	0.20	0.91
Avail Cap(c_a), veh/h	214	850	868	110	0	694	198	324	246	303	434	341
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	15.8	15.9	51.0	0.0	31.5	47.5	41.3	43.5	43.3	33.5	40.2
Incr Delay (d2), s/veh	34.8	0.1	0.1	13.8	0.0	27.0	19.5	0.9	6.3	32.5	0.2	26.0
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	6.9	2.7	2.8	1.2	0.0	21.1	4.2	2.3	3.7	9.8	1.7	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.8	16.0	16.0	64.8	0.0	58.5	67.1	42.2	49.7	75.7	33.7	66.2
LnGrp LOS	F	B	B	E	A	E	E	D	D	E	C	E
Approach Vol, veh/h		596			712			363			656	
Approach Delay, s/veh		36.9			58.8			54.0			66.2	
Approach LOS		D			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.4	20.0	7.4	56.6	13.6	28.8	17.0	47.0
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	18.4	18.7	6.7	48.4	12.0	25.1	13.0	42.1
Max Q Clear Time (g_c+I1), s	18.7	12.0	4.3	9.1	9.8	23.1	13.5	42.1
Green Ext Time (p_c), s	0.0	0.5	0.0	2.4	0.1	0.3	0.0	0.0

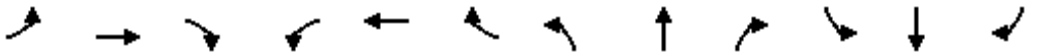
Intersection Summary	
HCM 6th Ctrl Delay	54.5
HCM 6th LOS	D



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	192	408	38	700	130	95	155	280	82	349
v/c Ratio	0.87	0.23	0.35	0.98	0.70	0.47	0.50	0.90	0.25	0.71
Control Delay	81.3	15.4	56.8	60.0	64.8	50.5	9.9	74.2	38.1	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.3	15.4	56.8	60.0	64.8	50.5	9.9	74.2	38.1	16.8
Queue Length 50th (ft)	124	78	24	431	82	59	0	180	47	34
Queue Length 95th (ft)	#276	127	61	#763	#174	110	42	#366	90	134
Internal Link Dist (ft)		2552		2573		1348			1231	
Turn Bay Length (ft)	260		200		120			100		
Base Capacity (vph)	220	1757	113	715	203	332	402	311	447	563
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.23	0.34	0.98	0.64	0.29	0.39	0.90	0.18	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	377	114	125	486	284	165	508	46	200	326	167
Future Volume (veh/h)	280	377	114	125	486	284	165	508	46	200	326	167
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.95	1.00		0.95	1.00		0.95
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	304	410	110	136	528	262	179	552	45	217	354	167
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, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	326	479	388	157	572	243	209	568	46	237	655	527
Arrive On Green	0.19	0.26	0.26	0.09	0.17	0.17	0.12	0.35	0.35	0.14	0.36	0.36
Sat Flow, veh/h	1725	1811	1468	1725	3441	1460	1725	1644	134	1725	1811	1459
Grp Volume(v), veh/h	304	410	110	136	528	262	179	0	597	217	354	167
Grp Sat Flow(s),veh/h/ln	1725	1811	1468	1725	1721	1460	1725	0	1778	1725	1811	1459
Q Serve(g_s), s	19.1	23.7	6.6	8.6	16.6	18.3	11.2	0.0	36.4	13.7	17.1	9.1
Cycle Q Clear(g_c), s	19.1	23.7	6.6	8.6	16.6	18.3	11.2	0.0	36.4	13.7	17.1	9.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	326	479	388	157	572	243	209	0	614	237	655	527
V/C Ratio(X)	0.93	0.86	0.28	0.87	0.92	1.08	0.86	0.00	0.97	0.92	0.54	0.32
Avail Cap(c_a), veh/h	326	479	388	157	572	243	292	0	614	237	655	527
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	38.5	32.2	49.3	45.2	45.8	47.4	0.0	35.5	46.8	27.9	25.3
Incr Delay (d2), s/veh	32.7	14.2	0.4	36.8	20.6	80.2	16.1	0.0	29.2	36.7	0.9	0.3
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	10.9	12.0	2.3	5.2	8.5	11.9	5.6	0.0	19.9	8.1	7.3	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.6	52.6	32.6	86.1	65.8	126.0	63.5	0.0	64.7	83.5	28.8	25.7
LnGrp LOS	E	D	C	F	E	F	E	A	E	F	C	C
Approach Vol, veh/h		824			926			776			738	
Approach Delay, s/veh		58.8			85.8			64.4			44.2	
Approach LOS		E			F			E			D	

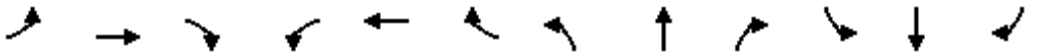
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.1	42.9	14.0	34.0	17.3	44.7	24.8	23.2
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	15.1	38.0	10.0	29.1	18.6	34.5	20.8	18.3
Max Q Clear Time (g_c+I1), s	15.7	38.4	10.6	25.7	13.2	19.1	21.1	20.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.9	0.2	2.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	64.5
HCM 6th LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	304	410	124	136	528	309	179	602	217	354	182
v/c Ratio	0.95	0.87	0.27	0.88	0.93	0.73	0.74	0.99	0.93	0.58	0.31
Control Delay	83.2	58.3	11.4	97.1	70.2	24.8	62.8	69.6	91.3	35.4	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.2	58.3	11.4	97.1	70.2	24.8	62.8	69.6	91.3	35.4	5.6
Queue Length 50th (ft)	214	277	14	97	195	58	121	416	154	207	0
Queue Length 95th (ft)	#383	#448	61	#212	#300	#168	195	#656	#299	315	50
Internal Link Dist (ft)		2573			1323			1461		1228	
Turn Bay Length (ft)	115		65	100		100	220		230		230
Base Capacity (vph)	322	474	453	154	566	422	287	610	233	608	596
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.86	0.27	0.88	0.93	0.73	0.62	0.99	0.93	0.58	0.31

Intersection Summary

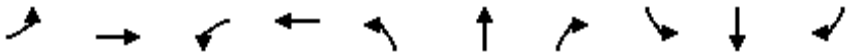
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	435	54	89	369	81	30	106	72	138	95	215
Future Volume (veh/h)	137	435	54	89	369	81	30	106	72	138	95	215
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.89	1.00		0.91
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	149	473	50	97	401	78	33	115	75	150	103	201
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	188	1110	117	125	465	90	62	328	247	190	463	359
Arrive On Green	0.11	0.35	0.35	0.07	0.31	0.31	0.04	0.18	0.18	0.11	0.25	0.25
Sat Flow, veh/h	1753	3180	335	1753	1486	289	1753	1841	1385	1753	1841	1427
Grp Volume(v), veh/h	149	259	264	97	0	479	33	115	75	150	103	201
Grp Sat Flow(s),veh/h/ln	1753	1749	1766	1753	0	1775	1753	1841	1385	1753	1841	1427
Q Serve(g_s), s	5.0	6.9	6.9	3.3	0.0	15.4	1.1	3.3	2.9	5.1	2.7	7.5
Cycle Q Clear(g_c), s	5.0	6.9	6.9	3.3	0.0	15.4	1.1	3.3	2.9	5.1	2.7	7.5
Prop In Lane	1.00		0.19	1.00		0.16	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	188	610	616	125	0	555	62	328	247	190	463	359
V/C Ratio(X)	0.79	0.42	0.43	0.78	0.00	0.86	0.54	0.35	0.30	0.79	0.22	0.56
Avail Cap(c_a), veh/h	260	662	669	292	0	704	170	609	459	260	703	545
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	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.4	15.1	15.1	27.7	0.0	19.6	28.8	21.9	21.7	26.4	18.0	19.8
Incr Delay (d2), s/veh	10.7	0.5	0.5	9.8	0.0	8.9	7.0	0.6	0.7	10.9	0.2	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	2.5	2.4	2.4	1.6	0.0	6.8	0.6	1.3	0.9	2.5	1.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	15.6	15.6	37.5	0.0	28.5	35.8	22.5	22.4	37.3	18.3	21.2
LnGrp LOS	D	B	B	D	A	C	D	C	C	D	B	C
Approach Vol, veh/h		672			576			223			454	
Approach Delay, s/veh		20.4			30.0			24.4			25.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	15.7	8.3	26.1	6.1	20.2	10.5	23.9
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	9.0	20.1	10.1	23.0	5.9	23.2	9.0	24.1
Max Q Clear Time (g_c+I1), s	7.1	5.3	5.3	8.9	3.1	9.5	7.0	17.4
Green Ext Time (p_c), s	0.1	0.7	0.1	2.5	0.0	1.0	0.1	1.6

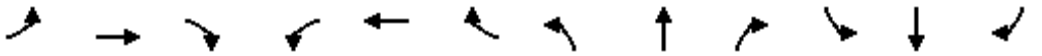
Intersection Summary	
HCM 6th Ctrl Delay	25.0
HCM 6th LOS	C



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	532	97	489	33	115	78	150	103	234
v/c Ratio	0.66	0.42	0.44	0.83	0.22	0.44	0.25	0.66	0.20	0.42
Control Delay	45.8	18.4	35.3	34.7	34.6	32.8	3.3	46.0	22.8	6.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.8	18.4	35.3	34.7	34.6	32.8	3.3	46.0	22.8	6.4
Queue Length 50th (ft)	62	87	39	179	14	46	0	62	31	0
Queue Length 95th (ft)	#149	143	85	#359	40	91	10	#150	78	53
Internal Link Dist (ft)		2552		2573		1348			1231	
Turn Bay Length (ft)	260		200		120			100		
Base Capacity (vph)	233	1265	262	644	153	549	518	233	634	642
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.42	0.37	0.76	0.22	0.21	0.15	0.64	0.16	0.36

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	341	169	154	335	291	157	539	52	277	495	187
Future Volume (veh/h)	180	341	169	154	335	291	157	539	52	277	495	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.94	1.00		0.95	1.00		0.96
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	196	371	167	167	364	261	171	586	52	301	538	189
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	217	377	305	178	639	268	200	589	52	309	769	625
Arrive On Green	0.12	0.20	0.20	0.10	0.18	0.18	0.11	0.36	0.36	0.18	0.42	0.42
Sat Flow, veh/h	1753	1841	1489	1753	3497	1467	1753	1658	147	1753	1841	1496
Grp Volume(v), veh/h	196	371	167	167	364	261	171	0	638	301	538	189
Grp Sat Flow(s),veh/h/ln	1753	1841	1489	1753	1749	1467	1753	0	1805	1753	1841	1496
Q Serve(g_s), s	12.1	22.1	11.1	10.4	10.4	19.4	10.5	0.0	38.8	18.8	26.5	9.3
Cycle Q Clear(g_c), s	12.1	22.1	11.1	10.4	10.4	19.4	10.5	0.0	38.8	18.8	26.5	9.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	217	377	305	178	639	268	200	0	641	309	769	625
V/C Ratio(X)	0.90	0.99	0.55	0.94	0.57	0.97	0.85	0.00	0.99	0.97	0.70	0.30
Avail Cap(c_a), veh/h	217	377	305	178	639	268	233	0	641	309	769	625
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	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	43.6	39.2	49.0	41.0	44.7	47.8	0.0	35.3	45.0	26.3	21.3
Incr Delay (d2), s/veh	36.2	42.3	2.1	49.0	1.2	47.4	22.9	0.0	34.1	43.9	2.8	0.3
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	7.4	14.2	4.1	6.9	4.5	10.4	5.8	0.0	22.2	11.7	11.6	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.8	85.9	41.3	98.0	42.2	92.1	70.8	0.0	69.4	88.9	29.2	21.6
LnGrp LOS	F	F	D	F	D	F	E	A	E	F	C	C
Approach Vol, veh/h		734			792			809			1028	
Approach Delay, s/veh		75.2			70.4			69.7			45.3	
Approach LOS		E			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.4	44.0	15.2	27.4	16.6	50.8	17.6	25.0
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	19.4	39.1	11.2	22.5	14.6	43.9	13.6	20.1
Max Q Clear Time (g_c+I1), s	20.8	40.8	12.4	24.1	12.5	28.5	14.1	21.4
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	3.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	63.6
HCM 6th LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	196	371	184	167	364	316	171	643	301	538	203
v/c Ratio	0.92	0.99	0.45	0.95	0.57	0.60	0.79	1.01	0.98	0.72	0.29
Control Delay	91.7	89.9	15.2	105.9	45.2	9.8	72.0	73.1	93.6	34.5	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.7	89.9	15.2	105.9	45.2	9.8	72.0	73.1	93.6	34.5	4.1
Queue Length 50th (ft)	139	263	27	119	124	0	118	~453	214	318	0
Queue Length 95th (ft)	#276	#457	93	#253	174	80	#221	#700	#390	452	45
Internal Link Dist (ft)		2573			1323			1461		1228	
Turn Bay Length (ft)	115		65	100		100	220		230		230
Base Capacity (vph)	214	373	411	176	634	524	230	639	306	743	710
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.99	0.45	0.95	0.57	0.60	0.74	1.01	0.98	0.72	0.29

Intersection Summary

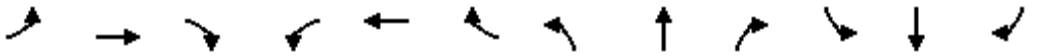
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX C

IMPROVED INTERSECTION ANALYSIS SHEETS

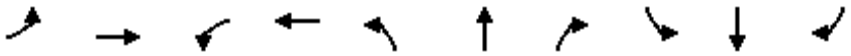
PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	348	28	35	502	142	120	87	143	258	75	321
Future Volume (veh/h)	177	348	28	35	502	142	120	87	143	258	75	321
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.91	1.00		0.95	1.00		0.96
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	192	378	26	38	546	128	130	95	138	280	82	294
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	238	1178	81	65	712	166	166	309	248	333	485	395
Arrive On Green	0.14	0.36	0.36	0.04	0.26	0.26	0.09	0.17	0.17	0.19	0.26	0.26
Sat Flow, veh/h	1753	3304	226	1753	2760	643	1753	1841	1474	1753	1841	1498
Grp Volume(v), veh/h	192	199	205	38	345	329	130	95	138	280	82	294
Grp Sat Flow(s),veh/h/ln	1753	1749	1781	1753	1749	1654	1753	1841	1474	1753	1841	1498
Q Serve(g_s), s	7.6	5.9	6.0	1.5	13.1	13.2	5.2	3.2	6.2	11.0	2.5	12.9
Cycle Q Clear(g_c), s	7.6	5.9	6.0	1.5	13.1	13.2	5.2	3.2	6.2	11.0	2.5	12.9
Prop In Lane	1.00		0.13	1.00		0.39	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	238	623	635	65	451	427	166	309	248	333	485	395
V/C Ratio(X)	0.81	0.32	0.32	0.59	0.76	0.77	0.78	0.31	0.56	0.84	0.17	0.75
Avail Cap(c_a), veh/h	440	959	977	166	686	649	318	542	434	612	850	692
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	16.7	16.8	34.0	24.6	24.6	31.7	26.1	27.3	28.0	20.3	24.2
Incr Delay (d2), s/veh	6.4	0.3	0.3	8.1	2.8	3.2	7.9	0.6	2.0	5.7	0.2	2.8
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	3.4	2.2	2.2	0.8	5.3	5.1	2.4	1.4	2.1	4.8	1.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.5	17.0	17.1	42.1	27.3	27.8	39.6	26.7	29.3	33.7	20.5	27.0
LnGrp LOS	D	B	B	D	C	C	D	C	C	C	C	C
Approach Vol, veh/h		596			712			363			656	
Approach Delay, s/veh		23.3			28.3			32.3			29.0	
Approach LOS		C			C			C			C	

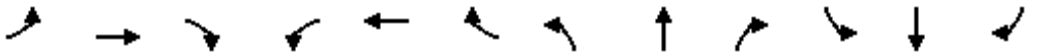
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.6	16.9	6.7	30.4	10.8	23.8	13.7	23.4
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	25.0	21.1	6.8	39.3	13.0	33.1	18.0	28.1
Max Q Clear Time (g_c+I1), s	13.0	8.2	3.5	8.0	7.2	14.9	9.6	15.2
Green Ext Time (p_c), s	0.6	0.7	0.0	2.3	0.1	1.4	0.3	3.3

Intersection Summary	
HCM 6th Ctrl Delay	27.9
HCM 6th LOS	C



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	192	408	38	700	130	95	155	280	82	349
v/c Ratio	0.65	0.28	0.28	0.77	0.58	0.44	0.47	0.72	0.21	0.60
Control Delay	47.4	18.7	49.1	35.1	49.7	45.7	9.4	44.3	31.4	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.4	18.7	49.1	35.1	49.7	45.7	9.4	44.3	31.4	8.2
Queue Length 50th (ft)	101	81	21	179	69	51	0	146	39	0
Queue Length 95th (ft)	195	135	58	284	146	109	42	260	82	72
Internal Link Dist (ft)		2552		2573		1348			1231	
Turn Bay Length (ft)	260		200		120			100		
Base Capacity (vph)	380	1634	143	1140	275	469	509	529	737	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.25	0.27	0.61	0.47	0.20	0.30	0.53	0.11	0.44

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	280	377	114	125	486	284	165	508	46	200	326	167
Future Volume (veh/h)	280	377	114	125	486	284	165	508	46	200	326	167
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.96	1.00		0.96
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811	1811
Adj Flow Rate, veh/h	304	410	110	136	528	262	179	552	45	217	354	167
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, %	6	6	6	6	6	6	6	6	6	6	6	6
Cap, veh/h	349	1115	486	171	759	330	219	701	57	258	829	356
Arrive On Green	0.20	0.32	0.32	0.10	0.22	0.22	0.13	0.22	0.22	0.15	0.24	0.24
Sat Flow, veh/h	1725	3441	1499	1725	3441	1496	1725	3210	261	1725	3441	1476
Grp Volume(v), veh/h	304	410	110	136	528	262	179	295	302	217	354	167
Grp Sat Flow(s),veh/h/ln	1725	1721	1499	1725	1721	1496	1725	1721	1751	1725	1721	1476
Q Serve(g_s), s	14.5	7.8	4.6	6.6	12.0	14.1	8.6	13.8	13.8	10.4	7.4	8.2
Cycle Q Clear(g_c), s	14.5	7.8	4.6	6.6	12.0	14.1	8.6	13.8	13.8	10.4	7.4	8.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	349	1115	486	171	759	330	219	376	382	258	829	356
V/C Ratio(X)	0.87	0.37	0.23	0.80	0.70	0.79	0.82	0.79	0.79	0.84	0.43	0.47
Avail Cap(c_a), veh/h	588	1416	617	367	975	424	440	568	579	426	1109	476
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	22.1	21.0	37.5	30.5	31.3	36.2	31.4	31.4	35.2	27.3	27.6
Incr Delay (d2), s/veh	7.5	0.2	0.2	8.2	1.5	7.8	7.4	4.2	4.2	7.7	0.3	1.0
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	6.4	3.0	1.5	3.0	4.9	5.5	3.9	5.8	6.0	4.7	2.9	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	22.3	21.2	45.7	32.0	39.1	43.6	35.5	35.6	42.9	27.7	28.6
LnGrp LOS	D	C	C	D	C	D	D	D	D	D	C	C
Approach Vol, veh/h		824			926			776			738	
Approach Delay, s/veh		28.8			36.0			37.4			32.4	
Approach LOS		C			D			D			C	

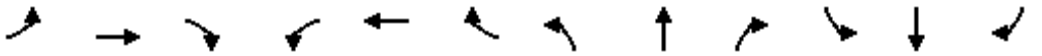
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.7	23.5	12.4	32.5	14.8	25.4	21.2	23.7
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	21.0	28.1	18.1	35.0	21.7	27.4	29.0	24.1
Max Q Clear Time (g_c+I1), s	12.4	15.8	8.6	9.8	10.6	10.2	16.5	16.1
Green Ext Time (p_c), s	0.4	2.7	0.2	3.0	0.3	2.5	0.7	2.7

Intersection Summary	
HCM 6th Ctrl Delay	33.7
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	304	410	124	136	528	309	179	602	217	354	182
v/c Ratio	0.80	0.40	0.25	0.62	0.75	0.66	0.68	0.79	0.76	0.43	0.38
Control Delay	56.9	32.1	12.4	59.0	48.6	21.7	57.9	47.4	61.4	37.5	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.9	32.1	12.4	59.0	48.6	21.7	57.9	47.4	61.4	37.5	8.1
Queue Length 50th (ft)	211	123	18	96	191	63	126	216	152	114	0
Queue Length 95th (ft)	#328	182	67	166	270	172	206	295	#268	173	60
Internal Link Dist (ft)		2573			1323			1461		1228	
Turn Bay Length (ft)	115		65	100		100	220		230		230
Base Capacity (vph)	487	1184	571	304	810	511	364	934	353	937	515
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.35	0.22	0.45	0.65	0.60	0.49	0.64	0.61	0.38	0.35

Intersection Summary

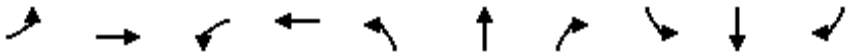
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	435	54	89	369	81	30	106	72	138	95	215
Future Volume (veh/h)	137	435	54	89	369	81	30	106	72	138	95	215
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.95	1.00		0.94	1.00		0.95
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	149	473	50	97	401	78	33	115	75	150	103	201
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	195	834	88	130	653	126	64	358	285	196	497	401
Arrive On Green	0.11	0.26	0.26	0.07	0.23	0.23	0.04	0.19	0.19	0.11	0.27	0.27
Sat Flow, veh/h	1753	3178	334	1753	2899	557	1753	1841	1462	1753	1841	1484
Grp Volume(v), veh/h	149	259	264	97	240	239	33	115	75	150	103	201
Grp Sat Flow(s),veh/h/ln	1753	1749	1763	1753	1749	1707	1753	1841	1462	1753	1841	1484
Q Serve(g_s), s	4.1	6.4	6.5	2.7	6.2	6.3	0.9	2.7	2.2	4.1	2.2	5.7
Cycle Q Clear(g_c), s	4.1	6.4	6.5	2.7	6.2	6.3	0.9	2.7	2.2	4.1	2.2	5.7
Prop In Lane	1.00		0.19	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	195	459	463	130	394	385	64	358	285	196	497	401
V/C Ratio(X)	0.76	0.56	0.57	0.75	0.61	0.62	0.51	0.32	0.26	0.76	0.21	0.50
Avail Cap(c_a), veh/h	562	879	887	386	704	688	211	741	589	562	1110	895
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	15.9	16.0	22.6	17.4	17.4	23.6	17.3	17.1	21.5	14.1	15.4
Incr Delay (d2), s/veh	6.1	1.1	1.1	8.2	1.5	1.6	6.2	0.5	0.5	6.0	0.2	1.0
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	1.8	2.2	2.3	1.3	2.2	2.2	0.4	1.0	0.7	1.8	0.8	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	17.0	17.1	30.9	18.9	19.1	29.7	17.8	17.5	27.6	14.3	16.4
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		672			576			223			454	
Approach Delay, s/veh		19.4			21.0			19.5			19.6	
Approach LOS		B			C			B			B	

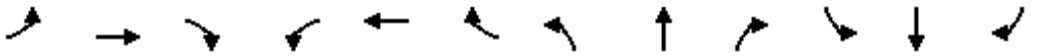
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	14.6	7.7	18.0	5.8	18.4	9.6	16.1
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	16.0	20.1	11.0	25.1	6.0	30.1	16.0	20.1
Max Q Clear Time (g_c+I1), s	6.1	4.7	4.7	8.5	2.9	7.7	6.1	8.3
Green Ext Time (p_c), s	0.2	0.7	0.1	2.7	0.0	1.2	0.2	2.1

Intersection Summary	
HCM 6th Ctrl Delay	19.9
HCM 6th LOS	B



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	149	532	97	489	33	115	78	150	103	234
v/c Ratio	0.44	0.54	0.36	0.55	0.17	0.37	0.18	0.44	0.18	0.38
Control Delay	31.9	22.7	33.6	24.7	35.5	31.8	0.9	31.9	20.2	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.9	22.7	33.6	24.7	35.5	31.8	0.9	31.9	20.2	5.6
Queue Length 50th (ft)	53	93	35	85	12	41	0	54	25	0
Queue Length 95th (ft)	127	168	96	165	45	104	0	129	80	51
Internal Link Dist (ft)		2552		2573		1348			1231	
Turn Bay Length (ft)	260		200		120			100		
Base Capacity (vph)	543	1675	373	1332	203	718	705	543	1008	911
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.32	0.26	0.37	0.16	0.16	0.11	0.28	0.10	0.26

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	341	169	154	335	291	157	539	52	277	495	187
Future Volume (veh/h)	180	341	169	154	335	291	157	539	52	277	495	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.96	1.00		0.97
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	196	371	167	167	364	261	171	586	52	301	538	189
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, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	239	797	346	207	734	317	212	759	67	350	1095	474
Arrive On Green	0.14	0.23	0.23	0.12	0.21	0.21	0.12	0.23	0.23	0.20	0.31	0.31
Sat Flow, veh/h	1753	3497	1520	1753	3497	1509	1753	3237	287	1753	3497	1515
Grp Volume(v), veh/h	196	371	167	167	364	261	171	316	322	301	538	189
Grp Sat Flow(s),veh/h/ln	1753	1749	1520	1753	1749	1509	1753	1749	1774	1753	1749	1515
Q Serve(g_s), s	8.8	7.4	7.7	7.5	7.4	13.4	7.7	13.7	13.7	13.4	10.1	7.9
Cycle Q Clear(g_c), s	8.8	7.4	7.7	7.5	7.4	13.4	7.7	13.7	13.7	13.4	10.1	7.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	239	797	346	207	734	317	212	410	416	350	1095	474
V/C Ratio(X)	0.82	0.47	0.48	0.81	0.50	0.82	0.81	0.77	0.77	0.86	0.49	0.40
Avail Cap(c_a), veh/h	455	946	411	416	868	375	452	672	681	649	1736	752
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	27.0	27.1	34.8	28.2	30.6	34.7	29.0	29.0	31.3	22.6	21.8
Incr Delay (d2), s/veh	6.9	0.4	1.0	7.2	0.5	12.1	7.1	3.1	3.1	6.2	0.3	0.5
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	4.0	3.0	2.7	3.5	3.0	5.6	3.5	5.7	5.8	5.9	3.9	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.9	27.4	28.2	42.0	28.7	42.6	41.7	32.1	32.1	37.5	22.9	22.4
LnGrp LOS	D	C	C	D	C	D	D	C	C	D	C	C
Approach Vol, veh/h		734			792			809			1028	
Approach Delay, s/veh		31.2			36.1			34.1			27.1	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.2	23.9	13.6	23.4	13.8	30.3	15.0	21.9
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	30.0	31.1	19.2	21.9	20.9	40.2	21.0	20.1
Max Q Clear Time (g_c+I1), s	15.4	15.7	9.5	9.7	9.7	12.1	10.8	15.4
Green Ext Time (p_c), s	0.7	3.2	0.3	2.3	0.3	4.3	0.4	1.4

Intersection Summary	
HCM 6th Ctrl Delay	31.8
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	196	371	184	167	364	316	171	643	301	538	203
v/c Ratio	0.68	0.59	0.49	0.64	0.63	0.64	0.64	0.75	0.76	0.48	0.33
Control Delay	54.4	43.1	19.6	54.6	45.8	13.1	53.5	41.4	50.9	29.4	5.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	43.1	19.6	54.6	45.8	13.1	53.5	41.4	50.9	29.4	5.5
Queue Length 50th (ft)	119	114	32	102	114	10	104	197	180	143	0
Queue Length 95th (ft)	225	192	110	197	192	103	198	305	314	224	52
Internal Link Dist (ft)		2573			1323			1461		1228	
Turn Bay Length (ft)	115		65	100		100	220		230		230
Base Capacity (vph)	392	819	451	358	751	555	390	1146	560	1502	758
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.45	0.41	0.47	0.48	0.57	0.44	0.56	0.54	0.36	0.27

Intersection Summary

APPENDIX D

VMT ANALYSIS

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION

CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: November 15, 2022

TO: Michael Pistoresi, DMP Development Corp.

FROM: Ambarish Mukherjee, P.E., AICP

SUBJECT: Carmel Homes II and Carmel Homes IV Residential Project Vehicle Miles Traveled (VMT) Analysis Memorandum

LSA has prepared a Vehicle Miles Traveled (VMT) Analysis Memorandum (Memo) for the proposed Carmel II and Carmel IV Homes Residential Development (project) in the City of Madera (City). Carmel II includes development of 110 single family residential units and Carmel IV proposes construction of 226 single family residential units. Both developments will be located on the southwest corner of Avenue 13 and Road 26 ½ in the City of Madera. Based on LSA's understanding, it is anticipated that one development application will be submitted to the City for the project. Hence both parcels are included in the VMT analysis using same model run, however, both parcels are modeled in separate traffic analysis zones (TAZs). Therefore, VMT metrics are estimated and presented separately for both parcels.

BACKGROUND

On December 28, 2018, the California Office of Administrative Law cleared the revised California Environmental Quality Act (CEQA) guidelines for use. Among the changes to the guidelines was removal of vehicle delay and level of service from consideration under CEQA. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled (VMT).

The project is located within the jurisdiction of City of Madera. The City has yet to adopt Senate Bill 743 (SB 743) guidelines, and therefore, the VMT analysis has been based upon the methodology and significant threshold criteria identified in the Governor's Office of Research and Planning (OPR) Technical Advisory (TA), dated December 2018.

The OPR TA includes multiple screening criteria for small land use projects to be screened out of a detailed VMT analysis. The project doesn't meet any of the screening criteria identified in the TA and so a detailed VMT analysis was conducted to evaluate the project VMT impact.

VMT Metrics and Thresholds

The project consists of residential land uses only and the TA recommends use of VMT per capita to evaluate residential land uses. Also, as per the OPR TA, a region should be defined based on where majority of the project trips are contained. As such, majority of the project trips are estimated to be start or end within the region defined for VMT analysis purposes. Typically, it is the city or county

boundary within which majority of those trips are contained. Given the project is located on the boundary of the City, it was determined that the county would be an appropriate definition for the region.

Based on OPR TA recommendations, the threshold for determining VMT impacts has been considered as 15 percent below the region's current baseline VMT per capita for residential projects. Therefore, the project would constitute a significant VMT impact if the project VMT per capita is greater than 85% of the regional/countywide VMT per capita.

The OPR TA recommends using regional travel demand model for detailed VMT analysis. The Madera County Transportation Commission (MCTC) travel demand model is the regional travel demand model. Most recent version of the travel model was requested from the county and was used to conduct the project VMT analysis.

Project Traffic Analysis Zone Update

To calculate the project VMT, the first step was to update the TAZs in the model that include the project area. The project should be isolated in the travel model to estimate project VMT. MCTC travel model includes ability to add new TAZs. Two new TAZs (one for Carmel II and one for Carmel IV) were used to model the project residential units. The project land uses were converted into model socioeconomic data and were included in the newly created zones for modeling purposes. No project specific network modifications were conducted. Model run was conducted for existing/base year scenario with updated model inputs. The outputs from this updated model run were utilized to estimate project specific VMT metrics.

VMT ANALYSIS

As mentioned above, the outputs from the updated model run were used to estimate project VMT per capita separately for the two parcels (Carmel II and Carmel IV). Table A shows the VMT analysis results using the county as the region. As shown in Table A, VMT per capita metric for both Carmel II and Carmel IV is 5.9% lower than the regional threshold. The regional/countywide average VMT per capita was obtained from "Chapter 17 – SB743 VMT Tool" section of the "Madera County Travel Demand Model – 2019 Model Update, September 23, 2020" (page 116 of the document).

Table A: Project and Threshold VMT per Capita

Parcel	Project VMT per Capita	Threshold VMT per capita *	Difference	Percentage Difference
Carmel II	8	8.5	-0.5	-5.9%
Carmel IV	8	8.5	-0.5	-5.9%

Source: Madera County Transportation Commission (MCTC) Travel Demand Model
** Threshold obtained from Madera County Travel Demand Model - 2019 Model Update, September 2020*

Conclusion

As mentioned before, the project consists of residential land uses only. The OPR TA recommends use of VMT per capita to evaluate residential projects. Also, based on OPR TA the project would constitute a significant VMT impact if the project VMT per capita is greater than 85% of the baseline regional VMT per capita. Madera County was considered as the region for evaluation of this project. As shown in Table A, the project VMT per capita is lower than the threshold and hence the project doesn't have a significant VMT impact.

Detailed VMT calculation for the project is included in Appendix A.

ATTACHMENT

Appendix A –VMT Calculation Worksheet

LSA

Appendix A - VMT Calculation Worksheet
Carmel II and Carmel IV Residential Project VMT Analysis

2018	Carmel II (project)	Madera County *
Households	110	
Population	361	158,328
Total Homebased (HB) VMT	2,901	1,586,940
HB VMT per capita	8.04	10.02

2018	Carmel IV (project)	Madera County *
Households	226	
Population	743	158,328
Total Homebased (HB) VMT	5,958	1,586,940
HB VMT per capita	8.02	10.02

** Obtained from Madera County Travel Demand Model - 2019 Model Update Document, September 2020*