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SEP 27 2024 TIME 12:40pm

FRESNO COUNTY CLERK

By Bryant DEPUTY

For County Clerk Stamp

CITY of CLOVIS

PLANNING & DEVELOPMENT

1033 FIFTH STREET • CLOVIS, CA 93612

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION
NOTICE OF PUBLIC HEARING
NOTICE OF PUBLIC REVIEW OF A PROPOSED MITIGATED NEGATIVE DECLARATION

Agency File No.: TM6452, PDP2023-001

Finding: The City of Clovis has determined that the project described below will not have a significant effect on the environment with implementation of mitigation measures and therefore the preparation of an Environmental Impact Report is not required.

Lead Agency: City of Clovis is the Lead Agency for this project.

Project Title: TM6452

Project Location: Northeast corner of N. Baron and Perrin Avenues

Project Description:

Consider items associated with approximately 18 acres of land located at the northeast corner of N. Baron and Perrin Avenues. Frances Ricchiuti and Patrick V. Ricchiuti, owners; Lennar Homes, applicant; Yamabe & Horn Engineering Inc., representative.

a) Consider Approval, Res. 24-__, TM6452, A resolution recommending the City Council approve of a vesting tentative tract map for a 153-lot single-family planned residential development on approximately 18 acres of land.

b) Consider Approval, Res. 24-__, PDP2023-001, A resolution recommending that the City Council approve a request to approve a planned development permit for a 153-lot single-family residential development.

Environmental Assessment: A mitigated negative declaration (MND) has been completed for the project, pursuant to Section 15070 of the California Environmental Quality Act. Recommendation of a proposed MND does not necessarily mean this project will be approved. The MND for this project is available for review at the City of Clovis, Planning and Development Services Department, 1033 Fifth Street, Clovis, CA 93612 Monday through Friday from 8:00 a.m. to 3:00 p.m., except major holidays. The comment period for the mitigated negative declaration shall commence on September 30, 2024 and shall end on October 24, 2024.

Justification for Mitigated Negative Declaration: The City of Clovis has completed the preparation of an Initial Study for the project described above. The Initial Study did not identify any potentially significant environmental effects that would result from the proposed activity. Accordingly, approval of a MND for the project is recommended. The City finds that the proposed activity can be adequately served by City public services. It will not have a negative aesthetic effect, will not affect any rare or

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endangered species of plant or animal or the habitat of such species, nor interfere with the movement of any resident or migratory fish or wildlife species.

It will not adversely affect water quality, contaminate public water supplies, or cause substantial flooding, erosion, or siltation. It will not have a significant effect on air quality, climate change, transportation or circulation systems, noise, light and glare, and land use. No significant cumulative impacts will occur from this project.

Public Hearing: The Planning Commission is scheduled to consider the project at their meeting on Thursday, October 24, 2024. The agenda and staff report(s) will be available on the City's website approximately 72 hours prior to the meeting time.

All interested parties are invited to comment in writing to the Planning Division no later than 4:00 p.m. on October 24, 2024 and/or to appear at the hearing described above to present testimony in regard to the above listed request.

If you challenge a project in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City at, or prior to, the public hearing.

For additional information, contact Liz Salazar, Assistant Planner at (559) 324-2305 or via email at lizs@clovisca.gov.

Lennar Homes

TM6452

Initial Study and Mitigated Negative Declaration

September 2024

PREPARED BY:

Liz Salazar
Assistant Planner
Planning & Development Services
(559) 324-2305
lizs@clovisca.gov

CITY of CLOVIS
PLANNING & DEVELOPMENT
1033 FIFTH STREET • CLOVIS, CA 93612

INITIAL STUDY

This Initial Study was prepared pursuant to the California Environmental Quality Act (CEQA) Public Resources Code Sections 21000 *et seq*., CEQA Guidelines Title 14, Section 15000 et seq. of the California Code of Regulations.

PROJECT TITLE:	Lennar Homes (TM6452)
LEAD AGENCY NAME AND ADDRESS:	City of Clovis Planning & Development Services 1033 Fifth Street Clovis, CA 93612
CONTACT PERSON AND PHONE NUMBER:	Liz Salazar, Assistant Planner (559) 324-2305 lizs@clovisca.gov
PROJECT LOCATION:	Northeast corner of N. Baron and Perrin Avenues County of Fresno, CA 93619 APN: 556-040-23S (portion)
PROJECT SPONSOR'S NAME AND ADDRESS:	Jeff Callaway, Project Manger Lennar Homes of California 8080 North Palm Ave., Suite 110 Clovis, CA 93711
LAND USE DESIGNATION:	See page 6 of this Initial Study
ZONING DESIGNATION:	See page 7 of this Initial Study
SURROUNDING CONDITIONS AND LAND USES:	See page 6 of this Initial Study
PROJECT DESCRIPTION:	See page 7 of this Initial Study
REQUIRED APPROVALS:	See page 8 of this Initial Study
HAVE CALIFORNIA NATIVE AMERICAN TRIBES REQUESTED CONSULTATION? IF SO, HAS CONSULTATION BEGUN?	No

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LIST OF FIGURES

LIST OF TABLES

A. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, as indicated by the checklist and corresponding discussion in this Initial Study.

☐ 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

Determination

On the basis of this initial evaluation:

☐ 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 proponents. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed Project MAY have a significant effect on the environmental, and an ENVIRONMENTAL IMPACT REPORT (EIR) will be prepared.

☐ I find that the proposed Project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environmental, 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 analyzed 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.

Prepared By:

Liz Salazar

Liz Salazar, Assistant Planner
City of Clovis Planning & Development Services

9/30/2024
Date

Approved By:

Renee Mathis 2024.09.30 13:36:28-07'00'

Renee Mathis, Director
City of Clovis Planning & Development Services

Date

B. PROJECT OVERVIEW

Lennar Homes proposes the construction of 153 single-family homes and associated site improvements (i.e., landscape, parking, sidewalks, and utilities infrastructure) on approximately 18 acres of vacant and undeveloped land on the northeast corner of N. Baron and Perrin Avenues in the County of Fresno, California, herein referred to throughout the document as “proposed Project” and/or “Project.”

C. PROJECT LOCATION

As shown in Figure 1 below, the Project is located northeast corner of N. Baron and Perrin Avenues and consists of approximately 18 acres of Assessor’s Parcel Number (APN) 556-040-23S. A remainder portion of approximately 3.54 acres of the subject parcel is planned for a City of Clovis public facility site and is not a part of the Project. The Project site is bound by a Fresno Metropolitan Flood Control Basin to the north, Sunnyside Avenue approximately 338 feet to the east, Perrin Avenue to the south, and N. Baron Avenue to the west.

D. EXISTING SETTING

This section describes the existing conditions, surrounding conditions, as well as the General Plan land use and zoning designations.

1. EXISTING CONDITIONS

As shown in Figure 2 below, the existing site is vacant and undeveloped, consisting of portions of clear areas and portions of vegetation, grasses, sunflower, jimson weed, and lupine. The site is generally flat and includes a graded dirt access road along the southern border. The existing site does not include any pedestrian or other vehicle circulation infrastructure.

2. SURROUNDING CONDITIONS

As referenced in Table 1 below, the Project site is partially surrounded by existing development consisting of single-family residential uses at varying densities to the south and east. To the west of the Project site, single-family homes are currently under entitlement processing, with these homes to the west, there will be residential uses surrounding the majority of the Project site.

Table 1: Surrounding Land Uses

	Land Use Designation*	Zoning**	Existing Land Use
North	Water	P-F	Vacant
East	Rural Residential	AL20	Rural Residential
South	Low Density Residential, Medium Density Residential, Public/Quasi Public Facilities	R-1 & P-F	Single-Family Residential (in construction) & PG&E Substation
West	Medium-High Density Residential	R-1-PRD	Vacant

Notes:
*Low Density Residential (2.1-4.0 Dwelling Units/Acre (DU/AC)), Medium Density Residential (4.1-7.0 DU/AC), Medium-High Density Residential (7.1-20 DU/AC)
**P-F (Public Facilities), AL20 (County of Fresno Zoning, Limited Agricultural), R-1 (Single-Family Residential), R-1-PRD (Single-Family Planned Residential Development)

3. LAND USE DESIGNATION

As shown on Figure 3, the Project site has two existing General Plan Land Use designations of Very Low Density Residential, which allows for a density range of 0.6 to 2.0 DU/AC and Medium Density Residential, which allows for a density range of 4.1 to 7.0 DU/AC. According to the 2014 Clovis General Plan, the Very Low Residential designation is intended for large lot single family residences and the Medium Density Residential designation is intended for detached and attached single family homes, patio homes, or zero lot lines.

4. ZONING DESIGNATION

The Project site is currently within the County of Fresno jurisdiction and zoned AE20 (Exclusive Agricultural). However, the Project site will be rezoned to the R-1-PRD (Single-Family Planned Residential Development) Zone District through a separate entitlement application (Rezone 2021-006). According to Section 9.10.010(B)(5) of the Clovis Municipal Code (CMC), the R-1-PRD Zone District identifies areas appropriate for single-family small lot uses, including attached and detached single-family structures on small lots.

E. PROJECT DESCRIPTION

This section describes the components of the proposed Project in more detail, including site preparation, proposed structures, and on- and off-site improvements.

1. PROJECT CONSTRUCTION

The Project is anticipated to begin construction April 2024, first occupancy June 2027, with full buildout by April 2029. This schedule is an estimation only and is contingent upon entitlements, and the market, among other factors.

2. SITE PREPARATION

Site preparation would include typical grading activities to ensure a level surface. Part of the preparation would include removal of vegetation, such as grasses, shrubs, and weeds. Other site preparation activities would include minor excavation for the installation of utility infrastructure, for coneyance of water, sewer, stormwater, and irrigation.

3. PROJECT COMPONENTS

This section describes the overall components of the Project, such as the proposed buildings, landscape, vehicle and pedestrian circulation, and utilities.

DEMOLITION

As described in existing conditions the site is vacant; therefore, no demolition is required.

SITE LAYOUT AND CIRCULATION

As shown in Figure 5, the Project proposes 153 individual single-family residential lots ranging in sizes from approximately 2,184 square-feet to 5,818 square-feet, with an average lot size of approximately 2,619 square-feet under Vesting Tentative Tract Map 6452 (TM6452). The Project also proposes an 8,990 square foot lot for a pocket park.

The Project includes a network of public and private streets throughout the neighborhood, which includes ingress/egress off of N. Baron Avenue to the west and Perrin Avenue to the South. There would be no direct access to Sunnyside Avenue further east. According to the Circulation Element of the 2014 Clovis General Plan,[1] the roadways bordering the Project along its western and southern frontages are designated as collectors.

Other features of the Project include pedestrian sidewalks that connect to the street network, as well as sidewalks along the frontage of the site along N. Baron and Perrin Avenues.

PLANNED RESIDENTIAL DEVELOPMENT

The Project site is included in a separate annexation (RO305) and prezoning (R2021-006) entitlement process for the change from the County of Fresno AE20 (Exclusive Agricultural) Zone District to the R-1-

1 2014 Clovis General Plan, Circulation Element, Figure C-1, Circulation Diagram.

PRD (Single-Family Planned Residential Development) Zone District. Chapter 9.66, Planned Development Permits, of the CMC provides a method whereby land may be designed and developed taking advantage of modern site planning techniques resulting in a more efficient use of land and better living environment than otherwise possible through strict application of the development standards. In general, this section of the CMC provides a mechanism to afford some relief to typical development standards, subject to an approved rezone to the R-1-PRD Zone District.

As part of the requirements for consideration of approval of a Planned Development Permit, the applicant has provided a draft of the proposed development standards, such as height limit, lot coverage, front, rear, and side setbacks that would apply to the proposed TM6452. These development standards are provided as Figure 6.

PARKING

The CMC requires that residential planned unit developments provide a minimum of two (2) covered spaces plus one (1) covered or uncovered guest space for each dwelling unit.[2] Each garage would be required to have an interior dimension of 20 feet by 20 feet. Each single-family home would have a two-car garage and the Project proposes sufficient guest parking, thus meeting the minimum parking requirement.

PROJECT DESIGN

Conceptual design of the units are shown in Figure 7; however, it is important to note that at this stage of the process, these designs are conceptual only. The overall footprint, height limit, and placement of the structures, described above, would generally remain the same, however, the color palette and design details are subject to change throughout the Residential Site Plan Review Process (RSPR), which typically occurs later on in the entitlement process.

LANDSCAPE

The Project would include landscape throughout the site. Landscaped areas would generally be located along the perimeter of the site where a variety of ornamental shrubs, plants, and trees would be planted, as well as landscape in areas in the perceived front yard area of each home. Landscape plans are typically provided at a later date at which time the proposed landscape would be reviewed for compliance with the City's water efficient landscape regulations and guidelines.

UTILITIES

Utilities for the site would consist of water, sewer, electric, cable, gas, and stormwater infrastructure. Trenching and digging activities would be required for the installation of necessary pipelines typical of residential development. All utility plans would be required to be reviewed and approved by the appropriate agency, and/or department to ensure that installation occurs to pertinent codes and regulations. Other infrastructure would include new fire hydrants as required by the City of Clovis Fire Department.

Utilities are provided by and managed from a combination of agencies, including Fresno Irrigation District (FID) which provides the City's water supply, Fresno Metropolitan Flood Control District (FMFCD) which has responsibility for storm water management, and the City's Public Utilities Department which provides for solid waste collection, and sewer collection services. Pacific Gas & Electric (PG&E) provides electricity and natural gas within the City of Clovis.

2 City of Clovis Municipal Code, Chapter, 9.32, Parking and Loading, Section 9.32.040, Number of Parking Spaces Requires, Table 3-12, Parking Requirements by Land Use.

F. REQUIRED PROJECT APPROVALS

The City of Clovis requires the following review, permits, and/or approvals for the proposed Project; however, other approvals not listed below may be required as identified throughout the entitlement process:

- Annexation (processed separately through RO305)
- Prezone (processed separately through R2021-006)
- Vesting Tentative Tract Map
- Planned Development Permit
- Residential Site Plan Review
- Grading Permit(s)
- Building Permit(s)

G. TECHNICAL STUDIES

The analysis of the Project throughout this Initial Study relied in part on the technical studies listed below prepared for the Project, as well as other sources, including, but not limited to, the 2014 Clovis General Plan EIR, departmental staff, California Department of Conservation, and the California Department of Toxic Control Substances.

- **Appendix A:** Air Quality and Greenhouse Gas Impact Assessment dated January 2024
- **Appendix B:** Biological Evaluation Report dated November 2023
- **Appendix C:** Cultural Resource Study dated November 2023
- **Appendix D:** Acoustical Analysis dated March 2024
- **Appendix E:** Transportation Impact Analysis dated February 2024

Figure 1: Project Location

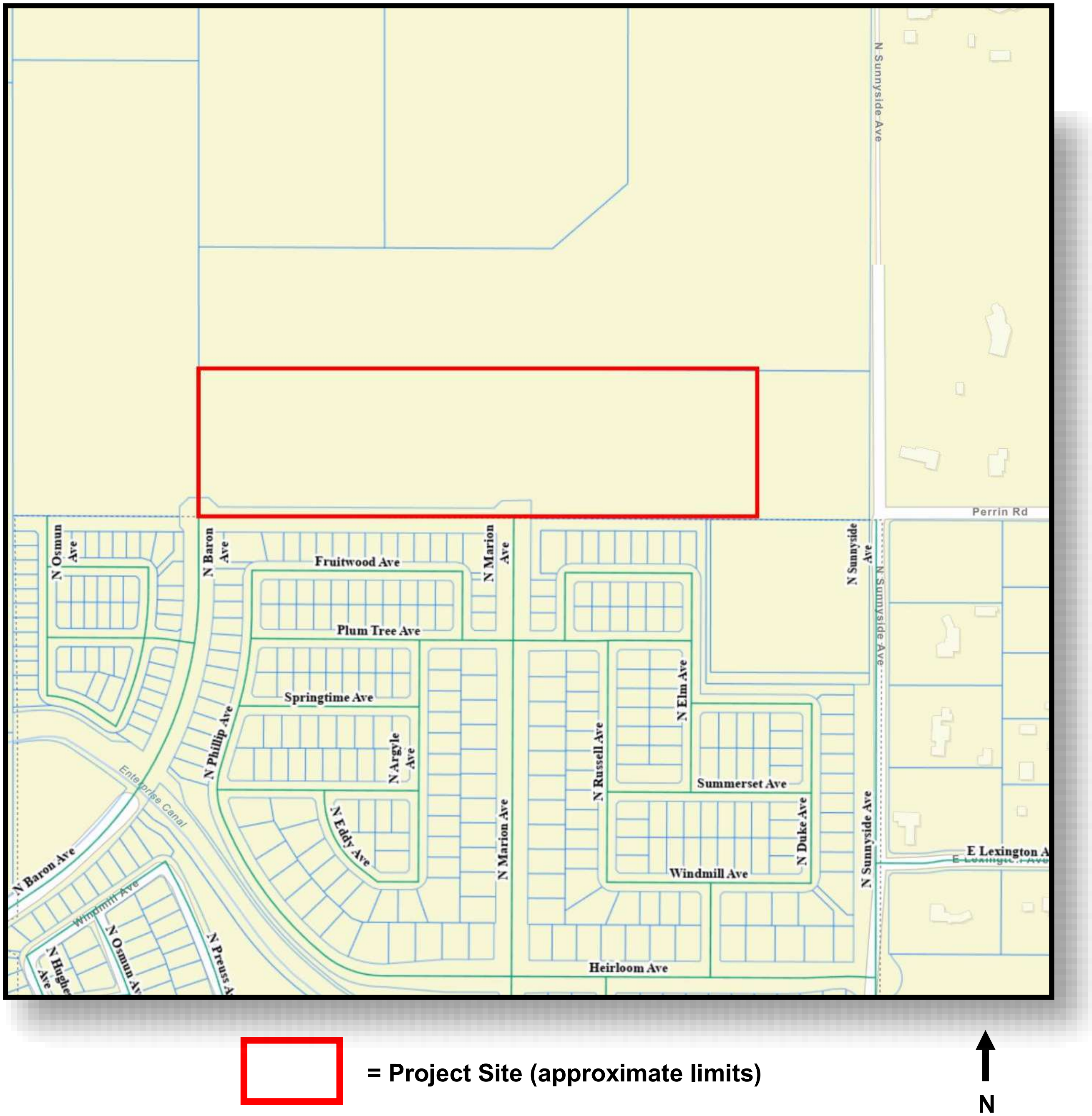
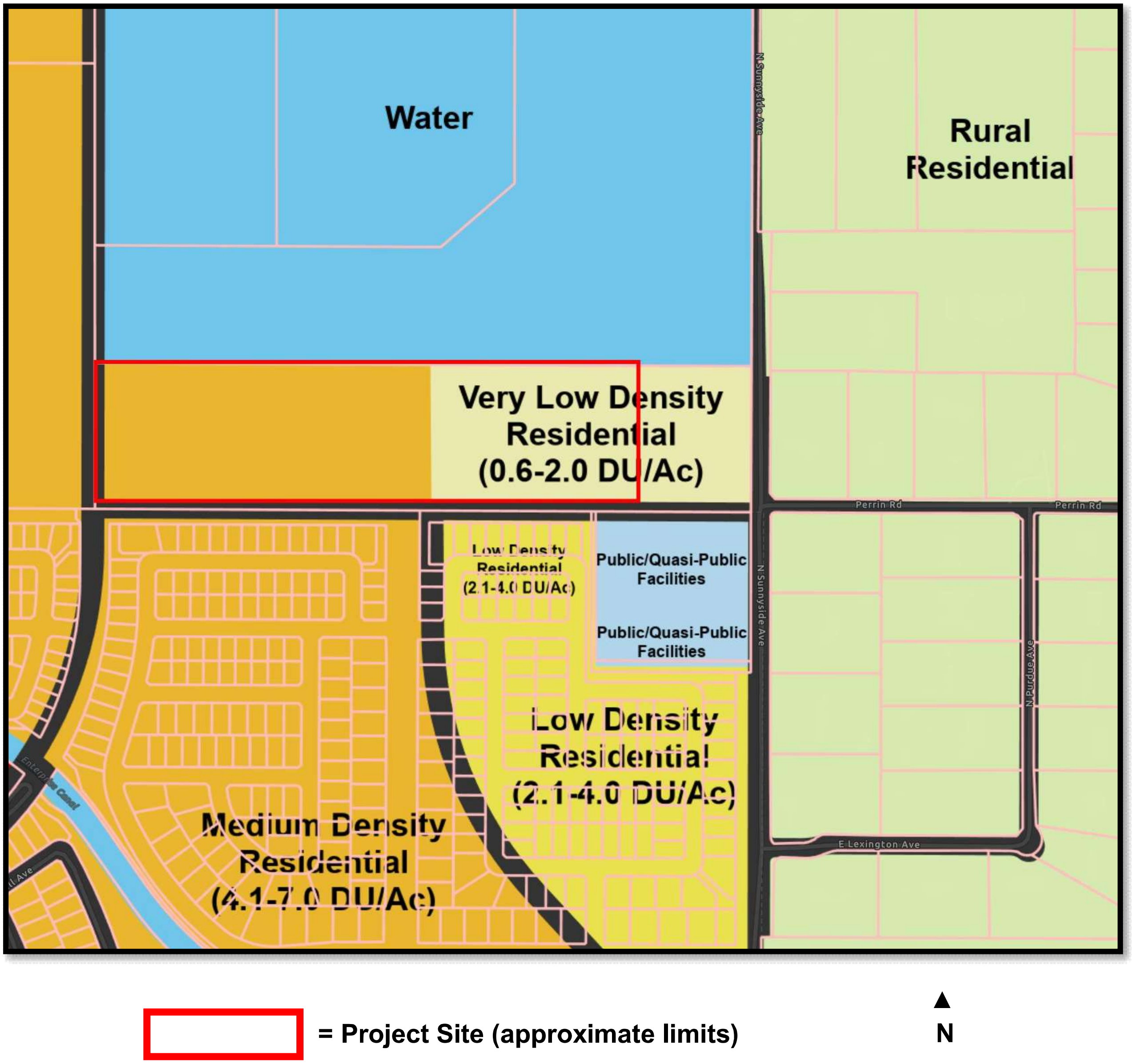


Figure 2: Aerial of Project Site

= Project Site (approximate limits)

N

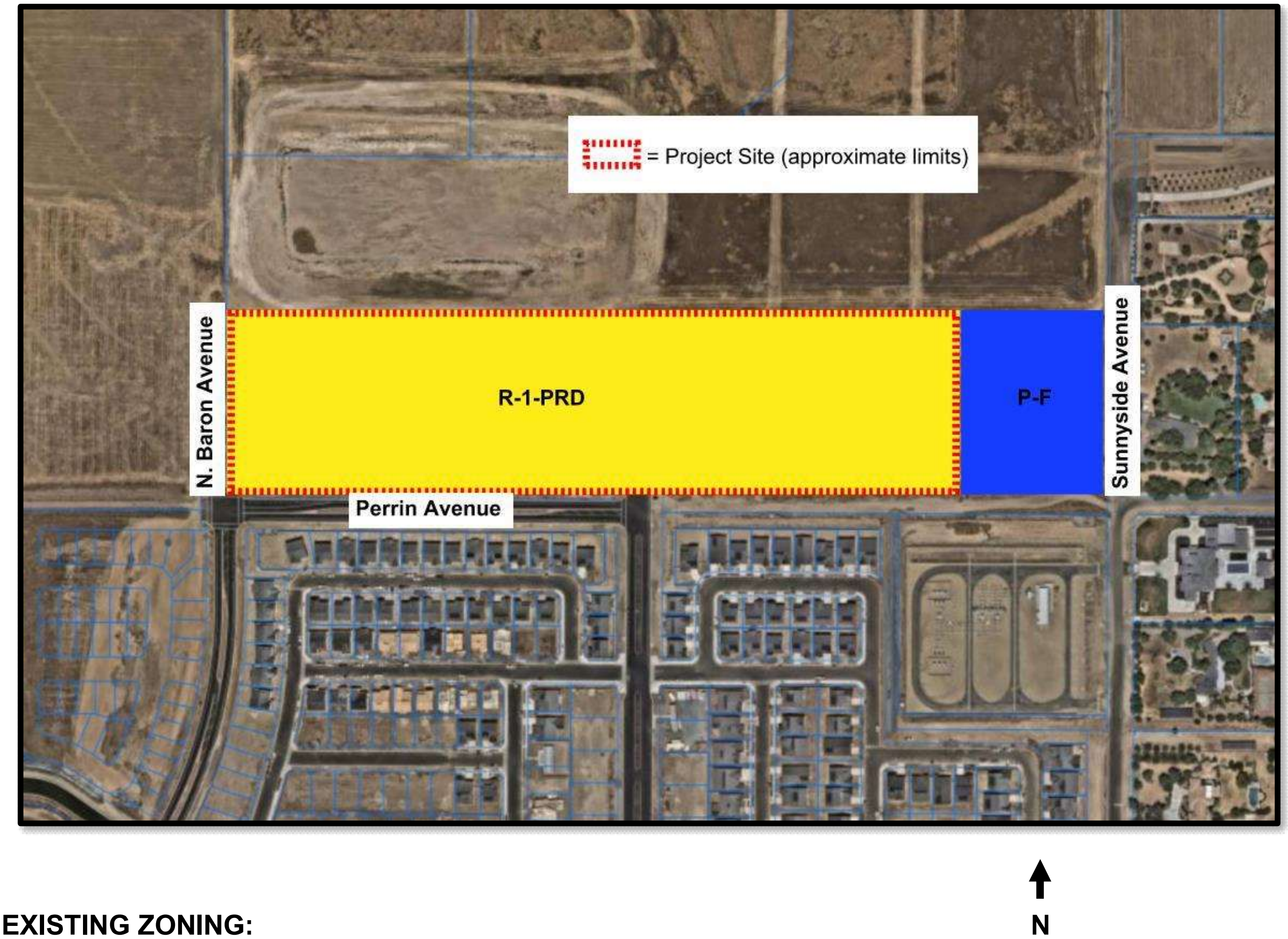
Figure 3: Land Use Designation



EXISTING DENSITY:
Medium Density and Very Low Density Residential

PROPOSED DENSITY:
No change

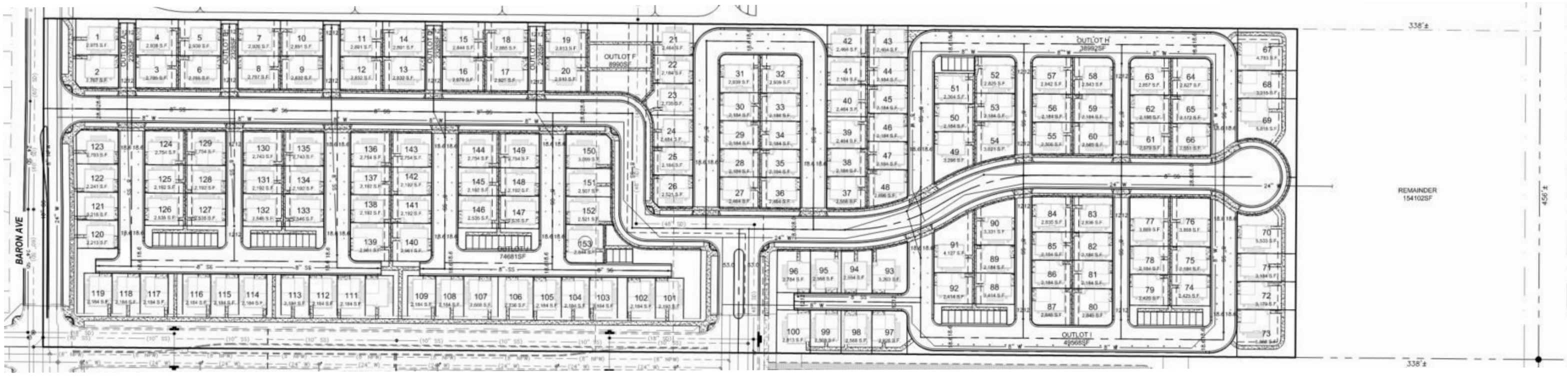
Figure 4: Zoning District



EXISTING ZONING:
AE20 – Exclusive Agricultural (Fresno County)

PROPOSED ZONING:
R-1-PRD (processed separately through R2021-006)

Figure 5: Proposed Site Plan



Approximate layout

Figure 6: Proposed Development Standards

TRACT 6452 Residential Land Use Development Standards		
Single Family Residential	Standard	Notes
Designation		
Zone District	R-1 PRD	
GP Density Range	Meduim Density and very low density (8.39 DU/AC)	
Dwelling Units	153	
BUILDING INTENSITY		
Minimum Lot Area	2184	
Minimum Lot Width	39	
Minimum Lot Depth	56	
Maximum Coverage	62%	
Maximum Height	26' 7"	
Curved Cul-de-Sac or Corner Lot	N/A	
Permitted Density		
Residential Density	1 Dwelling	
Set Backs (Minimum)		
Front:	10' from property line	
Side:	0 ft. Non Patio/7 ft. Patio	
Rear:	4 ft. min from property line	
Coverage (maximum)		
Site Coverage	None	
Garages/Street/Parking		
Garages/Street/Parking	2-car	20x20 min
Street (Interior)	24 ft. min	curb-to curb
Parking	174 uncovered spaces	
Accessory Uses		
Walls/Fences	4' min.-8'	
Trellises	12' High max.	
Pools and Spas	3' min	
Equiptment	N/A	
Covered Structures	12' High max.	
Accessory Buildings		
Building Exterior	Architectural treatment applied to all elevations of a building. At minimum, all doors, windows and other wall openings shall be trimmed consistant with architectural style.	

Proposed development standards only. Actual standards may change during the Planned Development Permit and Residential Site Plan Review process.

Figure 7: Conceptual Elevations

H. ENVIRONMENTAL CHECKLIST

This section provides an evaluation of the potential environmental impacts of the proposed project and are based on CEQA Guidelines Appendix G. For each issue area, one of four conclusions is made:

- **No Impact**: No project-related impact to the environment would occur with project development.
- **Less Than Significant Impact:** The proposed project would not result in a substantial and adverse change in the environment. This impact level does not require mitigation measures.
- **Less Than Significant with Mitigation Incorporated**: The proposed project would result in an environmental impact or effect that is potentially significant, but the incorporation of mitigation measure(s) would reduce the project-related impact to a less than significant level.
- **Potentially Significant Impact**: The proposed project would result in an environmental impact or effect that is potentially significant, and no mitigation can be identified that would reduce the impact to a less than significant level.

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 effect on a scenic vista?				X
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c. 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?			X	
d. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?			X	

ENVIRONMENTAL SETTING

The City of Clovis is located within the San Joaquin Valley. Thus, much of the City and its surrounding areas are predominately flat. As a result, on clear days, the Sierra Nevada Mountains are visible to the east depending on your location. Aside from Sierra Nevada, there are no officially designated focal points or viewsheds within the City. Policy 2.3, Visual Resources, of the Open Space Element of the 2014 Clovis General Plan, requires maintaining public views of open spaces, parks, and natural features and to preserve Clovis' viewshed of the surrounding foothills.

As mentioned above in the Project Description, the site is located on the northeast corner of N. Baron and Perrin Avenues. In general, the Project site is located in the fringes of Clovis and is situated adjacent to a mix of neighboring agricultural lands, rural residential, and low to medium density residential housing.

DISCUSSION

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

No Impact. As mentioned above, there are no officially designated scenic vistas or focal points in the City of Clovis. While the Sierra Nevada Mountains can be viewed on clear days, the Project would allow structures to be constructed at a maximum height of 26 feet 7 inches. The Project site is not within the immediate vicinity of open space, parks, or other natural features. Therefore, because the Project would be constructed at a reduced maximum height in comparison to the standard single family residential zone districts and because there are no officially designated scenic vistas in the area, **no impact** would occur with regards to the project having a substantial effect on a scenic vista. As a result, no mitigation measures are required.

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. As stated in the 2014 Clovis General Plan Environmental Impact Report (EIR), there are no Caltrans-designated scenic highways within the City of Clovis.[3] Further, there are no existing historical structures or rock outcroppings located on or within the immediate vicinity of the site; therefore, the Project would result in **no impact** with regards to substantially damaging scenic resources within a State scenic highway, and no mitigation measures are required.

c) *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?*

Less-Than-Significant Impact. As mentioned previously, the existing site is currently surrounded by residential uses of varying densities including medium, low, and rural. Thus, as a proposed blend of medium and very low-density residential project, the homes would fit within the character of the surrounding area.

Policy 3.6 of the Land Use Element of the Clovis General Plan encourages a mix of housing types, unit sizes, and densities. The Project being of a similar scale as surrounding development to the south and west (in entitlement processing) and as a blended density, would serve as a transition from the rural residential neighborhood to the east, which would comply with Policy 3.6 by resulting in a housing product that adds to the variety of housing stock within the City.

Further, the Project would undergo the RSPR process which would ensure that the overall design and character is consistent and/or complements the surrounding areas. The RSPR process will ensure the Project complies with relevant design policies, such as in the Heritage Grove Master Plan, the CMC, and the General Plan. During the review, the height, color and materials are reviewed for consistency with these plans and guidelines. Consequently, a **less-than-significant** impact would occur with regards to substantially degrading the existing visual character of the site and its surroundings, and no mitigation measures are required.

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

Less-Than-Significant Impact. The Project consists of 153 single-family homes. As a result of the existing site being vacant and undeveloped, the Project would result in new sources of light and glare. Light and glare from the Project would be typical of residential development, including but not limited to, sources such as exterior lighting for safety, light and glare from vehicles or from light reflecting off of surfaces such as windshields. Other sources of light would be the interior lighting of the units at night. These sources of light and glare are not

3 2014 Clovis General Plan EIR, June 2014, Page 5.1-1.

typically associated with causing significant effects on the environment, especially given that the surrounding developed area already emits similar sources of light and glare and are part of the existing conditions present in the vicinity. Further, the site will be surrounded by residential uses soon to be occupied to the south resulting in similar sources and intensities of light and glare. The development to the south that is under construction will contribute to the urbanization of the area, therefore, lighting and glare will be emitted in the vicinity. Sources of future light and glare are comprised of streetlights, and light and glare from vehicles going to and from home.

Although the Project would introduce new sources of light and glare, the RSPR process would ensure that the design and placement of lighting is appropriate to minimize potential light and glare impacts to surrounding properties. Further, the Project would be required to comply with Section 9.22.050, Exterior Light and Glare, of the CMC, which requires light sources to be shielded and that lighting does not spillover to adjacent properties.

Overall, through the City's design review process and compliance with Section 9.22.050 of the CMC, the Project would result in a **less-than-significant impact** with regard to lighting adversely affecting day or nighttime views in the area. No mitigation measures are required.

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.				X
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220 (g)) or timberland (as defined in Public Resources Code section 4526)?				X
d. Result in the loss of forest land or conversion of forest land to non-forest use?				X
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?				X

ENVIRONMENTAL SETTING

The Project site is located on northeast corner of N. Baron and Perrin Avenues. The site is within the fringe of the City and is surrounded by existing residential at varying densities to the south and east with future residential to the west.

DISCUSSION

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. According to the California Important Farmland finder interactive map from the California Department of Conservation,[4] the Project site is considered Farmland of Local Importance (2020 data), which is defined by the Department of Conservation as farmable lands within Fresno County that do meet the definitions of Prime, Statewide, or Unique farmlands. Generally, Farmland of Local Importance is or has been used for irrigated pasture, dryland farming, livestock, dairy, and grazing land.

The Project site does not appear to have previously been cultivated, other than possible dry farming, nor is it zoned or designated for farming-related activities under the 2014 Clovis General Plan. Although the Project site is considered Farmland of Local Importance it is not considered Prime, Unique, or Farmland of Statewide Importance; therefore, **no impact** would occur, and no mitigation measures are required.

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

No Impact. As shown on Figure 5.2-2 of the Agricultural Resources Chapter of the 2014 Clovis General Plan EIR, the Project site is not under a Williamson Act Contract. Further, as mentioned above, the site is not currently zoned or designated for agricultural use. As a result, the Project would have **no impact** with regards to conflicting with zoning for agricultural use or a Williamson Act Contract. No mitigation measures are required.

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

No Impact. The Project site is vacant and undeveloped, thus, does not contain forest land. Further, the site is not zoned for forestry or other forestry related uses. As a result, **no impact** would occur with regards to conflicts with zoning for, or cause rezoning of, forest land. No mitigation measures are required.

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

No Impact. See discussion under Section 2c.

e) *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. Although the Project site is considered Farmland of Local Importance according to the Department of Conservation, the site is not zoned for or designated for agricultural uses. Further, the existing site hasn't been used for agricultural-related uses in recent years. The 2014 Clovis General Plan designates the site for residential uses. Additionally, see discussion under Section 2.C related to forest land. Overall, the project would have a **no impact** with regards to this topic and no mitigation measure are required.

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4 Farmland Mapping, California Department of Conservation, Interactive mapping tool (https://maps.conservation.ca.gov/DLRP/CIFF/).

3. AIR QUALITY

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?			X	
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?			X	
c. Expose sensitive receptors to substantial pollutant concentrations?			X	
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			X	

ENVIRONMENTAL SETTING

An Air Quality and Greenhouse Gas Impact Assessment (AQ/GHG Report) was prepared by VRPA Technologies, Inc. in January 2024 (see Appendix A). Information in this AQ/GHG Report is used for the analysis included in both the Air Quality and Greenhouse Gas Emissions section of this Initial Study.

San Joaquin Valley Air Basin

The City of Clovis (City) is in the central portion of the San Joaquin Valley Air Basin (SJVAB). SJVAB consists of eight counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. Air pollution from significant activities in the SJVAB includes a variety of industrial-based sources as well as on- and off-road mobile sources. These sources, coupled with geographical and meteorological conditions unique to the area, stimulate the formation of unhealthy air.

The SJVAB is approximately 24,840 square miles and is the second largest air basin in California. It is bordered by the Sierra Nevada to the east, the Coast Ranges to the west, and the Tehachapi mountains to the south. The SJVAB is open to the north extending to the Sacramento Valley Air Basin.

Topography[5]

The topography of a region is important for air quality because mountains can block airflow that would help disperse pollutants and can channel air from upwind areas that transports pollutants to downwind areas. Wind patterns within the SJVAB generally flow into the basin from the San Joaquin River Delta. The mountain ranges from the west hinder wind access into the SJVAB while the Sierra Nevada Mountain Range provides a barrier to the east. As mentioned above, these topographic features result in weak airflow that becomes restricted vertically by high barometric pressure over the SJVAB.

5 Air Quality and Greenhouse Gas Analysis Report, VRPA Technologies, Inc, page 18-20, January 2024.

Climate [6]

The SJVAB is in a Mediterranean climate zone. Mediterranean climates are characterized by hot, dry summers with sparse rainfall, which occurs mainly in winter. Summertime maximum temperatures often exceed 100°F while winter low temperatures range between 40-50 degrees and is not uncommon to drop below freezing.

In addition to the topographic conditions, the climate can contribute to air quality problems. Temperature inversions can trap air within the SJVAB, thereby preventing the vertical dispersal of air pollutants.

Any emissions of pollutants can be trapped below the inversion.

Ozone often afflicts aeras downwind of the original source and can be easily transported by winds. Peak ozone tends to be higher in the southern portion of the SJVAB. Other primary pollutants such as carbon monoxide may form in high concentrations when wind speed is low, during winder cooler temperatures and calm conditions increase the likelihood of carbon monoxide concentrations.

Ambient Air Quality Standards

The Clean Air Act (CAA) was passed in 1963 by the US Congress and has been amended several times. The 1970 Clean Air Act amendments strengthened previous legislation and laid the foundation for the regulatory scheme of the 1970s and 1980s. In 1977, Congress again added several provisions, including nonattainment requirements for areas not meeting National AAQS and the Prevention of Significant Deterioration program. The 1990 amendments represent the latest in a series of federal efforts to regulate the protection of air quality in the United States. The CAA allows states to adopt more stringent standards or to include other pollution species. The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the state to achieve and maintain the California AAQS by the earliest practical date. The California AAQS tend to be more restrictive than the National AAQS, based on even greater health and welfare concerns.

These National and California AAQS are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect “sensitive receptors,” those most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

Both California and the federal government have established health-based AAQS for seven air pollutants. As shown in Table 4, Ambient Air Quality Standards for Criteria Pollutants, these pollutants are ozone (O3), nitrogen dioxide (NO2), carbon monoxide (CO), sulfur dioxide (SO2), coarse inhalable particulate matter (PM10), fine inhalable particulate matter (PM2.5), and lead (Pb). In addition, the state has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

In addition to the criteria pollutants, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TACs are regulated on the basis of risk rather than specification of safe levels of contamination.

Table 2: Ambient Air Quality Standards

6 Air Quality and Greenhouse Gas Analysis Report, VRPA Technologies, Inc, page 14,22, January 2024.

Pollutant	Averaging Time	State Standard	Federal Primary Standard
Ozone	1-Hour 8-Hour	0.09 ppm 0.07 ppm	-- 0.07 ppm
Carbon Monoxide	1-Hour 8-Hour	20 ppm 9 ppm	35 ppm 9 ppm
Nitrogen Dioxide	1-Hour Annual	0.18 ppm 0.030 ppm	100 ppb 0.053 ppm
Sulfur Dioxide	1-Hour 3-Hour 24-Hour Annual	0.25 ppm -- 0.04 ppm --	75 ppb -- 0.14 ppm 0.030 ppm
PM_{10}	24-Hour Annual	50 ug/m^3 20 ug/m^3	150 ug/m^3 --
$PM_{2.5}$	24-Hour Annual	-- 12 ug/m^3	35 ug/m^3 12 ug/m^3
Lead	30-Day Avg. Calendar Quarter 3-Month Avg.	1.5 ug/m^3 -- --	-- 1.5 ug/m^3 0.15 ug/m^3
Sulfates	24 Hour	25 ug/m^3	--
Hydrogen Sulfide	1 Hour	0.03 ppm	--
Vinyl Chloride	24 Hour	0.01 ppm	--
Notes: ppm = parts per million; ppb = parts per billion; ug/m3 = micrograms per cubic meter. Source: Air Quality and Greenhouse Gas Analysis Report, VRPA Technologies, Inc, page 9, January 2024.			

Attainment Status[7]

The San Joaquin Valley Air Pollution Control District (SJVAPCD) is the responsible agency for monitoring and regulating air pollutant emissions from stationary, area, and indirect sources within Fresno County and throughout SJVAB. The SJVAPCD prepares plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, issuance of permits for stationary sources of air pollution, inspection of stationary sources of air pollution and response to citizen complaints, monitoring of ambient air quality and meteorological conditions, and implementation of programs and regulations required by FCAA and CCAA. The SJVAPCD adopted the San Joaquin Valley Air Quality Attainment Plan (AQAP), in response to the requirements of the State CCAA.

The SJVAPCD and the California Air Resources Board (CARB) maintain numerous air quality monitoring sites throughout each County to measure ozone, PM2.5, and PM10. The SJVAB is nonattainment for ozone (1 hour and 8 hour) and PM. The EPA uses standard classifications to reflect the severity of the nonattainment problem; classifications range from marginal nonattainment to extreme nonattainment. The SJVAB was classified as extreme nonattainment for ozone by the EPA (2004). The federal 1 hour ozone standard was revoked on June 6, 2005.

DISCUSSION

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

7 Air Quality and Greenhouse Gas Analysis Report, VRPA Technologies, Inc, page 14,22, January 2024.

Less-Than-Significant Impact. In general, regional air quality impacts and attainment of standards are the result of the cumulative impacts of all emission sources within the air basin. Thus, individual projects are generally not large enough to contribute measurably to an existing violation or air quality standards alone. Although the CEQA Guidelines indicate that a significant impact would occur if the Project were to conflict with or obstruct implementation of the applicable air quality plan, the SJVAPCDs 2015 Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI) does not provide specific guidance on analyzing conformity with the plan. Thus, for purposes of analyzing this potential impact, the AQ/GHG Report considered impacts based on: (1) Conflict with or obstruct implementation of the applicable air quality plan; (2) Result in a cumulatively considerable net increase if any criteria pollutant for which the project region nonattainment under an applicable federal or state ambient air quality standard: (3) Expose sensitive receptors to substantial pollutant concentrations; and (4) Result in other emissions such as those lead to odors adversely affecting a substantial number of people.[8]

The primary way of determining consistency with the air quality plan's assumptions is determining consistency with the General Plan to ensure that the Project's density and land use are consistent with the growth assumption used in the air quality plan. The Project is consistent with the currently adopted 2014 General Plan; therefore, is consistent with the growth assumptions under the applicable air quality plan and per the AQ/GHG Report, the Project will not conflict with or obstruct implementation of any air quality plans.

Lastly, the SJVAPCD provided a comment letter, dated March 15, 2024 indicating that the Project would not exceed thresholds for criteria pollutants. However, the Project would be subject to compliance with District Rule 9510 which is intended to mitigate a project's impact through project design elements or payment of off-site fees. The Project applicant would be required to submit to the SJVAPCD an Air Impact Assessment (AIA). Further, the Project would be required to submit a Dust Control Plan (DCP) to the SJVAPCD for review and approval. Consequently, a **less-than-significant** impact would occur and no mitigation measures are required.

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. See discussion under Section 3a above.

Additionally, results of the analysis show that emissions generated from construction and operation of the Project will be less than the applicable SJVAPCD emission thresholds for criteria pollutants; therefore, no mitigation measures are required.

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

Less-Than-Significant Impact. Sensitive receptors are generally considered to include children, the elderly, and persons with pre-existing respiratory and cardiovascular illness. The SJVAPCD considers a sensitive receptor a location that houses or attracts children, the elderly, or people with illnesses. Examples of these receptors are considered to be hospitals, residences, schools and school facilities, daycare facilities, and convalescent facilities. The nearest sensitive receptors to the Project site would be the residences adjacent to the site to the south (in construction) and east (existing). Based the AQ/GHG Report, an evaluation of nearby land uses considering CARB's Pollution Mapping Tool shows that the Project will not place sensitive receptors in the vicinity of exiting toxic sources and is located 2.5 miles from the State Route 168 freeway[9]; therefore, a **less-than-significant** impact would occur with no mitigation measures.

8 Air Quality and Greenhouse Gas Analysis Report, VRPA Technologies, Inc, page 52-53, January 2024.

9 Biological Evaluation Report for Tract 6263 prepared by Live Oak Associates, Inc., pages 8 to 21, May 2019.

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. Generally, sources considered to emit odors are associated with wastewater treatment facilities, sanitary landfills, petroleum refineries, chemical manufacturing, and other industrial/manufacturing related uses. The Project is a residential use, thus, the odors associated with such use would be similar to that of the surrounding area which include residential uses. Overall, because the Project is a residential use, similar to existing residential uses, the types of odor that could result from the Project would not be considered an objectionable odor source. Thus, a **less-than-significant** impact would occur with no mitigation measures.

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?		X		
b. 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 the California Department of Fish and Game or US Fish and Wildlife Service?			X	
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?				X
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?				X
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
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?				X

ENVIRONMENTAL SETTING

A Biological Evaluation Report (Biological Report) was prepared by Live Oak Associates, Inc. (LOA) in November 2023 (see Appendix B). This Biological Report included an investigation of the biotic resources of the Project area and assessed potential project-related impacts pursuant to CEQA. As part of the Biological Report, the Project area was surveyed in September 2023 for habitat, plants, and animals.

The existing Project site is vacant and undeveloped with dirt roads containing several cleared and graded areas. The Project site supported grasses and forbs typical of annual grasslands, best characterized as ruderal grassland habitat.

The following analysis is based on information provided by the Biological Report prepared by LOA.

DISCUSSION

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 With Mitigation. As described in the Biological Report, a reconnaissance-level field survey of the Project area was conducted on September 25, 2023 by LOA. The survey consisted of driving and walking throughout the site to identify habitats, plant, and animal species. During the field survey, the site was identified as ruderal grasslands; although presence of disturbance including disking and mowing, road construction, and localized grading was present.

As part of the Biological Report, a search of the California Natural Diversity Database (CNDDB) was conducted to determine the possible presence of special-status species in the vicinity of the Project. According to the search and field survey the Project site has the potential to be used by various wildlife including special status tricolored blackbird Swainson's hawk (CA threated species), golden eagle, pallid bat, spotted bot, and western mastiff bat.[10] While none of these species have the potential to nest or roost on the Project site, the Swainson's hawk could potentially nest close enough to the site that individuals could be disturbed by construction activities.

There are no known Habitat Conservation Plans or Natural Community Conservation Plans in the area; however, Swainson's hawk, has occasionally been sighted in the Project vicinity and there is some chance for individuals of the species to forage on the site from time to time. Possible Swainson's hawk nesting habitat is absent from the Project site but may be found on nearby rural residential along the Enterprise Canal. Nevertheless, implementation of mitigation measures BIO-1 would ensure that a **less-than-significant impact with mitigation** occurs.

> <u>Mitigation Measure BIO-1:</u> **Swainson's hawk.** If possible, construction activities should occur outside of the avian nesting season, typically defined as February 1 – August 31. If that is not feasible, pre-construction surveys shall occur if construction must occur between February 1 – August 31. A qualified biologist shall conduct surveys for active bird nests within seven (7) days prior to the start of work during this period. The survey area shall encompass the Project site and accessible surrounding lands within ¼ mile for nesting Swainson's hawk, 500 feet for other nesting raptors, and 250 feet for nesting birds. Should any active nests be discovered in or near proposed construction zones, the biologist will identify

10 Biological Evaluation Report for Lennar Homes Tract 6452 prepared by Live Oak Associates, Inc., pages 10 to 16, September 2023.

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 are capable of foraging independently.

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, or regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?*

Less-Than-Significant Impact. As mentioned previously, the Project site is characterized as vacant and undeveloped with ruderal grassland as the only habitat with the Project site. According to the Biological Report, 19 special status plants documented in the general vicinity of the project site; however, all 19 species are considered absent from or unlikely to occur on the project site due to an absence of suitable habitat and or soils.[11] Therefore, the impact would be **less-than-significant**. No mitigation measures are required.

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

No Impact. Aquatic features, including any potentially jurisdictional waters or wetlands, are absent from the Project Site. [12]

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?*

No Impact. Wildlife corridors are typically considered to be valleys, ridgelines, and rivers and creeks supporting riparian vegetation. According to the Biological Report, the Project site does not contain or adjoin any features likely to function as wildlife movement corridors.[13] Thus, **no impact** would occur and no mitigation measures are required.

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

No Impact. The Project site does not indicate the presence of any sensitive habitat or wildlife features that would be impacted and will be consistent with the CMC and 2014 General Plan polices. Although Policy 2.6 of the Open Space and Conservation Element of the General Plan calls for the protection of biological resources, the Biological Evaluation did not identify any such resources at the site due to its location. Further, trees and shrubs are absent from the Project site; therefore, **no impact** would occur and no mitigation measures are required.

f) *Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*

11 Biological Evaluation Report for Lennar Homes Tract 6452 prepared by Live Oak Associates, Inc., page 27, September 2023.

12 Biological Evaluation Report for Lennar Homes Tract 6452 prepared by Live Oak Associates, Inc., page 16, September 2023.

13 Biological Evaluation Report for Lennar Homes Tract 6452 prepared by Live Oak Associates, Inc., page 17, September 2023.

No Impact. There are no known Habitat Conservation Plans or Natural Community Conservation Plans for the Project vicinity[14]; thus, **no impact** would occur and no mitigation measures are required.

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 §15064.5?				X
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?		X		
c. Disturb any human remains, including those interred outside of formal cemeteries?		X		

ENVIRONMENTAL SETTING

The Project site is located on a vacant undeveloped site. The site is surrounded by existing and future residential development at varying densities.

A Cultural Resource Study (Cultural Study) was prepared by Applied EarthWorks, Inc. dated November 2023 (see Appendix C). This Cultural Study included a records search at the California Historical Resources Information System (CHRIS) Southern San Joaquin Valley Information Center (SSJVIC), Native American Hertiage Commission's (NAHC) Sacred Lands File, desktop archival research, as well as a pedestrian survey of the Project site.

In addition to the Cultural Study, City staff conducted Native American Consultation in compliance with Assembly Bill 52 (AB52). In compliance with AB52, invitations for consultation were mailed on April 8, 2024 which affords Native tribes thirty (30) days to respond and to request consultation. During this timeframe, no requests for consultations were received.

DISCUSSION

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

No Impact. As part of the Cultural Study, the SSJVIC of the CHRIS at the California State University, Bakersfield preformed a records search on June 31, 2023, to identify previously recorded resources and prior surveys within the Project area and surrounding 0.25 mile search radius.[15] According to the results, there were four previous cultural resource investigations within the Project area and one previous investigation with the 0.25 mile radius

14 Biological Evaluation Report for Lennar Homes Tract 6452 prepared by Live Oak Associates, Inc., page 29, September 2023.

15 Cultural Resource Study for the Clovis Tract 6452 prepared by Applied Earthworks, Inc., page 14, November 2023.

site, the previous studies date from 1991 to 2018.[16] Additionally, as part of the Cultural Study historical topographic maps and aerial photographs were reviewed and a requested search of the Sacred Lands File was conducted by the NAHC on August 17, 2023.[17] According to Cultural Study no cultural resource sites were identified in the Project area.[18] Further, compliance with Policy 2.9 of the 2014 General Plan, which calls for the preservation of historical sites and buildings of state or national significance, would ensure that if there were historical resources present, they would be protected. Therefore, **no impact** would occur with regard to the Project causing a substantial adverse change in the significance of a historical resource and no mitigation measures are required.

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. The site is undeveloped with the site's grounds only have previously disturbed as a result of some light grading with dirt roads and the mowing of weeds. Further, the Cultural Study concluded that there were no cultural resources including potential historical resources were identified in the Project area.[17]

Because there is the slight possibility for the accidental or inadvertent uncovering of archaeological resources during construction, Mitigation Measure CULT-1 would serve to reduce those potential impacts by requiring the stopping of any work until any found artifacts can be properly removed and inventoried by a qualified archaeologist. Therefore, the Project would result in a **less-than-significant impact with mitigation**.

> Mitigation Measure CULT-1: If archaeological or tribal resources or materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified professional archaeologist, can evaluate the significance of the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants.
>
> If the qualified professional archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation.
>
> If a potentially-eligible resource is encountered, then the qualified professional archaeologist, the Lead Agency, and the project proponent shall arrange for either 1) total avoidance of the resource or 2) test excavations to evaluate eligibility and, if eligible, total data recovery. The determination shall be formally documented in writing and submitted to the Lead Agency as verification that the provisions for managing unanticipated discoveries have been met.

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

Less-Than-Significant Impact With Mitigation. As mentioned in the discussion for Section 5a the site is undeveloped. The Cultural Study concluded no cultural resource sites were identified in the Project area.

16 Cultural Resource Study for the Clovis Tract 6452 prepared by Applied Earthworks, Inc., page 16, November 2023.

17 Cultural Resource Study for the Clovis Tract 6452 prepared by Applied Earthworks, Inc., page 17, November 2023.

18 Cultural Resource Study for the Clovis Tract 6452 prepared by Applied Earthworks, Inc., page 21, November 2023.

Nevertheless, the potential remains that human remains could be inadvertently or accidentally uncovered during ground-disturbing activities such as trenching, digging, and the installation of utilities and other infrastructure.

Because there is the slight possibility for the accidental or inadvertent uncovering of human remains during construction, Mitigation Measure CULT-2 would serve to reduce those potential impacts by requiring the stopping of any work until any found human remains can be properly removed by the County coroner and/or tribes. Therefore, the Project would result in a **less-than-significant impact with mitigation**.

> Mitigation Measure CULT-2: If human remains are discovered during construction or operational activities, further excavation or disturbance shall be prohibited pursuant to Section 7050.5 of the California Health and Safety Code and Project shall follow the procedures and protocols set for un CEQA Guidelines Section 15064.4(e)(1). If human remains are identified to be those of Native American, California Health and Safety Code 7050.5 requires the County coroner notify the NAHC within 24 hours of discovery. All reports, correspondence, and determinations regarding the discovery of human remains on the Project site shall be submitted to the Lead Agency.

6. ENERGY

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

ENVIRONMENTAL SETTING

The Project site is located on a vacant undeveloped site. The site is surrounded by existing and future residential development at varying densities.

DISCUSSION

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

Less-Than-Significant Impact. The Project proposes the construction of 153 single-family homes on ±18 acres, along with associated landscape, hardscape, and infrastructure (i.e., drive aisles, utilities, etc.). The Project would include construction activities typical of residential development, thus, is not generally considered the type of use or intensity that would result in the unnecessary consumption of energy. The units themselves would comply with Title 24 Green Building Standards for energy efficiency, as well as be required to comply with the latest water efficient landscape policy regulations, and California Building Code. Further, the Project would be required to comply with Clovis 2014 General Plan Policy 3.4, and 3.7 of the Open Space and Conservation, which call for the use of water conserving and drought tolerant landscape, as well as energy efficient buildings. Consequently, compliance with these measures would ensure that the Project does not result in a significant impact due to the unnecessary consumption of energy and **less-than-significant** impact would occur with no mitigation measures.

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

Less-Than-Significant Impact. See discussion under Section 6a above.

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?				X
ii) Strong seismic ground shaking?				X
iii) Seismic-related ground failure, including liquefaction?				X
iv) Landslides?				X
b. Result in substantial soil erosion or the loss of topsoil?			X	
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?				X
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?				X
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste disposal systems where sewers are not available for the disposal of wastewater?				X
f. Directly or indirectly destroy a unique paleontological resource or unique geologic feature?		X		

ENVIRONMENTAL SETTING

The 2014 Clovis General Plan EIR identified no geologic hazards or unstable soil conditions known to exist on the Project site.

DISCUSSION

a) *Would the project 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?; ii) Strong seismic ground shaking?; iii) Seismic-related ground failure, including liquefaction?; iv) Landslides?*

No Impact. Pursuant to the California Department of Conservation, the California Earthquake Hazards Zone Application mapping tool identifies the Project parcel as not within an Earthquake Fault Zone.[19] Additionally, adherence to the most current California Building Codes would ensure that the structures are constructed safely and in compliance with the appropriate Building Codes. With regards to liquefaction, the 2014 General Plan EIR states that the soil types in the area are not considered conducive to liquefaction due to their high clay content or from being too coarse.[20] Further, the site is generally flat and therefore landslides would not occur at the Project site. Overall, due to the Project site not being located within an earthquake fault zone, adherence to the most recent California Building Codes, and the flat topography, **no impact** would occur with regards to potential impacts from seismic activity.

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

Less-Than-Significant Impact. Although the site is relatively flat, grading activities would be required to ensure a flat and graded surface prior to construction, which may result in the soil erosion and loss of topsoil. However, as part of the Project, grading plans are required to be submitted and approved by the Engineering Division to ensure appropriate grading of the site. Thus, this review and approval process would ensure that a **less-than-significant** impact occur and no mitigation measures are required.

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. See discussion under Section 7a.

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

No Impact. According to the 2014 Clovis General Plan EIR, expansive soils are mostly present in areas along the northern edge of the non-Sphere of Influence (SOI) and the easternmost part of the Clovis non-SOI plan area. Because the Project is within the City's SOI; therefore, not within the vicinity of those areas, there would be no potential for creating direct or indirect substantial risks to life or property with regards to expansive soils. As a result, **no impact** would occur and no mitigation measures are required.

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

No Impact. The Project does not propose the use of septic tanks; therefore, **no impact** would occur.

19 California Department of Conservation, the California Earthquake Hazards Zone Application mapping tool, https://maps.conservation.ca.gov/cgs/EQZApp/app/

20 2014 Clovis General Plan EIR, Chapter 5: Geology and Soils, page 5.6-3.

f) *Would the project directly or indirectly destroy a unique paleontological resource or unique geologic feature?*

Less-Than-Significant Impact With Mitigation. The Project site is vacant and undisturbed and the Cultural Study concluded that there are no cultural resources including potential historical resources identified in the Project area. Nevertheless, the possibility remains that the inadvertent or accidental discovery could occur during ground disturbing construction activities. However, Mitigation Measure GEO-1, below, would serve to protect the accidental discovery of paleontological resources. As such, a **less-than-significant with mitigation** impact would occur.

Mitigation Measure GEO-1: If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified professional archaeologist and/or paleontologist, can evaluate the significance of the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants.

If the qualified professional determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation.

If a potentially-eligible resource is encountered, then the qualified professional archaeologist and/or paleontologist, the Lead Agency, and the project proponent shall arrange for either 1) total avoidance of the resource or 2) test excavations to evaluate eligibility and, if eligible, total data recovery. The determination shall be formally documented in writing and submitted to the Lead Agency as verification that the provisions for managing unanticipated discoveries have been met.

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?		X		
b. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?			X	

ENVIRONMENTAL SETTING

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs) because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does. The accumulation of GHG's has been implicated as a driving force for global climate change. Definitions of climate change vary between and across regulatory authorities and the scientific community, but in general can be described as the changing of the earth's climate caused by natural fluctuations and anthropogenic activities which alter the composition of the global atmosphere.

Individual Projects contribute to the cumulative effects of climate change by emitting GHGs during construction and operational phases. The principal GHGs are carbon dioxide, methane, nitrous oxide, ozone, and water vapor. While the presence of the primary GHGs in the atmosphere are naturally occurring, carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O) are largely emitted from human activities, accelerating the rate at which these compounds occur within earth's atmosphere. Carbon dioxide is the "reference gas" for climate change, meaning that emissions of GHGs are typically reported in "carbon dioxide-equivalent" measures. Emissions of carbon dioxide are largely by-products of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices and landfills. Other GHGs, with much greater heat-absorption potential than carbon dioxide, include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes.

There is international scientific consensus that human-caused increases in GHGs have and will continue to contribute to global warming, although there is uncertainty concerning the magnitude and rate of the warming. Potential global warming impacts in California may include, but are not limited to, loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.

In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide emission of greenhouse gases (GHG) would be progressively reduced, as follows: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels. In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32), which requires the CARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020.

In December 2009, the San Joaquin Valley Air Pollution Control District (SJVAPCD) adopted guidance for addressing GHG impacts in its *Guidance for Valley Land Use Agencies in Addressing GHG Impacts for New Projects Under* CEQA. The guidance relies on performance-based standards, otherwise known as Best Performance Standards (BPS), to assess significance of project-specific GHG emissions on global climate change during the environmental review process.

Projects can reduce their GHG emission impacts to a less than significant level by implementing BPS. Projects can also demonstrate compliance with the requirements of AB 32 by demonstrating that their emissions achieve a 29% reduction below "business as usual" (BAU) levels. BAU is a projected GHG emissions inventory assuming no change in existing business practices and without considering implementation of any GHG emission reduction measures.

Significance Criteria

The SJVAPCDs *Guidance for Valley Land Use Agencies in Addressing GHG Impacts for New Projects Under CEQA* provides initial screening criteria for climate change analyses, as well as draft guidance for the determination of significance.

The effects of project-specific GHG emissions are cumulative, and therefore climate change impacts are addressed as a cumulative, rather than a direct, impact. The guidance for determining significance of impacts has been developed from the requirements of AB 32. The guideline addresses the potential cumulative impacts that a project's GHG emissions could have on climate change. Since climate change is a global phenomenon, no direct impact would be identified for an individual land development project. The following criteria are used to evaluate whether a project would result in a significant impact for climate change impacts:

- Does the project comply with an adopted statewide, regional, or local plan for reduction or mitigation of GHG emissions? If no, then
- Does the project achieve 29% GHG reductions by using approved Best Performance Standards? If no, then
- Does the project achieve AB 32 targeted 29% GHG emission reductions compared with BAU?

Projects that meet one of these guidelines would have less than significant impact on the global climate.

In December 2022 the 2022 Scoping Plan was approved by the CARB which assesses progress toward achieving carbon neutrality by 2045. Because neither the City of Clovis or the SJVAPCD have developed or adopted numerical GHG significance threshold, the proposed Project was analyzed for consistency with the 2022 Scoping Plan consistent with statewide climate goals. The 2022 Scoping Plan includes key project attributes that reduce operational GHG emissions.

DISCUSSION

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 With Mitigation. The Project would include the construction and operation of 153 single-family homes and associated infrastructure (i.e., sewer and water infrastructure, roadways, sidewalks, etc.). As such, GHG emissions would be produced through the construction and operational phases of the Project. As a result, an estimate of the Project's operational emissions in 2005 were compared to the operational emission in 2020 in order to determine if the Project meets the 29% emission reduction. Results of the analysis show that the Project's GHG emission in the year 2020 is 2179.68 MTCO2eq./year, which represents an achievement of 16% GHG emission reduction on the basis of BAU, which does not meet the 29% GHG emission reduction target.[21] Although, the Project does not meet the 29% GHG emission reduction, the 2022 Scoping Plan recommends that for determining whether a proposed residential or mixed-use residential development would align with the State's climate goals is to examine whether the project includes key project attributes that reduce operational GHG emissions while simultaneously advancing fair housing. With the implementation of recommended mitigation, the proposed project is generally consistent with the key project attributes recommended in the 2022 Scoping Plan, as further discussed below.

The 2022 Scoping Plan recommends that project attributes consistent with specific priority strategies would accommodate growth in a manner consistent with State GHG reduction. The 2022 Scoping Plan recommends that a residential or mixed-use project provide EV charging infrastructure that, at minimum, meets the most ambitious voluntary standard in the California Green Building Standards Code at the time of project approval. CALGreen requires provision of infrastructure to accommodate EV chargers for new single family and attached dwelling units/town houses. It is not yet known whether the proposed project would include electric vehicle charging; therefore, implementation of Mitigation Measure GHG-1 would be required to ensure the proposed project would provide electric vehicle charging.

The 2022 Scoping Plan further recommends that a proposed project be located on infill sites that are surrounded by existing urban uses and reuses or redevelops previously undeveloped or underutilized land that is presently served by existing utilities and essential public services (e.g., transit, streets, water, sewer). The proposed Project is located in close proximity to other single-family residential uses that are presently served by existing utilities and essential public services (e.g., transit, streets, water, sewer). The Project site and adjacent parcels

21 Air Quality and Greenhouse Gas Analysis Report, VRPA Technologies, Inc, page 56, January 2024.

have been identified for future development in the 2014 General Plan. CARB guidance recommends that, to be consistent with State goals, a proposed project should not result in the loss or conversion of natural and working lands. As discussed in Section 2A the Project will not result in the loss or conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural uses. Therefore, the proposed project would be consistent with this key project attribute.

The proposed project would also be generally consistent with the transit density criteria recommended in the 2022 Scoping Plan. The proposed Project would include an approximately 20-foot-wide parkway containing an approximately 6-foot-wide pedestrian sidewalk and 10-foot-wide landscaping along both N. Baron and Perrin Avenues. Additionally, the Project includes multiple direct pedestrian connections into the proposed Project that would support the ability to use alternative modes of transportation. As such, the project would promote initiatives to reduce vehicle trips and VMT and would increase the use of alternate means of transportation.

The 2022 Scoping Plan recommends that a proposed project reduce parking requirements by eliminating parking requirements or including maximum allowable parking ratios (i.e., the ratio of parking spaces to residential units or square feet); or providing residential parking supply at a ratio of less than one parking space per dwelling unit. The proposed Project would consist of 153 residential lots with construction of approximately 59 dedicated off-street parking spaces. Based on the minimal parking spaces when compared to the number of residential units, the proposed project would be consistent with this key project attribute. An additional State goal is to advance the availability of fair housing. The proposed project would help to address the California housing shortage and would increase the number of residences available to residents of the San Joaquin Valley. Finally, consistent with the recommendations in the 2022 Scoping Plan, the proposed Project would be all electric and not include natural gas connections.

With implementation of Mitigation Measures GHG-1 the Project would result in **less-than-significant impact with mitigation.**

> Mitigation Measure GHG-1: In order to meet the 2022 Scoping Plan GHG requirements, consistent with State GHG reduction and equity prioritization goals, each residential unit shall provide electric vehicle charging capabilities as part of the final project design.

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

Less-Than-Significant Impact. Based on the AQ/GHG Report,[22] as required by California law General Plans contain land use elements that detail types and quantities of land uses needed for future growth assumptions. Therefore, determination of consistency with a county/city's General Plan can be used to confirm that the Project's density and land use are consistent with the growth assumption used in the air quality plan. The Project is consistent with the currently adopted 2014 General Plan; therefore, is consistent with the growth assumptions under the applicable air quality plan and per the AQ/GHG Report, the Project will not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHG. Additionally, as indicated in the discussion above under Section 8a, the Project was analyzed for consistency with the goals of the 2022 Scoping Plan, a state adopted plan for Statewide climate goals and greenhouse gas emission reduction. Consequently, the AQ/GHG Report found this potential impact to be **less than significant** impact would occur with no mitigation measures.

22 Air Quality and Greenhouse Gas Analysis Report, VRPA Technologies, Inc, page 58-59, January 2024.

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?			X	
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?			X	
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
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?				X
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?				X
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X	
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?			X	

ENVIRONMENTAL SETTING

For purposes of this chapter, the term “hazardous materials” refers to both hazardous substances and hazardous wastes. A “hazardous material” is defined in the Code of Federal Regulations (CFR) as “substance or material that is capable of posing an unreasonable risk to health, safety, and property when transported in commerce” (49 CFR 171.8). California Health and Safety Code Section 25501 defines a hazardous material as follows:

“Hazardous material” means any material that, because of its quantity, concentration, or physical, or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. “Hazardous materials” include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment. "Hazardous wastes" are defined in California Health and Safety Code Section 25141(b) as wastes that because of their quantity, concentration, or physical, chemical, or infectious characteristics, [may either] cause or significantly contribute to an increase in mortality or an increase in serious illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

The nearest school to the Project site is Woods Elementary School, located approximately one (1) mile southwest of the site at its closest point.

DISCUSSION

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. The Project consists of the construction of 153 single-family homes on ±18 acres. The type of hazardous materials that would be associated with the Project are those typical of residential uses, such as the use of household cleaners, landscape maintenance products, soaps, and potential pesticides (for pest control). These materials, when used and applied properly, would not necessarily create a significant hazard to the public or the environment. Further, these materials are not anticipated to be stored in large quantities that could pose a threat. Overall, the Project would not routinely transport, use, or dispose of hazardous materials other than those typical of residential development, which are not generally considered of the type or quantity that would pose a significant hazard to the public when used as directed. During construction, typical equipment and materials would be used that are associated with residential construction; however, any chemicals or materials would be handled, stored, disposed of, and/or transported according to applicable laws. Consequently, because the Project is not of the type of use that would routinely transport, use, or dispose of hazardous materials a **less-than-significant** impact would occur with no mitigation measures.

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. See discussion above under Section 9a.

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?*

No Impact. As mentioned above, the Project site is located approximately one (1) mile from the nearest school. Further, the Project is not of the type of use typically associated with emitting hazardous emissions or handling the type or quantity of hazardous materials such that it would pose a risk or threat to the school, or surrounding area. Therefore, **no impact** would occur.

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. According the California Department of Toxic Substance Control EnviroStor Database, the Project site is not located on or within the immediate vicinity of a hazardous materials site.[23] Therefore, **no impact** would occur.

e) *For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?*

No Impact. The Project is not within an airport land use plan nor is the site within two miles of a public airport. Therefore, **no impact** would occur.

f) *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*

Less-Than-Significant Impact. The Project will connect in the internal street network to N. Baron, Perrin, and N. Marion Avenues already developed from previous development. Although the Project could result in temporary traffic detouring or closures during buildout, these delays would be temporary and would be coordinated with the City Planning and Development Services Department and other departments to ensure safe access to and from the area is maintained. Further, the site itself would be reviewed by City departments to ensure adequate site access and circulation is provided in the event of an emergency. Overall, a **less-than-significant** impact would occur with no mitigation measures.

g) *Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?*

Less-Than-Significant Impact. The Project site it is not located in an area typically associated with wildfires. Although urban fires could occur, the Project would be constructed to the latest fire code standards, which would include fire sprinklers in each unit, as well as the installation of several fire hydrants throughout the site as required by the Clovis Fire Department. Further, other life safety features would be required such as smoke detectors, which would be reviewed and checked by the Fire Department to ensure proper operation prior to occupancy. Ultimately, a **less-than-significant** impact would occur with no mitigation measures.

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

23 California Department of Toxic Substance Control, EnviroStor Database, https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=Clovis, accessed on April 11, 2024

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 offsite; (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?			X	
i) Result in substantial erosion or siltation on- or off-site?			X	
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?			X	
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?			X	
iv) Impede or redirect flood flows?			X	
d. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?			X	
e. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?			X	

ENVIRONMENTAL SETTING

The City is within the drainages of three streams: Dry Creek, Dog Creek, and Redbank Slough. On the north, Dry Creek discharges into the Herndon Canal in the City of Fresno west of Clovis. South of Dry Creek, Dog Creek is a tributary of Redbank Slough, which discharges into Mill Ditch south of Clovis (USGS 2012). A network of storm drains in the City and the Plan Area discharges into 31 retention basins, most of which provide drainage for a one- to two-square-mile area. Most of the Plan Area east and northeast of the City is not in drainage areas served by retention basins. Those areas drain to streams that discharge into reservoirs, including Big Dry Creek Reservoir in the north-central part of the Plan Area and Redbank Creek Dam and Reservoir in the southeast part of the Plan Area. Fancher Creek Dam and Reservoir are near the east Plan Area boundary.

The Project is located within the FMFCD boundary, and subject to its standards and regulations. Detention and retention basins in the FMFCD's flood control system are sized to accommodate stormwater from each basin's drainage area in builtout condition. The current capacity standard for FMFCD basins is to contain runoff from six inches of rainfall during a ten-day period and to infiltrate about 75 to 80 percent of annual rainfall into the groundwater basin (Rourke 2014). Basins are highly effective at reducing average concentrations of a broad range of contaminants, including several polyaromatic hydrocarbons, total suspended solids, and most metals (FMFCD 2013). Pollutants are removed by filtration through soil, and thus don't reach the groundwater aquifer (FMFCD 2014). Basins are built to design criteria exceeding statewide Standard Urban Stormwater Mitigation

Plan (SUSMP) standards (FMFCD 2013). The urban flood control system provides treatment for all types of development—not just the specific categories of development defined in a SUSMP—thus providing greater water quality protection for surface water and groundwater than does a SUSMP.

In addition to their flood control and water quality functions, many FMFCD basins are used for groundwater recharge with imported surface water during the dry season through contracts with the FID and the cities of Fresno and Clovis; such recharge totaled 48,139 acre feet of water in 2020.

The pipeline collection system in the urban flood control system is designed to convey the peak flow rate from a two-year storm.

Most drainage areas in the urban flood control system do not discharge to other water bodies, and drain mostly through infiltration into groundwater. When necessary, FMFCD can move water from a basin in one such drainage area to a second such basin by pumping water into a street and letting water flow in curb and gutter to a storm drain inlet in an adjoining drainage area (Rourke 2014). Two FMFCD drainage areas discharge directly to the San Joaquin River, and three to an irrigation canal, without storage in a basin. Six drainage areas containing basins discharge to the San Joaquin River, and another 39 basins discharge to canals (FMFCD 2013).

A proposed development that would construct more impervious area on its project site than the affected detention/retention basin is sized to accommodate is required to infiltrate some stormwater onsite, such as through an onsite detention basin or drainage swales (Rourke 2014).

The Big Dry Creek Reservoir has a total storage capacity of about 30 thousand acre-feet (taf) and controls up to 230-year flood flows. Fancher Creek Dam and Reservoir hold up to 9.7 taf and controls up to 200-year flood flows. Redbank Creek Dam and Reservoir hold up to 1 taf and controls up to 200-year flood flows.

Groundwater

Clovis is underlain by the Kings Groundwater Basin that spans 1,530 square miles of central Fresno County and small areas of northern Kings and Tulare counties. Figure 5.9-4, Kings Groundwater Basin, shows that the basin is bounded on the north by the San Joaquin River, on the west by the Delta-Mendota and Westside Subbasins, the south by the Kings River South Fork and the Empire West Side Irrigation District, and on the east by the Sierra Nevada foothills. Depth to groundwater in 2016 ranged from 196.5 feet at the northwest City boundary to 69.5 feet at the southeast City boundary (Clovis 2016), 25 feet at the southeast SOI boundary, and about 20 feet at the eastern Plan Area boundary (FID 2013). The Kings Subbasin has been identified as critically overdrafted (Provost & Pritchard 2011).

In the Plan Area, groundwater levels are monitored by the City of Clovis and FID. The overall area has not experienced land subsidence due to groundwater pumping since the early 1900s (FID 2006). Subsidence occurs when underground water or natural resources (e.g., oil) are pumped to the extent that the ground elevation lowers. No significant land subsidence is known to have occurred in the last 50 years as a result of land development, water resources development, groundwater pumping, or oil drilling (FID 2006). The City has identified a localized area of subsidence of 0.6 feet in the vicinity of Minnewawa and Herndon Avenues within the last 14 years (Clovis 2016). Regional ground subsidence in the Plan Area was mapped as less than one foot by the US Geological Survey in 1999 (Galloway and Riley 1999). Groundwater levels in the San Joaquin Valley are forecast to hit an all-time low in 2014 (UCCHM 2014).

New development in accordance with the General Plan Update would increase the amount of impervious surface in the Plan Area, potentially affecting the amount of surface water that filters into the groundwater supply. Groundwater levels are monitored in the Plan Area by the FID and the City of Clovis. As described in the 2015

City of Clovis Urban Water Management Plan (UWMP), groundwater recharge occurs both naturally and artificially throughout the City. The Kings Groundwater Basin area is recharged through a joint effort between the Cities of Clovis and Fresno and the FID (CDWR 2006). Approximately 8,400 acre-feet per year (afy) of water are intentionally recharged into the Kings Groundwater Basin by the City of Clovis, and approximately 7,700 afy of water naturally flow into groundwater in the City's boundaries (Clovis 2011).

The FMFCD urban stormwater drainage system would provide groundwater infiltration for runoff from developed land uses in detention basins in the drainage system service area.

Projects pursuant to the proposed General Plan Update and developed outside of the FMFCD urban stormwater drainage system would be required to meet the requirements of NPDES regulations, including the implementation of BMPs to improve water retention and vegetation on project sites.

DISCUSSION

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 Impact. The Project is located on a site that was previously anticipated for residential use. As with any development, existing policies and standards are required to be complied with, which are assessed during review of the entitlements. As such, the Engineering Division, as well as outside agencies such as the FMFCD review all plans to ensure that none of the water quality standards are violated and that waste discharge requirements are adhered to during construction and operation of the Project. Consequently, this process of Project review and approval would ensure that a **less-than-significant** impact occur with no mitigation measures.

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. The Project would not deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level due to the Project. The 2014 General Plan EIR identified a net decrease in ground water aquifer throughout the region, however, because the City's domestic water system is primarily served through surface water via existing water entitlements, the loss of aquifer is less than significant. The City has developed a surface water treatment plant (opened in June, 2004) that reduces the need for pumped groundwater, and has also expanded the municipal groundwater recharge facility. The Projects impacts to groundwater are **less than significant** with no mitigation measures required.

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, 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 offsite; (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?*

Less-Than-Significant Impact. There are no streams or rivers on the site that would be altered as a result of the Project. Further, some of the infrastructure surrounding the site, such as stormdrains are already in place from existing development to the south. The site is mostly pervious since it is currently undeveloped, and as a result, the Project would increase the amount of impervious surfaces by installing paving for roadways and sidewalks. However, the drainage pattern would be constructed per existing policies and regulations through review of the plans by the City Engineering Division and the FMFCD to ensure the site is properly and adequately drained such that the stormdrain system is maintained and so that no flooding occurs. Consequently, this review and approval by City engineers and FMFCD would mean that the Project result in a **less-than-significant** impact would occur with no mitigation measures.

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

Less-Than-Significant Impact. Due to the Central Valley's location away from the ocean, an impact from a tsunami is unlikely. The majority of the site is located within the 1% annual flood (100-year flood) area as mapped by Federal Emergency Management Agency (FEMA); however, the CMC Section 8.12, Floodplain Management lists standards and requirements for new construction within special flood zones; therefore, the Project would implement flood hazard management as required by the CMC. As a result of adhering to required flood hazard management, the Project would not risk the release of pollutants due to inundation and consequently, the Project would result in a **less-than-significant** impact would occur with no mitigation measures.

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

Less-Than-Significant Impact. The City of Clovis is within the North Kings County Groundwater Sustainability Agency (GSA). Pursuant to the Sustainable Groundwater Management Act of 2014 (SGMA), certain regions in California are required to develop and implement a groundwater management plan that sustainably manages groundwater resources. The proposed Project would comply with the 2020 City of Clovis UWMP which promotes programs and policies to manage water supplies. Nevertheless, the Project would derive the majority of its water from surface water sources and does not propose or include plans for groundwater use. With regards to water quality control, the Project would be required to adhere to appropriate storm drain conveyance and the protection of water resources which would include the installation of backflow preventers. Consequently, the Project would result in a **less-than-significant** impact with no mitigation measures.

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 existing community?			X	
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?			X	

ENVIRONMENTAL SETTING

As described above in the Project Description, the Project site is vacant and undeveloped and is surrounded by residential development, including existing rural residential to the east, residential to the south currently under construction, and development under entitlement processing to the west.

DISCUSSION

a) *Would the project physically divide an existing community?*

Less-Than-Significant Impact. Although the site is currently vacant and undeveloped, the general area to the south is urbanized with residential uses of varying densities. Typically, physically dividing existing communities is associated with the construction of a new road intersecting an established area or introducing uses that are not necessarily in line with the existing uses and planned land uses of the area. However, the Project site has been previously designated in the 2014 Clovis General Plan and zoned for residential use.

Consequently, because the proposed Project is the type of use previously planned for this site and the general areas, it would not physically divide an existing community. Rather, it seeks to add new housing stock to the City with installation of a new public sidewalk and roadway infrastructure. Therefore, a **less-than-significant** impact would occur and no mitigation measures are required.

b) *Would the project 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?*

Less-Than-Significant Impact. As mentioned in the Existing Setting Section above, the Project site is currently within the County of Fresno jurisdiction and zoned AE20 (Exclusive Agricultural). However, the Project site will be rezoned to the R-1-PRD (Single-Family Planned Residential Development) Zone District though a separate entitlement application (Rezone 2021-006). According to Section 9.10.010(B)(5) of the CMC, the R-1-PRD Zone District identifies areas appropriate for single-family small lot uses, including attached and detached single-family structures on small lots. If approved, the Project will be required to go through the RSPR entitlement process for review for compliance with relevant design policies, such as in the Heritage Grove Master Plan, the CMC, and the General Plan. During the review, the height, color and materials are reviewed for consistency with these plans and guidelines. As a result of the Project in complying with the land use and zoning designation upon approval, as well as the review process ensuring General Plan and other applicable policies are adhered to, the Project would result in a **less-than-significant** impact with regards to conflicting with a land use plan. No mitigation measures are required.

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?				X
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?				X

ENVIRONMENTAL SETTING

The City of Clovis 2014 General Plan EIR defines minerals as any naturally occurring chemical elements or compounds formed from inorganic processes and organic substances.[24] The 2014 General Plan EIR indicates that there are no active mines or inactive mines within the Plan Area of the City of Clovis.

24 2014 Clovis General Plan EIR, Chapter 5: Mineral Resources, page 5.11-1.

DISCUSSION

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. As stated above, the City of Clovis does not have any active mines or inactive mines. Further, the Project site is not designated, or otherwise mapped for mineral resource extraction, or for having mineral resources of value to the region present on or below the surface of the site. Therefore, **no impact** would occur and no mitigation measures are required.

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. Please refer to the discussion under Section 12a.

13. NOISE

Would the project:	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?		X		
b. Generation of excessive groundborne vibration or groundborne noise levels?			X	
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?				X

ENVIRONMENTAL SETTING

The Project site is vacant and surrounded by residential development, including existing rural residential to the east, residential development to the south currently under construction, and residential development under entitlement processing to the west. As such, existing ambient noise levels are typical of those associated with residential development, such as the sound of vehicles passing by, the sound of talking, and recreating could be expected within the Project vicinity. As a result of construction to the south, existing ambient noise levels may be slightly elevated as a result of the use of construction equipment, such as large trucks, tractors, and other construction tools associated with residential development. These increases would be temporary, however, and would cease upon completion of the neighborhood.

An acoustical analysis was prepared for the Project by WJV Acoustics on March 14, 2024 and the analysis below is based in part on the study. As part of the acoustical analysis, noise exposure from traffic on Perrin and N. Clovis Avenues was calculated for future (2046) conditions using the Federal Highway Administration

(FHWA) Highway Traffic Noise Prediction Model. The acoustical analysis can be found in Appendix D of this Initial Study.

DISCUSSION

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 include development of 153 single-family homes on an undeveloped site. Thus, the Project would result in a temporary and permanent increase in ambient noise levels as a result of construction and operation. However, as mentioned above, the Project site will be surrounded by residential development of varying densities. The Project would introduce new ambient noise from the construction and operation of the homes, these noises would represent the typical type of noise levels that is expected for a planned residential land use. While increases in ambient noise would occur due to the construction of the Project, this increase would be temporary and would be required to adhere to local regulations limiting the hours of construction.

The CMC Section 9.22.080, Noise, sets forth noise standards for development which would need to be complied with. For example, construction would only be permitted between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, and between 9:00 a.m. and 5:00 p.m. on weekends. However, between June 1 and September 15, construction may begin at 6:00 a.m. on weekdays.

The acoustical analysis indicated that exterior traffic noise exposure at the closest proposed lots to Perrin Avenue would be approximately 61 dB CNEL for future traffic conditions and approximately 51 dB CNEL for the closest proposed lots to N. Clovis Avenue.[25] As such, the exterior noise exposure would not exceed the City's exterior noise level of 65 dB CNEL.

The acoustical analysis indicated that the worst-case interior noise exposure within the proposed Project would be approximately 61 dB CNEL which exceeds the City's standard for interior noise; however, the mitigation measures below would reduce these impacts sufficiently to meet the City standards for noise. Consequently, a **less-than-significant impact with mitigation** would occur.

> Mitigation Measure NOISE-1: Interior Noise. Mechanical ventilation or air conditioning shall be provided for all homes to enable windows and doors to remain closed for sound insulation purposes.

b) *Would the project result in generation of excessive groundborne vibration or groundborne noise levels?*

Less-Than Significant Impact. The Project includes development of 153 single-family homes and associated infrastructure (i.e., sidewalks, roadways, curb, gutter, stormdrains, etc.). Therefore, construction equipment typical of the development of residential homes would be utilized temporarily. This equipment could include the use of heavy tractors, trucks, and other equipment; however, this type of equipment isn't typically associated with excessive groundborne vibration. If any vibration were to occur, it's likely that it would be temporary in nature and not at levels that would significantly impact the surrounding area. Further, the Project would be required to comply with the provisions of Section 9.22.090 of the CMC which requires that vibration not be perceptible along property lines and that it shall not interfere with operations or facilities on adjoining parcels. It's important to note also that temporary construction vibration and noise is exempt from these provisions due to the fact that construction is temporary. Overall, because the type of equipment likely to be used in the

25 Acoustical Analysis Tract 6452, VJV Acoustics, Inc, page 8, March 2024.

development of the Project is not considered to be of the type and intensity to result in substantial vibration or groundborne noise, the impact would be **less than significant** and no mitigation measures are required.

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. The Project is not located within the vicinity of a private airstrip or within an airport land use plan nor is the site within two miles a public airport. Therefore, **no impact** would occur.

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)?			X	
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				X

ENVIRONMENTAL SETTING

The Project is located on a vacant site that is planned for residential use in the 2014 Clovis General Plan. The Project site is ±18 acres and proposes 153 single-family homes.

DISCUSSION

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 Project would result in 153 single-family homes. The Project site has two existing General Plan Land Use designations of Very Low Density Residential, which allows for a density range of 0.6 to 2.0 DU/AC and Medium Density Residential, which allows for a density range of 4.1 to 7.0 DU/AC. Calculated with net acres, the Project site would require a range of 42 to 80 dwelling units. Thus, blending of density will be utilized with adjacent TM6200, to the south. TM6200 was recorded on December 24, 2019, which allowed for a maximum of 871 dwelling units. TM6200 has been processed in phases currently with 586 dwelling units approved for development which leaves a 283-unit surplus. Thus, the Project will utilize 73 units of the remaining 283 units for a blended product. Further, the Project includes residential use on a site that is planned for the type of use being proposed. Unplanned population growth is typically associated with providing new services in remote areas of the City or other infrastructure that was not previously identified in the General Plan. Although the Project would result in new housing units and population to the site, this growth was previously planned and anticipated under the 2014 General Plan. Thus, a **less-than-significant** impact would occur and no mitigation measures are required.

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

No Impact. The Project site is vacant and undeveloped; therefore, **no impact** would occur and no mitigation measure are required.

15. PUBLIC SERVICES

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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:				
a. Fire protection?			X	
b. Police protection?			X	
c. Schools?			X	
d. Parks?			X	
e. Other public facilities?			X	

ENVIRONMENTAL SETTING

The Project would be served by the Clovis Fire Department, Clovis Police Department, with mutual aid from the City of Fresno, when needed. The Project site would also be within the Clovis Unified School District.

The nearest fire station is Fire Station #3, located approximately three (3) miles southwest of the site. The other closest fire station is Fire Station #5, located approximately four (4) miles to southeast of the site.

DISCUSSION

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 fire protection services?*

Less-Than-Significant Impact. Although the Project would result in 153 new residential units, the site is located adjacent to an area of the City that is already able to be served by the Clovis Fire Department. Upon annexation (R2021-006), the Project will then be located in an area the City will be able to serve. Also, the site itself is in close proximity to Fire Station's #3 and #5, which would mean that response times should be able to be maintained during calls for service. As part of the entitlement process for the Project, the Clovis Fire Department will review the design and site layout to ensure adequate fire safety measures and site circulation are achieved. This would include placement of new fire hydrants in certain locations throughout the site, adequate drive widths for fire truck and emergency vehicle access, and the appropriate application of fire codes, such as installation of sprinkler systems, fire alarms, and smoke detectors. Overall, with the site's close proximity to numerous fire stations, construction that would meet the latest fire code standards, and review by the Clovis Fire Department, impacts related to effects on the performance of the Fire Department would be **less-than-significant** and no mitigation measures are required.

b) *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 police protection services?*

Less-Than-Significant Impact. Although the Project would result in 153 new residential units, the site is located adjacent to an area of the City this already able to be served by the Clovis Police Department. Upon annexation (R2021-006), the Project will then be located in an area the City will be able to serve. The Clovis Police Department headquarters are located at 1233 Fifth Street, which is approximately five (5) miles from the site. As part of the entitlement process for the Project, the Clovis Police Department will review the design and site layout to ensure adequate safety measures are achieved. Consequently, a **less-than-significant** impact would occur and no mitigation measures are required.

c) *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 schools?*

Less-Than-Significant Impact. As part of the review process, Clovis Unified School District (CUSD) is provided the opportunity to comment and work closely with the City as development is proposed. As mentioned previously, the Project site was previously planned for residential development, as indicated in the 2014 Clovis General Plan. As such, the CUSD has been aware of the potential for this type of development at this location. As part of the process, the Project would be required to pay school fees which typically go towards the improvement and/or construction of new schools or expanding existing schools if and when needed, as determined by the CUSD. Therefore, because the Project is consistent with what was previously planned for at this site in addition to payment of appropriate school fees set by the CUSD, a **less-than-significant** impact would occur and no mitigation measures are required.

d) *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 parks?*

Less-Than-Significant Impact. Although the Project proposes one (1) approximately 8,990 square foot pocket park, this park would not cause significant environmental impacts in order to maintain acceptable service ratios, response times or other performance objectives for parks. Furthermore, the Project is required to request annexation to and provide a covenant for the Landscape Maintenance District. Consequently, a **less-than-significant** impact would occur and no mitigation measures are required.

e) *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 other public facilities?*

Less-Than-Significant Impact. Although the Project would result in 153 new residential units, residential uses have been previously planned for in the 2014 Clovis General Plan in this area. Also, through the entitlement process, the Project would undergo review by several departments and agencies for compliance with appropriate regulations and policies. This could result in various impact fees that are intended to maintain and enhance public facilities as appropriate to be able to accommodate the Project. As such, payment of the typical development fees, as well as project review by the different department and agencies, would result in the Project having a **less-than-significant** impact to public facilities. No mitigation measures are required.

16. RECREATION

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?			X	
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?			X	

ENVIRONMENTAL SETTING

The nearest existing recreational site is Dry Creek Trailhead, located at the corner of Shepherd and Sunnyside Avenues. A future community park is planned approximately 0.30 miles west of the Project site.

DISCUSSION

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. As mentioned in the Population and Housing section of this Initial Study, the Project is of the type previously planned and accounted for in the 2014 Clovis General Plan. Although 153 new residential units would be constructed, therefore, adding new population to the area that may utilize parks within the surrounding area, this growth was planned for with regards to park usage throughout the city. Further, the Project itself would include landscaped and open space areas on-site for its residents, as well as a pocket park space within the neighborhood, thereby, providing areas of recreation within the site itself. The Project would also be required to comply with 2014 General Plan Policy 2.2 of the Open Space and Conservation Element which encourages the incorporation of on-site natural resources.

Overall, the Project is not likely to increase the use of existing parks such that physical deterioration would occur. Therefore, the impact would be **less-than-significant** and no mitigation measures are required.

b) *Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?*

Less-Than-Significant Impact. The Project site itself would construct on-site a pocket park. The Project itself would not require the construction or expansion of new recreational facilities elsewhere that would have an adverse physical effect on the environment. The Project would also be required to contribute a proportionate share towards the acquisition and development of future parks in order for the City to maintain its adopted ratio of providing four (4) acres of parkland per 1,000 residents, as stated in Policy 1.1 in the Open Space and Conservation Element of the 2014 General Plan, and Section 3.4.03 of the CMC. As such, a **less-than-significant** impact would occur and no mitigation measures are required.

17. TRANSPORTATION

Would the project:	Significant and Unavoidable	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?			X	
b. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	X			
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
d. Result in inadequate emergency access?			X	

ENVIRONMENTAL SETTING

The project is bounded by Perrin Avenue to the south, N. Baron Avenue to the west, a planned FMFCD basin to the north, and rural residential to the east. The circulation network serving the site including internal site circulation will be constructed as part of the project.

According to the 2014 Clovis General Plan Circulation Diagram in the Circulation Element (Figure C-1 of the Circulation Element), N. Baron and Perrin Avenues are classified as “Collector” streets. Collectors generally intended to provide for relatively short distance travel between and within neighborhoods and that serve longer through trips. N. Baron Avenue is planned to connect to N. Clovis and N. Minnewawa Avenues “Arterials” to the west.

A Transportation Impact Analysis (TIA) was prepared by Peters Engineering Group on February 8, 2024 (included as Appendix E of this Initial Study). The information and analysis in the following sections is based in part on the results of the TIA.

DISCUSSION

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

Less-Than-Significant Impact. As mentioned above, the site is on land that was previously planned for residential use in the 2014 Clovis General Plan. As described in the Population and Housing section above, the Project will be consistent with the planned density through density blending with the adjacent TM6200. The 2024 Clovis General Plan considers level of service (LOS) D as the LOS standard vehicle traffic operations, except for roadway segments that are adopted in the City’s General Plan EIR to operate at LOS E or F. At study intersections under the jurisdiction of the City of Clovis, a significant impact would occur at a signalized intersection when LOS falls below the target LOS of D with the addition of project traffic or when project increases the average delay at an intersection already operating at an unacceptable LOS.

The TIA studied six (6) intersections 1) N. Minnewawa and Behymer Avenues, 2) N. Baron and Behymer Avenues, 3) N. Baron and Perrin Avenues, 4) N. Clovis and Baron Avenues, 5) N. Clovis and Shephard Avenues, and 6) Sunnyside and Sheperd Avenues for existing conditions, existing-plus-project conditions, near term with project conditions, and cumulative conditions to the year 2045. A discussion of each of these scenarios is included below. Each scenario is based on the Projects a.m. and p.m. peak hour trips as determined in the TIS. According to the TIS, the Project would result in 108 trips in the a.m. peak hours of between 7:00 a.m. and 9:00 a.m. and 144 trips in the p.m. peak hours between 4:00 p.m. and 6:00 p.m., as well as a total of 1,444 daily vehicle trips.

Existing Traffic Conditions

Based on the TIA,[26] existing traffic volumes were determined during morning peak hours of 7:00 a.m. to 9:00 a.m., and between evening peak hours of 4:00 p.m. and 6:00 p.m. on a weekday. According to the TIA, the intersections of Minnewawa and Behymer Avenues and Sunnyside and Shepherd Avenues are not currently operating at an acceptable LOS based on City of Clovis standards.[27]

Existing-Plus-Project Conditions

Existing-Plus-Project conditions represent existing conditions plus buildout of the Project if none of the pending and approved project in the vicinity were constructed. According to the TIA, all intersections currently operating at an acceptable LOS are not expected to operate below the City LOS standard.[28] Although delays are expected to increase at the intersection of Minnewawa and Behymer Avenues, the delays are relatively minimal. Delays are also expected to increase at the intersection of Sunnyside and Shepherd Avenues during the p.m. peak hour causing the LOS to drop from E to F; however, construction of a traffic signal at the intersection is currently underway.

In order for the intersection of Minnewawa and Behymer Avenues to operate at an acceptable LOS, the intersection may be signalized or at a minimum a dedicated left-turn lanes with protected left-turn phasing would be required on the northbound and southbound approaches. With signalization this intersection is expected to operate at LOS B during a.m. and p.m. peak hours. [29]

Near-Term-With-Project Conditions

These conditions are based on buildout of the Project plus the near term planned or entitled projects that are reasonably foreseeable. The following projects were considered in the near-term analyses: TM6205, 605 single-family homes (NE of Shepherd and Sunnyside), TM6343, 590 single-family homes (NE of Behymer and Baron), TM6406, 51 single-family homes (SW of Perrin and Baron), TM6375, 387 single-family homes (W of Clovis and Baron), and Heritage Grove, 18-acre mixed use development (SE of Willow and Shepherd). Under this scenario, the intersections of Minnewawa and Behymer Avenues and Clovis and N. Baron Avenues would exceed acceptable LOS thresholds per City standards during peak hours.[30] Additionally, per the TIS the intersection of N. Clovis and Shepherd Avenues would not meet the 95th percentile queues for existing storage

26 Transportation Impact Analysis, Proposed Tract No. 6452, Peters Engineering Group, February 8, 2024 page 2.
27 Transportation Impact Analysis, Proposed Tract No. 6452, Peters Engineering Group, February 8, 2024 page 9.
28 Transportation Impact Analysis, Proposed Tract No. 6452, Peters Engineering Group, February 8, 2024 page 9.
29 Transportation Impact Analysis, Proposed Tract No. 6452, Peters Engineering Group, February 8, 2024 page 15.

30 Transportation Impact Analysis, Proposed Tract No. 6452, Peters Engineering Group, February 8, 2024 page 16.

capacity for the left-turn lane on the northbound approach, right turn lanes on the eastbound and northbound approaches.

In order for the intersection of Minnewawa and Behymer Avenues to operate at an acceptable LOS the same improved condition as outlined above in the Existing-Plus-Project Conditions summary is recommended. In order for the intersection of N. Clovis and Baron Avenues to operate at an acceptable LOS, the intersection would require signalization. With signalization, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours. It is not recommended to require installation of signalization with the Project alone; the intersection should require signalization until N. Clovis Avenue is extended north of Baron Avenue.[31]

In order to better accommodate queues at the intersection of N. Clovis and Shepherd Avenues, striping may be modified to open the second left-turn lane on the northbound approach, with this modification the intersection is expected to operate at LOS C during a.m. and p.m. peak hours. [32]

<u>Cumulative 2045 Traffic Conditions</u>

These conditions represent anticipated traffic volumes for the year 2045 using the Fresno Council of Governments (Fresno COG) travel model. As described in the TIS, only one (1) study intersection would operate at an acceptable LOS for the year 2045. [33]

In order for the intersection of Minnewawa and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized or at a minimum dedicated left turn lanes with protected left turn phasing would be required on all four approaches and a dedicated right turn lame would be required on the westbound approach. With signalization, the intersection is expected to operate at LOS D during the a.m. and p.m. peak hours.

In order for the intersection of N. Baron and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized, at a minimum a dedicated left turn lane with protected left turn phasing would be required on the westbound approach. With signalization, the intersection is expected to operate at LOS B during the a.m. and peak hour and LOS A during the p.m. peak hour.

In order for the intersection of N. Baron and Perrin to operate at acceptable LOS, all way stop control may be installed. With all-way stop control, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours.

To better accommodate the intersection of N. Clovis and Shepherd Avenues, striping may be modified to open the second left-turn on the northbound approach. With the modification the intersection is expected to operate at LOS C during the a.m. and p.m. peak hours.

For Sunnyside and Shepherd Avenues to operate at acceptable LOS, the intersection would require modification from the planned signalized lane to the following:

- Eastbound: two left turn lanes, two through lanes, and one right turn lane
- Westbound: one left turn lane, two through lanes, and one right turn lane

31 Transportation Impact Analysis, Proposed Tract No. 6452, Peters Engineering Group, February 8, 2024 page 16.

32 Transportation Impact Analysis, Proposed Tract No. 6452, Peters Engineering Group, February 8, 2024 page 16.

33 Transportation Impact Analysis, Proposed Tract No. 6452, Peters Engineering Group, February 8, 2024 page 10.

- Northbound: one left turn lane, one through lane, and one right turn lane
- Southbound: two left turn lanes, one through lane, and one right turn lane

With the recommended widening the intersection is expected to operate at LOS C during the a.m. peak hour and LOS D during the p.m. peak hour.

Bicycle Facilities

With regards to bicycle facilities, Figure C-2 of the 2014 Clovis General Plan does not indicate any planned bicycle or trail systems fronting the Project.

Consequently, the Project itself would help to facilitate improved circulation by adding a pedestrian sidewalk along N. Baron and Perrin Avenues fronting the site, which would provide a complete connection of sidewalk to the existing developments to the south the Project.

The traffic conditions above recommend improvements for each study intersection. With incorporation of improvements recommended for each scenario all study intersections will operate at satisfactory LOS levels thus, the Project, will not conflict with the Circulation Element of the 2014 General Plan. Consequently, a **less-than-significant** impact would occur. No mitigation measures are required.

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

Significant and Unavoidable Impact. Senate Bill 743 (SB 743) requires that relevant CEQA analysis of transportation impacts be conducted using a metric known as vehicle miles traveled (VMT) instead of level of service (LOS). VMT measures how much actual auto travel (additional miles driven) a proposed project would create on California roads. If the proposed project adds excessive car travel onto our roads, the proposed project may cause a significant transportation impact. Per CEQA Guidelines Section 15064.3(b)(4) a lead agency has discretion to choose the most appropriate methodology to evaluate a project's VMT, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's VMT, and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate VMT and any revisions to model outputs should be documented and explained in the environmental document prepared for the project.

On October 17, 2022, the City of Clovis adopted the Transportation Impact Analysis Guidelines (Guidelines), dated September 15, 2022. Consistent with CEQA Guidelines Section 15064.3, the City of Clovis has adopted thresholds of significance to determine when a project will have a significant transportation impact based on VMT. The City has developed screening criteria to streamline the analysis for projects that meet certain criteria. A project will require a detailed VMT analysis unless it meets at least one of the City's five screening criteria[34]:

- Small Projects that generate less than 500 vehicle trips per day (i.e., Single-Family Residential developments with less than 53 dwelling units).
- Provision of affordable housing
- Local-serving retail projects with areas of 100,000 square feet and below

34 Transportation Impact Analysis Guidelines, City of Clovis, September 15, 2022 page 4.

- Projects located in a High-Quality Transit Area (HQTA) as defined on page 8 of the City's Transportation Impact Analysis Guidelines

- Project located in low VMT area

The Project does not qualify for the screening criteria; therefore, shall be evaluated per Guidelines thresholds. The significance thresholds and specific VMT metrics are described on page 10 of the City's Transportation Impact Analysis Guidelines. Per the City's Transportation Impact Analysis Guidelines, the residential land use impact threshold is 14.1 VMT per capita. The Project will generate 17.9 VMT per capita which is greater than the threshold of 14.1 VMT per capita; therefore, the Project would create a significant transportation impact. Feasible mitigation measures must be identified to avoid or substantially reduce a significant impact under CEQA. Mitigation of VMT impacts typically requires changes in habits and behaviors of residents. Project design features that encourage mode shift from automobiles to transit or nonmotorized modes can potentially reduce project-specific VMT. The potential VMT reduction was estimated using the California Air Pollution Control Officers Association's (CAPCOA) *"Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity – Designed for Local Governments, Communities, and Project Developers"* dated December 2021.

The Project will implement feasible mitigation measures such as constructing one (1) mile of sidewalks and less than one (1) mile of Class II Bike Lane on Baron and Perrin Avenues; however, implementation of the Project design features described above only reduces the calculated Project VMT by up to approximately 1.7 percent. While the described mitigation measures can help offset a portion of the VMT impact, it will not reduce the impact to less than significant; therefore, the Project will have a **significant and unavoidable** transportation impact.

The City adopted a Supplemental Environmental Impact Report (SEIR) for the 2014 General Plan Circulation Element Update on October 17, 2022. The SEIR evaluated potential land uses consistent with the General Plan and their associated VMT impacts. The SEIR finds that implementation of the 2014 General Plan may result in VMT metrics that are greater than the applicable thresholds. Mitigation measures include policies to reduce VMT. Because the City cannot demonstrate that the implementation of these policies would achieve VMT reductions to meet the VMT thresholds, the impacts would remain significant and unavoidable. Therefore, following approval of the SEIR, individual land use development projects that are consistent with the 2014 General Plan have the opportunity to tier their environmental review from the General Plan SEIR pursuant to section 15152 of the CEQA Guidelines. The SEIR has disclosed the VMT impacts of land use development consistent with the General Plan. Therefore, significant and unavoidable VMT impacts associated with the General Plan have already been disclosed. Because the proposed Project is consistent with the 2014 General Plan, the Project's significant transportation impact does not require the preparation of a project specific EIR. Although the Project, has been determined to be consistent with the 2014 General Plan and is tiering from the SEIR, it would remain a **Significant and Unavoidable** 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)?*

Less-Than-Significant Impact. The Project would result in a significant impact if it would include features that would create a hazard such as a sharp curve in a new roadway, or create a blind corner or result in sight distance issues from entryways. Through the entitlement process, the Project would undergo review by multiple City divisions, such as Planning and Engineering, to ensure that the site layout conforms to existing regulations, such as the CMC, and other applicable codes, such as the fire code and building code. During this review, the Project would need to make the necessary corrections to ensure that no hazardous design features would result from the Project. Further, the main roadway network (N. Baron and Perrin Avenues) will be constructed to City roadway standards. Therefore, because the Project would undergo site plan and design review to ensure consistency and adherence to applicable design and site layout guidelines, a **less-than-significant** impact would occur and no mitigation measures are required.

d) *Would the project result in inadequate emergency access?*

Less-Than-Significant Impact. The Project would include two (2) ingress/egress access points to the proposed development, including access from N. Baron and Perrin Avenues. As part of the Project review, the Clovis Fire Department would review all plans to ensure adequate emergency access is provided. This review includes review for adequate roadway widths, turning radii, as well as adequate access to units and accessibility to water. Consequently, because the Project plans would be required by the CMC to be reviewed and approved by Clovis Fire Department and Police Department prior to construction, this impact would be **less than significant** and no mitigation measures are required.

18. TRIBAL CULTURAL RESOURCES

Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?				X
b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American Tribe?		X		

ENVIRONMENTAL SETTING

On September 25, 2014, Governor Jerry Brown signed Assembly Bill (AB52), which intends to protect a new class of recourse under CEQA. This new class is Tribal Cultural Resources and provides an avenue to identify Tribal Cultural resources through a consultation process. AB52 applies to all projects where a Notice of Determination is filed. Furthermore, the consultation process is required to be complete prior to filing a Notice of Intent.

City staff conducted Native American Consultation in compliance with AB52. In compliance with AB52, invitations for consultation were mailed on April 8, 2024, which affords Native tribes thirty (30) days to respond and to request consultation. During this timeframe, no requests for consultations were received.

The Cultural Study prepared by Applied EarthWorks, Inc. dated November 2023 (included a records search from the CHRIS SSJVIC, as well as desktop archival research.

DISCUSSION

a) *Would the project cause a substantial adverse change to a listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?*

No Impact. See discussion under Section 5a.

b) *Would the project cause a substantial adverse change to 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 Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American Tribe?*

Less-Than-Significant Impact With Mitigation. The site's ground has been minimally disturbed as a result of some light grading and the mowing of weeds and shrubs. Further, the Cultural Studyconcluded that there was no evidence of prehistoric archaeological sites, isolated artifacts, or other archaeological features.[35] However, the potential remains that tribal cultural resources could be inadvertently or accidentally uncovered during ground-disturbing activities such as trenching, digging, and the installation of utilities and other infrastructure.

Because there is the slight possibility for the accidental or inadvertent uncovering of tribal cultural resources during construction, Mitigation Measures TCR-1 and TCR-2 would serve to reduce those potential impacts by requiring the stopping of any work until any found artifacts can be properly removed and inventoried by a qualified archaeologist. Therefore, the Project would result in a **less-than-significant impact with mitigation**.

Mitigation Measure TCR-1: If archaeological or tribal resources or materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified professional archaeologist, can evaluate the significance of the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants.

If the qualified professional archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation.

If a potentially-eligible resource is encountered, then the qualified professional archaeologist, the Lead Agency, and the project proponent shall arrange for either 1) total avoidance of the resource or 2) test excavations to evaluate eligibility and, if eligible, total data recovery. The determination shall be formally documented in writing and submitted to the Lead Agency as verification that the provisions for managing unanticipated discoveries have been met.

Mitigation Measure TCR-2: If human remains are discovered during construction or operational activities, further excavation or disturbance shall be prohibited pursuant to Section 7050.5 of the California Health and Safety Code and Project shall follow the procedures and protocols set for un CEQA Guidelines Section 15064.4(e)(1). If human remains are identified to be those of Native American, California Health and Safety Code 7050.5 requires the County coroner notify the NAHC within 24 hours of discovery. All

35 Cultural Resource Study for the Clovis Tract 6452 prepared by Applied Earthworks, Inc., page 21, November 2023.

reports, correspondence, and determinations regarding the discovery of human remains on the project site shall be submitted to the Lead Agency.

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?			X	
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?			X	
c. Result in a determination by the wastewater treatment provider that 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?			X	
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?			X	
e. Comply with federal, state, and local management reduction statutes and regulations related to solid waste?			X	

ENVIRONMENTAL SETTING

Pacific Gas & Electric (PG&E) provides electricity and natural gas services in the City of Clovis. AT&T/SBC provides telephone service to the City.

The City's water supply sources include groundwater drawn from the Kings Sub-basin of the San Joaquin Valley Groundwater Basin and treated surface water from the FID. Surface water is treated at the City of Clovis Surface Water Treatment Facility.

The City of Clovis provides sewer collection service to its residents and businesses. Treatment of wastewater occurs at the Fresno-Clovis Regional Wastewater Treatment Plant (RWTP). The Fresno-Clovis RWTP is operated and maintained by the City of Fresno and operates under a waste discharge requirement issued by the Central Valley Regional Water Quality Control Board. Additionally, the City of Clovis has completed a 2.8 mgd wastewater treatment/water reuse facility, which will service the City's new growth areas.

The FMFCD has the responsibility for storm water management within the Fresno-Clovis metropolitan area of the Project site. Stormwater runoff that is generated by land development is controlled through a system of pipelines and storm drainage detention basins.

DISCUSSION

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 Project includes construction of 153 residential units. As mentioned above, the site is a use previously accounted for in the 2014 Clovis General Plan. Further, as part of the review process for the Project, the wastewater impacts will be evaluated by the City Engineer to ensure compliance with the City's Waste Water Master Plan, as well as FMFCD, so that the Project would not exceed wastewater treatment requirements such that a new facility would be required nor would the existing treatment facility need to be expanded. While the Project would introduce new units at this site, the type of development would be consistent with the land use designation and Zone District. Upon review and approval by the City Engineer, the Project would result in a **less-than-significant** impact. No mitigation measures are required.

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. The Project is of the type of development previously accounted for the in 2014 Clovis General Plan, and is adjacent to the south with existing urban uses which are served adequately with City water. The Project will be primarily served through surface water and will be required to purchase water allocation rights through Fresno Irrigation District. Therefore, the Project is anticipated to be adequately served by City water. Further, the Project would comply with current Green Building Codes, as well as the water efficient landscape policies with regards to water conserving features. Lastly, the Project would be required to comply several water conserving policies, such as Policy 3.4 and 3.5 of the Open Space and Conservation Element. Overall, a **less-than-significant** impact would occur with no mitigation measures.

c) *Would the project result in a determination by the wastewater treatment provider that 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. Because the Project is of the type previously planned and accounted for in the 2014 Clovis General Plan, it is not likely that the Project would result in a demand that would exceed the capacity of the wastewater treatment facility. Further, the Project is reviewed by the appropriate departments and agencies to ensure compliance and adequate capacity with regard to infrastructure, such as the ability to provide adequate wastewater treatment. Consequently, the impact would be **less than significant**. No mitigation measures are required.

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. The Project would introduce new solid waste throughout construction and operation of the Project. However, the Project would be required to comply with Chapter 6.3.1, Recycling and Diversion of Construction and Demolition Debris, of the CMC during construction. This section of the CMC requires that a minimum of fifty percent (50%) of waste tonnage from a project be diverted from disposal, and that all new residential (and commercial) construction within the City shall submit and obtain approval for a waste management plan prior to construction activities. Compliance with these measures would ensure that the Project does not result in a significant impact during the construction phase of the Project. Further, compliance with policies in the General Plan for the reduction and recycling of solid waste would serve to reduce impacts of solid waste by promoting and encouraging the recycling of materials. Lastly, according to the California Department of Resources Recycling and Recovery (CalRecycle), the City of Clovis has exceeded their target per resident disposal rate of 4.7 pounds per day per resident, meaning that Clovis residents are actually producing less solid waste than the target set by the State.[36] Consequently, a **less-than-significant** impact would occur. No mitigation measures are required.

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

Less-Than-Significant. See discussion 19d above.

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?			X	
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?			X	
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?			X	
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?			X	

ENVIRONMENTAL SETTING

The Project site is located on a vacant undeveloped site surrounded by existing residential homes at various densities to the south and east. The site's topography is generally flat and characterized primarily by low lying shrubs and grasses.

DISCUSSION

36 Calrecycle, City of Clovis, https://www2.calrecycle.ca.gov/LGCentral/DiversionProgram/JurisdictionDiversionPost2006, accessed April 17, 2024.

a) *Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?*

Less-Than-Significant Impact. The Project is located at a site that is surrounded by existing residential development to the south and east. Further, the road network is in construction and will be in place from previous development. Although the Project could result in temporary traffic detouring or closures during buildout, these delays would be temporary and would be coordinated with the City Engineering Division and other departments to ensure safe access to and from the area is maintained. Further, the site itself would be reviewed by City departments to ensure adequate site access and circulation is provided in the event of an emergency. Overall, a **less-than-significant** impact would occur with no mitigation measures.

b) *Would the project, 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?*

Less-Than-Significant Impact. The general vicinity of the site is flat, therefore, is not of the type of topography nor in a location likely to exacerbate wildfire risks. Additionally, the Project site is located in an area mapped by CAL FIRE as "unzoned" per the Fire Hazard Severity Zone Viewer, indicating the area is not located in an area within State Responsibility Areas into Fire Hazard Severity Zones. Further, the Project would be required to comply with the latest fire codes and would be required to include sprinklers on the interior of the homes and require installation of several hydrants throughout the site. Lastly, the site plans would undergo review by the Clovis Fire Department to ensure that all fire safety regulations are met. Project site is Therefore, a **less-than-significant** impact would occur with no mitigation measures.

c) *Would the project 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?*

Less-Than-Significant Impact. As a new development, installation of a private roadway network, water lines, and power lines would be required; however, these utilities and infrastructure are typical of residential development and would be constructed to standards of the respective agencies and departments which oversee them, as well as be required to comply all necessary plan review and permitting requirements of such departments and agencies. As such, a **less-than-significant** impact would occur. No mitigation measures are required.

d) *Would the project 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 City of Clovis is generally flat topography, and the site itself is in an area that is not in close proximity to hillsides such that it would expose people or structures to significant risks associates with downstream flooding or landslides as a result of runoff or post-fire slope instability. As such, **no impact** would occur.

21. MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the			X	

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

ENVIRONMENTAL SETTING

The Project is located within the sphere of influence of the City of Clovis, within the jurisdiction of the County of Fresno, substantially surrounded by existing development to the south.

DISCUSSION

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. As discussed above throughout the Initial Study, the Project would not result in any significant impacts with implementation of mitigation measures prescribed above. Therefore, the Project would have a **less-than-significant** impact as it would not substantially degrade the quality of the environment. No mitigation measures are required.

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. The Project includes mitigation measures in certain topic areas identified throughout this Initial Study, which would reduce potential impacts to a less-than-significant level. None of these impacts would be cumulatively considerable since most are either temporary impacts from construction or site specific. With the exception of air quality that is generally considered measurable cumulatively, the Project was found to have a less-than-significant impact as discussed in the GHG section of this Initial Study. As such, this Project would be required to comply with those same regulations, ensuring adequate mitigation as development occurs. Lastly, while the Project would introduce 153 new residential units to an existing vacant site, the type of use was previously accounted for in the 2014 Clovis General Plan buildout. Thus, a **less-than-significant** impact would occur with no mitigation measures.

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

Less-Than-Significant Impact. As discussed throughout the document, although the Project would result in a significant and unavoidable transportation impact; however, all other effects on human beings either directly or indirectly would not result in an impact that could not be mitigated to a less-than-significant level. Therefore, a **less-than-significant** impact would occur. No migration measures are required.

Report Preparation

LEAD AGENCY

Liz Salazar
Assistant Planner
City of Clovis
Planning & Development Services

TECHNICAL STUDIES

Air Quality and Greenhouse Impact Assessment
Wilde North at Hertiage Grove Residential Development
Georgiena Vivian, Project Manager
VRPA Technologies, Inc.

Biological Evaluation Report
Lennar Homes Tract 6452
Austin Pearson, Vice President
Rebekah Jenson, Senior Project Manager and Ecologist
Live Oak Associates, Inc.

Cultural Resource Study
Clovis Tract 6254 Residential Development, City of Clovis, Fresno County, California
Nicole Saenz
Applied EarthWorks, Inc.

Acoustical Analysis
Tract 6452
WJV Acoustics, Inc.

Traffic Impact Analysis
Proposed Tract 6452
Peters Engineering Group

MITIGATION MONITORING AND REPORTING PROGRAM
TM6452

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
Biological Resources				
BIO-1	**Swainson's Hawk.** If possible, construction activities should occur outside of the avian nesting season, typically defined as February 1 – August 31. If that is not feasible, pre-construction surveys shall occur if construction must occur between February 1 – August 31. A qualified biologist shall conduct surveys for active bird nests within seven (7) days prior to the start of work during this period. The survey area shall encompass the Project site and accessible surrounding lands within ¼ mile for nesting Swainson's hawk, 500 feet for other nesting raptors, and 250 feet for nesting birds. 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 are capable of foraging independently.	City of Clovis Planning	*Prior to Permits and During Construction*	
Cultural Resources				
CULT-1	If archaeological or tribal resources or materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified professional archaeologist, can evaluate	City of Clovis Planning	*Prior to Permits and During Construction*	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	the significance of the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified professional archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation. If a potentially-eligible resource is encountered, then the qualified professional archaeologist, the Lead Agency, and the project proponent shall arrange for either 1) total avoidance of the resource or 2) test excavations to evaluate eligibility and, if eligible, total data recovery. The determination shall be formally documented in writing and submitted to the Lead Agency as verification that the provisions for managing unanticipated discoveries have been met.			
CULT-2	If human remains are discovered during construction or operational activities, further excavation or disturbance shall be prohibited pursuant to Section 7050.5 of the California Health and Safety Code and Project shall follow the procedures and protocols set for un CEQA	City of Clovis Planning	*Prior to Permits and During Construction*	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	Guidelines Section 15064.4(e)(1). If human remains are identified to be those of Native American, California Health and Safety Code 7050.5 requires the County coroner notify the NAHC within 24 hours of discovery. All reports, correspondence, and determinations regarding the discovery of human remains on the project site shall be submitted to the Lead Agency.			
Geological Resources				
GEO-1	If prehistoric or historic-era cultural materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified professional archaeologist and/or paleontologist, can evaluate the significance of the find and make recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified professional determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation.	City of Clovis Planning	*Prior to Permits and During Construction*	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	If a potentially-eligible resource is encountered, then the qualified professional archaeologist and/or paleontologist, the Lead Agency, and the project proponent shall arrange for either 1) total avoidance of the resource or 2) test excavations to evaluate eligibility and, if eligible, total data recovery. The determination shall be formally documented in writing and submitted to the Lead Agency as verification that the provisions for managing unanticipated discoveries have been met.			
Greenhouse Gas Emissions				
GHG-1	In order to meet the 2022 Scoping Plan GHG requirements, consistent with State GHG reduction and equity prioritization goals, each residential unit shall provide electric vehicle charging capabilities as part of the final project designs.	City of Clovis Planning	*Prior to Permits and During Construction*	
Noise				
NOISE-1	Interior Noise. Mechanical ventilation or air conditioning shall be provided for all homes to enable windows and doors to remain closed for sound insulation purposes.	City of Clovis Planning	*During Construction and Prior to Occupancy*	
Tribal Cultural Resources				
TCR-1	If archaeological or tribal resources or materials are encountered during construction activities, all work in the immediate vicinity of the find shall halt until a qualified professional archaeologist, can evaluate the significance of the find and make	City of Clovis Planning	*Prior to Permits and During Construction*	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	recommendations. Cultural resource materials may include prehistoric resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified professional archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations may be required to mitigate adverse impacts from project implementation. These additional studies may include avoidance, testing, and evaluation or data recovery excavation. If a potentially-eligible resource is encountered, then the qualified professional archaeologist, the Lead Agency, and the project proponent shall arrange for either 1) total avoidance of the resource or 2) test excavations to evaluate eligibility and, if eligible, total data recovery. The determination shall be formally documented in writing and submitted to the Lead Agency as verification that the provisions for managing unanticipated discoveries have been met.			
TCR-2	If human remains are discovered during construction or operational activities, further excavation or disturbance shall be prohibited pursuant to Section 7050.5 of the California Health and Safety Code and Project shall follow the procedures and protocols set for un CEQA Guidelines Section 15064.4(e)(1). If human remains	City of Clovis Planning	*Prior to Permits and During Construction*	

Proposed Mitigation	Summary of Measure	Monitoring Responsibility	Timing	Verification (Date and Initials)
	are identified to be those of Native American, California Health and Safety Code 7050.5 requires the County coroner notify the NAHC within 24 hours of discovery. All reports, correspondence, and determinations regarding the discovery of human remains on the project site shall be submitted to the Lead Agency.			

Wilde North at Heritage Grove Residential Development

Air Quality & Greenhouse Gas Impact Assessment
January, 2024

Prepared by:
VRPA Technologies, Inc.
4630 W. Jennifer, Suite 105
Fresno, CA 93722
Project Manager: Georgiena Vivian

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1.0 Introduction

1.1 Description of the Region/Project

The proposed project aims to develop 153 single-family residential units in on Northern portion Clovis in unincorporated area of Fresno County. The project site spans approximately 18.23 acres of land and is situated in the northeast portion of Baron and Perrin Avenue within the sphere of influence of City of Clovis. It is positioned approximately 2.5 miles north of State Route (SR) 168 within the City of Clovis, which is located in Fresno County.

This Air Quality & Greenhouse Gas Impact Assessment has been prepared for the purpose of identifying potential project-specific or site-specific air quality impacts that may result from the Project. Figures 1 and 2 show the location of the Project long with major roadways and highways.

The City of Clovis is located in Fresno County one of the most polluted air basins in the country – the San Joaquin Valley Air Basin (SJVAB). The surrounding topography includes foothills and mountains to the east and west. These mountain ranges direct air circulation and dispersion patterns. Temperature inversions can trap air within the Valley, thereby preventing the vertical dispersal of air pollutants. In addition to topographic conditions, the local climate can also contribute to air quality problems. Climate in Fresno is characterized by hot, dry summers and cool winters with the notable presence of Tule fog.

1.2 Regulatory

Air quality within the Project area is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policymaking, education, and a variety of programs. The agencies primarily responsible for improving the air quality within the City of Clovis and Fresno County are discussed below along with their individual responsibilities.

1.2.1 *Federal Agencies*

✓ **U.S. Environmental Protection Agency (EPA)**

The Federal Clean Air Bill first adopted in 1967 and periodically amended since then, established federal ambient air quality standards. A 1987 amendment to the Bill set a deadline for the attainment of these standards. That deadline has since passed. The other Clean Air Act (CAA) Bill Amendments, passed in 1990, share responsibility with the State in reducing emissions from mobile sources. The U.S. Environmental Protection Agency (EPA) is responsible for enforcing the 1990 amendments.

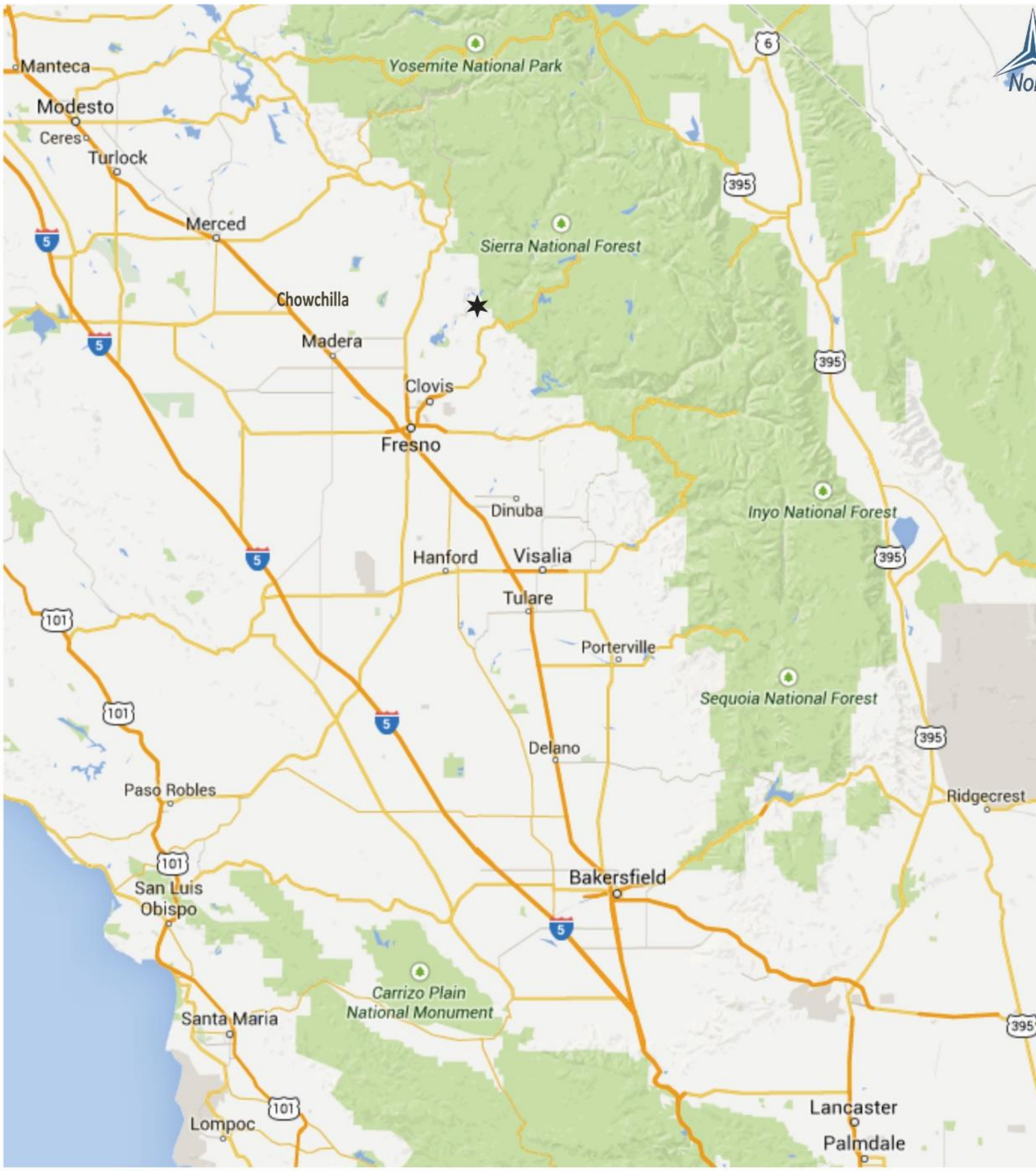
The CAA and the national ambient air quality standards identify levels of air quality for six "criteria" pollutants, which are considered the maximum levels of ambient air pollutants considered safe, with an adequate margin of safety, to protect public health and welfare. The six criteria pollutants include ozone, carbon monoxide (CO), nitrogen dioxide, sulfur dioxide, particulate matter, and lead.

CAA Section 176(c) (42 U.S.C. 7506(c)) and EPA transportation conformity regulations (40 CFR 93 Subpart A) require that each new RTP and Transportation Improvement Program (TIP) be demonstrated to conform to the State Implementation Plan (SIP) before the RTP and TIP are approved by the Metropolitan planning organization (MPO) or accepted by the U.S. Department of Transportation (DOT). The conformity analysis is a federal requirement designed to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). However, because the State Implementation Plan (SIP) for particulate matter 10 microns or less in diameter (PM10), particulate matter 2.5 microns or less in diameter (PM2.5), and Ozone address attainment of both the State and federal standards, for these pollutants, demonstrating conformity to the federal standards is also an indication of progress toward attainment of the State standards. Compliance with the State air quality standards is provided on the pages following this federal conformity discussion.

The EPA approved San Joaquin Valley reclassification of the ozone (8-hour) designation to extreme nonattainment in the Federal Register on May 5, 2010, even though the San Joaquin Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard. In accordance with the CAA, EPA uses the design value at the time of standard promulgation to assign nonattainment areas to one of several classes that reflect the severity of the nonattainment problem; classifications range from marginal nonattainment to extreme nonattainment. In the Federal Register on October 26, 2015, the EPA revised the primary and secondary standard to 0.070 parts per million (ppm) to provide increased public health protection against health effects associated with long- and short-term exposures. The previous ozone standard was set in 2010 at 0.075 ppm.

Fresno County is located in a nonattainment area for the 8-hour ozone standard, PM2.5 standard, and PM10 standard.

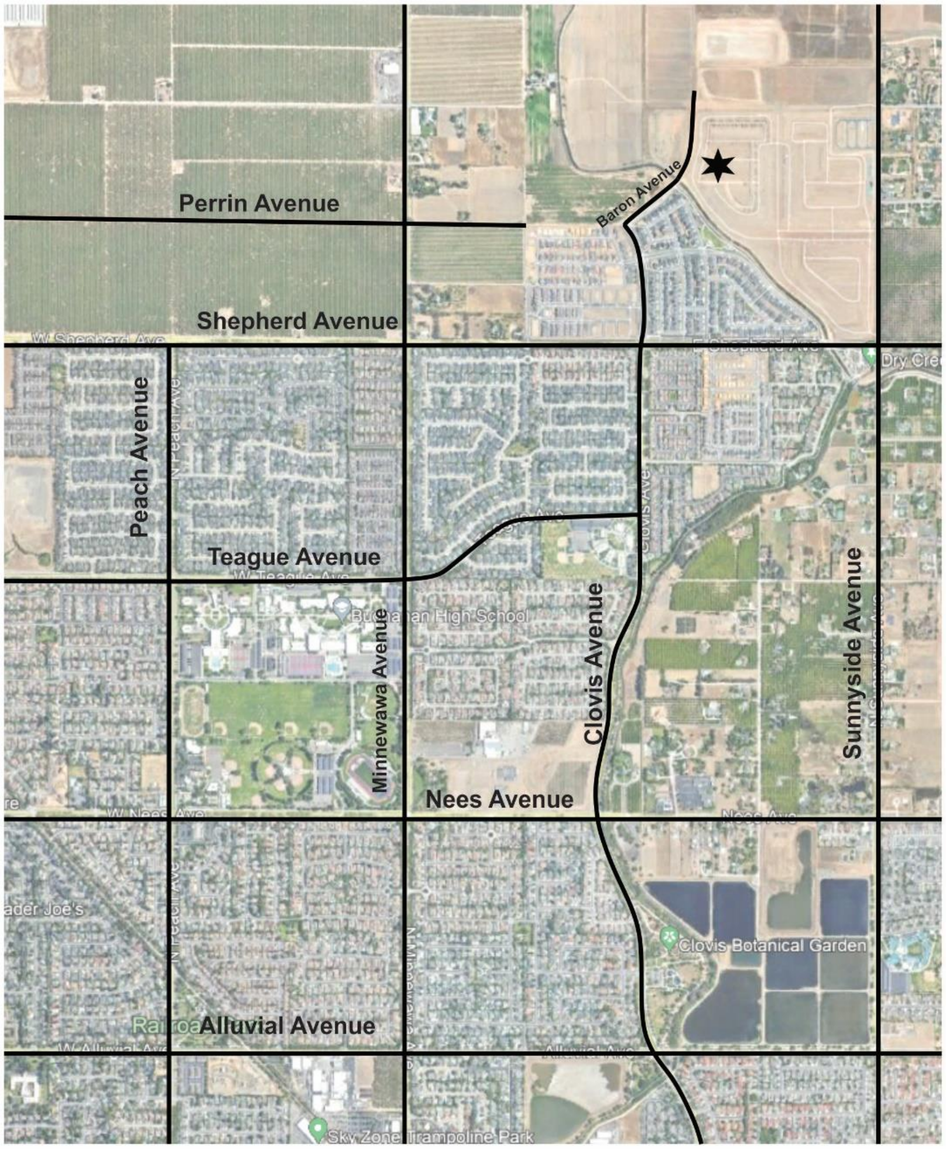
Wilde at North Heritage Grove Residential Development AQ/GHG **Figure 1**
Regional Location



LEGEND

★ Project Location

Wilde at North Heritage Grove Residential Development AQ/GHG **Figure**
Project Location **2**



LEGEND

✶	Project Location

North

1.2.2 *Federal Regulations*

- ✓ **National Environmental Policy Act (NEPA)**

NEPA provides general information on the effects of federally funded projects. The Act was implemented by regulations included in the Code of Federal Regulations (40CFR6). The code requires careful consideration concerning environmental impacts of federal actions or plans, including projects that receive federal funds. The regulations address impacts on land uses and conflicts with state, regional, or local plans and policies, among others. They also require that projects requiring NEPA review seek to avoid or minimize adverse effects of proposed actions and to restore and enhance environmental quality as much as possible.

- ✓ **State Implementation Plan (SIP)/ Air Quality Management Plans (AQMPs)**

To ensure compliance with the NAAQS, EPA requires states to adopt SIP aimed at improving air quality in areas of nonattainment or a Maintenance Plan aimed at maintaining air quality in areas that have attained a given standard. New and previously submitted plans, programs, district rules, state regulations, and federal controls are included in the SIPs. Amendments made in 1990 to the federal CAA established deadlines for attainment based on an area's current air pollution levels. States must enact additional regulatory programs for nonattainment's areas in order to adhere with the CAA Section 172. In California, the SIPs must adhere to both the NAAQS and the California Ambient Air Quality Standards (CAAQS).

To ensure that State and federal air quality regulations are being met, Air Quality Management Plans (AQMPs) are required. AQMPs present scientific information and use analytical tools to identify a pathway towards attainment of NAAQS and CAAQS. The San Joaquin Valley Air Pollution Control District (SJVAPCD) develops the AQMPs for the region where the Fresno Council of Governments(FCOG) operates. The regional air districts begin the SIP process by submitting their AQMPs to the California Air Resources Board (CARB). CARB is responsible for revising the SIP and submitting it to EPA for approval. EPA then acts on the SIP in the Federal Register. The items included in the California SIP are listed in the Code of Federal Regulations Title 40, Chapter 1, Part 52, Subpart 7, Section 52.220.

- ✓ **Transportation Control Measures**

One particular aspect of the SIP development process is the assessment of available transportation control measures (TCMs) as a part of making progress towards clean air goals. TCMs are defined in Section 108(f)(1) of the CAA and are strategies designed to reduce vehicle miles traveled, vehicle idling, and associated air pollution. These goals are generally achieved by developing attractive and convenient alternatives to single-occupant vehicle use. Examples of TCMs include ridesharing programs, transportation infrastructure improvements such as adding bicycle and carpool lanes, and expansion of public transit.

- **Energy Policy Act of 1992 (EPAct)**

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of alternative fueled vehicles (AFVs). States are also required by the act to consider a variety of incentive programs to help promote AFVs.

1.2.3 *State Agencies*

- **California Air Resources Board (CARB)**

CARB is the agency responsible for coordination and oversight of State and local air pollution control programs in California and for implementing its own air quality legislation called the California Clean Air Act (CCAA), adopted in 1988. CARB was created in 1967 from the merging of the California Motor Vehicle Pollution Control Board and the Bureau of Air Sanitation and its Laboratory.

CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the NAAQS established by the EPA. Whereas CARB has primary responsibility and produces a major part of the SIP for pollution sources that are statewide in scope, it relies on the local air districts to provide additional strategies for sources under their jurisdiction. CARB combines its data with all local district data and submits the completed SIP to the EPA. The SIP consists of the emissions standards for vehicular sources and consumer products set by CARB, and attainment plans adopted by the Air Pollution Control Districts (APCDs) and Air Quality Management District's (AQMDs) and approved by CARB.

States may establish their own standards, provided the State standards are at least as stringent as the NAAQS. California has established California Ambient Air Quality Standards (CAAQS) pursuant to California Health and Safety Code (CH&SC) [§39606(b)] and its predecessor statutes.

The CH&SC [§39608] requires CARB to "identify" and "classify" each air basin in the State on a pollutant-by-pollutant basis. Subsequently, CARB designated areas in California as nonattainment based on violations of the CAAQSs. Designations and classifications specific to the SJVAB can be found in the next section of this document. Areas in the State were also classified based on severity of air pollution problems. For each nonattainment class, the CCAA specifies air quality management strategies that must be adopted. For all nonattainment categories, attainment plans are required to demonstrate a five percent-per-year reduction in nonattainment air pollutants or their precursors, averaged every consecutive three-year period, unless an approved alternative measure of progress is developed. In addition, air districts in violation of CAAQS are required to prepare an Air Quality Attainment Plan (AQAP) that lays out a program to attain and maintain the CCAA mandates.

CARB, in consultation with MPOs, has provided each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. For the Fresno Council of Governments (FCOG) region, CARB set targets at six(6) percent per capita decrease in 2020 and a thirteen (13) percent per capita decrease in 2035 from a base year of 2005. FCOG's 2022 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was adopted in July 2022, projects that the Fresno County region would achieve the prescribed emissions targets.

Other CARB duties include monitoring air quality. CARB has established and maintains, in conjunction with local APCDs and AQMDs, a network of sampling stations (called the State and Local Air Monitoring [SLAMS] network), which monitor the present pollutant levels in the ambient air.

Fresno County is in the CARB-designated, SJVAB. A map of the SJVAB is provided in Figure 3. In addition to Fresno County, the SJVAB includes Kings, Kern, Madera, Merced, San Joaquin, Stanislaus, and Tulare Counties. Federal and State standards for criteria pollutants are provided in Table 1.

Wilde at North Heritage Grove Residential Development AQ/GHG **Figure 3**
San Joaquin Valley Air Basin

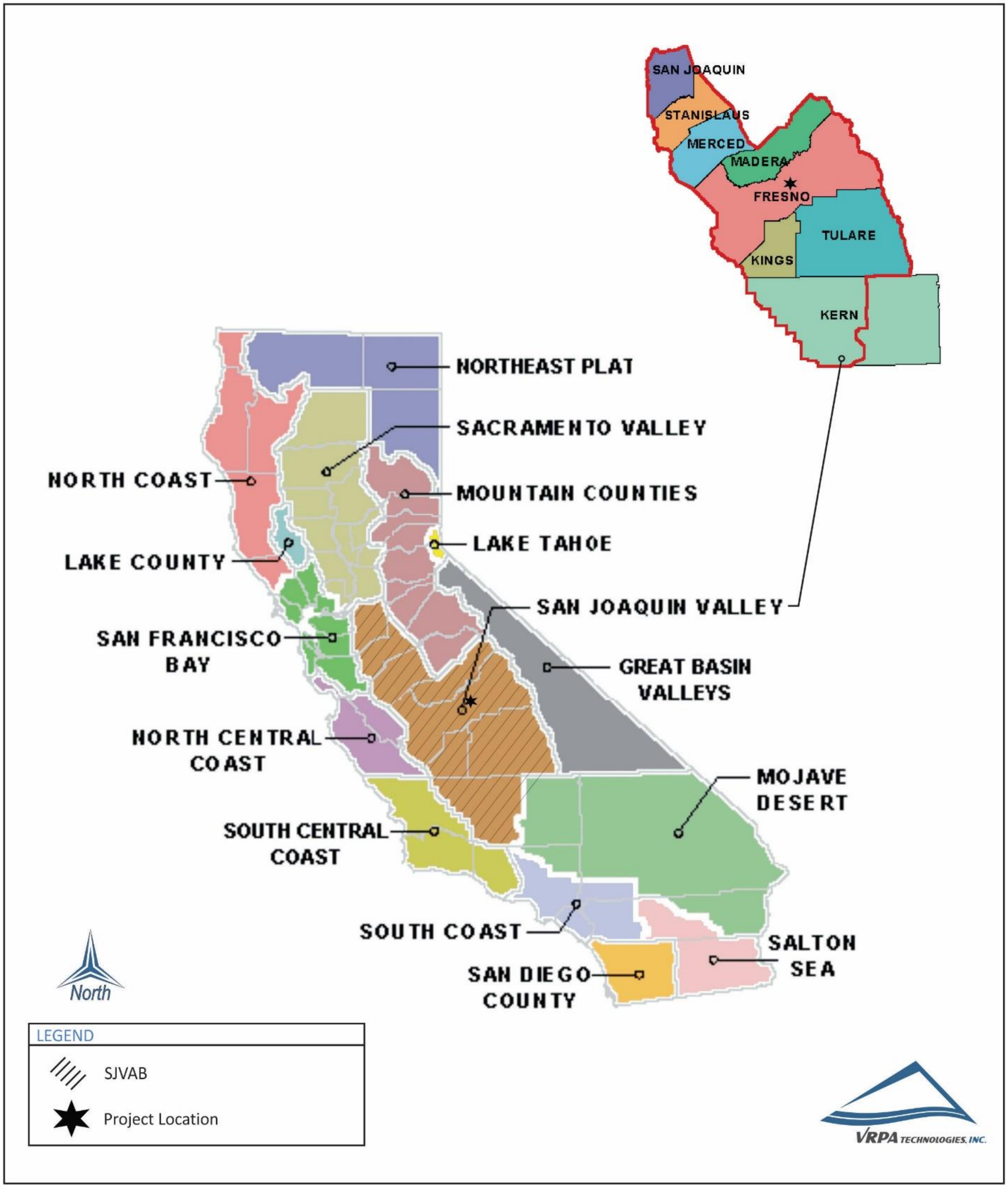


Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3) [8]	1 Hour	0.09 ppm (180 μg/m^3)	Ultraviolet Photometry	--	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 μg/m^3)		0.070 ppm (137 μg/m^3)		
Respirable Particulate Matter (PM10) [9]	24 Hour	50 μg/m^3	Gravimetric or Beta Attenuation	150 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 μg/m^3		--		
Fine Particulate Matter (PM2.5) [9]	24 Hour	--	--	35 μg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 μg/m^3	Gravimetric or Beta Attenuation	12.0 μg/m^3	15 μg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	--	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	--	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		--	--	
Nitrogen Dioxide (NO_2) [10]	1 Hour	0.18 ppm (339 μg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 μg/m^3)	--	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)		0.053 ppm (100 μg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2) [11]	1 Hour	0.25 ppm (655 μg/m^3)	Ultraviolet Fluorescence	75 ppb (196 μg/m^3)	--	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	--		--	0.5 ppm (1300 μg/m^3)	
	24 Hour	0.04 ppm (105 μg/m^3)		0.14 ppm (for cetain areas) [11]	--	
	Annual Arithmetic Mean	--		0.030 ppm (for cetain areas) [11]	--	
Lead [12,13]	30 Day Average	1.5 μg/m^3	Atomic Absorption	--	--	High Volume Sampler and Atomic Absorption
	Calendar Quarter	--		1.5 μg/m^3 (for certain areas)[11]	Same as Primary Standard	
	Rolling 3-Month Average	--		0.15 μg/m^3		
Visibility Reducing Particles [14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 μg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 μg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride [12]	24 Hour	0.01 ppm (26 μg/m^3)	Gas Chromatography			

See footnotes on next page ...

Footnotes:

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the U.S. EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the U.S. EPA.
8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
9. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 µg/m3 to 12.0 µg/m3. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 µg/m3, as was the annual secondary standard of 15 µg/m3. The existing 24-hour PM10 standards (primary and secondary) of 150 µg/m3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
11. On June 2, 2010, a new 1-hour SO2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

12. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
13. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

1.2.4 *State Regulations*

✓ **CARB Mobile-Source Regulation**

The State of California is responsible for controlling emissions from the operation of motor vehicles in the State. Rather than mandating the use of specific technology or the reliance on a specific fuel, CARB's motor vehicle standards specify the allowable grams of pollutant per mile driven. In other words, the regulations focus on the reductions needed rather than on the manner in which they are achieved.

✓ **California Clean Air Act**

The CCAA was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state's air quality goals, planning and regulatory strategies, and performance. The CCAA establishes more stringent ambient air quality standards than those included in the Federal CAA. CARB is the agency responsible for administering the CCAA. CARB established ambient air quality standards pursuant to the CH&SC [§39606(b)], which are similar to the federal standards. The SJVAPCD is one of 35 AQMDs that have prepared air quality management plans to accomplish a five percent (5%) annual reduction in emissions documenting progress toward the State ambient air quality standards.

✓ **Tanner Air Toxics Act**

California regulates Toxic Air Contaminants (TACs) primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and has adopted EPA's list of Hazardous Air Pollutants (HAPs) as TACs. Once a TAC is identified, CARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate Best Available Control Technology (BACT) to minimize emissions.

AB 2588 requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators).

These rules and standards provide for:

- More stringent emission standards for some new urban bus engines, beginning with 2002 model year engines.
- Zero-emission bus demonstration and purchase requirements applicable to transit agencies
- Reporting requirements under which transit agencies must demonstrate compliance with the urban transit bus fleet rule.

✓ **AB 1493 (Pavley)**

AB 1493 (Pavley) enacted on July 22, 2002, required CARB to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light duty trucks. Regulations adopted by CARB would apply to 2009 and later model year vehicles. CARB estimated that the regulation would reduce climate change emissions from light duty passenger vehicles by an estimated 18 percent in 2020 and by 27 percent in 2030 [Association of Environmental Professionals (AEP) 2007)]. In 2005, the CARB requested a waiver from U.S. EPA to enforce the regulation, as required under the CAA. Despite the fact that no waiver had ever been denied over a 40-year period, the then Administrator of the EPA sent Governor Schwarzenegger a letter in December 2007, indicating he had denied the waiver. On March 6, 2008, the waiver denial was formally issued in the Federal Register. Governor Schwarzenegger and several other states immediately filed suit against the federal government to reverse that decision. On January 21, 2009, CARB requested that EPA reconsider denial of the waiver. EPA scheduled a re-hearing on March 5, 2009. On June 30, 2009, EPA granted a waiver of CAA preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year.

✓ **Assembly Bill 32 (California Global Warming Solutions Act of 2006)**

California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 required that statewide GHG emissions be reduced to 1990 levels by 2020. December 31, 2020 is the deadline for achieving the 2020 GHG emissions cap. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state reduces GHG emissions enough to meet the cap. AB 32 also includes guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers are not unfairly affected by the reductions. Using these criteria to reduce statewide GHG emissions to 1990 levels by 2020 would represent an approximate 25 to 30 percent reduction in current emissions levels. However, CARB has discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that are not anticipated to significantly increase emissions.

CARB's 2017 Climate Change Scoping Plan builds on the efforts and plans encompassed in the initial Scoping Plan adopted in December of 2008. The current plan has identified new policies and actions to accomplish the State's 2030 GHG limit.

✓ **Senate Bill 375**

SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will prescribe land use allocation in that MPO's regional transportation plan. CARB, in consultation with MPOs, has provided each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. For the Fresno Council of Governments(FCOG), CARB set targets at six (6) percent per capita decrease in 2020 and a thirteen (13) percent per capita decrease in 2035 from a base year of 2018. FCOG 2022 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was adopted in July 2022, projects that the Fresno County region would achieve the prescribed emissions targets.

This law also extends the minimum time period for the regional housing needs allocation cycle from five years to eight years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required to be consistent with the regional transportation plan (and associated SCS or APS). However, new provisions of CEQA incentivize (through streamlining and other provisions) qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

✓ **Executive Order B-30-15**

Executive Order B-30-15, which was signed by Governor Brown in 2016, establishes a California greenhouse gas reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050. Executive Order B-30-15 requires MPO's to implement measures that will achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 greenhouse gas emissions reductions targets.

✓ **California Global Warming Solutions Act of 2006: emissions limit, or SB 32**

SB 32 is a California Senate bill expanding upon AB 32 to reduce greenhouse gas (GHG) emissions. SB 32 was signed into law on September 8, 2016, by Governor Brown. SB 32 sets into law the mandated reduction target in GHG emissions as written into Executive Order B-30-15. SB 32 requires that there be a reduction in GHG emissions to 40% below the 1990 levels by 2030. Greenhouse gas emissions include carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. The California Air Resources Board (CARB) is responsible for ensuring that California meets this goal. The provisions of SB 32 were added to Section 38566 of the Health and Safety Code subsequent to the bill's approval. The bill went into effect January 1, 2017. SB 32 builds onto Assembly Bill (AB) 32 written by Senator Fran Pavley and Assembly Speaker Fabian Nunez passed into law on September 27, 2006. AB 32 required California to reduce greenhouse gas emissions to 1990 levels by 2020 and SB 32 continues that timeline to reach the targets set in Executive Order B-30-15. SB 32 provides another intermediate target between the 2020 and 2050 targets set in Executive Order S-3-05.

1.2.5 *Regional Agencies*

✓ **San Joaquin Valley Air Pollution Control District**

The SJVAPCD is the agency responsible for monitoring and regulating air pollutant emissions from stationary, area, and indirect sources within Fresno County and throughout the SJVAB. The District also has responsibility for monitoring air quality and setting and enforcing limits for source emissions. CARB is the agency with the legal responsibility for regulating mobile source emissions. The District is precluded from such activities under State law.

The District was formed in mid-1991 and prepared and adopted the San Joaquin Valley Air Quality Attainment Plan (AQAP), dated January 30, 1992, in response to the requirements of the State CCAA. The CCAA requires each non-attainment district to reduce pertinent air contaminants by at least five percent (5%) per year until new, more stringent, 1988 State air quality standards are met.

Activities of the SJVAPCD include the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, issuance of permits for stationary sources of air pollution, inspection of stationary sources of air pollution and response to citizen complaints, monitoring of ambient air quality and meteorological conditions, and implementation of programs and regulations required by the FCAA and CCAA.

The SJVAPCD has prepared the following State Implementation Plans to address ozone, PM-10 and PM2.5 that currently apply to non-attainment areas:

- The 2016 Ozone Plan (2008 standard) was adopted by SJVAPCD on June 16, 2016 and subsequently adopted by ARB on July 21, 2016.

- The 2013 1-Hour Ozone Plan (revoked 1997 standard) was adopted by the SJVAPCD on September 19, 2013. EPA withdrew its approval of the plan due to litigation. The District plans to submit a "redesignation substitute" to EPA to maintain its attainment status for this revoked ozone standard.

- The 2007 PM-10 Maintenance Plan (as revised in 2015) was approved by EPA on July 8, 2016 (effective September 30, 2016).

- The 2012 PM2.5 Plan (as revised in 2015) was approved by EPA on August 16, 2016 (effective September 30, 2016).

The SJVAPCD Plans identified above represent SJVAPCD's plan to achieve both state and federal air quality standards. The regulations and incentives contained in these documents must be legally enforceable and permanent. These plans break emissions reductions and compliance into different emissions source categories.

The SJVAPCD also prepared the *Guide for Assessing and Mitigation Air Quality Impacts* (GAMAQI), dated March 19, 2015. The GAMAQI is an advisory document that provides Lead Agencies, consultants, and project applicants with analysis guidance and uniform procedures for addressing air quality impacts in environmental documents. Local jurisdictions are not required to utilize the methodology outlined therein. This document describes the criteria that SJVAPCD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for determining whether or not projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts.

1.2.6 *Regional Regulations*

The SJVAPCD has adopted numerous rules and regulations to implement its air quality plans. Following, are significant rules that will apply to the Project.

✓ **Regulation VIII – Fugitive PM10 Prohibitions**

Regulation VIII is comprised of District Rules 8011 through 8081, which are designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and track out, landfill operations, etc. The proposed Project will be required to comply with this regulation. Regulation VIII control measures are provided below:

1. *All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.*
2. *All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.*

3. *All land clearing, grubbing, scraping, excavation, land leveling, grading, cut & fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.*
4. *When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.*
5. *All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.*
6. *Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.*
7. *Within urban areas, track out shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.*

✓ **Rule 8021 – Construction, Demolition, Excavation, and Other Earthmoving Activities**

District Rule 8021 requires owners or operators of construction projects to submit a Dust Control Plan to the District if at any time the project involves non-residential developments of five or more acres of disturbed surface area or moving, depositing, or relocating of more than 2,500 cubic yards per day of bulk materials on at least three days of the project or residential projects which include 10 or more acres of disturbed surface area. The proposed Project will meet these criteria and will be required to submit a Dust Control Plan to the District in order to comply with this rule.

✓ **Rule 4641 – Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations**

If asphalt paving will be used, then paving operations of the proposed Project will be subject to Rule 4641. This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations.

✓ **Rule 9510 – Indirect Source Review (ISR)**

The purpose of this rule is to fulfill the District's emission reduction commitments in the PM10 and Ozone Attainment Plans, achieve emission reductions from construction activities, and to provide a mechanism for reducing emissions from the construction of and use of development projects through off-site measures. The rule is expected to reduce nitrogen oxides and particulates throughout the San Joaquin Valley by more than 10 tons per day.

1.2.7 *Local Plans*

✓ **City of Clovis General Plan**

California State Law requires every city and county to adopt a comprehensive General Plan to guide its future development. The General Plan essentially serves as a "constitution for development"— the document that serves as the foundation for all land use decisions. The City of Clovis 2035 General Plan Update (2014) includes various elements, including air quality and greenhouse gases, that address local concerns and provides goals and policies to achieve its development goals.

2.0 Environmental Setting

This section describes existing air quality within the San Joaquin Valley Air Basin and in Fresno County, including the identification of air pollutant standards, meteorological and topological conditions affecting air quality, and current air quality conditions. Air quality is described in relation to ambient air quality standards for criteria pollutants such as, ozone, carbon monoxide, and particulate matter. Air quality can be directly affected by the type and density of land use change and population growth in urban and rural areas.

2.1 Geographical Location

The SJVAB is comprised of eight counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. Encompassing 24,840 square miles, the San Joaquin Valley is the second largest air basin in California. Cumulatively, counties within the Air Basin represent approximately 16 percent of the State's geographic area. The Air Basin is bordered by the Sierra Nevada Mountains on the east (8,000 to 14,492 feet in elevation), the Coastal Range on the west (4,500 feet in elevation), and the Tehachapi Mountains on the south (9,000 feet elevation). The San Joaquin Valley is open to the north extending to the Sacramento Valley Air Basin.

2.2 Topographic Conditions

Fresno County is located within the San Joaquin Valley Air Basin [as determined by the California Air Resources Board (CARB)]. Air basins are geographic areas sharing a common "air shed." A description of the Air Basin in the County, as designated by CARB, is provided in the paragraph below. Air pollution is directly related to the region's topographic features, which impact air movement within the Basin.

Wind patterns within the SJVAB result from marine air that generally flows into the Basin from the San Joaquin River Delta. The Coastal Range hinders wind access into the Valley from the west, the Tehachapi's prevent southerly passage of airflow, and the high Sierra Nevada Mountain Range provides a significant barrier to the east. These topographic features result in weak airflow that becomes restricted vertically by high barometric pressure over the Valley. As a result, the SJVAB is highly susceptible to pollutant accumulation over time. Most of the surrounding mountains are above the normal height of summer inversion layers (1,500-3,000 feet).

2.3 Climate Conditions

Fresno is located in one of the most polluted air basins in the country. Temperature inversions can trap air within the Valley, thereby preventing the vertical dispersal of air pollutants. In addition to topographic conditions, the local climate can also contribute to air quality problems. Climate in Fresno is characterized by warm, dry summers and cool winters with significant Tule fog.

Ozone, classified as a "regional" pollutant, often afflicts areas downwind of the original source of precursor emissions. Ozone can be easily transported by winds from a source area. Peak ozone levels tend to be higher in the southern portion of the Valley, as the prevailing summer winds sweep precursors downwind of northern source areas before concentrations peak. The separate designations reflect the fact that ozone precursor transport depends on daily meteorological conditions.

Other primary pollutants, carbon monoxide (CO), for example, may form high concentrations when wind speed is low. During the winter, Fresno experiences cold temperatures and calm conditions that increase the likelihood of a climate conducive to high CO concentrations.

Precipitation and fog tend to reduce or limit some pollutant concentrations. Ozone needs sunlight for its formation, and clouds and fog block the required radiation. CO is slightly water-soluble, so precipitation and fog tends to "reduce" CO concentrations in the atmosphere. PM10 is somewhat "washed" from the atmosphere with precipitation. Precipitation in the San Joaquin Valley is strongly influenced by the position of the semi-permanent subtropical high-pressure belt located off the Pacific coast. In the winter, this high- pressure system moves southward, allowing Pacific storms to move through the San Joaquin Valley. These storms bring in moist, maritime air that produces considerable precipitation on the western, upslope side of the Coast Ranges. Significant precipitation also occurs on the western side of the Sierra Nevada. On the valley floor, however, there is some down slope flow from the Coast Ranges and the resultant evaporation of moisture from associated warming results in a minimum of precipitation. Nevertheless, the majority of the precipitation falling in the San Joaquin Valley is produced by those storms during the winter. Precipitation during the summer months is in the form of convective rain showers and is rare. It is usually associated with an influx of moisture into the San Joaquin Valley through the San Francisco area during an anomalous flow pattern in the lower layers of the atmosphere. Although the hourly rates of precipitation from these storms may be high, their rarity keeps monthly totals low.

Precipitation on the San Joaquin Valley floor and in the Sierra Nevada decreases from north to south. Stockton in the north receives about 20 inches of precipitation per year, Fresno in the center, receives about 10 inches per year, and Bakersfield at the southern end of the valley receives less than 6 inches per year. This is primarily because the Pacific storm track often passes through the northern part of the state while the southern part of the state remains protected by the Pacific High. Precipitation in the San Joaquin Valley Air Basin (SJVAB) is confined primarily to the winter months with some also occurring in late summer and fall. Average annual rainfall for the entire San Joaquin Valley is approximately 5 to 16 inches. Snowstorms, hailstorms, and ice storms occur infrequently in the San Joaquin Valley and severe occurrences of any of these are very rare.

The winds and unstable air conditions experienced during the passage of storms result in periods of low pollutant concentrations and excellent visibility. Between winter storms, high pressure and light winds allow cold moist air to pool on the San Joaquin Valley floor. This creates strong low-level temperature inversions and very stable air conditions. This situation leads to the San Joaquin Valley's famous Tule Fogs. The formation of natural fog is caused by local cooling of the atmosphere until it is saturated (dew point temperature). This type of fog, known as radiation fog, is more likely to occur inland. Cooling may also be accomplished by heat radiation losses or by horizontal movement of a mass of air over a colder surface. This second type of fog, known as advection fog, generally occurs along the coast.

Conditions favorable to fog formation are also conditions favorable to high concentrations of CO and PM10. Ozone levels are low during these periods because of the lack of sunlight to drive the photochemical reaction. Maximum CO concentrations tend to occur on clear, cold nights when a strong surface inversion is present and large numbers of fireplaces are in use. A secondary peak in CO concentrations occurs during morning commute hours when a large number of motorists are on the road and the surface inversion has not yet broken.

The water droplets in fog, however, can act as a sink for CO and nitrogen oxides (NOx), lowering pollutant concentrations. At the same time, fog could help in the formation of secondary particulates such as ammonium sulfate. These secondary particulates are believed to be a significant contributor of winter season violations of the PM10 and PM2.5 standards.

2.4 Anthropogenic (Man-made) Sources

In addition to climatic conditions (wind, lack of rain, etc.), air pollution can be caused by anthropogenic or man-made sources. Air pollution in the SJVAB can be directly attributed to human activities, which cause air pollutant emissions. Human causes of air pollution in the Valley consist of population growth, urbanization (gas-fired appliances, residential wood heaters, etc.), mobile sources (i.e., cars, trucks, airplanes, trains, etc.), oil production, agriculture, and other socioeconomic activities. The most significant factors, which are accelerating the decline of air quality in the SJVAB, are the Valley's rapid population growth and its associated increases in traffic, urbanization, and industrial activity.

Carbon monoxide emissions overwhelmingly come from mobile sources in the San Joaquin Valley; on-road vehicles contributed 34 percent, while other mobile vehicles, such as trains, planes, and off-road vehicles, contribute another 20 percent in 2012 according to emission projections from the CARB. Motor vehicles account for significant portions of regional gaseous and particulate emissions. Local large employers such as industrial plants can also generate substantial regional gaseous and particulate emissions. In addition, construction and agricultural activities can generate significant temporary gaseous and particulate emissions (dust, ash, smoke, etc.).

Ozone is the result of a photochemical reaction between Oxides of nitrogen (NOx) and Reactive Organic Gases (ROG). Mobile sources contribute 84 percent of all NOx emitted from anthropogenic sources based on data provided in Appendix B of the Air District's 2016 Ozone

Plan. In addition, mobile sources contribute 26 percent of all the ROG emitted from sources within the San Joaquin Valley.

The principal factors that affect air quality in and around Fresno are:

1. The sink effect, climatic subsidence and temperature inversions and low wind speeds
2. Automobile and truck travel
3. Increases in mobile and stationary pollutants generated by local urban growth

Automobiles, trucks, buses and other vehicles using hydrocarbon (HC) fuels release exhaust products into the air. Each vehicle by itself does not release large quantities; however, when considered as a group, the cumulative effect is significant.

Other sources may not seem to fit into any one of the major categories or they may seem to fit in a number of them. These could include agricultural uses, dirt roads, animal shelters; animal feed lots, chemical plants and industrial waste disposal, which may be a source of dust, odors, or other pollutants. For Fresno County, this category includes several agriculturally related activities, such as plowing, harvesting, dusting with herbicides and pesticides and other related activities. Finally, industrial contaminants and their potential to produce various effects depend on the size and type of industry, pollution controls, local topography, and meteorological conditions. Major sources of industrial emissions in Fresno County consist of agricultural production and processing operations.

The primary contributors of PM10 emissions in the San Joaquin Valley are farming activities (22%) and road dust, both paved and unpaved (35%) in 2020 according to emission projections from the CARB. Fugitive windblown dust from “open” fields contributed 14 percent of the PM10.

The four major sources of air pollutant emissions in the SJVAB include industrial plants, motor vehicles, construction activities, and agricultural activities. Industrial plants account for significant portions of regional gaseous and particulate emissions. Motor vehicles, including those from large employers, generate substantial regional gaseous and particulate emissions. Finally, construction and agricultural activities can generate significant temporary gaseous and particulate emissions (dust, ash, smoke, etc.). In addition to these primary sources of air pollution, urban areas upwind from Fresno County including areas north and west of the San Joaquin Valley, can cause or generate emissions that are transported into Fresno County. All four of the major pollutant sources affect ambient air quality throughout the Air Basin.

2.4.1 *Motor Vehicles*

Automobiles, trucks, buses and other vehicles using hydrocarbon fuels release exhaust products into the air. Each vehicle by itself does not release large quantities; however, when considered as a group, the cumulative effect is significant.

2.4.2 *Agricultural and Other Miscellaneous Activities*

Other sources may not seem to fit into any one of the major categories or they may seem to fit in a number of them. These could include agricultural uses, dirt roads, animal shelters, animal feed lots, chemical plants and industrial waste disposal, which may be a source of dust, odors, or other pollutants. For Fresno, this category includes several agriculturally related activities, such as plowing, harvesting, dusting with herbicides and pesticides and other related activities.

2.4.3 *Industrial Plants*

Industrial contaminants and their potential to produce various effects depend on the size and type of industry, pollution controls, local topography, and meteorological conditions. Major sources of industrial emissions in Fresno County consist of agricultural production and processing operations.

2.5 San Joaquin Valley Air Basin Monitoring

SJVAPCD and the CARB maintain numerous air quality monitoring sites throughout each County in the Air Basin to measure ozone, PM2.5, and PM10. It is important to note that the federal ozone 1-hour standard was revoked by the EPA and is no longer applicable for federal standards. The closest monitoring station to the Project is located at Clovis-N Villa Avenue Monitoring Station. The station monitors particulates, ozone, carbon monoxide, and nitrogen dioxide. Monitoring data for the past three years is summarized in Table 2.

Table 3 identifies the Fresno County's attainment status. As indicated, the SJVAB is nonattainment for Ozone (1 hour and 8 hour) and PM. In accordance with the FCAA, EPA uses the design value at the time of standard promulgation to assign nonattainment areas to one of several classes that reflect the severity of the nonattainment problem; classifications range from marginal nonattainment to extreme nonattainment. The FCAA contains provisions for changing the classifications using factors such as clean air progress rates and requests from States to move areas to a higher classification.

On April 16, 2004 EPA issued a final rule classifying the SJVAB as extreme nonattainment for Ozone, effective May 17, 2004 (69 FR 20550). The (federal) 1-hour ozone standard was revoked on June 6, 2005. However, many of the requirements in the 1-hour attainment plan (SIP) continue to apply to the SJVAB. The current ozone plan is the (federal) 8-hour ozone plan adopted in 2007. The SJVAB was reclassified from a "serious" nonattainment area for the 8-hour ozone standard to “extreme” effective June 4, 2010.

Table 2
Maximum Pollutant Levels at Clovis
Clovis-N Villa Monitoring Station

Pollutant	Time Averaging	2020 Maximums	2021 Maximums	2022 Maximums	Standards National	Standards State
Ozone (O_3)	1 hour	0.142 ppm	0.123 ppm	0.109 ppm	0.119 ppm	0.114 ppm
Ozone (O_3)	8 hour	0.108ppm	0.1 ppm	0.084 ppm	0.070 ppm	0.070 ppm
Nitrogen Dioxide (NO_2)	1 hour	54 ppm	49 ppm	51 ppm	51 ppm	60 ppm
Nitrogen Dioxide (NO_2)	Annual Average	9 ppm	8 ppm	9 ppm	8 ppm	8 ppm
Particulates (PM_{10})	24 hour	296.4 $\mu g/m^3$	281.0 $\mu g/m^3$	116.1 $\mu g/m^3$	42 $\mu g/m^3$	48 $\mu g/m^3$
Particulates (PM_{10})	Federal Annual Arithmetic Mean	45.8 $\mu g/m^3$	37.6 $\mu g/m^3$	35.5 $\mu g/m^3$	-	18 $\mu g/m^3$
Particulates ($PM_{2.5}$)	24 hour	193.7 $\mu g/m^3$	104.6 $\mu g/m^3$	41.9 $\mu g/m^3$	15.5 $\mu g/m^3$	-
Particulates ($PM_{2.5}$)	Federal Annual Arithmetic Mean	18.4 µg/m3	15.1 µg/m3	10.5 µg/m3	-	18 µg/m3

Source: California Air Resources Board (ADAM) Air Pollution Summaries

"-"represents insufficient data available to determine the value.

Table 3
Fresno County Attainment Status

Pollutant	Designation/Classification	
	Federal Standards	State Standards
Ozone - 1 Hour	Revoked in 2005	Nonattainment
Ozone - 8 Hour	Nonattainment/Extreme	No State Standard
PM10	Attainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
Carbon Monoxide	Unclassified/Attainment	Unclassified
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Unclassified/Attainment	Attainment
Lead (Particulate)	Unclassified/Attainment	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified

Source: CARB Website, 2023

a. Though the Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

Notes:

National Designation Categories

Non-Attainment Area: Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.

Unclassified/Attainment Area: Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant or meets the national primary or secondary ambient air quality standard for the pollutant.

State Designation Categories

Unclassified: A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or non-attainment.

Attainment: A pollutant is designated attainment if the State standard for that pollutant was not violated at any site in the area during a three-year period.

Non-attainment: A pollutant is designated non-attainment if there was at least one violation of a State standard for that pollutant in the area.

Non-Attainment/Transitional: A subcategory of the non-attainment designation. An area is designated non-attainment/transitional to signify that the area is close to attaining the standard for the pollutant.

2.6 Air Quality Standards

The FCAA, first adopted in 1963, and periodically amended since then, established National Ambient Air Quality Standards (NAAQS). A set of 1977 amendments determined a deadline for the attainment of these standards. That deadline has since passed. Other CAA amendments, passed in 1990, share responsibility with the State in reducing emissions from mobile sources.

In 1988, the State of California passed the CCAA (State 1988 Statutes, Chapter 568), which set forth a program for achieving more stringent California Ambient Air Quality Standards. The CARB implements State ambient air quality standards, as required in the CCAA, and cooperates with the federal government in implementing pertinent sections of the FCAA Amendments (FCAAA). Further, CARB regulates vehicular emissions throughout the State. The SJVAPCD regulates stationary sources, as well as some mobile sources. Attainment of the more stringent State PM10 Air Quality Standards is not currently required.

The EPA uses six "criteria pollutants" as indicators of air quality and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called the NAAQS.

The SJVAPCD operates regional air quality monitoring networks that provide information on average concentrations of pollutants for which State or federal agencies have established ambient air quality standards. Descriptions of nine pollutants of importance in Fresno County follow.

2.6.1 *Ozone (1-hour and 8-hour)*

The most severe air quality problem in the Air Basin is the high level of ozone. Ozone occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. Here, ground level, or "bad" ozone, is an air pollutant that damages human health, vegetation, and many common materials. It is a key ingredient of urban smog. The troposphere extends to a level about 10 miles up, where it meets the second layer, the stratosphere. The stratospheric, or "good" ozone layer, extends upward from about 10 to 30 miles and protects life on earth from the sun's harmful ultraviolet rays.

"Bad" ozone is what is known as a photochemical pollutant. It needs reactive organic gases (ROG), NOx, and sunlight. ROG and NOx are emitted from various sources throughout Fresno County. In order to reduce ozone concentrations, it is necessary to control the emissions of these ozone precursors.

Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins.

Ozone is a regional air pollutant. It is generated over a large area and is transported and spread by wind. Ozone, the primary constituent of smog, is the most complex, difficult to control, and pervasive of the criteria pollutants. Unlike other pollutants, ozone is not emitted directly into the air by specific sources. Ozone is created by sunlight acting on other air pollutants (called precursors), specifically NOx and ROG. Sources of precursor gases to the photochemical reaction that form ozone number in the thousands. Common sources include consumer products, gasoline vapors, chemical solvents, and combustion products of various fuels. Originating from gas stations, motor vehicles, large industrial facilities, and small businesses such as bakeries and dry cleaners, the ozone-forming chemical reactions often take place in another location, catalyzed by sunlight and heat. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins. Approximately 50 million people lived in counties with air quality levels above the EPA's health-based national air quality standard in 1994. The highest levels of ozone were recorded in Los Angeles, closely followed by the San Joaquin Valley. High levels also persist in other heavily populated areas, including the Texas Gulf Coast and much of the Northeast.

While the ozone in the upper atmosphere absorbs harmful ultraviolet light, ground-level ozone is damaging to the tissues of plants, animals, and humans, as well as to a wide variety of inanimate materials such as plastics, metals, fabrics, rubber, and paints. Societal costs from ozone damage include increased medical costs, the loss of human and animal life, accelerated replacement of industrial equipment, and reduced crop yields.

✓ ***Health Effects***

While ozone in the upper atmosphere protects the earth from harmful ultraviolet radiation, high concentrations of ground-level ozone can adversely affect the human respiratory system. Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems, such as: forests and foothill communities; agricultural crops; and some man-made materials, such as rubber, paint, and plastic. High levels of ozone may negatively affect immune systems, making people more susceptible to respiratory illnesses, including bronchitis and pneumonia. Ozone accelerates aging and exacerbates pre-existing asthma and bronchitis and, in cases with high concentrations, can lead to the development of asthma in active children. Active people, both children and adults, appear to be more at risk from ozone exposure than those with a low level of activity. Additionally, the elderly and those with respiratory disease are also considered sensitive populations for ozone.

People who work or play outdoors are at a greater risk for harmful health effects from ozone. Children and adolescents are also at greater risk because they are more likely than adults to spend time engaged in vigorous activities. Research indicates that children under 12 years of age spend nearly twice as much time outdoors daily than adults. Teenagers spend at least twice as much time as adults in active sports and outdoor activities. In addition, children inhale more air per pound of body weight than adults, and they breathe more rapidly than adults. Children are less likely than adults to notice their own symptoms and avoid harmful exposures.

Ozone is a powerful oxidant—it can be compared to household bleach, which can kill living cells (such as germs or human skin cells) upon contact. Ozone can damage the respiratory tract, causing inflammation and irritation, and it can induce symptoms such as coughing, chest tightness, shortness of breath, and worsening of asthmatic symptoms. Ozone in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. Exposure to levels of ozone above the current ambient air quality standard leads to lung inflammation and lung tissue damage and a reduction in the amount of air inhaled into the lungs.

The CARB found ozone standards in Fresno County nonattainment of Federal and State standards.

2.6.2 *Suspended PM (PM10 and PM2.5)*

Particulate matter pollution consists of very small liquid and solid particles that remain suspended in the air for long periods. Some particles are large or concentrated enough to be seen as soot or smoke. Others are so small they can be detected only with an electron microscope. Particulate matter is a mixture of materials that can include smoke, soot, dust, salt, acids, and metals. Particulate matter is emitted from stationary and mobile sources, including diesel trucks and other motor vehicles; power plants; industrial processes; wood-burning stoves and fireplaces; wildfires; dust from roads, construction, landfills, and agriculture; and fugitive windblown dust. PM10 refers to particles less than or equal to 10 microns in aerodynamic diameter. PM2.5 refers to particles less than or equal to 2.5 microns in aerodynamic diameter and are a subset of PM10. Particulates of concern are those that are 10 microns or less in diameter. These are small enough to be inhaled, pass through the respiratory system and lodge in the lungs, possibly leading to adverse health effects.

In the western United States, there are sources of PM10 in both urban and rural areas. Because particles originate from a variety of sources, their chemical and physical compositions vary widely. The composition of PM10 and PM2.5 can also vary greatly with time, location, the sources of the material and meteorological conditions. Dust, sand, salt spray, metallic and mineral particles, pollen, smoke, mist, and acid fumes are the main components of PM10 and PM2.5. In addition to those listed previously, secondary particles can also be formed as precipitates from chemical and photochemical reactions of gaseous sulfur dioxide (SO2) and NOx in the atmosphere to create sulfates (SO4) and nitrates (NO3). Secondary particles are of greatest concern during the winter months where low inversion layers tend to trap the precursors of secondary particulates.

The District's 2008 PM2.5 Plan built upon the aggressive emission reduction strategy adopted in the 2007 Ozone Plan and strives to bring the valley into attainment status for the 1997 NAAQS for PM2.5. The District's 2012 PM2.5 Plan provides multiple control strategies to reduce emissions of PM2.5 and other pollutants that form PM2.5. The plan's comprehensive control strategy includes regulatory actions, incentive programs, technology advancement, policy and legislative positions, public outreach, participation and communication, and additional strategies.

✓ ***Health Effects***

PM10 and PM2.5 particles are small enough—about one-seventh the thickness of a human hair, or smaller—to be inhaled and lodged in the deepest parts of the lung where they evade the respiratory system's natural defenses. Health problems begin as the body reacts to these foreign particles. Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, and coughing, bronchitis, and respiratory illnesses in children. Recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Non-health-related effects include reduced visibility and soiling of buildings. PM10 can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. PM10 and PM2.5 can aggravate respiratory disease and cause lung damage, cancer, and premature death.

Although particulate matter can cause health problems for everyone, certain people are especially vulnerable to adverse health effects of PM10. These "sensitive populations" include children, the elderly, exercising adults, and those suffering from chronic lung disease such as asthma or bronchitis. Of greatest concern are recent studies that link PM10 exposure to the premature death of people who already have heart and lung disease, especially the elderly. Acidic PM10 can also damage manmade materials and is a major cause of reduced visibility in many parts of the United States.

The CARB found PM10 standards in Fresno County in attainment of Federal standards and nonattainment for State standards. The CARB found PM2.5 standards in Fresno County nonattainment of Federal and State standards.

2.6.3 *Carbon Monoxide (CO)*

Carbon monoxide (CO) is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. CO is an odorless, colorless, poisonous gas that is highly reactive. CO is a byproduct of motor vehicle exhaust, contributes more than two thirds of all CO emissions nationwide. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. These emissions can result in high concentrations of CO, particularly in local areas with heavy traffic congestion. Other sources of CO emissions include industrial processes and fuel combustion in sources such as boilers and incinerators. Despite an overall downward trend in concentrations and emissions of CO, some metropolitan areas still experience high levels of CO.

- ***Health Effects***

CO enters the bloodstream and binds more readily to hemoglobin than oxygen, reducing the oxygen-carrying capacity of blood and thus reducing oxygen delivery to organs and tissues. The health threat from CO is most serious for those who suffer from cardiovascular disease. Healthy individuals are also affected but only at higher levels of exposure. At high concentrations, CO can cause heart difficulties in people with chronic diseases and can impair mental abilities. Exposure to elevated CO levels is associated with visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, difficulty performing complex tasks, and in prolonged, enclosed exposure, death.

The adverse health effects associated with exposure to ambient and indoor concentrations of CO are related to the concentration of carboxyhemoglobin (COHb) in the blood. Health effects observed may include an early onset of cardiovascular disease; behavioral impairment; decreased exercise performance of young, healthy men; reduced birth weight; sudden infant death syndrome (SIDS); and increased daily mortality rate.

Most of the studies evaluating adverse health effects of CO on the central nervous system examine high-level poisoning. Such poisoning results in symptoms ranging from common flu and cold symptoms (shortness of breath on mild exertion, mild headaches, and nausea) to unconsciousness and death.

The CARB found CO standards in Fresno County as unclassified/attainment of Federal standards and attainment for State standards.

2.6.4 *Nitrogen Dioxide (NO2)*

Nitrogen oxides (NOx) is a family of highly reactive gases that are primary precursors to the formation of ground-level ozone and react in the atmosphere to form acid rain. NOx is emitted from combustion processes in which fuel is burned at high temperatures, principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. A brownish gas, NOx is a strong oxidizing agent that reacts in the air to form corrosive nitric acid, as well as toxic organic nitrates. EPA regulates only nitrogen dioxide (NO2) as a surrogate for this family of compounds because it is the most prevalent form of NOx in the atmosphere that is generated by anthropogenic (human) activities.[1]

1 United States Environmental Protection Agency (EPA), Nitrogen Oxides (NOx). Why and How They Are Controlled, 456/F-99-006R, November 2019

- ***Health Effects***

NOx is an ozone precursor that combines with Reactive Organic Gases (ROG) to form ozone. See the ozone section above for a discussion of the health effects of ozone.

Direct inhalation of NOx can also cause a wide range of health effects. NOx can irritate the lungs, cause lung damage, and lower resistance to respiratory infections such as influenza. Short-term exposures (e.g., less than 3 hours) to low levels of nitrogen dioxide (NO2) may lead to changes in airway responsiveness and lung function in individuals with preexisting respiratory illnesses. These exposures may also increase respiratory illnesses in children. Long-term exposures to NO2 may lead to increased susceptibility to respiratory infection and may cause irreversible alterations in lung structure. Other health effects associated with NOx are an increase in the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO2 may lead to eye and mucus membrane aggravation, along with pulmonary dysfunction. NOx can cause fading of textile dyes and additives, deterioration of cotton and nylon, and corrosion of metals due to production of particulate nitrates. Airborne NOx can also impair visibility. NOx is a major component of acid deposition in California. NOx may affect both terrestrial and aquatic ecosystems. NOx in the air is a potentially significant contributor to a number of environmental effects such as acid rain and eutrophication in coastal waters. Eutrophication occurs when a body of water suffers an increase in nutrients that reduce the amount of oxygen in the water, producing an environment that is destructive to fish and other animal life.

NO2 is toxic to various animals as well as to humans. Its toxicity relates to its ability to combine with water to form nitric acid in the eye, lung, mucus membranes, and skin. Studies of the health impacts of NO2 include experimental studies on animals, controlled laboratory studies on humans, and observational studies.

In animals, long-term exposure to NOx increases susceptibility to respiratory infections, lowering their resistance to such diseases as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of NO2, can suffer lung irritation and, potentially, lung damage. Epidemiological studies have also shown associations between NO2 concentrations and daily mortality from respiratory and cardiovascular causes as well as hospital admissions for respiratory conditions.

NOx contributes to a wide range of environmental effects both directly and when combined with other precursors in acid rain and ozone. Increased nitrogen inputs to terrestrial and wetland systems can lead to changes in plant species composition and diversity. Similarly, direct nitrogen inputs to aquatic ecosystems such as those found in estuarine and coastal waters can lead to eutrophication as discussed above. Nitrogen, alone or in acid rain, also can acidify soils and surface waters. Acidification of soils causes the loss of essential plant nutrients and increased levels of soluble aluminum, which is toxic to plants. Acidification of surface waters creates conditions of low pH and levels of aluminum that are toxic to fish and other aquatic organisms.

The CARB found NO2 standards in Fresno County as unclassified/attainment of Federal standards and attainment for State standards.

2.6.5 *Sulfur Dioxide (SO2)*

The major source of sulfur dioxide (SO2) is the combustion of high-sulfur fuels for electricity generation, petroleum refining and shipping. High concentrations of SO2 can result in temporary breathing impairment for asthmatic children and adults who are active outdoors. Short-term exposures of asthmatic individuals to elevated SO2 levels during moderate activity may result in breathing difficulties that can be accompanied by symptoms such as wheezing, chest tightness, or shortness of breath. Other effects that have been associated with longer-term exposures to high concentrations of SO2, in conjunction with high levels of PM, include aggravation of existing cardiovascular disease, respiratory illness, and alterations in the lungs' defenses. SO2 also is a major precursor to PM2.5, which is a significant health concern and a main contributor to poor visibility. In humid atmospheres, sulfur oxides can react with vapor to produce sulfuric acid, a component of acid rain.

The CARB found SO2 standards in Fresno County as unclassified for Federal standards and attainment for State standards.

2.6.6 *Lead (Pb)*

Lead, a naturally occurring metal, can be a constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Lead was used until recently to increase the octane rating in automobile fuel. Since the 1980s, lead has been phased out in gasoline, reduced in drinking water, reduced in industrial air pollution, and banned or limited in consumer products. Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels; however, the use of leaded fuel has been mostly phased out. Since this has occurred the ambient concentrations of lead have dropped dramatically.

Exposure to lead occurs mainly through inhalation of air and ingestion of lead in food, water, soil, or dust. It accumulates in the blood, bones, and soft tissues and can adversely affect the kidneys, liver, nervous system, and other organs. Excessive exposure to lead may cause neurological impairments such as seizures, mental retardation, and behavioral disorders. Even at low doses, lead exposure is associated with damage to the nervous systems of fetuses and young children. Effects on the nervous systems of children are one of the primary health risk concerns from lead. In high concentrations, children can even suffer irreversible brain damage and death. Children 6 years old and under are most at risk, because their bodies are growing quickly.

The CARB found Lead standards in Fresno County as unclassified/attainment of Federal standards and attainment for State standards.

2.6.7 *Toxic Air Contaminants (TAC)*

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TAC) are another group of pollutants of concern. TAC are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TAC is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TAC are regulated on the basis of risk rather than specification of safe levels of contamination. The ten TAC are acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel particulate matter (diesel PM). Caltrans' guidance for transportation studies references the Federal Highway Administration (FHWA) memorandum titled "Interim Guidance on Air Toxic Analysis in NEPA Documents" which discusses emissions quantification of six "priority" compounds of 21 Mobile Source Air Toxics (MSAT) identified by the United States Environmental Protection Agency (USEPA). The six "priority" compounds are diesel exhaust (particulate matter and organic gases), benzene, 1,3-butadiene, acetaldehyde, formaldehyde, and acrolein.

Some studies indicate that diesel PM poses the greatest health risk among the TAC listed above. A 10-year research program (California Air Resources Board 1998) demonstrated that diesel PM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to diesel PM poses a chronic health risk. In addition to increasing the risk of lung cancer, exposure to diesel exhaust can have other health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. Diesel exhaust is a major source of fine particulate pollution as well, and studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems.

Diesel PM differs from other TAC in that it is not a single substance but a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled, internal combustion engines, the composition of the emissions varies, depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TAC, however, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. The CARB has made preliminary concentration estimates based on a diesel PM exposure method. This method uses the CARB emissions inventory's PM10 database, ambient PM10 monitoring data, and the results from several studies to estimate concentrations of diesel PM. Table 4 depicts the CARB Handbook's recommended buffer distances associated with various types of common sources.

Existing air quality concerns within Fresno and the entire SJVAB are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, odors, and increases in greenhouse gas emissions contributing to climate change. The primary source of ozone (smog) pollution is motor vehicles. Particulate matter is caused by dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.

TABLE 4
Recommendations on Siting New Sensitive Land Uses Such As Residences, Schools, Daycare Centers, Playgrounds, or Medical Facilities*

SOURCE CATEGORY	ADVISORY RECOMMENDATIONS
Freeways and High-Traffic Roads [1]	- Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	- Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). - Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	- Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. - Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	- Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the ARB on the status of pending analyses of health risks.
Refineries	- Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	- Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloroethylene	- Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district. - Do not site new sensitive land uses in the same building with perchloroethylene dry cleaning operations.
Gasoline Dispensing Facilities	- Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50 foot separation is recommended for typical gas dispensing facilities.

1: The recommendation to avoid siting new sensitive land uses within 500 feet of a freeway was identified in CARB's Air Quality and Land Use Handbook published in 2005. CARB recently published a technical advisory to the Air Quality and Land Use Handbook indicating that new research has demonstrated promising strategies to reduce pollution exposure along transportation corridors.

*Notes:
• These recommendations are advisory. Land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.
• Recommendations are based primarily on data showing that the air pollution exposures addressed here (i.e., localized) can be reduced as much as 80% with the recommended separation.
• The relative risk for these categories varies greatly (see Table 1-2). To determine the actual risk near a particular facility, a site-specific analysis would be required. Risk from diesel PM will decrease over time as cleaner technology phases in.
• These recommendations are designed to fill a gap where information about existing facilities may not be readily available and are not designed to substitute for more specific information if it exists. The recommended distances take into account other factors in addition to available health risk data (see individual category descriptions).
• Site-specific project design improvements may help reduce air pollution exposures and should also be considered when siting new sensitive land uses.
• This table does not imply that mixed residential and commercial development in general is incompatible. Rather it focuses on known problems like dry cleaners using perchloroethylene that can be addressed with reasonable preventative actions.
• A summary of the basis for the distance recommendations can be found in the ARB Handbook: Air Quality and Land Use Handbook: A Community Health Perspective.

Source: SJVAPCD 2022

2.6.8 *Odors*

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJVAB. The types of facilities that are known to produce odors are shown in Table 5 along with a reasonable distance from the source within which, the degree of odors could possibly be significant. The Project does not propose any uses that would be potential odor sources; however, the information presented in Table 5 will be used as a screening level analysis to determine if the Project would be impacted by existing odor sources in the study area. Such information is presented for informational purposes, but it is noted that the environment's effect on the Project, including exposure to potential odors, would not be an impact for CEQA purposes.

TABLE 5
Screening Levels for Potential Odor Sources

Type of Facility	Distance
Wastewater Treatment Facilities	2 miles
Sanitary Landfill	1 mile
Transfer Station	1 mile
Compositing Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	1 mile
Chemical Manufacturing	1 mile
Fiberglass Manufacturing	1 mile
Painting/Coating Operations (e.g. auto body shops)	1 mile
Food Processing Facility	1 mile
Feed Lot/Dairy	1 mile
Rendering Plant	1 mile

Source: SJVAPCD 2022

2.6.9 *Naturally Occurring Asbestos (NOA)*

Asbestos is a term used for several types of naturally occurring fibrous minerals found in many parts of California. The most common type of asbestos is chrysotile, but other types are also found in California. Asbestos is commonly found in ultramafic rock and near fault zones. The amount of asbestos that is typically present in these rocks' ranges from less than 1% up to approximately 25% and sometimes more. It is released from ultramafic rock when it is broken or crushed. This can happen when cars drive over unpaved roads or driveways, which are surfaced with these rocks, when land is graded for building purposes, or at quarrying operations. Asbestos is also released naturally through weathering and erosion. Once released from the rock, asbestos can become airborne and may stay in the air for long periods of time. Asbestos is hazardous and can cause lung disease and cancer dependent upon the level of exposure. The longer a person is exposed to asbestos and the greater the intensity of the exposure, the greater the chances for a health problem.

The proposed Project's construction phase may cause asbestos to become airborne due to the construction activities that will occur on site. The Project would be required to submit a Dust Control Plan under the SJVAPCD's Rule 8021.

2.6.10 *Greenhouse Gas Emissions*

Gases that trap heat in the atmosphere are often called greenhouse gases. Some greenhouse gases such as carbon dioxide occur naturally and are emitted to the atmosphere through natural processes and human activities. Other greenhouse gases (e.g., fluorinated gases) are created and emitted solely through human activities. The principal greenhouse gases that enter the atmosphere because of human activities are:

- ✓ **Carbon Dioxide (CO_2):** Carbon dioxide enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement, asphalt paving, truck trips). Carbon dioxide is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- ✓ **Methane (CH_4):** Methane is 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.
- ✓ **Nitrous Oxide (N_2O):** Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- ✓ **Fluorinated Gases:** Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances (i.e., CFCs, HCFCs, and halons). These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes referred to as High Global Warming Potential gases ("High GWP gases").

3.0 Air-Quality Impacts

3.1 Methodology

The impact assessment for air quality focuses on potential effects the Project might have on air quality within the Fresno region. The SJVAPCD has established thresholds of significance for determining environmental significance. These thresholds separate a project's short-term emissions from its long-term emissions. The short-term emissions are mainly related to the construction phase of a project, which are recognized to be short in duration. The long-term emissions are primarily related to the activities that will occur indefinitely as a result of Project operations. Impacts will be evaluated both on the basis of CEQA Appendix G criteria and SJVAPCD significance criteria. The impacts to be evaluated will be those involving construction and operational emissions of criteria pollutants. The SJVAPCD has established thresholds for certain pollutants shown in Table 6.

Table 6
SJVAPCD Air Quality Thresholds of Significance

Project Type	Ozone Precursor Emissions (tons/year)					
	CO	NO_X	ROG	SO_X	PM_{10}	$PM_{2.5}$
Construction Emissions	100	10	10	27	15	15
Operational Emissions (Permitted Equipment and Activities)	100	10	10	27	15	15
Operational Emissions (Non-Permitted Equipment and Activities)	100	10	10	27	15	15

Source: SJVAPCD 2023

3.1.1 *CalEEMod*

CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. The model quantifies direct emissions from construction and operations (including vehicle use), as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use.

The model is an accurate and comprehensive tool for quantifying air quality impacts from land use projects throughout California. The model can be used for a variety of situations where an air quality analysis is necessary or desirable such as CEQA and NEPA documents, pre-project planning, compliance with local air quality rules and regulations, etc.

3.2 Short-Term Impacts

Short-term impacts are mainly related to the construction phase of a project and are recognized to be short in duration. Construction air quality impacts are generally attributable to dust and exhaust pollutants generated by equipment and vehicles. Fugitive dust is emitted both during construction activity and as a result of wind erosion over exposed earth surfaces. Clearing and earth moving activities do comprise major sources of construction dust emissions, but traffic and general disturbances of soil surfaces also generate significant dust emissions. Further, dust generation is dependent on soil type and soil moisture. Exhaust pollutants are the non-useable gaseous waste products produced during the combustion process. Engine exhaust contains CO, HC, and NOx pollutants which are harmful to the environment.

Adverse effects of construction activities cause increased dust-fall and locally elevated levels of total suspended particulate. Dust-fall can be a nuisance to neighboring properties or previously completed developments surrounding or within the Project area and may require frequent washing during the construction period.

PM10 emissions can result from construction activities of the Project. The SJVAPCD has determined that compliance with Regulation VIII and other control measures will constitute sufficient mitigation to reduce PM10 impacts to a level considered less-than significant for most development projects. Even with implementation of District Regulation VIII and District Rule 9510, large development projects may not be able to reduce project specific construction impacts below District thresholds of significance.

Ozone precursor emissions are also an impact of construction activities and can be quantified through calculations. Numerous variables factored into estimating total construction emission include: level of activity, length of construction period, number of pieces and types of equipment in use, site characteristics, weather conditions, number of construction personnel, and amount of materials to be transported onsite or offsite. Additional exhaust emissions would be associated with the transport of workers and materials. Because the specific mix of construction equipment is not presently known for this Project, construction emissions were estimated using CalEEMod Model defaults for construction equipment.

Table 7 shows the CalEEMod estimated construction emissions that would be generated from construction of the Project. Results of the analysis show that emissions generated from construction of the Project will not exceed the SJVAPCD emission thresholds.

Table 7
Project Construction Emissions (tons/year)

Summary Report	CO	NO_x	ROG	SO_x	PM_{10}	$PM_{2.5}$	CO2e
Project Construction Emissions	2.42	2.22	2.67	0.01	0.39	0.21	428.69
SJVAPCD Level of Significance	100	10	10	27	15	15	None
Does the Project Exceed Standard?	No	No	No	No	No	No	No

Source: CalEEMod

3.3 Long-Term Emissions

Long-Term emissions from the Project would be generated primarily by mobile source (vehicle) emissions from the Project site and area sources such as lawn maintenance equipment.

3.3.1 *Localized Operational Emissions – Ozone/Particulate Matter*

The Fresno County area is nonattainment for Federal and State air quality standards for ozone, attainment of Federal standards for PM10 and nonattainment for State standards, and nonattainment for Federal and State standards for PM2.5. Nitrogen oxides and reactive organic gases are regulated as ozone precursors. Significance criteria have been established for criteria pollutant emissions as documented in Section 3.1. Operational emissions have been estimated for the Project using the CalEEMod Model and detailed results are included in Appendix A of this report.

Results of the CalEEMod analysis are shown in Table 8. Results indicate that the annual operational emissions from the Project will be less than the SJVAPCD emission thresholds for criteria pollutants.

Table 8
Project Operational Emissions (tons/year)

Summary Report	CO	NO_x	ROG	SO_x	PM_{10}	$PM_{2.5}$	CO2e
Project Opeational Emissions	7.53	1.36	2.05	0.02	1.60	0.45	1957.22
SJVAPCD Level of Significance	100	10	10	27	15	15	None
Does the Project Exceed Standard?	No	No	No	No	No	No	No

Source: CalEEMod

3.3.2 *Localized Operational Emissions*

✓ **Carbon Monoxide**

The SJVAPCD is currently in unclassified/attainment for Federal standards and unclassified for State standards for CO. An analysis of localized CO concentrations is typically warranted to ensure that standards are maintained. Also, an analysis is required to ensure that localized concentrations don't reach potentially unhealthful levels that could affect sensitive receptors (residents, school children, hospital patients, the elderly, etc.).

Typically, high CO concentrations are associated with roadways or intersections operating at an unacceptable Level of Service (LOS). CO "Hot Spot" modeling is required if a traffic study reveals that the project will reduce the LOS on one or more streets to E or F or if the project will worsen an existing LOS F.

To analyze the Cumulative Year 2046 Plus Project "worst case" CO concentrations at study roadway segments, the analysis methodology considered the highest annual maximum CO concentration reported in 2013, using 1.0 PPM as an estimate of the background concentration for the 8-hour standard and 2.2 PPM for the 1-hour standard (source: CARB annual publications). Other modeling assumptions include a wind speed of .5 m/s, flat topography, 1,000-meter mixing height, and a 5 degree wind deviation.

✓ **Toxic Air Contaminants (TAC)**

The SJVAPCD's Guidance Document, Guidance for Assessing and Mitigating Air Quality Impacts – 2015, identifies the need for projects to analyze the potential for adverse air quality impacts to sensitive receptors. Sensitive receptors refer to those segments of the population most susceptible to poor air quality (i.e., children, the elderly, and those with pre-existing serious health problems affected by air quality). Land uses that have the greatest potential to attract these types of sensitive receptors include schools, parks, playgrounds, daycare centers, nursing homes, hospitals, and residential communities. From a health risk perspective, the Project is a Type B Project in that it may potentially place sensitive receptors in the vicinity of existing sources.

The first step in evaluating the potential for impacts to sensitive receptors for TAC's from the Project is to perform a screening level analysis. For Type B Projects, one type of screening tool is found in the CARB Handbook: Air Quality and Land Use Handbook: A Community Perspective. This handbook includes a table (depicted in Table 4) with recommended buffer distances associated with various types of common sources. The screening level analysis for the Project shows that TAC's are not a concern based upon the recommendations provided in Table 4. An evaluation of nearby land uses considering CARB's Pollution Mapping Tool shows that the Project will not place sensitive receptors in the vicinity of existing toxic sources. The Project is located a 2.5 mile from the State Route (SR) 168 freeway. Table 4 indicates that new sensitive land uses shouldn't be sited within 500 feet of a freeway/urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day. The Project is located more than 2.5 miles from the SR 168 freeway. As a result, a health risk assessment is not needed at this time.

- ✓ **Odors**

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

While offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and the SJVAPCD. Any project with the potential to frequently expose members of the public to objectionable odors should be deemed to have a significant impact.

The SJVAPCD requires that an analysis of potential odor impacts be conducted for the following two situations:

- Generators – projects that would potentially generate odorous emissions proposed to be located near existing sensitive receptors or other land uses where people may congregate, and
- Receivers – residential or other sensitive receptor projects or other projects built for the intent of attracting people locating near existing odor sources.

The Project will not generate odorous emissions given the nature or characteristics of the Project. The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJV Air Basin. The types of facilities that are known to produce odors are shown in Table 5 above along with a reasonable distance from the source within which, the degree of odors could possibly be significant. None of the facilities shown in Table 5 are located within two (2) miles of the Project.

- ✓ **Naturally Occurring Asbestos (NOA)**

Asbestos is a term used for several types of naturally occurring fibrous minerals found in many parts of California. The most common type of asbestos is chrysotile, but other types are also found in California. Construction of the Project may cause asbestos to become airborne due to the construction activities that will occur on site. The Project would be required to submit a Dust Control Plan under the SJVAPCD's Rule 8021. Compliance with Rule 8021 would limit fugitive dust emissions from construction, demolition, excavation, extraction, and other earthmoving activities associated with the Project.

The Dust Control Plan may include the following measures:

1. Water wetting of road surfaces
2. Rinse vehicles and equipment
3. Wet loads of excavated material, and
4. Cover loads of excavated material

✓ **Greenhouse Gas Emissions**

CARB, in consultation with MPOs, has provided each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. For the Fresno Council of Governments(FCOG) region, CARB set targets at six (6) percent per capita decrease in 2020 and a thirteen (13) percent per capita decrease in 2035 from a base year of 2005. FCOG's 2018 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), which was adopted in July 2022, projects that the Fresno County region would achieve the prescribed emissions targets.

In 2009, the SJVAPCD adopted the following guidance documents applicable to projects within the San Joaquin Valley:

- ✓ Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA (SJVAPCD 2009), and
- ✓ District Policy: Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency (SJVAPCD 2009).

This guidance and policy are the reference documents referenced in the SJVAPCD's Guidance for Assessing and Mitigating Air Quality Impacts adopted in March 2015 (SJVAPCD 2015). Consistent with the District Guidance and District Policy above, SJVAPCD (2015) acknowledges the current absence of numerical thresholds, and recommends a tiered approach to establish the significance of the GHG impacts on the environment:

i. If a project complies 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, then the project would be determined to have a less than significant individual and cumulative impact for GHG emissions;
ii. If a project does not comply with an approved GHG emission reduction plan or mitigation program, then it would be required to implement Best Performance

Standards (BPS); and

iii. If a project is not implementing BPS, then it should demonstrate that its GHG emissions would be reduced or mitigated by at least 29 percent compared to Business as Usual (BAU).

As shown in Table 9, the Project would generate 2608.35 Metric Tons of Carbon Dioxide Equivalent per year (MTCO2eq./year) using an operational year of 2005, which includes area, energy, mobile, waste, and water sources. "Business as usual" (BAU) is referenced in CARB's AB 32 Scoping Plan as emissions projected to occur in 2020 if the average baseline emissions during the 2002-2004 period grew to 2020 levels, without control or Best Performance Standards (BPS) offsets. As a result, an estimate of the Project's operational emissions in 2005 were compared to operational emissions in 2020 in order to determine if the Project meets the 29% emission reduction. The SJVAPCD has reviewed relevant scientific information related to GHG emissions and has determined that they are not able to determine a specific quantitative level of GHG emissions increase, above which a project would have a significant impact on the environment, and below which would have an insignificant impact. As a result, the SJVAPCD has determined that projects achieving at least a 29% GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG. Results of the analysis show that the Project's GHG emissions in the year 2020 is 2179.68 MTCO2eq./year. This represents an achievement of 16% GHG emission reduction on the basis of BAU, which does not meet the 29% GHG emission reduction target.

In the event that a local air district's guidance for addressing GHG impacts does not use numerical GHG emissions thresholds, at the lead agency's discretion, a neighboring air district's GHG threshold may be used to determine impacts. In December 2008, the South Coast Air Quality Management District (SCAQMD) Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. The SCAQMD guidance identifies a threshold of 10,000 MTCO2eq./year for GHG for construction emissions amortized over a 30-year project lifetime, plus annual operation emissions. This threshold is often used by agencies, such as the California Public Utilities Commission, to evaluate GHG impacts in areas that do not have specific thresholds (CPUC 2015)[2]. Therefore, because this threshold has been established by the SCAQMD in an effort to control GHG emissions in the largest metropolitan area in the State of California, this threshold is considered a conservative approach for evaluating the significance of GHG emissions in a more rural area, such as Fresno County. Though the Project is under SJVAPCD jurisdiction, the SCAQMD GHG threshold provides some perspective on the GHG emissions generated by the Project. Table 10 shows the yearly GHG emissions generated by the Project as determined by the CalEEMod model, which is approximately 80% less than the threshold identified by the SCAQMD. Though the Project is under SJVAPCD jurisdiction, the SCAQMD

2 California Public Utilities Commission (CPUC). 2015. Section 4.7, "Greenhouse Gases." Final Environmental Impact Report for the Santa Barbara County Reliability Project. May 2015. Accessed January 18, 2018. http://www.cpuc.ca.gov/environment/info/ene/sbcrp/SBCRP_FEIR.html.

GHG threshold provides some perspective on the GHG emissions generated by the Project. Table 10 shows the yearly GHG emissions generated by the Project as determined by the CalEEMod model.

Table 9
2005/2020 Operational greenhouse Gas Emissions

Summary Report	CO_2e
Operational Emissions Per Year (2005)	7368.31 MT/yr
Operational Emissions Per Year (2020)	6253.23 MT/yr
SJVAPCD Level of Significance	29% Reduction Compared to BAU
Does the Project Meet the Standard	No

Source: CalEEMod Emissions Model

Table 10
Project Operational Greenhouse Gas Emissions

Summary Report	CO_2e
Project Operational Emissions Per Year(Plus amortized construction emissions)	1971.51 MT/yr

Source: CalEEMod

3.3.3 *Indirect Source Review*

The Plans assess current and proposed rules, along with state and federal regulations, to model future emissions and achieve pollution attainment. The proposed Project is subject to the SJVAPCD's ISR program since there are more than 50 residential units. It applies to any applicant that seeks to gain final discretionary approval for a development project of more that 50 residential units as of projects approved after 2006. Rule 9510 and the Administrative ISR Fee Rule (Rule 3180) are the result of state requirements outlined in the California Health and Safety Code, Section 40604 and the State Implementation Plan (SIP). The purpose of the SJVAPCD's ISR program is to reduce emissions of NOx and PM10 from new projects. In general, new development contributes to the air-pollution problem in the Valley by increasing the number of vehicles and vehicle miles traveled.

Utilizing the ISR Fee Estimator calculator available on the SJVAPCD website, it was determined that the Project's total cost for emission reductions is $108,033.12 without implementation of emission reduction measures. After the application of ISR rule No_x will be reduced by 0.44 MT/yr and PM_{10} will be reduced by 0.17 MT/yr during construction phase. The ISR Fee Estimator worksheets are included in Appendix B. The fee noted above may be reduced dependent upon the formal ISR review process.

4.0 Impact Determinations and Recommended Mitigation

In accordance with CEQA, when a proposed project is consistent with a General Plan for which an EIR has been certified, the effects of that project are evaluated to determine if they will result in project-specific significant adverse impacts on the environment. The criteria used to determine the significance of an air quality or greenhouse gas impact are based on the following thresholds of significance, which come from Appendix G of the CEQA Guidelines and the General Plan EIR. Accordingly, air quality or greenhouse gas impacts resulting from the Project are considered significant if the Project would:

Air Quality

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?

Greenhouse Gas Emissions

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?

4.1 Air Quality

4.1.1 *Conflict with or obstruct implementation of the applicable air quality plan*

The primary way of determining consistency with the air quality plan's (AQP's) assumptions is determining consistency with the applicable General Plan to ensure that the Project's population density and land use are consistent with the growth assumptions used in the AQPs for the air basin.

As required by California law, city and county General Plans contain a Land Use Element that details the types and quantities of land uses that the city or county estimates will be needed for future growth, and that designate locations for land uses to regulate growth. FCOG uses the growth projections and land use information in adopted general plans to estimate future average daily trips and then VMT, which are then provided to SJVAPCD to estimate future emissions in the AQPs. Existing and future pollutant emissions computed in the AQP are based on land uses from area general plans. AQPs detail the control measures and emission reductions required for reaching attainment of the air standards.

The applicable General Plan for the project is the City of Clovis 2035 General Plan Update, which was adopted in 2014. The Project is consistent with the currently adopted General Plan for the City of Clovis and is therefore consistent with the population growth and VMT applied in the plan. Therefore, the Project is consistent with the growth assumptions used in the applicable AQPs. As a result, the Project will not conflict with or obstruct implementation of any air quality plans. Therefore, no mitigation is needed.

4.1.2 *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*

The Fresno County area is nonattainment for Federal and State air quality standards for ozone, in attainment of Federal standards and nonattainment for State standards for PM10, and nonattainment for Federal and State standards for PM2.5. The SJVAPCD has prepared the 2016 and 2013 Ozone Plans, 2007 PM10 Maintenance Plan, and 2012 PM2.5 Plan to achieve Federal and State standards for improved air quality in the SJVAB regarding ozone and PM. Inconsistency with any of the plans would be considered a cumulatively adverse air quality impact. As discussed in Section 4.1.1, the Project is consistent with the currently adopted General Plan for the City of Clovis and is therefore consistent with the population growth and VMT applied in the plan. Therefore, the Project is consistent with the growth assumptions used in the 2016 and 2013 Ozone Plan, 2007 PM10 Maintenance Plan, and 2012 PM2.5 Plan.

Project specific emissions that exceed the thresholds of significance for criteria pollutants would be expected to result in a cumulatively considerable net increase of any criteria pollutant for which the County is in non-attainment under applicable federal or state ambient air quality standards. It should be noted that a project is not characterized as cumulatively insignificant when project emissions fall below thresholds of significance. As discussed in Section 3.1, the SJVAPCD has established thresholds of significance for determining environmental significance which are provided in Table 6.

As discussed above in Section 3.2 and 3.3, results of the analysis show that emissions generated from construction and operation of the Project will be less than the applicable SJVAPCD emission thresholds for criteria pollutants. Therefore, no mitigation is needed.

4.1.3 *Expose sensitive receptors to substantial pollutant concentrations*

Sensitive receptors refer to those segments of the population most susceptible to poor air quality (i.e., children, the elderly, and those with pre-existing serious health problems affected by air quality). Land uses that have the greatest potential to attract these types of sensitive receptors include schools, parks, playgrounds, daycare centers, nursing homes, hospitals, and residential communities. From a health risk perspective, the Project is a Type B project in that it may potentially place sensitive receptors in the vicinity of existing sources.

The first step in evaluating the potential for impacts to sensitive receptors for TAC's from the Project is to perform a screening level analysis. For Type B Projects, one type of screening tool is found in the CARB Handbook: Air Quality and Land Use Handbook: A Community Perspective. This handbook includes a table (depicted in Table 4) with recommended buffer distances associated with various types of common sources. The screening level analysis for the Project shows that TAC's are not a concern based upon the recommendations provided in Table 4. An evaluation of nearby land uses considering CARB's Pollution Mapping Tool shows that the Project will not place sensitive receptors in the vicinity of existing toxic sources. The Project is located a 2.5 mile from the State Route (SR) 168 freeway. Table 4 indicates that new sensitive land uses shouldn't be sited within 500 feet of a freeway/urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day. The Project is located more than 2.5 miles from the SR 168 freeway. Therefore, no mitigation is needed.

Short-Term Impacts

The annual emissions from the construction phase of the Project will be less than the applicable SJVAPCD emission thresholds for criteria pollutants as shown in Table 8. The construction emissions are therefore considered less than significant with the implementation of the SJVAPCD applicable Regulation VIII control measures, which are provided below.

1. *All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.*
2. *All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.*
3. *All land clearing, grubbing, scraping, excavation, land leveling, grading, cut & fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.*
4. *When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.*
5. *All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.*
6. *Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions*

utilizing sufficient water or chemical stabilizer/suppressant.

7. *Within urban areas, track out shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.*

Naturally Occurring Asbestos (NOA)

The proposed Project's construction phase may cause asbestos to become airborne due to the construction activities that will occur on site. In order to control naturally-occurring asbestos dust, the Project will be required to submit a Dust Control Plan under the SJVAPCD's Rule 8021. The Dust Control Plan may include the following measures:

1. Water wetting of road surfaces
2. Rinse vehicles and equipment
3. Wet loads of excavated material, and
4. Cover loads of excavated material

Long-Term Impacts

Long-Term emissions from the Project are generated primarily by mobile source (vehicle) emissions from the project site and area sources such as lawn maintenance equipment. Emissions from long-term operations generally represent a project's most substantial air quality impact. Table 8 summarizes the Project's operational impacts by pollutant. Results indicate that operational emissions from the Project will not exceed the SJVAPCD emissions threshold for any emissions, hence no mitigations are required.

4.1.4 *Result in other emissions such as those leading to odors adversely affecting a substantial number of people*

The SJVAPCD requires that an analysis of potential odor impacts be conducted for the following two situations:

- ✓ Generators – projects that would potentially generate odorous emissions proposed to be located near existing sensitive receptors or other land uses where people may congregate, and

- ✓ Receivers – residential or other sensitive receptor projects or other projects built for the intent of attracting people located near existing odor sources.

The proposed Project will not generate odorous emissions given the nature or characteristics of residential developments. The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJV Air Basin. The types of facilities that are known to produce odors are shown in Table 5 above along with a reasonable distance from the source within which, the degree of odors could possibly be significant. None of the facilities shown in Table 5 are located within two (2) miles of the Project. Therefore, no mitigation is needed.

4.2 Greenhouse Gas Emissions

4.2.1 *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment*

In 2009, the SJVAPCD adopted the following guidance documents applicable to projects within the San Joaquin Valley:

- ✓ Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA (SJVAPCD 2009), and
- ✓ District Policy: Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency (SJVAPCD 2009).

As shown in Table 9, the Project would generate 2608.35 Metric Tons of Carbon Dioxide Equivalent per year (MTCO2eq./year) using an operational year of 2005, which includes area, energy, mobile, waste, and water sources. “Business as usual” (BAU) is referenced in CARB’s AB 32 Scoping Plan as emissions projected to occur in 2020 if the average baseline emissions during the 2002-2004 period grew to 2020 levels, without control or Best Performance Standards (BPS) offsets. As a result, an estimate of the Project’s operational emissions in 2005 were compared to operational emissions in 2020 in order to determine if the Project meets the 29% emission reduction. The SJVAPCD has reviewed relevant scientific information related to GHG emissions and has determined that they are not able to determine a specific quantitative level of GHG emissions increase, above which a project would have a significant impact on the environment, and below which would have an insignificant impact. As a result, the SJVAPCD has determined that projects achieving at least a 29% GHG emission reduction compared to BAU would be determined to have a less than significant individual and cumulative impact for GHG. Results of the analysis show that the Project’s GHG emissions in the year 2020 is 2179.68 MTCO2eq./year. This represents an achievement of 16% GHG emission reduction on the basis of BAU, which does not meet the 29% GHG emission reduction target.

In the event that a local air district’s guidance for addressing GHG impacts does not use numerical GHG emissions thresholds, at the lead agency’s discretion, a neighboring air district’s GHG threshold may be used to determine impacts. In December 2008, the South Coast Air Quality Management District (SCAQMD) Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. The SCAQMD guidance identifies a threshold of 10,000 MTCO2eq./year for GHG for construction emissions amortized over a 30-year project lifetime, plus annual operation emissions. This threshold is often used by agencies, such as the California Public Utilities Commission, to evaluate GHG impacts in areas that do not have specific thresholds (CPUC 2015)[3]. Therefore, because this threshold has been established by the SCAQMD in an effort to control GHG emissions in the largest metropolitan area in the State of California, this threshold is considered a conservative approach for evaluating the significance of GHG emissions in a more rural area, such as Fresno County. Though 80% less than the threshold identified by the SCAQMD.

CARB's California GHG Emissions Inventory provides estimates of anthropogenic GHG emissions within California, as well as emissions associated with imported electricity; natural sources are not included in the inventory. California's GHG emissions for 2020 totaled approximately 358.76 million MTCO2eq. The proposed Project's GHG emissions represents less than 0.001% of the total GHG emissions for the state of California when compared to year 2018 emissions data.

Based on the assessment above, the Project will not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. Therefore, any impacts would be less than significant.

4.2.2 *Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases*

California passed the California Global Warming Solutions Act of 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. Under AB 32, CARB must adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 emission cap by 2020. On December 11, 2008, CARB adopted its initial Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. CARB's 2017 Climate Change Scoping Plan builds on the efforts and plans encompassed in the initial Scoping Plan.

SB 375 requires MPOs to adopt a SCS or APS that will prescribe land use allocation in that MPO's regional transportation plan. CARB, in consultation with MPOs, has provided each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. For the FCOF region, CARB set targets at six (6) percent per capita decrease in 2020 and a thirteen (13) percent per capita decrease in 2035 from a base year of 2005. FCOG's 2022 RTP/SCS, which was adopted in July 2022, projects that the Fresno County

3 California Public Utilities Commission (CPUC). 2015. Section 4.7, "Greenhouse Gases." Final Environmental Impact Report for the Santa Barbara County Reliability Project. May 2015. Accessed January 18, 2018. http://www.cpuc.ca.gov/environment/info/ene/sbcrp/SBCRP_FEIR.html.

region would achieve the prescribed emissions targets.

Executive Order B-30-15 establishes a California greenhouse gas reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050. Executive Order B-30-15 requires MPO's to implement measures that will achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 greenhouse gas emissions reductions targets.

As required by California law, city and county General Plans contain a Land Use Element that details the types and quantities of land uses that the city or county estimates will be needed for future growth, and that designate locations for land uses to regulate growth. FCOG uses the growth projections and land use information in adopted general plans to estimate future average daily trips and then VMT, which are then provided to SJVAPCD to estimate future emissions in the AQPs. The applicable General Plan for the project is City of Clovis 2035 General Plan Update, which was adopted in 2014.

The Project is consistent with the currently adopted General Plan for the City of Clovis and the adopted FCOG 2022 RTP/SCS and is therefore consistent with the population growth and VMT applied in those plan documents. Therefore, the Project is consistent with the growth assumptions used in the applicable AQP. It should also be noted that yearly GHG emissions generated by the Project (Table 9) are approximately 80% less than the threshold identified by the SCAQMD (see the discussion for Impact 4.2.1 above).

CARB's 2017 Climate Change Scoping Plan builds on the efforts and plans encompassed in the initial Scoping Plan. The current plan has identified new policies and actions to accomplish the State's 2030 GHG limit. Below is a list of applicable strategies in the Scoping Plan and the Project's consistency with those strategies.

- ✓ California Light-Duty Vehicle GHG Standards – Implement adopted standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs for long-term climate change goals.
  - The Project is consistent with this reduction measure. This measure cannot be implemented by a particular project or lead agency since it is a statewide measure. When this measure is implemented, standards would be applicable to light-duty vehicles that would access the Project. The Project would not conflict or obstruct this reduction measure.
- ✓ Energy Efficiency – Pursuit of comparable investment in energy efficiency from all retail providers of electricity in California. Maximize energy efficiency building and appliance standards.
  - The Project is consistent with this reduction measure. Though this measure applies to the State to increase its energy standards, the Project would comply with this measure

through existing regulation. The Project would not conflict or obstruct this reduction measure.

- ✓ Low Carbon Fuel – Development and adoption of the low carbon fuel standard.
  - The Project is consistent with this reduction measure. This measure cannot be implemented by a particular project or lead agency since it is a statewide measure. When this measure is implemented, standards would be applicable to the fuel used by vehicles that would access the Project. The Project would not conflict or obstruct this reduction measure.

Based on the assessment above, the Project will not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. Therefore, any impacts would be less than significant.

Appendix-A
CalEEMod Worksheets

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Tract 000

Fresno County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	153.00	Dwelling Unit	18.63	275,400.00	438

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2025
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 description

Table Name	Column Name	Default Value	New Value
tblLandUse	LotAcreage	49.68	18.63
tblWoodstoves	NumberCatalytic	18.63	0.00
tblWoodstoves	NumberNoncatalytic	18.63	0.00

2.0 Emissions Summary

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule 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					
2024	0.2460	2.2201	2.4298	4.8400e-003	0.2939	0.0962	0.3901	0.1209	0.0899	0.2107	0.0000	424.6752	424.6752	0.0960	5.4300e-003	428.6945
2025	2.6768	0.7936	1.0828	2.0400e-003	0.0307	0.0328	0.0635	8.3000e-003	0.0308	0.0391	0.0000	178.9658	178.9658	0.0358	2.8400e-003	180.7065
Maximum	**2.6768**	**2.2201**	**2.4298**	**4.8400e-003**	**0.2939**	**0.0962**	**0.3901**	**0.1209**	**0.0899**	**0.2107**	**0.0000**	**424.6752**	**424.6752**	**0.0960**	**5.4300e-003**	**428.6945**

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					
2024	0.2460	2.2201	2.4298	4.8400e-003	0.2939	0.0962	0.3901	0.1209	0.0899	0.2107	0.0000	424.6748	424.6748	0.0960	5.4300e-003	428.6941
2025	2.6768	0.7936	1.0828	2.0400e-003	0.0307	0.0328	0.0635	8.3000e-003	0.0308	0.0391	0.0000	178.9656	178.9656	0.0358	2.8400e-003	180.7063
Maximum	**2.6768**	**2.2201**	**2.4298**	**4.8400e-003**	**0.2939**	**0.0962**	**0.3901**	**0.1209**	**0.0899**	**0.2107**	**0.0000**	**424.6748**	**424.6748**	**0.0960**	**5.4300e-003**	**428.6941**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule 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	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	1-10-2024	4-9-2024	0.9567	0.9567
2	4-10-2024	7-9-2024	0.5160	0.5160
3	7-10-2024	10-9-2024	0.5218	0.5218
4	10-10-2024	1-9-2025	0.5195	0.5195
5	1-10-2025	4-9-2025	0.4761	0.4761
6	4-10-2025	7-9-2025	1.7410	1.7410
7	7-10-2025	9-30-2025	1.2065	1.2065
		Highest	1.7410	1.7410

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	1.3748	0.0703	1.1593	4.3000e-004		0.0109	0.0109		0.0109	0.0109	0.0000	68.1364	68.1364	3.0500e-003	1.2200e-003	68.5747
Energy	0.0198	0.1695	0.0721	1.0800e-003		0.0137	0.0137		0.0137	0.0137	0.0000	309.1390	309.1390	0.0220	5.8100e-003	311.4214
Mobile	0.6651	1.1272	6.3070	0.0153	1.5673	0.0126	1.5799	0.4193	0.0118	0.4311	0.0000	1,452.2520	1,452.2520	0.0731	0.0778	1,477.2689
Waste						0.0000	0.0000		0.0000	0.0000	32.0076	0.0000	32.0076	1.8916	0.0000	79.2975
Water						0.0000	0.0000		0.0000	0.0000	3.1626	7.0259	10.1884	0.3260	7.8100e-003	20.6642
Total	**2.0598**	**1.3669**	**7.5384**	**0.0169**	**1.5673**	**0.0372**	**1.6045**	**0.4193**	**0.0364**	**0.4557**	**35.1702**	**1,836.5532**	**1,871.7234**	**2.3158**	**0.0927**	**1,957.2267**

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	1.3748	0.0703	1.1593	4.3000e-004		0.0109	0.0109		0.0109	0.0109	0.0000	68.1364	68.1364	3.0500e-003	1.2200e-003	68.5747
Energy	0.0198	0.1695	0.0721	1.0800e-003		0.0137	0.0137		0.0137	0.0137	0.0000	309.1390	309.1390	0.0220	5.8100e-003	311.4214
Mobile	0.6651	1.1272	6.3070	0.0153	1.5673	0.0126	1.5799	0.4193	0.0118	0.4311	0.0000	1,452.2520	1,452.2520	0.0731	0.0778	1,477.2689
Waste						0.0000	0.0000		0.0000	0.0000	32.0076	0.0000	32.0076	1.8916	0.0000	79.2975
Water						0.0000	0.0000		0.0000	0.0000	3.1626	7.0259	10.1884	0.3260	7.8100e-003	20.6642
Total	**2.0598**	**1.3669**	**7.5384**	**0.0169**	**1.5673**	**0.0372**	**1.6045**	**0.4193**	**0.0364**	**0.4557**	**35.1702**	**1,836.5532**	**1,871.7234**	**2.3158**	**0.0927**	**1,957.2267**

	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**

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	1/10/2024	2/6/2024	5	20	
2	Site Preparation	Site Preparation	2/7/2024	2/20/2024	5	10	
3	Grading	Grading	2/21/2024	4/2/2024	5	30	

4	Building Construction	Building Construction	4/3/2024	5/27/2025	5	300	
5	Paving	Paving	5/28/2025	6/24/2025	5	20	
6	Architectural Coating	Architectural Coating	6/25/2025	7/22/2025	5	20	

Acres of Grading (Site Preparation Phase): 15

Acres of Grading (Grading Phase): 90

Acres of Paving: 0

Residential Indoor: 557,685; Residential Outdoor: 185,895; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	7.00	231	0.29
Demolition	Excavators	3	8.00	158	0.38
Grading	Excavators	2	8.00	158	0.38
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Grading	Graders	1	8.00	187	0.41
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
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	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
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	55.00	16.00	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
Architectural Coating	1	11.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2024

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	0.0224	0.2088	0.1971	3.9000e-004		9.6000e-003	9.6000e-003		8.9200e-003	8.9200e-003	0.0000	33.9961	33.9961	9.5100e-003	0.0000	34.2338
Total	**0.0224**	**0.2088**	**0.1971**	**3.9000e-004**		**9.6000e-003**	**9.6000e-003**		**8.9200e-003**	**8.9200e-003**	**0.0000**	**33.9961**	**33.9961**	**9.5100e-003**	**0.0000**	**34.2338**

3.2 Demolition - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	2.7000e-004	3.2800e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	0.9308	0.9308	3.0000e-005	3.0000e-005	0.9390
Total	**4.3000e-004**	**2.7000e-004**	**3.2800e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2000e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9308**	**0.9308**	**3.0000e-005**	**3.0000e-005**	**0.9390**

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	0.0224	0.2088	0.1971	3.9000e-004		9.6000e-003	9.6000e-003		8.9200e-003	8.9200e-003	0.0000	33.9960	33.9960	9.5100e-003	0.0000	34.2338
Total	**0.0224**	**0.2088**	**0.1971**	**3.9000e-004**		**9.6000e-003**	**9.6000e-003**		**8.9200e-003**	**8.9200e-003**	**0.0000**	**33.9960**	**33.9960**	**9.5100e-003**	**0.0000**	**34.2338**

3.2 Demolition - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	2.7000e-004	3.2800e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	0.9308	0.9308	3.0000e-005	3.0000e-005	0.9390
Total	**4.3000e-004**	**2.7000e-004**	**3.2800e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2000e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9308**	**0.9308**	**3.0000e-005**	**3.0000e-005**	**0.9390**

3.3 Site Preparation - 2024

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					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0133	0.1359	0.0917	1.9000e-004		6.1500e-003	6.1500e-003		5.6600e-003	5.6600e-003	0.0000	16.7285	16.7285	5.4100e-003	0.0000	16.8638
Total	**0.0133**	**0.1359**	**0.0917**	**1.9000e-004**	**0.0983**	**6.1500e-003**	**0.1044**	**0.0505**	**5.6600e-003**	**0.0562**	**0.0000**	**16.7285**	**16.7285**	**5.4100e-003**	**0.0000**	**16.8638**

3.3 Site Preparation - 2024

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	2.6000e-004	1.6000e-004	1.9700e-003	1.0000e-005	7.2000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5585	0.5585	2.0000e-005	2.0000e-005	0.5634
Total	**2.6000e-004**	**1.6000e-004**	**1.9700e-003**	**1.0000e-005**	**7.2000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5585**	**0.5585**	**2.0000e-005**	**2.0000e-005**	**0.5634**

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					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0133	0.1359	0.0917	1.9000e-004		6.1500e-003	6.1500e-003		5.6500e-003	5.6500e-003	0.0000	16.7285	16.7285	5.4100e-003	0.0000	16.8638
Total	**0.0133**	**0.1359**	**0.0917**	**1.9000e-004**	**0.0983**	**6.1500e-003**	**0.1044**	**0.0505**	**5.6500e-003**	**0.0562**	**0.0000**	**16.7285**	**16.7285**	**5.4100e-003**	**0.0000**	**16.8638**

3.3 Site Preparation - 2024

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	2.6000e-004	1.6000e-004	1.9700e-003	1.0000e-005	7.2000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.5585	0.5585	2.0000e-005	2.0000e-005	0.5634
Total	**2.6000e-004**	**1.6000e-004**	**1.9700e-003**	**1.0000e-005**	**7.2000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.5585**	**0.5585**	**2.0000e-005**	**2.0000e-005**	**0.5634**

3.4 Grading - 2024

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					0.1381	0.0000	0.1381	0.0548	0.0000	0.0548	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0483	0.4857	0.4158	9.3000e-004		0.0200	0.0200		0.0184	0.0184	0.0000	81.7793	81.7793	0.0265	0.0000	82.4405
Total	**0.0483**	**0.4857**	**0.4158**	**9.3000e-004**	**0.1381**	**0.0200**	**0.1581**	**0.0548**	**0.0184**	**0.0732**	**0.0000**	**81.7793**	**81.7793**	**0.0265**	**0.0000**	**82.4405**

3.4 Grading - 2024

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	8.6000e-004	5.3000e-004	6.5500e-003	2.0000e-005	2.4000e-003	1.0000e-005	2.4100e-003	6.4000e-004	1.0000e-005	6.5000e-004	0.0000	1.8616	1.8616	5.0000e-005	5.0000e-005	1.8780
Total	**8.6000e-004**	**5.3000e-004**	**6.5500e-003**	**2.0000e-005**	**2.4000e-003**	**1.0000e-005**	**2.4100e-003**	**6.4000e-004**	**1.0000e-005**	**6.5000e-004**	**0.0000**	**1.8616**	**1.8616**	**5.0000e-005**	**5.0000e-005**	**1.8780**

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					0.1381	0.0000	0.1381	0.0548	0.0000	0.0548	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0483	0.4857	0.4158	9.3000e-004		0.0200	0.0200		0.0184	0.0184	0.0000	81.7792	81.7792	0.0265	0.0000	82.4404
Total	**0.0483**	**0.4857**	**0.4158**	**9.3000e-004**	**0.1381**	**0.0200**	**0.1581**	**0.0548**	**0.0184**	**0.0732**	**0.0000**	**81.7792**	**81.7792**	**0.0265**	**0.0000**	**82.4404**

3.4 Grading - 2024

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	8.6000e-004	5.3000e-004	6.5500e-003	2.0000e-005	2.4000e-003	1.0000e-005	2.4100e-003	6.4000e-004	1.0000e-005	6.5000e-004	0.0000	1.8616	1.8616	5.0000e-005	5.0000e-005	1.8780
Total	**8.6000e-004**	**5.3000e-004**	**6.5500e-003**	**2.0000e-005**	**2.4000e-003**	**1.0000e-005**	**2.4100e-003**	**6.4000e-004**	**1.0000e-005**	**6.5000e-004**	**0.0000**	**1.8616**	**1.8616**	**5.0000e-005**	**5.0000e-005**	**1.8780**

3.5 Building Construction - 2024

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	0.1435	1.3108	1.5763	2.6300e-003		0.0598	0.0598		0.0563	0.0563	0.0000	226.0529	226.0529	0.0535	0.0000	227.3893
Total	**0.1435**	**1.3108**	**1.5763**	**2.6300e-003**		**0.0598**	**0.0598**		**0.0563**	**0.0563**	**0.0000**	**226.0529**	**226.0529**	**0.0535**	**0.0000**	**227.3893**

3.5 Building Construction - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6300e-003	0.0685	0.0201	3.1000e-004	0.0103	4.4000e-004	0.0108	2.9900e-003	4.2000e-004	3.4100e-003	0.0000	29.4908	29.4908	1.5000e-004	4.4400e-003	30.8175
Worker	0.0154	9.4900e-003	0.1171	3.6000e-004	0.0429	2.0000e-004	0.0431	0.0114	1.8000e-004	0.0116	0.0000	33.2767	33.2767	9.2000e-004	9.0000e-004	33.5692
Total	**0.0170**	**0.0780**	**0.1372**	**6.7000e-004**	**0.0532**	**6.4000e-004**	**0.0539**	**0.0144**	**6.0000e-004**	**0.0150**	**0.0000**	**62.7675**	**62.7675**	**1.0700e-003**	**5.3400e-003**	**64.3867**

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	0.1435	1.3108	1.5763	2.6300e-003		0.0598	0.0598		0.0563	0.0563	0.0000	226.0526	226.0526	0.0535	0.0000	227.3890
Total	**0.1435**	**1.3108**	**1.5763**	**2.6300e-003**		**0.0598**	**0.0598**		**0.0563**	**0.0563**	**0.0000**	**226.0526**	**226.0526**	**0.0535**	**0.0000**	**227.3890**

3.5 Building Construction - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.6300e-003	0.0685	0.0201	3.1000e-004	0.0103	4.4000e-004	0.0108	2.9900e-003	4.2000e-004	3.4100e-003	0.0000	29.4908	29.4908	1.5000e-004	4.4400e-003	30.8175
Worker	0.0154	9.4900e-003	0.1171	3.6000e-004	0.0429	2.0000e-004	0.0431	0.0114	1.8000e-004	0.0116	0.0000	33.2767	33.2767	9.2000e-004	9.0000e-004	33.5692
Total	**0.0170**	**0.0780**	**0.1372**	**6.7000e-004**	**0.0532**	**6.4000e-004**	**0.0539**	**0.0144**	**6.0000e-004**	**0.0150**	**0.0000**	**62.7675**	**62.7675**	**1.0700e-003**	**5.3400e-003**	**64.3867**

3.5 Building Construction - 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	0.0718	0.6547	0.8444	1.4200e-003		0.0277	0.0277		0.0261	0.0261	0.0000	121.7577	121.7577	0.0286	0.0000	122.4733
Total	**0.0718**	**0.6547**	**0.8444**	**1.4200e-003**		**0.0277**	**0.0277**		**0.0261**	**0.0261**	**0.0000**	**121.7577**	**121.7577**	**0.0286**	**0.0000**	**122.4733**

3.5 Building Construction - 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	8.6000e-004	0.0368	0.0106	1.6000e-004	5.5700e-003	2.4000e-004	5.8100e-003	1.6100e-003	2.3000e-004	1.8400e-003	0.0000	15.5744	15.5744	8.0000e-005	2.3400e-003	16.2749
Worker	7.6900e-003	4.5500e-003	0.0587	1.9000e-004	0.0231	1.0000e-004	0.0232	6.1400e-003	9.0000e-005	6.2300e-003	0.0000	17.4866	17.4866	4.5000e-004	4.5000e-004	17.6328
Total	**8.5500e-003**	**0.0413**	**0.0692**	**3.5000e-004**	**0.0287**	**3.4000e-004**	**0.0290**	**7.7500e-003**	**3.2000e-004**	**8.0700e-003**	**0.0000**	**33.0610**	**33.0610**	**5.3000e-004**	**2.7900e-003**	**33.9077**

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	0.0718	0.6547	0.8444	1.4200e-003		0.0277	0.0277		0.0261	0.0261	0.0000	121.7576	121.7576	0.0286	0.0000	122.4731
Total	**0.0718**	**0.6547**	**0.8444**	**1.4200e-003**		**0.0277**	**0.0277**		**0.0261**	**0.0261**	**0.0000**	**121.7576**	**121.7576**	**0.0286**	**0.0000**	**122.4731**

3.5 Building Construction - 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	8.6000e-004	0.0368	0.0106	1.6000e-004	5.5700e-003	2.4000e-004	5.8100e-003	1.6100e-003	2.3000e-004	1.8400e-003	0.0000	15.5744	15.5744	8.0000e-005	2.3400e-003	16.2749
Worker	7.6900e-003	4.5500e-003	0.0587	1.9000e-004	0.0231	1.0000e-004	0.0232	6.1400e-003	9.0000e-005	6.2300e-003	0.0000	17.4866	17.4866	4.5000e-004	4.5000e-004	17.6328
Total	**8.5500e-003**	**0.0413**	**0.0692**	**3.5000e-004**	**0.0287**	**3.4000e-004**	**0.0290**	**7.7500e-003**	**3.2000e-004**	**8.0700e-003**	**0.0000**	**33.0610**	**33.0610**	**5.3000e-004**	**2.7900e-003**	**33.9077**

3.6 Paving - 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	9.1500e-003	0.0858	0.1458	2.3000e-004		4.1900e-003	4.1900e-003		3.8500e-003	3.8500e-003	0.0000	20.0193	20.0193	6.4700e-003	0.0000	20.1811
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.1500e-003**	**0.0858**	**0.1458**	**2.3000e-004**		**4.1900e-003**	**4.1900e-003**		**3.8500e-003**	**3.8500e-003**	**0.0000**	**20.0193**	**20.0193**	**6.4700e-003**	**0.0000**	**20.1811**

3.6 Paving - 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	4.0000e-004	2.4000e-004	3.0500e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	0.0000	3.2000e-004	0.0000	0.9084	0.9084	2.0000e-005	2.0000e-005	0.9160
Total	**4.0000e-004**	**2.4000e-004**	**3.0500e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2000e-003**	**3.2000e-004**	**0.0000**	**3.2000e-004**	**0.0000**	**0.9084**	**0.9084**	**2.0000e-005**	**2.0000e-005**	**0.9160**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.1500e-003	0.0858	0.1458	2.3000e-004		4.1900e-003	4.1900e-003		3.8500e-003	3.8500e-003	0.0000	20.0192	20.0192	6.4700e-003	0.0000	20.1811
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.1500e-003**	**0.0858**	**0.1458**	**2.3000e-004**		**4.1900e-003**	**4.1900e-003**		**3.8500e-003**	**3.8500e-003**	**0.0000**	**20.0192**	**20.0192**	**6.4700e-003**	**0.0000**	**20.1811**

3.6 Paving - 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	4.0000e-004	2.4000e-004	3.0500e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	0.0000	3.2000e-004	0.0000	0.9084	0.9084	2.0000e-005	2.0000e-005	0.9160
Total	**4.0000e-004**	**2.4000e-004**	**3.0500e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2000e-003**	**3.2000e-004**	**0.0000**	**3.2000e-004**	**0.0000**	**0.9084**	**0.9084**	**2.0000e-005**	**2.0000e-005**	**0.9160**

3.7 Architectural Coating - 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					
Archit. Coating	2.5849					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7100e-003	0.0115	0.0181	3.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	2.5533	2.5533	1.4000e-004	0.0000	2.5567
Total	**2.5866**	**0.0115**	**0.0181**	**3.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.4000e-004**	**0.0000**	**2.5567**

3.7 Architectural Coating - 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	2.9000e-004	1.7000e-004	2.2300e-003	1.0000e-005	8.8000e-004	0.0000	8.8000e-004	2.3000e-004	0.0000	2.4000e-004	0.0000	0.6662	0.6662	2.0000e-005	2.0000e-005	0.6717
Total	**2.9000e-004**	**1.7000e-004**	**2.2300e-003**	**1.0000e-005**	**8.8000e-004**	**0.0000**	**8.8000e-004**	**2.3000e-004**	**0.0000**	**2.4000e-004**	**0.0000**	**0.6662**	**0.6662**	**2.0000e-005**	**2.0000e-005**	**0.6717**

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	2.5849					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.7100e-003	0.0115	0.0181	3.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	2.5533	2.5533	1.4000e-004	0.0000	2.5567
Total	**2.5866**	**0.0115**	**0.0181**	**3.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.4000e-004**	**0.0000**	**2.5567**

3.7 Architectural Coating - 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	2.9000e-004	1.7000e-004	2.2300e-003	1.0000e-005	8.8000e-004	0.0000	8.8000e-004	2.3000e-004	0.0000	2.4000e-004	0.0000	0.6662	0.6662	2.0000e-005	2.0000e-005	0.6717
Total	**2.9000e-004**	**1.7000e-004**	**2.2300e-003**	**1.0000e-005**	**8.8000e-004**	**0.0000**	**8.8000e-004**	**2.3000e-004**	**0.0000**	**2.4000e-004**	**0.0000**	**0.6662**	**0.6662**	**2.0000e-005**	**2.0000e-005**	**0.6717**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	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
	tons/yr										MT/yr					
Mitigated	0.6651	1.1272	6.3070	0.0153	1.5673	0.0126	1.5799	0.4193	0.0118	0.4311	0.0000	1,452.2520	1,452.2520	0.0731	0.0778	1,477.2689
Unmitigated	0.6651	1.1272	6.3070	0.0153	1.5673	0.0126	1.5799	0.4193	0.0118	0.4311	0.0000	1,452.2520	1,452.2520	0.0731	0.0778	1,477.2689

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	1,444.32	1,459.62	1308.15	4,180,793	4,180,793
Total	1,444.32	1,459.62	1,308.15	4,180,793	4,180,793

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	48.40	15.90	35.70	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.521458	0.053308	0.175656	0.151963	0.025001	0.006656	0.014407	0.022718	0.000702	0.000287	0.023515	0.001463	0.002865

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	112.8805	112.8805	0.0183	2.2100e-003	113.9967
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	112.8805	112.8805	0.0183	2.2100e-003	113.9967
NaturalGas Mitigated	0.0198	0.1695	0.0721	1.0800e-003		0.0137	0.0137		0.0137	0.0137	0.0000	196.2585	196.2585	3.7600e-003	3.6000e-003	197.4248
NaturalGas Unmitigated	0.0198	0.1695	0.0721	1.0800e-003		0.0137	0.0137		0.0137	0.0137	0.0000	196.2585	196.2585	3.7600e-003	3.6000e-003	197.4248

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	3.67775e +006	0.0198	0.1695	0.0721	1.0800e-003		0.0137	0.0137		0.0137	0.0137	0.0000	196.2585	196.2585	3.7600e-003	3.6000e-003	197.4248
Total		**0.0198**	**0.1695**	**0.0721**	**1.0800e-003**		**0.0137**	**0.0137**		**0.0137**	**0.0137**	**0.0000**	**196.2585**	**196.2585**	**3.7600e-003**	**3.6000e-003**	**197.4248**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	3.67775e +006	0.0198	0.1695	0.0721	1.0800e-003		0.0137	0.0137		0.0137	0.0137	0.0000	196.2585	196.2585	3.7600e-003	3.6000e-003	197.4248
Total		**0.0198**	**0.1695**	**0.0721**	**1.0800e-003**		**0.0137**	**0.0137**		**0.0137**	**0.0137**	**0.0000**	**196.2585**	**196.2585**	**3.7600e-003**	**3.6000e-003**	**197.4248**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.22002e +006	112.8805	0.0183	2.2100e-003	113.9967
Total		**112.8805**	**0.0183**	**2.2100e-003**	**113.9967**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	1.22002e +006	112.8805	0.0183	2.2100e-003	113.9967
Total		**112.8805**	**0.0183**	**2.2100e-003**	**113.9967**

6.0 Area Detail

6.1 Mitigation Measures Area

	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	1.3748	0.0703	1.1593	4.3000e-004		0.0109	0.0109		0.0109	0.0109	0.0000	68.1364	68.1364	3.0500e-003	1.2200e-003	68.5747
Unmitigated	1.3748	0.0703	1.1593	4.3000e-004		0.0109	0.0109		0.0109	0.0109	0.0000	68.1364	68.1364	3.0500e-003	1.2200e-003	68.5747

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	0.2585					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0756					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	6.7000e-003	0.0572	0.0244	3.7000e-004		4.6300e-003	4.6300e-003		4.6300e-003	4.6300e-003	0.0000	66.2807	66.2807	1.2700e-003	1.2200e-003	66.6746
Landscaping	0.0341	0.0131	1.1350	6.0000e-005		6.3000e-003	6.3000e-003		6.3000e-003	6.3000e-003	0.0000	1.8557	1.8557	1.7800e-003	0.0000	1.9001
Total	**1.3748**	**0.0703**	**1.1593**	**4.3000e-004**		**0.0109**	**0.0109**		**0.0109**	**0.0109**	**0.0000**	**68.1364**	**68.1364**	**3.0500e-003**	**1.2200e-003**	**68.5747**

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	0.2585					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0756					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	6.7000e-003	0.0572	0.0244	3.7000e-004		4.6300e-003	4.6300e-003		4.6300e-003	4.6300e-003	0.0000	66.2807	66.2807	1.2700e-003	1.2200e-003	66.6746
Landscaping	0.0341	0.0131	1.1350	6.0000e-005		6.3000e-003	6.3000e-003		6.3000e-003	6.3000e-003	0.0000	1.8557	1.8557	1.7800e-003	0.0000	1.9001
Total	**1.3748**	**0.0703**	**1.1593**	**4.3000e-004**		**0.0109**	**0.0109**		**0.0109**	**0.0109**	**0.0000**	**68.1364**	**68.1364**	**3.0500e-003**	**1.2200e-003**	**68.5747**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	10.1884	0.3260	7.8100e-003	20.6642
Unmitigated	10.1884	0.3260	7.8100e-003	20.6642

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	9.96857 / 6.28453	10.1884	0.3260	7.8100e-003	20.6642
Total		**10.1884**	**0.3260**	**7.8100e-003**	**20.6642**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	9.96857 / 6.28453	10.1884	0.3260	7.8100e-003	20.6642
Total		**10.1884**	**0.3260**	**7.8100e-003**	**20.6642**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	32.0076	1.8916	0.0000	79.2975
Unmitigated	32.0076	1.8916	0.0000	79.2975

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	157.68	32.0076	1.8916	0.0000	79.2975
Total		**32.0076**	**1.8916**	**0.0000**	**79.2975**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	157.68	32.0076	1.8916	0.0000	79.2975
Total		**32.0076**	**1.8916**	**0.0000**	**79.2975**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix-B
ISR Fee Estimate

Emissions Estimator Worksheet

1/12/2024

Applicant/Business Name:	**Lennar Central Valley California**
Project Name:	**Wilde North at Heritage Grove Residential Development(Ricchiuti Sunnyside)**
Project Location:	**Northeast portion of Perrin and Bryan Avenue, Fresno County**
District Project ID No.:	

Project Construction Emissions

If applicant selected Construction Clean Fleet Mitigation Measure - Please select "Yes" from dropdown menu: **Yes**

			NOx					PM10				
Project Phase Name	ISR Phase	Construction Start Date	Unmitigated Baseline(1) (TPY)	Mitigated Baseline(2) (TPY)	Achieved On-site Reductions(3) (tons)	Required Off-site Reductions(4) (tons)	Emission Reductions Required by Rule(5)	Unmitigated Baseline(1) (TPY)	Mitigated Baseline(2) (TPY)	Achieved On-site Reductions(3) (tons)	Required Off-site Reductions(4) (tons)	Emission Reductions Required by Rule(5)
Ricchiuti Sunnyside	1	1/8/2025	2.2200	1.7760	0.4440	0.0000	0.4440	0.3900	0.2145	0.1755	0.0000	0.1755
	2				0.0000	0.0000	0.0000			0.0000	0.0000	0.0000
	3				0.0000	0.0000	0.0000			0.0000	0.0000	0.0000
	4				0.0000	0.0000	0.0000			0.0000	0.0000	0.0000
	5				0.0000	0.0000	0.0000			0.0000	0.0000	0.0000
	6				0.0000	0.0000	0.0000			0.0000	0.0000	0.0000
	7				0.0000	0.0000	0.0000			0.0000	0.0000	0.0000
	8				0.0000	0.0000	0.0000			0.0000	0.0000	0.0000
	9				0.0000	0.0000	0.0000			0.0000	0.0000	0.0000
	10				0.0000	0.0000	0.0000			0.0000	0.0000	0.0000
		Total	**2.2200**	**1.7760**	**0.4440**	**0.0000**	0.4440	**0.3900**	**0.2145**	**0.1755**	**0.0000**	0.1755

Total Achieved On-Site Reductions (tons)

ISR Phase	NOx	PM10
1	0.4440	0.1755
2	0.0000	0.0000
3	0.0000	0.0000
4	0.0000	0.0000
5	0.0000	0.0000
6	0.0000	0.0000
7	0.0000	0.0000
8	0.0000	0.0000
9	0.0000	0.0000
10	0.0000	0.0000
Total	**0.4440**	**0.1755**

Project Operations Emissions (Area + Mobile)

			NOx						PM10					
Project Phase Name	ISR Phase	Operation Start Date	Unmitigated Baseline(1) (TPY)	Mitigated Baseline(2) (TPY)	Achieved On-site Reductions(3) (tons)	Required Off-site Reductions(4) (tons)	Total Emission Reductions Required by Rule(6)	Average Annual Emission Reductions Required by Rule(7)	Unmitigated Baseline(1) (TPY)	Mitigated Baseline(2) (TPY)	Achieved On-site Reductions(3) (tons)	Required Off-site Reductions(4) (tons)	Total Emission Reductions Required by Rule(6)	Average Annual Emission Reductions Required by Rule(7)
Ricchiuti SunnySide	1	9/9/2025	1.3600	1.3600	0.0000	3.4000	3.4000	0.3400	1.6000	1.6000	0.0000	8.0000	8.0000	0.8000
	2				0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
	3				0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
	4				0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
	5				0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
	6				0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
	7				0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
	8				0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
	9				0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
	10				0.0000	0.0000	0.0000	0.0000			0.0000	0.0000	0.0000	0.0000
		Total	**1.3600**	**1.3600**	**0.0000**	**3.4000**	**3.4000**	**0.3400**	**1.6000**	**1.6000**	**0.0000**	**8.0000**	**8.0000**	**0.8000**

Total Required Off-Site Reductions (tons)

ISR Phase	NOx	PM10
1	3.4000	8.0000
2	0.0000	0.0000
3	0.0000	0.0000
4	0.0000	0.0000
5	0.0000	0.0000
6	0.0000	0.0000
7	0.0000	0.0000
8	0.0000	0.0000
9	0.0000	0.0000
10	0.0000	0.0000
Total	**3.4000**	**8.0000**

Notes:

TPY: Tons Per Year

(1) **Unmitigated Baseline:** The project's baseline emissions generated with no on-site emission reduction measures.

(2) **Mitigated Baseline:** The project's baseline emissions generated after on-site emisison reduction measures have been applied.

(3) **Achieved On-site Reductions:** The project's emission reductions achieved after on-site emission reduction measures have been applied.

(4) **Required Off-site Reductions:** The project's remaining emission reductions required by Rule 9510 if on-site emission reduction measures did not achieive the required rule reductions.

(5) **Emission Reductions Required by Rule:** The project's emission reductions required (20% NOx and 45% PM10) for construction from the unmitigated baseline.

(6) **Total Emission Reductions Required by Rule:** The project's emission reductions required (33.3% NOx and 50% PM10) for operations from the unmitigated baseline over a 10-year period.

(7) **Average Annual Emission Reductions Required by Rule:** The project's total emission reduction for operations required by Rule 9510 divided by 10 years.

Fee Estimator Worksheet

1/12/2024

Applicant/Business Name:	**Lennar Central Valley California**
Project Name:	**Wilde North at Heritage Grove Residential Development(Ricchiuti Sunnyside)**
Project Location:	**Northeast portion of Perrin and Bryan Avenue, Fresno County**
District Project ID No.:	

NOTES:

(1) The start date for each ISR phase is shown in TABLE 1.

(2) If you have chosen a **ONE-TIME** payment for the project, then the total amount due for ALL PHASES is shown under TABLE 2.

(3) If you have chosen a **DEFERRED** payment schedule or would like to propose a **DEFERRED** payment schedule for the project, the total amount due for a specific year is shown in TABLE 3 according to the schedule in TABLE 1.

***** If you have not provided a proposed payment date, the District sets a default invoice date of 60 days prior to start of the ISR phase.

If applicant selected Fee Deferral Schedule - Please select "Yes" from dropdown menu	Yes

TABLE 1 - PROJECT INFORMATION

Project Phase Name	ISR Phase	Start Date per Phase	Scheduled Payment Date*
0	1	1/8/25	FALSE
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
TOTAL (tons)			

TABLE 2 - No Fee Deferral Schedule (FDS) / **TABLE 2 - NO FDS**

ISR Phase	Pollutant	Required Offsite Reductions (tons)	2021
1	NOx	3.4000	3.4000
1	PM10	8.0000	8.0000
2	NOx	0.0000	0.0000
2	PM10	0.0000	0.0000
3	NOx	0.0000	0.0000
3	PM10	0.0000	0.0000
4	NOx	0.0000	0.0000
4	PM10	0.0000	0.0000
5	NOx	0.0000	0.0000
5	PM10	0.0000	0.0000
6	NOx	0.0000	0.0000
6	PM10	0.0000	0.0000
7	NOx	0.0000	0.0000
7	PM10	0.0000	0.0000
8	NOx	0.0000	0.0000
8	PM10	0.0000	0.0000
9	NOx	0.0000	0.0000
9	PM10	0.0000	0.0000
10	NOx	0.0000	0.0000
10	PM10	0.0000	0.0000
TOTAL (tons)	NOx	3.4000	3.4000
TOTAL (tons)	PM10	8.0000	8.0000

Offsite Fee by Pollutant ($)	NOx	$31,790
	PM10	$72,088
Administrative Fee ($)		$4,155.12
Offsite Fee ($)		$103,878.00
Total Project Offsite Fee ($)		$108,033.12

TABLE 3 - APPROVED FEE DEFERRAL SCHEDULE (FDS) BY PAYMENT YEAR

2021	2022	2023	2024	2025	2026	2027	2028	2029
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0
$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	$0.00	$0.00
			$0.00					

Rule 9510 Fee Schedule ($/ton)

Year	Nox	PM10
2021 and Beyond	$9,350	$9,011

LIVE OAK
ASSOCIATES, INC.

BIOLOGICAL EVALUATION
LENNAR HOMES TRACT 6452
FRESNO COUNTY, CALIFORNIA

Prepared by:

LIVE OAK ASSOCIATES, INC.

Austin Pearson, Vice President
Rebekah Jensen, Senior Project Manager and Ecologist

Prepared for:

Jeff Callaway
Lennar Central Valley
8080 North Palm Avenue, Suite 110
Fresno, CA 93711

November 8, 2023 PN 2817-01

EXECUTIVE SUMMARY

Live Oak Associates, Inc. (LOA) investigated the biological resources of an approximately 18-acre site proposed for a residential development and evaluated potential project-related impacts to such resources pursuant to the California Environmental Quality Act (CEQA). The site is located immediately north of Clovis city limits, in unincorporated Fresno County, California. The project would subdivide the existing parcel into 153 single-family lots, annex the development into the City of Clovis, and change the zoning to accommodate medium- and low-density residential housing. Full buildout of the site is anticipated.

LOA's analysis was based on a reconnaissance-level field survey conducted on September 25, 2023. At that time, the site consisted of a vacant field traversed by several dirt roads and containing several cleared and graded areas. It supported grasses and forbs typical of annual grasslands in the region, and could best be characterized as ruderal grassland habitat. It did not contain aquatic resources, wildlife movement corridors, sensitive natural communities, or designated critical habitat.

The project site has the potential to be used by various wildlife species, possibly including the special-status tricolored blackbird, Swainson's hawk, golden eagle, pallid bat, spotted bat, and western mastiff bat. None of these species have the potential to nest or roost on the project site; however, the Swainson's hawk could potentially nest close enough to the site that individuals could be disturbed by construction activities. Construction-related injury, mortality, and disturbance of nesting Swainson's hawks and other nesting birds and raptors is considered a potentially significant impact of the project.

No other biological resources would be significantly impacted by project implementation. Impacts are considered less than significant for all regionally-occurring special status plant species, 22 of 23 regionally-occurring special status animal species, wildlife movement corridors, sensitive natural communities, jurisdictional waters, and designated critical habitat. The project appears to be consistent with City of Clovis and County of Fresno General Plan policies related to biological resources, and there are no known Habitat Conservation Plans or Natural Community Conservation Plans in the area.

TABLE OF CONTENTS

1.0 INTRODUCTION

This technical report, prepared by Live Oak Associates, Inc. (LOA) in support of California Environmental Quality Act (CEQA) review, describes the biological resources of an approximately 18-acre site ("project site") proposed for a residential development ("project"), and evaluates the potential impacts to biological resources associated with project implementation. The project is located immediately north of Clovis city limits in unincorporated Fresno County, California (Figure 1). It may be found on the *Clovis* and *Friant* U.S. Geological Survey (USGS) 7.5-minute quadrangles, in Section 20 of Township 12 South, Range 21 East, Mount Diablo Base and Meridian (Figure 2).

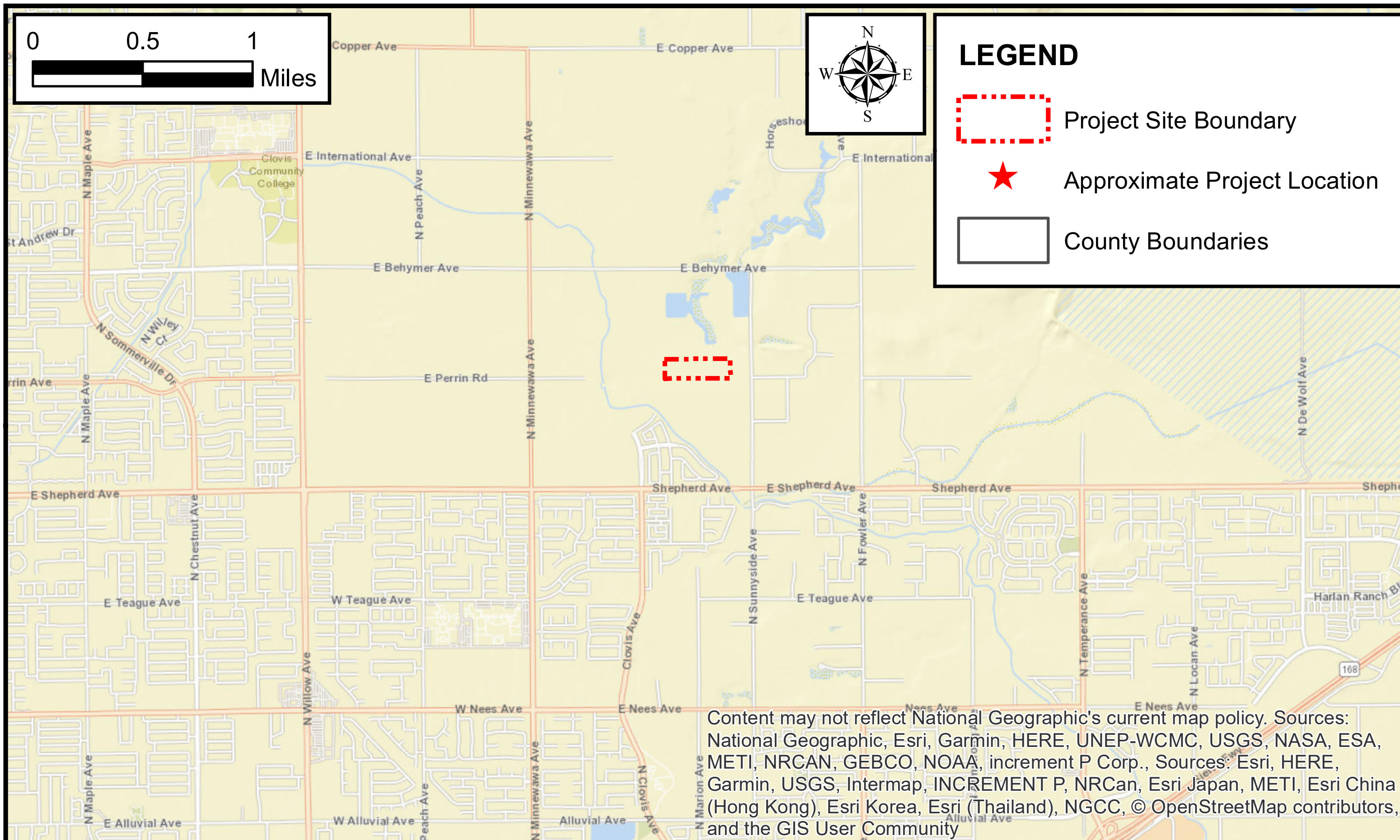
1.1 PROJECT DESCRIPTION

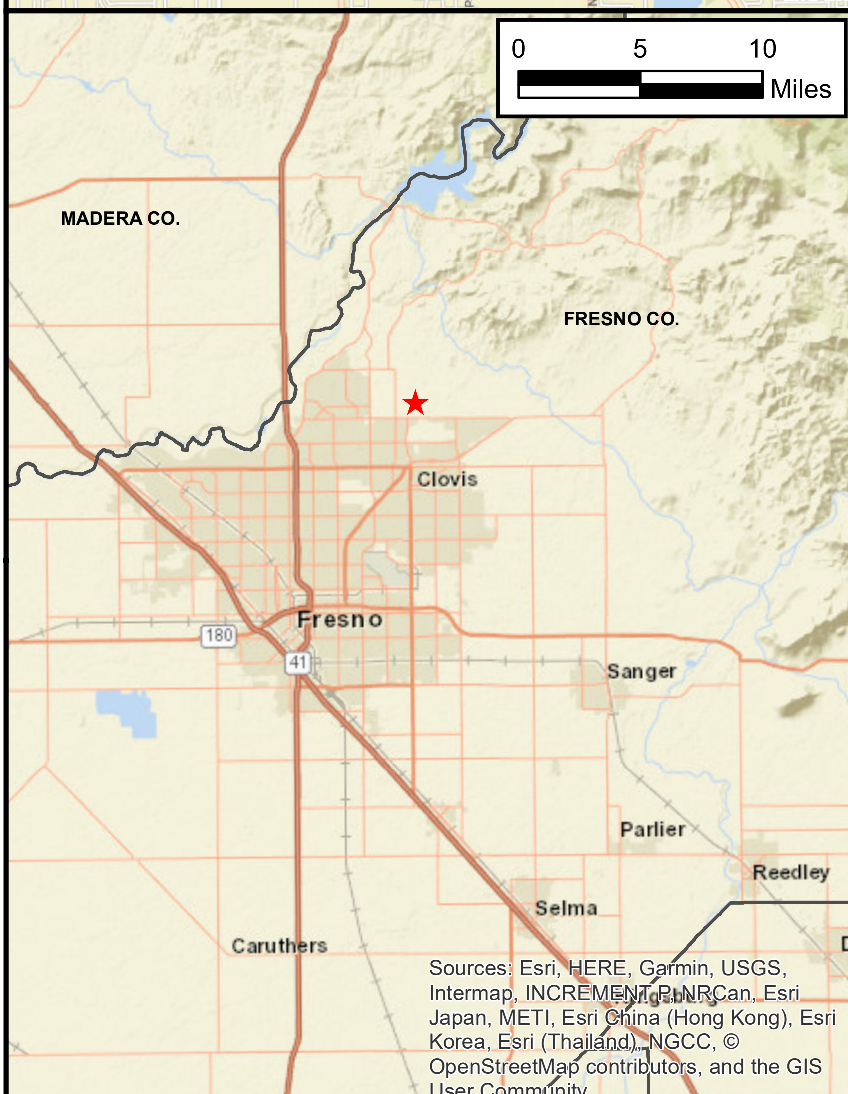
Lennar Homes Central Valley proposes a residential development on approximately 18 acres located between Barron and Sunnyside Avenues, north of Perrin Avenue. The existing Tract 6452 will be subdivided into 153 single-family lots and annexed into the City of Clovis. Current County of Fresno zoning is AE-20, which provides for agricultural and related uses on minimum 20-acre parcels; proposed City of Clovis zoning is Medium and Low Density Residential (M/L). The residential development will be located within the City of Clovis Heritage Grove Master Plan and will be subject to design development standards of the plan.

1.2 REPORT OBJECTIVES

This report summarizes a biological study conducted by LOA to facilitate environmental review pursuant to CEQA. As such, the report's objectives are to:

- Characterize the project site's existing biological resources, including biotic habitats, flora and fauna, soils, and aquatic resources.
- Evaluate the project site's potential to support sensitive resources such as special status species, sensitive natural communities, and jurisdictional waters and wetlands.
- Summarize all state and federal natural resource protection laws that may be relevant to project implementation.
- Identify and discuss potential project-related impacts to biological resources within the context of CEQA and other state and federal laws.

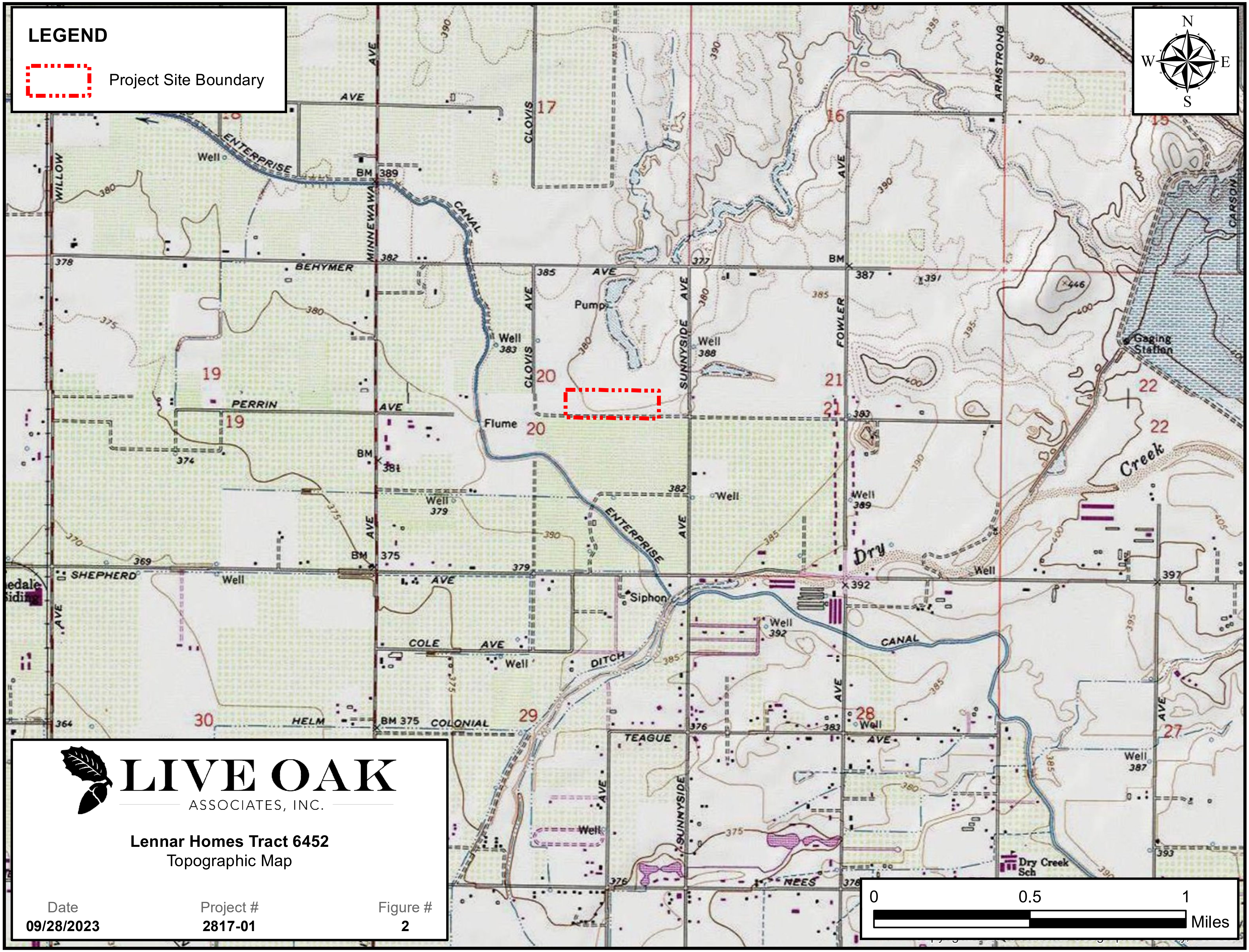




LIVE OAK
ASSOCIATES, INC.

Lennar Homes Tract 6452
Vicinity Map

Date	Project #	Figure #
09/28/2023	**2817-01**	**1**


LEGEND
Project Site Boundary
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LIVE OAK
ASSOCIATES, INC.
Lennar Homes Tract 6452
Topographic Map
Date
09/28/2023
Project #
2817-01
Figure #
2
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1
Miles
ENTERPRISE CANAL
BEHYMER AVE
PERRIN AVE
SHEPHERD AVE
COLE AVE
HELM AVE
COLONIAL
TEAGUE AVE
NEES
WILLOW AVE
MINNEWAWA AVE
CLOVIS AVE
SUNNYSIDE AVE
FOWLER AVE
ARMSTRONG
CARSON
Dry Creek
DITCH
Flume
Siphon
Pump
Gaging Station
Dry Creek Sch

- Identify avoidance and mitigation measures that would reduce the magnitude of project-related impacts in a manner consistent with CEQA and species-specific guidelines.

1.3 STUDY METHODOLOGY

A reconnaissance-level field survey of the project site was conducted on September 25, 2023 by LOA ecologist Jeff Gurule. The survey consisted of walking and driving through the project site while identifying its principal land uses, biotic habitats, flora, and fauna, and assessing its potential to support special status species and other sensitive resources.

LOA conducted an analysis of potential project impacts based on the known and potential biotic resources of the project site. Sources of information used in the preparation of this analysis included the *California Natural Diversity Data Base* (CDFW 2023), *Online Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2023), and manuals, reports, and references related to plants and animals of the project vicinity.

2.0 EXISTING CONDITIONS

2.1 REGIONAL SETTING

The project site is located near the eastern margin of the San Joaquin Valley, about four miles southwest of the lowest Sierra foothills. The San Joaquin Valley is a large, nearly flat alluvial plain bordered by the Sierra Nevada to the east, the Tehachapi Mountains to the south, the California coast ranges to the west, and the Sacramento-San Joaquin Delta to the north.

Like most of California, the San Joaquin Valley experiences a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. Summer temperatures commonly exceed 90 degrees Fahrenheit, and the relative humidity is generally very low. Winter temperatures rarely exceed 70 degrees Fahrenheit, with daytime highs often below 60 degrees Fahrenheit. Annual precipitation in the project vicinity varies considerably from year to year, but averages approximately 11 inches, almost all of which falls between the months of October and March (Western Regional Climate Center 2018). Nearly all precipitation falls in the form of rain.

The principal drainage of the project vicinity is Dry Creek, which originates in the Sierra Nevada foothills and flows past the project site approximately 0.6 mile to the southeast at its closest point. Like many other natural drainages in Fresno County, Dry Creek in the project vicinity is heavily modified, having been channelized, realigned, dammed, and diverted to prevent flooding and to convey flows around developed areas.

The project site is located in the outskirts of Clovis, at the interface of urban and rural land uses. It is situated in a mosaic of agricultural lands, rural residences, and low- to medium-density residential subdivisions. An adjacent Lennar Homes housing development, Tract 6200, is located immediately south of the site and was actively under construction at the time of LOA's field survey. A Fresno Metropolitan Flood Control District (FMFCD) basin facility is located immediately to the north. To the east and west lie vacant land similar to the project site. The nearest areas of relatively undisturbed natural lands are located approximately 0.6 mile east and 2 miles north of the project site; both are annual grasslands that do not appear to have previously been used for agricultural cultivation. Please refer to Figure 3 for an aerial map of the project site and surrounding lands.

LIVE OAK ASSOCIATES, INC.

Lennar Homes Tract 6452
Aerial Map

Date	Project #	Figure #
09/28/2023	**2817-01**	**3**

2.2 PROJECT SITE

The project site has relatively level topography and sits at an elevation of approximately 385 feet above sea level. At the time of LOA's survey, it consisted of a vacant field traversed by several dirt roads. A portion of the eastern end of the site had elevated topography, possibly the result of excess soil storage, and a shallow excavated area was observed in the middle of the site. An approximately 2-acre area along the site's southern boundary was enclosed by silt fencing associated with the adjoining Lennar Homes Tract 6200 project, which was under construction. The project site does not appear to have previously been cultivated, other than possible dry-farming. Analysis of aerial imagery indicates that it is periodically disked and/or mowed, with some areas subject to grading, and that the configuration of dirt roads has changed over time.

The site contains two soil map units: Atwater sandy loam, 0 to 3 percent slopes; and Greenfield sandy loam, 0 to 3 percent slopes (NRCS 2023). Neither of these map units are considered hydric, meaning they do not have the propensity to pond water and support the growth of wetland vegetation.

Lists of the vascular plant species observed within the project site and the terrestrial vertebrates using, or potentially using, the site are provided in Appendices A and B, respectively. Representative photographs are presented in Appendix C.

2.3 LAND USES / BIOTIC HABITATS

A single biotic habitat was identified within the project site: ruderal grassland. This habitat supported grasses and forbs typical of annual grasslands in the project vicinity, but was characterized by repeated disturbance including disking and mowing, road construction, and localized grading. Dominant plant species at the time of LOA's survey were primarily non-native and included foxtail barley (*Hordeum murinum*), wild oats (*Avena* sp.), ripgut brome (*Bromus diandrus*), prickly lettuce (*Lactuca serriola*), doveweed (*Croton setiger*), jimsonweed (*Datura wrightii*), and red-stemmed filaree (*Erodium cicutarium*).

The degraded nature of this grassland, combined with its location within the outskirts of Clovis, limits its potential for faunal biodiversity. However, some wildlife species certainly utilize the grassland. Reptiles expected to occur in this habitat include the side-blotched lizard (*Uta stansburiana*), common kingsnake (*Lampropeltis californiae*), and Pacific gopher snake (*Pituophis catenifer catenifer*). Common amphibians such as the western toad (*Bufo boreas*) and Sierran treefrog (*Pseudacris sierra*) may breed at the adjoining FMFCD basin facility and subsequently disperse through the site's grassland habitat.

The site's ruderal grassland is expected to support both nesting and foraging by various avian species. Likely nesters include the western meadowlark (*Sturnella neglecta*) and mourning dove (*Zenaida macroura*), both of which nest in ground vegetation, and the killdeer (*Charadrius vociferus*), which preferentially nests in disturbed areas and may use sparsely vegetated or barren portions of the grassland. Likely foragers include the western kingbird (*Tyrannus verticalis*) in the summer, the Say's phoebe (*Sayornis saya*) and savannah sparrow (*Passerculus sandwichensis*) in the winter, and the Brewer's blackbird (*Euphagus cyanocephalus*), American kestrel (*Falco sparverius*) and red-tailed hawk (*Buteo jamaicensis*) year-round.

Small mammal use of the ruderal grassland is expected to include the deer mouse (*Peromyscus maniculatus*), California vole (*Microtus californicus*), and Botta's pocket gopher (*Thomomys bottae*). At the time of LOA's field survey, burrowing rodent activity was limited to a small area in the northwestern portion of the site that was recently used for bee boxes (Google Earth aerial imagery dated May 2023) and was relatively barren of vegetation. All burrows in this area were associated with the Botta's pocket gopher and were plugged with soil. No open burrows were observed anywhere on the site.

Mammalian predators expected to use the site's ruderal grassland include the coyote (*Canis latrans*), raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*). Due to the proximity of residences, domestic dogs (*Canis familiaris*) and cats (*Felis catus*) may also occur here from time to time.

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 3.2, 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" or "fully protected" by CDFW. The California Native Plant Society (CNPS) has developed its own ranking system, California Rare Plant Ranks (CRPR), for native plants considered rare, threatened, or endangered (CNPS 2023). Plants with a CRPR ranking of 1 or 2 meet the definitions of the California Endangered Species Act and are eligible for state listing. Collectively, all of the aforementioned plants and animals are referred to as "special status species."

The California Natural Diversity Data Base (CNDDB) (CDFW 2023) was queried for special status species occurrences in the twelve USGS 7.5-minute quadrangles containing and immediately surrounding the project site *(Clovis, Friant, Little Table Mtn., Millerton Lake West, Millerton Lake East, Academy, Round Mountain, Sanger, Malaga, Fresno South, Fresno North,* and *Lanes Bridge*). These species, and their potential to occur on site, are listed in Table 1 on the following pages. Sources of information for Table 1 included *California's Wildlife, Volumes I, II, and III* (Zeiner et. al 1988), *The Jepson Manual: Vascular Plants of California, second edition* (Baldwin et al. 2012), CNPS's *Online Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2023), Calflora.org, and eBird.org.

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

PLANTS (adapted from CDFW 2023, CNPS 2023)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat / Range	Occurrence on the Project Site
Succulent owl's clover (*Castilleja campestris var. succulenta*)	FT, CE, CRPR 1B	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 vernal pool habitat for this species is absent from the project site.
California jewelflower (*Caulanthus californicus*)	FE, CE, CRPR 1B	Occurs in chenopod scrub, pinyon and juniper woodland, and valley and foothill grassland in sandy soils. Elevations between 200 and 3,300 feet. Blooms February-May.	**Absent**. All historical populations of this species on the San Joaquin Valley floor are thought to have been extirpated by 1986 (USFWS 1998). There is only one known occurrence of the California jewelflower, historical or otherwise, within approximately 50 miles of the project site. It is generally mapped to Fresno, based on a collection from the late 1890s or early 1900s. That population has long since been extirpated (CDFW 2023).
Boggs Lake hedge-hyssop (*Gratiola heterosepala*)	CE, CRPR 1B	Found in vernal pools or lake margins, usually in clay soils; elevations up to 7,800 feet. Blooms April-August.	**Absent**. Suitable aquatic habitat for this species is absent from the project site.
San Joaquin Valley orcutt grass (*Orcuttia inaequalis*)	FT, CE CRPR 1B	Occurs in Central Valley vernal pools between 130 and 820 ft. in elevation. Requires deep pools with prolonged periods of inundation. Blooms April-Sept.	**Absent**. Suitable vernal pool habitat for this species is absent from the project site.
Hairy orcutt grass (*Orcuttia pilosa*)	FE, CE CRPR 1B	Occurs in Central Valley vernal pools between 65 and 1,215 ft. in elevation. Requires deep pools with prolonged periods of inundation. Blooms May-Sept.	**Absent**. Suitable vernal pool habitat for this species is absent from the project site.
Hartweg's golden sunburst (*Pseudobahia bahiifolia*)	FE, CE CRPR 1B	Occurs in grasslands of the western foothills of the Sierra Nevada in heavy clay soils of the Porterville, Cibo, Mt. Olive and Centerville soil series, between 230 and 525 ft. in elevation. Blooms March-April.	**Absent**. Suitable soils for this species are absent from the project site.
San Joaquin adobe sunburst (*Pseudobahia peirsonii*)	FT, CE, CRPR 1B	Annual sunflower occurs in grasslands of the Sierra Nevada foothills in heavy clay soils of the Porterville and Centerville series, between 300 and 2,625 ft. in elevation. Blooms March-April.	**Absent**. Suitable soils for this species are absent from the project site.
Greene's tuctoria (*Tuctoria greenei*)	FE, CR CRPR 1B	Occurs in vernal pools between 130 and 3,740 ft. in elevation. Requires deep pools with prolonged periods of inundation. Blooms May-Sept.	**Absent**. Suitable vernal pool habitat for this species is absent from the project site.

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

PLANTS (cont'd)

CNPS-ranked Species

Species	Status	Habitat / Range	Occurrence on the Project Site
Hoover's calycadenia (*Calycadenia hooveri*)	CRPR 1B	Occurs on exposed, rocky, barren soil within valley grasslands and foothill woodlands between 200 and 980 ft. in elevation. Blooms June-September.	**Absent**. Suitable rocky soils for this species are absent from the project site. There is only one documented occurrence of this species on the valley floor, recorded in Stanislaus County in 1976. All other known populations are on and around rock formations in the lower foothills (CDFW 2023).
Bristly sedge (*Carex comosa*)	CRPR 2B	Found at the margins of lakes and other marsh habitats within valley and foothill grassland and coastal prairie ecosystems. Elevations up to 2,000 ft. Blooms May-September.	**Absent**. Suitable habitat for this species is absent from the project site.
Tree-anemone (*Carpenteria californica*)	CRPR 1B	Found within on well-drained granitic soils within woodland and chaparral habitats, usually in north-facing ravines and drainages. Elevations 1,100-4,400 feet; blooms April-July.	**Absent**. Habitat for tree-anemone is absent from the project site, and the site is situated below this species' elevational distribution.
Dwarf downingia (*Downingia pusilla*)	CRPR 2B	Occurs in vernal pools in valley and foothill grassland habitats up to 1,460 ft. in elevation. Blooms March-May.	**Absent**. Suitable vernal pool habitat for this species is absent from the project site.
Spiny-sepaled button-celery (*Eryginum spinosepalum*)	CRPR 1B	Occurs in vernal pools in valley and foothill grasslands of the San Joaquin Valley and the Tulare Basin, between 330 and 840 ft. in elevation. Blooms April-May.	**Absent**. Suitable vernal pool habitat for this species is absent from the project site.
California satintail (*Imperata brevifolia*)	CRPR 2B	Found in wetland seeps and riparian areas within various types of scrub, chaparral, and desert communities up to 4,000 feet in elevation. Blooms September-May.	**Absent.** Suitable habitat for this species is absent from the project site.
Forked hare-leaf (*Lagophylla dichotoma*)	CRPR 1B	Occurs in woodland and valley and foothill grassland habitats, sometimes in clay soils, at elevations from 600 to 1,100 feet. Blooms April-May.	**Absent**. The site is below the typical elevational range of the forked hare-leaf, and its degraded grassland habitat would be marginal, at best, for this species. There are only seven CNDDB occurrences of the forked hare-leaf; only one of these, from 1915, is mapped on the valley floor, and there is considerable location uncertainty associated with it. All other known occurrences are in the lower foothills.
Madera leptosiphon (*Leptosiphon serrulatus*)	CRPR 1B	Found on dry slopes, often on decomposed granite, within cismontane woodlands and lower montane coniferous forests. May occur in disturbed locations such as roadcuts (CDFW 2023, iNaturalist 2023). Elevations between 100 and 4,200 ft.; blooms April – May.	**Absent**. Habitat for Madera leptosiphon is absent from the project site, and the site is situated below this species' elevational distribution.

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

PLANTS (cont'd)

CNPS-ranked Species

Species	Status	Habitat / Range	Occurrence on the Project Site
Orange Lupine (*Lupinus citrinus* var. *citrinus*)	CRPR 1B	Found in association with rocky, decomposed granitic outcrops in chaparral, woodland, and lower montane coniferous forest 2,000-5,500 ft. in elevation. Blooms April-August.	**Absent**. Habitat for orange lupine is absent from the project site, and the site is situated below this species' elevational distribution.
Pincushion navarretia (*Navarretia myersii ssp. myersii*)	CRPR 1B	Found in vernal pools within annual grassland habitats at elevations up to 1,000 ft. Blooms April-May.	**Absent**. Suitable vernal pool habitat for this species is absent from the project site.
Sanford's arrowhead (*Sagittaria sanfordii*)	CRPR 1B	Occurs in shallow freshwater marshes, ponds, sloughs, and ditches of the Central Valley and Sierra Nevada foothills up to 2,100 ft. in elevation. Blooms May-October.	**Absent.** Suitable aquatic habitat for this species is absent from the project site.

ANIMALS (cont'd)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Crotch bumblebee (*Bombus crotchii*)	CCE	Once common in the Central Valley, this species is now absent from most of it, particularly in the central portion of its historic range. Where present, it is associated with open grassland and scrub habitats, where it relies on food plants of the *Asclepias, Chaenactis, Lupinus, Medicago, Phacelia,* and *Salvia* genera (Williams et al. 2014).	**Unlikely.** This species is unlikely to occur in the matrix of residential and agricultural lands that characterizes the project vicinity. In fact, it is generally thought to be absent from the valley floor.
Valley elderberry longhorn beetle (VELB) (*Desmocerus californicus dimorphus*)	FT	Lives in mature elderberry shrubs of California's Central Valley and Sierra foothills, generally along waterways and in floodplains.	**Absent.** The USFWS has revised its understanding of VELB distribution to exclude the San Joaquin Valley south of Merced County. Moreover, elderberry shrubs are absent from 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 vernal pool habitat for this species is absent from the project site.
Vernal pool tadpole shrimp (*Lepidurus packardi*)	FE	Found in vernal pools and other seasonal wetlands in the Central Valley, Bay Delta, and eastern San Francisco Bay Area.	**Absent.** Suitable vernal pool habitat for this species is absent from the project site.

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

ANIMALS (cont'd)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat / Range	Occurrence on the Project Site
California tiger salamander (CTS) (*Ambystoma californiense*)	FT, CT	Found primarily in annual grasslands; requires vernal pools for breeding and rodent burrows for aestivation. Although most CTS aestivate within 0.4 mile of their breeding pond, outliers may aestivate up to 1.3 miles away (Orloff 2011).	**Unlikely.** CTS were historically common in the project vicinity; the CNDDB lists 14 occurrences within 5 miles of the project site. All extant occurrences in the project vicinity are associated with contiguous grassland habitats. The closest such grassland is about 0.6 mile east of the project site at its nearest point. The closest extant CTS occurrences are in this same grassland area, at about 0.9 and 1.3 miles east of site boundaries. While CTS associated with this block of natural land may be physiologically capable of accessing the project site, it is extremely unlikely that individuals of this species would forgo suitable habitat in favor of the anthropogenic landscape that characterizes the project vicinity. Moreover, the site does not contain any habitat features that could support CTS life stages. Aquatic habitat is absent, and at the time of LOA's survey, the site contained no open burrows within which CTS could aestivate.
Western pond turtle (*Actinemys marmorata*)	FPT, CSC	Occurs in ponds, lakes, rivers, creeks, marshes, and irrigation ditches with abundant vegetation, and either rocky or muddy bottoms. Logs, rocks, cattail mats, and exposed banks are required for basking. Eggs are deposited in a variety of soil types on shore.	**Unlikely.** Suitable aquatic habitat for the western pond turtle is absent from the project site and adjacent lands. The detention basins of the adjoining FMFCD facility do not appear to have an adequate inundation regime for this species.
Swainson's hawk (*Buteo swainsoni*)	CT	This breeding migrant to California nests in mature trees in riparian areas and oak savannah, and occasionally in lone trees at the margins of agricultural fields. Requires adjacent suitable foraging areas such as grasslands or alfalfa fields supporting rodent populations.	**Possible.** Swainson's hawks are occasionally sighted in the project vicinity (eBird 2023), and there is some chance for individuals of this species to forage on site from time to time. Nesting habitat is absent from the site itself, but may be found on nearby rural residential properties and along the Enterprise Canal.
Golden eagle (*Aquila chrysaetos*)	CFP	Found a wide range of habitats throughout California's mountains, foothills, sage-juniper flats, and deserts. Primarily nests on cliffs, but may also use large trees in open areas.	**Possible.** Golden eagles may occasionally pass over or forage on site, but nesting habitat is absent from the site and surrounding lands.
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FT, CE	Frequents valley foothill and desert riparian habitats in scattered locations in California.	**Absent**. This species has been extirpated from the project vicinity.
Least Bell's vireo (*Vireo bellii pusillus*)	FE, CE	This breeding migrant nests in dense, early-successional riparian vegetation, and forages in adjacent chaparral and coastal sage scrub. Winters in Mexico and Central America.	**Absent.** Suitable habitat for this species is absent from the project vicinity.

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

ANIMALS (cont'd)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat / Range	Occurrence on the Project Site
Tricolored blackbird (*Agelaius tricolor)*	CT	Nests colonially near fresh water in dense cattails or tules, in thickets of willows or shrubs, and increasingly in grain fields. Forages in grassland and cropland areas.	**Possible.** Tricolored blackbirds may occasionally forage on the project site, but nesting habitat is absent from the site and surrounding lands.
Fresno kangaroo rat (*Dipodomys nitratoides exilis*)	FE, CE	Historically occupied chenopod scrub and grassland communities on the San Joaquin Valley floor east of the wetlands of the San Joaquin River and Fresno Slough. Associated with bare alkaline clay-based soils in level terrain.	**Absent**. The project site does not contain suitable habitat for the Fresno kangaroo rat, and no known populations of this species remain in Fresno County.
San Joaquin kit fox (SJKF) (*Vulpes macrotis mutica*)	FE, CT	Frequents desert alkali scrub and annual grasslands and may forage in adjacent agricultural habitats. Utilizes enlarged ground squirrel burrows as denning habitat.	**Unlikely.** The highly disturbed habitats of the project site and surrounding lands are marginal, at best, for this species. Moreover, there are no natural occurrences of the SJKF in the project vicinity. There is only one record of this species within a 10-mile radius of the project area, recorded in Friant in the early 1990s. That sighting has since been characterized by the observer as a kit fox that had been domesticated and transported from another part of the state (D. Mitchell, pers. comm.).

California Species of Special Concern or Fully Protected

Hardhead (*Mylopharadon conocephalus*)	CSC	Occurs in clear deep streams with a slow but present flow, in a low to mid-elevation environment. May also inhabit lakes or reservoirs. Spawns in pools, runs, or rifles with a gravel and rocky substrate.	**Absent.** Aquatic habitat is absent from the project site.
Western spadefoot (*Spea hammondii*)	CSC	Occurs in grasslands of San Joaquin Valley, where it breeds in vernal pools or other seasonal wetlands and aestivates in underground refugia such as rodent burrows. Baumberger et al. (2019) recorded a maximum distance of around 890 feet between breeding and aestivation sites.	**Unlikely.** The project site does not contain suitable habitat for the western spadefoot. Aquatic habitat is absent, and at the time of LOA's survey, the site contained no open burrows within which this species could aestivate. Moreover, although the western spadefoot has been documented in grassland habitats approximately 2.5 miles north of the project site, and may also occur in the contiguous grassland 0.6 mile east of the site, it is unlikely to have persisted in the anthropogenic landscape that characterizes the immediate project vicinity. The site is well outside of the distance from suitable habitat that this species is capable of dispersing.

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

ANIMALS (cont'd)

California Species of Special Concern or Fully Protected

Species	Status	Habitat	Occurrence on the Project Site
Northern California legless lizard (*Anniella pulchra*)	CSC	Occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Requires moist soils.	**Absent.** The project site does not contain suitable habitat for the northern California legless lizard. The only CNDDB record for this species in the Fresno/Clovis area is from the 1880s.
Coast horned lizard (*Phrynosoma blainvillii*)	CSC	Ranges from the central and southern California coast inland through the western Sierra Nevada, where it is found in grassland and open areas within woodland and forest habitats. Often found in sandy areas including washes and floodplains.	**Absent.** The only CNDDB record for the coast horned lizard in the Fresno/Clovis area is from 1893. Any habitat for this species that may have once been present in the project vicinity would have been lost with the area's conversion to anthropogenic uses.
California glossy snake (*Arizona elegans occidentalis*)	CSC	Inhabits arid scrub, rocky washes, grasslands, and chaparral, where it forages nocturnally, hiding in underground burrows during the day. Prefers loose, sandy soils.	**Absent.** The project site is outside of the current distribution of this species (California Herps 2023).
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.	**Unlikely.** The project site is situated in the outskirts of Clovis, in a landscape dominated by residential development, orchards, and other uses incompatible with burrowing owl ecology. The closest known occurrences of this species are approximately 3 miles to the east in contiguous grassland habitat associated with Dry Creek and the Big Dry Creek Reservoir (eBird 2023). Landscape factors are likely to preclude burrowing owls from occurring in the project vicinity and, by extension, the site itself. Moreover, at the time of LOA's survey, the site contained no California ground squirrel burrows or any other open burrow within which burrowing owls could nest or roost, further limiting their potential for occurrence.
Pallid bat (*Antrozous pallidus*)	CSC	Found in grasslands, chaparral, and woodlands, where it feeds on ground- and vegetation-dwelling arthropods, and occasionally takes insects in flight. Prefers to roost in rock crevices, but many also use tree cavities, caves, bridges, and buildings.	**Possible.** The pallid bat could forage on or over the site, but roosting habitat is absent.

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

ANIMALS (cont'd)

California Species of Special Concern or Fully Protected

Species	Status	Habitat	Occurrence on the Project Site
Spotted bat (*Euderma maculatum*)	CSC	Typically associated with prominent rocky habitats where it roosts in crevices, but is known to occur in a wide range of habitats. Forages in large open habitats, including Ponderosa pine forests and marshlands.	**Possible.** The spotted bat could forage over the site, but roosting habitat is absent.
Western mastiff bat (*Eumops perotis* ssp. *californicus*)	CSC	Frequents open, semi-arid to arid habitats, including conifer, and deciduous woodlands, coastal scrub, grasslands, palm oasis, chaparral and urban. Roosts in cliff faces, high buildings, and tunnels.	**Possible.** The western mastiff bat could forage over the site, but roosting habitat is absent.
American badger (*Taxidea taxus*)	CSC	Found in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Utilize subterranean burrows, usually self-dug, for rest and reproduction.	**Unlikely.** The site's disturbed nature and urban setting make it highly unlikely to be occupied or utilized by American badgers.

OCCURRENCE DESIGNATIONS AND STATUS CODES

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	CE	California Endangered
FT	Federally Threatened	CT	California Threatened
FC	Federal Candidate	CCE	California Candidate Endangered
FPT	Federal Proposed Threatened	CFP	California Fully Protected
		CSC	California Species of Special Concern
		CR	California Rare

CRPR CODES

1A	Plants Presumed Extinct in California	2B	Plants Rare, Threatened, or Endangered in California, but more common elsewhere
1B	Plants Rare, Threatened, or Endangered in California and elsewhere		

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 with a continuous surface connection to these waters, where wetlands are defined by the presence of hydric soils, hydrophytic vegetation, and wetland hydrology. All waters under USACE jurisdiction are also regulated by the RWQCB as waters of the State. Additionally, the RWQCB asserts jurisdiction over certain isolated features disclaimed by the USACE. The CDFW has jurisdiction over waters that have a defined bed and bank. The regulation of jurisdictional waters is discussed in more detail in Section 3.2.8.

Aquatic features, including any potentially jurisdictional waters or wetlands, are absent from the project site.

2.6 SENSITIVE NATURAL COMMUNITIES

California contains a wide range of natural communities, or unique assemblages of plants and animals. These communities have largely been classified and mapped by CDFW as part of their Vegetation Classification and Mapping Program (VegCAMP). Natural communities are assigned state and global ranks according to their rarity and the magnitude and trend of the threats they face. Any natural community with a state rank of 3 or lower (on a 1 to 5 scale) is considered “sensitive” and must be considered in CEQA review.

The project site does not contain or adjoin any sensitive natural communities.

2.7 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 or adjoin any features likely to function as wildlife movement corridors.

2.8 DESIGNATED CRITICAL HABITAT

The 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 immediate vicinity. The nearest unit of critical habitat is located approximately 3.0 miles northeast of the project site at its closest point, and is designated for the protection of the succulent owl's-clover (*Castilleja campestris var. succulenta*). Critical habitat for the San Joaquin Valley orcutt grass (*Orcuttia inaequalis*) and vernal pool fairy shrimp (*Branchinecta lynchi*) is located in the same general area, approximately 3.1 miles north-northeast of the project site.

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 sites.
- 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 OTHER RELEVANT LAWS AND POLICIES

3.2.1 Fresno County and Clovis General Plans

California state law requires cities and counties to adopt general plans to guide future development while conserving natural resources and working landscapes. In general, projects must be consistent with the goals and policies of these general plans. Because the proposed residential development will be annexed into the City of Clovis, it is assumed that it is subject to both the County of Fresno and City of Clovis general plans. The City of Clovis's general plan was adopted in 2014, and has a planning horizon extending through 2035. The County of Fresno's general plan was adopted in 2000, and has a planning horizon of 15 to 25 years.

The Open Space and Conservation Element of the Clovis General Plan includes goals concerning preservation of natural resources and protection of water quality. These goals are supported by numerous policies and implementation programs. Policies relevant to the project include: 1) encourage new development to incorporate on-site natural resources and low impact development techniques, 2) support the protection of biological resources through the conservation of high quality habitat, 3) encourage the use of native plant species and prohibit the use of invasive species, and 4) minimize the use of non-point source pollutants and storm water runoff.

The Open Space and Conservation Element of the Fresno County General Plan includes a number of goals, policies, and implementation programs concerning biological resources. Policies of particular relevance to the project are summarized as follows: 1) the County shall support the "no-net-loss" wetlands policies of the USACE, USFWS, and CDFW, and shall require new development to fully mitigate the loss of regulated wetlands, 2) the County shall require new development to be designed in such a manner that pollutants and siltation do not significantly degrade the area, value, or function of wetlands, 3) the County shall require new developments to preserve and enhance native riparian habitat unless public safety concerns require removal of habitat, and shall require riparian protection zones around natural watercourses, 4) the County shall identify and conserve remaining upland habitat areas adjacent to wetland and riparian areas that are critically important to wildlife species associated with those wetland and riparian areas, 5) where practicable, the County shall support efforts to avoid the "net" loss of important wildlife habitat, and should preserve in a natural state those areas defined as habitats for rare and endangered animal and plant species, 6) if loss of important habitat for special status species or other valuable wildlife resources cannot be avoided, the County shall impose adequate mitigation, 7) the County shall require adequate buffer zones between construction activities and significant wildlife resources, 8) the County shall support the preservation of significant areas of natural vegetation, e.g. oak woodlands, riparian areas, and vernal pools, and 9) the County shall require that new developments preserve natural woodlands to the maximum extent possible.

3.2.2 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). The USFWS commonly interprets "take" to include the loss of habitat utilized by a listed species.

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.

3.2.3 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 (CESA), 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.

3.2.4 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.

3.2.5 Birds of Prey

Birds of prey are also protected in California under provisions of the State Fish and Game Code, Section 3503.5, 1992), which states that it is “unlawful to take, possess, or destroy any birds in the order *Falconiformes* or *Strigiformes* (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “taking” by the CDFW.

3.2.6 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.

3.2.7 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 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.

3.2.8 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.

Waters of the U.S. are presently defined by the EPA and USACE's joint 2023 Revised Definition of 'Waters of the U.S.' Rule (2023 WOTUS Rule), issued in January 2023 and amended in August 2023. Generally speaking, waters of the U.S. include:

- 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
- The territorial seas
- Interstate waters
- Impoundments of waters otherwise defined as waters of the United States under the definition
- Tributaries to other waters of the U.S. that are relatively permanent, standing or continuously flowing bodies of water
- Wetlands adjacent to other waters of the U.S. that have a continuous surface connection to those waters

The 2023 WOTUS Rule also defines a number of exclusions from the definition of waters of the U.S., many of which are longstanding exclusions from earlier regulatory regimes. These generally include:

- Waste treatment systems
- Prior converted cropland
- Ditches excavated wholly in and draining only dry land that do not carry a relatively permanent flow of water
- Certain artificial features, e.g. irrigation basins, swimming pools, borrow pits, and artificially irrigated areas
- Swales and erosional features characterized by low volume, infrequent, or short duration flow

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.

Under the Porter-Cologne Water Quality Control Act of 1969, the State Water Resources Control Board (SWRCB) 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 a Section 404 Clean Water Act permit. Discharges into waters of the State that are not also waters of the U.S. require Waste Discharge Requirements (WDRs), or waivers of WDRs, from the RWQCB.

The SWRCB and RWQCBs also administer the federal National Pollution Discharge Elimination System (NPDES) program, which is concerned with the discharge of stormwater and other pollutants into water bodies. Projects that disturb one or more acres of soil must obtain coverage under the SWRCB's current NPDES Construction Stormwater General Permit. A prerequisite for permit coverage is the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Other types of pollutant discharges into waters of the U.S., such as wastewater, may require coverage under a different NPDES general permit, and in some cases an individual 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 address the potential impacts to biological resources associated with future residential buildout of Tract 6452. In the absence of a detailed site plan, it is assumed that the full 18 acres will be developed.

4.1 POTENTIALLY SIGNIFICANT PROJECT IMPACTS/MITIGATION

4.1.1 Potential Project Impacts to Nesting Birds and Raptors including the Swainson's Hawk

Potential Impacts. The project site has the potential to be used for nesting by several avian species that nest in ground vegetation or barren areas. Trees and shrubs are absent from the site itself but occur on nearby lands; these could support nesting by a wide variety of birds and raptors, possibly including the Swainson's hawk (*Buteo swainsoni*), a California Threatened species. If birds or raptors are nesting on or near the site at the time of future residential buildout, individual birds could be killed or disturbed such that they would abandon their nests. Construction-related mortality of nesting birds and construction-related disturbance leading to nest abandonment are potentially significant impacts of the project. Moreover, such incidents would violate the Migratory Bird Treaty Act, California Fish and Game Code, and, in the case of the Swainson's hawk, the California Endangered Species Act.

Swainson's hawks are not expected to be adversely affected by project-related loss of habitat. Residential buildout will eliminate approximately 18 acres of ruderal grassland that could potentially be used by foraging Swainson's hawks. However, the site is located in the outskirts of Clovis, where Swainson's hawks are uncommon, and use of this grassland would be infrequent, at best. Following project development, considerable alternative foraging habitat for this species will remain available in the larger project vicinity, including contiguous blocks of grassland habitat located approximately 0.6 mile to the east and 2 miles to the north of the site.

Mitigation. The following measures will be implemented for the protection of nesting birds and raptors including the state-threatened Swainson's hawk.

> ***Mitigation Measure 4.1.1a (Construction Timing).*** If feasible, future construction activities will take place entirely outside of the avian nesting season, typically defined as February 1 to August 31.

***Mitigation Measure 4.1.1b (Preconstruction Surveys*).** If construction must occur between February 1 and August 31, a qualified biologist will conduct surveys for active bird nests within 7 days prior to the start of work during this period. The survey area will encompass the site and accessible surrounding lands within ¼ mile for nesting Swainson's hawks, 500 feet for other nesting raptors, and 250 feet for nesting birds.

***Mitigation 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 project impacts to nesting birds and raptors, including the state-threatened Swainson's hawk, to a less than significant level under CEQA and ensure compliance with state and federal laws protecting these species.

4.2 LESS THAN SIGNIFICANT PROJECT IMPACTS

4.2.1 Potential Project Impacts to Special Status Plants

Potential Impacts. Nineteen special status plant species have been documented in the general vicinity of the project site (see Table 1). All 19 species are considered absent from or unlikely to occur on the project site due to an absence of suitable habitat and/or soils, the site's being situated outside of the species' distribution, or a combination thereof (see Table 1). The project is not expected to adversely affect these species, either directly or indirectly, and impacts are considered less than significant under CEQA.

Mitigation. No mitigation is warranted.

4.2.2 Project Impacts to Special Status Animal Species Absent from or Unlikely to Occur on the Project Site

Potential Impacts. Twenty-three special status animal species have been documented in the general vicinity of the project site, or are known to occur regionally (Table 1). Of these, 17 are considered absent from or unlikely to occur on the site due to the absence of suitable habitat, the site's urban setting and other landscape factors, and/or the site's being situated outside of the species' known distribution. These comprise the Crotch bumblebee (*Bombus crotchii*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), vernal pool fairy shrimp

(*Branchinecta lynchi*), vernal pool tadpole shrimp (*Lepidurus packardi*), California tiger salamander (*Ambystoma californiense*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), least Bell's vireo (*Vireo bellii pusillus*), Fresno kangaroo rat (*Dipodomys nitratoides exilis*), San Joaquin kit fox (*Vulpes macrotis mutica*), hardhead (*Mylopharadon conocephalus*), western spadefoot (*Spea hammondii*), western pond turtle (*Actinemys marmorata*), northern California legless lizard (*Anniella pulchra*), coast horned lizard (*Phrynosoma blainvillii*), California glossy snake (*Arizona elegans occidentalis*), burrowing owl (*Athene cunicularia*), and American badger (*Taxidea taxus*). Because these species have no appreciable potential to occur on site, they are not expected to be affected by the project, directly or indirectly. Project impacts are considered less than significant under CEQA.

Mitigation. Mitigation measures are not warranted.

4.2.3 Project Impacts to Special Status Animal Species that Would Use the Site for Foraging Only

Potential Impacts. Five special status animal species, the golden eagle (*Aquila chrysaetos*), tricolored blackbird (*Agelaius tricolor*), pallid bat (*Antrozous pallidus*), spotted bat (*Euderma maculatum*), and western mastiff bat (*Eumops perotis* ssp. *californicus*), have the potential to forage on the site from time to time but would not nest or roost on or near enough to the site that they could be vulnerable to construction-related injury, mortality, or reproductive failure (see Table 1). Individuals of these species are unlikely to be injured or killed by construction activities because they are highly mobile while foraging and would be expected to simply avoid active work areas.

The project would not adversely affect any of these species through loss of foraging habitat. The site does not offer unique habitat for any of these species, nor is it likely to represent an important part of any individual foraging range, given its disturbed nature and urban setting. Similar and higher quality habitats, including contiguous blocks of grassland habitat located approximately 0.6 mile to the east and 2 miles to the north of the site, are regionally abundant. For these reasons, impacts to the golden eagle, tricolored blackbird, pallid bat, spotted bat, and western mastiff bat are considered less than significant under CEQA.

Mitigation. Mitigation is not warranted.

4.2.4 Project Impacts to Wildlife Movement Corridors

Potential Impacts. The project site does not contain or adjoin features likely to function as a wildlife movement corridor. No impacts to such corridors are anticipated.

Mitigation. Mitigation is not warranted.

4.2.5 Project Impacts to Sensitive Natural Communities and Critical Habitat

Potential Impacts. The project site does not contain or adjoin any sensitive natural communities or designated critical habitat. There will be no impact to such resources.

Mitigation. Mitigation is not warranted.

4.2.6 Project Impacts to Jurisdictional Waters

Potential Impacts. The project site does not contain any aquatic features. No impacts to jurisdictional waters are anticipated.

Mitigation. Mitigation is not warranted.

4.2.7 Consistency with Local Policies and Ordinances

Potential Impacts. The project appears consistent with Clovis and Fresno County General Plan policies related to biological resources.

Mitigation. Mitigation measures are not warranted.

4.2.8 Consistency with Habitat Conservation Plans and Natural Community Conservation Plans

Potential Impacts. There are no known HCPs or NCCPs in effect for the project vicinity.

Mitigation. Mitigation measures are not warranted.

5.0 LITERATURE REFERENCED

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APPENDIX A: VASCULAR PLANT LIST

APPENDIX A
VASCULAR PLANTS OF THE PROJECT SITE

The plants species listed below were observed on the project site during LOA's September 25, 2023 surveys. The U.S. Fish and Wildlife Service wetland indicator status of each plant, if available, has been shown following its common name.

OBL - Obligate
FACW - Facultative Wetland
FAC - Facultative
FACU - Facultative Upland
UPL - Upland

AMARANTHACEAE – Amaranth Family		
Amaranthus albus	Pigweed Amaranth	FACU
Amaranthus blitoides	Prostrate Pigweed	FACU
ASTERACEAE – Sunflower Family		
Centaurea solstitialis	Yellow Starthistle	UPL
Centromadia pungens	Common Tarweed	FAC
Erigeron bonariensis	Flax-leaved Horseweed	FACU
Helianthus annuus	Common Sunflower	FACU
Heterotheca grandiflora	Telegraph Weed	UPL
Lactuca serriola	Prickly Lettuce	FACU
BORAGINACEAE- Borage Family		
Amsinckia sp.	Fiddleneck	UPL
BRASSICACEAE – Mustard Family		
Hirschfeldia incana	Mustard	UPL
CHENOPODIACEAE – Goosefoot Family		
Chenopodium album	Lambs Quarters	FACU
CONVOLVULACEAE – Morning Glory Family		
Convolvulus arvensis	Field Bindweed	UPL
EUPHORBIACEAE – Spurge Family		
Croton setiger	Turkey Mullein	UPL
FABACEAE – Legume Family		
Acmispon americanus	Spanish Clover	UPL
Trifolium hirtum	Rose Clover	UPL
GERANIACEAE – Geranium Family		
Erodium cicutarium	Redstem Filaree	UPL
LAMIACEAE – Mint Family		
Trichostema lanceolatum	Vinegarweed	FACU
ONAGRACEAE – Evening-Primrose Family		
Epilobium brachycarpum	Willow Herb	FAC
POACEAE – Grass Family		
Avena sp.	Wild Oats	UPL
Bromus diandrus	Ripgut Brome	UPL

Bromus hordeaceus	Soft Chess	FACU
Cynodon dactylon	Bermuda Grass	FAC
Festuca myuros	Rattail Sixweeks Grass	UPL
Hordeum murinum	Foxtail Barley	FACU
POLYGONACEAE – Smartweed Family		
Polygonum aviculare	Prostrate Knotweed	FAC
Rumex crispus	Curly Dock	FAC
SOLANACEAE – Nightshade Family		
Datura wrightii	Jimson Weed	UPL
ZYGOPHYLLACEAE – Puncture Vine Family		
Tribulus terrestris	Puncture Vine	UPL

APPENDIX B: TERRESTRIAL VERTEBRATE SPECIES THAT POTENTIALLY OCCUR ON THE PROJECT SITE

APPENDIX B
TERRESTRIAL VERTEBRATE SPECIES THAT POTENTIALLY OCCUR ON THE PROJECT SITE

The species listed below are those that may be expected to routinely and predictably use or pass through the project site during some or all of the year. An asterisk denotes a species observed on or immediately adjacent to the site during surveys conducted for the current project by LOA on September 25, 2023.

CLASS: AMPHIBIA
ORDER: ANURA (Frogs and Toads)
FAMILY: BUFONIDAE (True Toads)
Western Toad (*Bufo boreas*)
FAMILY: HYLIDAE (Treefrogs and Relatives)
Pacific Tree Frog (*Pseudacris regilla*)
FAMILY: RANIDAE (True Frogs)
American Bullfrog (*Lithobates catesbeianus*)
CLASS: REPTILIA
ORDER: SQUAMATA (Lizards and Snakes)
SUBORDER: SAURIA (Lizards)
FAMILY: PHRYNOSOMATIDAE
Side-blotched Lizard (*Uta stansburiana*)
Western Fence Lizard (*Sceloporus occidentalis*)
FAMILY: TEIIDAE (Whiptails and relatives)
Western Whiptail (*Cnemidophorus tigris*)
SUBORDER: SERPENTES (Snakes)
FAMILY: COLUBRIDAE (Colubrids)
Pacific Gopher Snake (*Pituophis catenifer catenifer*)
Common Kingsnake (*Lampropeltis californiae*)
FAMILY: VIPERIDAE (Vipers)
Western Rattlesnake (*Crotalus viridis*)

CLASS: AVES
ORDER: CICONIIFORMES (Herons, Storks, Ibises and Relatives)
FAMILY: ARDEIDAE (Bitterns, Herons, and Egrets)
Great Blue Heron (*Ardea herodi*as)
Great Egret (*Ardea alba*)
FAMILY: CATHARTIDAE (New World Vultures)
Turkey Vulture (*Cathartes aura*)
ORDER: FALCONIFORMES (Vultures, Hawks, and Falcons)
FAMILY: ACCIPITRIDAE (Hawks, Old World Vultures, and Harriers)
*Red-tailed Hawk (*Buteo jamaicensis*)
FAMILY: FALCONIDAE (Caracaras and Falcons)
*American Kestrel (*Falco sparverius*)
ORDER: GALLIFORMES (Megapodes, Currassows, Pheasants, and Relatives)
FAMILY: ODONTOPHORIDAE (New World Quails)
California Quail (*Callipepla californica*)

ORDER: CHARADRIIFORMES (Shorebirds, Gulls, and relatives)
FAMILY: CHARADRIIDAE (Plovers and relatives)
Killdeer (*Charadrius vociferus*)
ORDER: COLUMBIFORMES (Pigeons and Doves)
FAMILY: COLUMBIDAE (Pigeons and Doves)
Rock Pigeon (*Columba livia*)
Mourning Dove (*Zenaida macroura*)
Eurasian Collared Dove (*Streptopelia decaocto*)
ORDER: STRIGIFORMES (Owls)
FAMILY: TYTONIDAE (Barn Owls)
Barn Owl (*Tyto alba*)
ORDER: APODIFORMES (Swifts and Hummingbirds)
FAMILY: TROCHILIDAE (Hummingbirds)
Black-chinned Hummingbird (*Archilochus alexandri*)
Anna's Hummingbird (*Calypte anna*)
ORDER: PASSERIFORMES (Perching Birds)
FAMILY: TYRANNIDAE (Tyrant Flycatchers)
Black Phoebe (*Sayornis nigricans*)
Say's Phoebe (*Sayornis saya*)
Western Kingbird (*Tyrannus verticalis*)
FAMILY: CORVIDAE (Jays, Magpies, and Crows)
American Crow (*Corvus brachyrhynchos*)
Common Raven (*Corvus corax*)
FAMILY: ALAUDIDAE (Larks)
Horned Lark (*Eremophila alpestris*)
FAMILY: HIRUNDINIDAE (Swallows)
Cliff Swallow (*Petrochelidon pyrrhonota*)
Barn Swallow (*Hirundo rustica*)
Northern Rough-winged Swallow (*Stelgidopteryx serripennis*)
FAMILY: AEGITHALIDAE (Bushtits)
Bushtit (*Psaltriparus minimus*)
FAMILY: TURDIDAE (Thrushes)
Western Bluebird (*Sialia mexicana*)
American Robin (*Turdus migratorius*)
FAMILY: MIMIDAE (Mockingbirds and Thrashers)
Northern Mockingbird (*Mimus polyglottos*)
FAMILY: STURNIDAE (Starlings and Allies)
European Starling (*Sturnus vulgaris*)
FAMILY: MOTACILLIDAE (Wagtails and Pipits)
American Pipit (*Anthus rubrescens*)
FAMILY: EMBERIZIDAE (Sparrows)
*Savannah Sparrow (*Passerculus sandwichensis*)
White-crowned Sparrow (*Zonotrichia leucophrys*)
Golden-crowned Sparrow (*Zonotrichia atricapilla*)
FAMILY: ICTERIDAE (Blackbirds, Orioles and Allies)
*Western Meadowlark (*Sturnella neglecta*)

Red-winged Blackbird (*Agelaius phoeniceus*)
Great-tailed Grackle (*Quiscalus mexicanus*)
Brewer's Blackbird (*Euphagus cyanocephalus*)
Brown-headed Cowbird (*Molothrus ater*)
FAMILY: FRINGILLIDAE (Finches)
House Finch (*Carpodacus mexicanus*)
Lesser Goldfinch (*Carduelis psaltria*)
FAMILY: PASSERIDAE (Old World Sparrows)
House Sparrow (*Passer domesticus*)

CLASS: MAMMALIA
ORDER: DIDELPHIMORPHIA (Marsupials)
FAMILY: DIDELPHIDAE (Opossums)
Virginia Opossum (*Didelphis virginiana*)
ORDER: INSECTIVORA (Shrews and Moles)
FAMILY: TALPIDAE (Moles)
Broad-footed Mole (*Scapanus latimanus*)
ORDER: CHIROPTERA (Bats)
FAMILY: VESPERTILIONIDAE (Vespertilionid Bats)
Yuma Myotis (*Myotis yumanensis*)
California Myotis (*Myotis californicus*)
Western Pipistrelle (*Pipistrellus hesperus*)
Big Brown Bat (*Eptesicus fuscus*)
Pale Big-eared Bat (*Corynorhinus townsendii pallescens*)
FAMILY: MOLOSSIDAE (Free-tailed Bat)
Brazilian Free-tailed Bat (*Tadarida brasiliensis*)
ORDER: LAGOMORPHA (Rabbits, Hares, and Pikas)
FAMILY: LEPORIDAE (Rabbits and Hares)
Audubon's Cottontail (*Sylvilagus audubonii*)
Black-tailed Jackrabbit (*Lepus californicus*)
ORDER: RODENTIA (Rodents)
FAMILY: SCIURIDAE (Squirrels, Chipmunks, and Marmots)
California Ground Squirrel (*Otospermophilus beecheyi*)
FAMILY: GEOMYIDAE (Pocket Gophers)
*Botta's Pocket Gopher (*Thomomys bottae*)
FAMILY: MURIDAE (Mice, Rats and Voles)
Western Harvest Mouse (*Reithrodontomys megalotis*)
Deer Mouse (*Peromyscus maniculatus*)
Norway Rat (*Rattus norvegicus*)
House Mouse (*Mus musculus*)
California Vole (*Microtus californicus*)
FAMILY: HETEROMYIDAE (Kangaroo Rats)
Heermann's Kangaroo Rat (*Dipodomys heermanni*)
ORDER: CARNIVORA (Carnivores)
FAMILY: CANIDAE (Foxes, Wolves, and Relatives)
Red Fox (*Vulpes vulpes*)
Coyote (*Canis latrans*)

Domestic Dog (*Canis familiaris*)
FAMILY: PROCYONIDAE (Raccoons and Relatives)
Raccoon (*Procyon lotor*)
FAMILY: MUSTELIDAE (Weasels and Relatives)
Striped Skunk (*Mephitis mephitis*)
FAMILY: FELIDAE (Cats)
Feral Cat (*Felis catus*)

APPENDIX C: REPRESENTATIVE PHOTOS OF THE PROJECT SITE

Photos 1 (above) and 2 (below). The project site's ruderal grassland habitat. Both photos were taken in the southern portion of the site; Photo 2 faces south toward the adjoining Lennar Homes Tract 6200 project, which was under construction at the time of LOA's survey.

Photos 3 (above) and 4 (below). Recently-disturbed portions of the site's ruderal grassland.

Photo 5 (above). One of the project site's dirt roads. **Photo 6 (below).** Silt fencing in the southern portion of the project site. The fencing was presumably associated with construction of the adjoining Lennar Homes Tract 6200 project, pictured in the background.

Cultural Resource Study for the Clovis Tract 6452 Residential Development, City of Clovis, Fresno County, California

Nicole Saenz

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November 2023

USGS Friant, CA and Clovis, CA 7.5′ quadrangles, T12S, R21E, Sec. 20
18.2 acres surveyed
Resources: None

MANAGEMENT SUMMARY

Applied EarthWorks, Inc. (Æ) conducted a cultural resource inventory for Lennar Central Valley's proposed 18.2-acre Tract 6452 Residential Development Project (Project) in the city of Clovis within Fresno County, California. The Project is north of Perrin Road, between Clovis Avenue and North Sunnyside Avenue.

The proposed development will require a permit issued by the City of Clovis. Therefore, the Project is subject to the California Environmental Quality Act (CEQA), which mandates that public agencies determine whether a proposed project will cause a significant change to the environment, including cultural resources. To assist Lennar Central Valley in fulfilling their responsibility under CEQA, Æ conducted a cultural resource study to identify whether there are potential historical resources (i.e., cultural resources listed or eligible for listing in the California Register [CRHR]) within the Project area.

To meet the requirements under CEQA, Æ conducted: (1) a records search at the Southern San Joaquin Valley Information Center (SSJVIC) of the California Historical Resources Information System (CHRIS); (2) desktop research to better understand the history of land use in the Project area; (3) a search of the Native American Heritage Commission's (NAHC) Sacred Lands File, and nongovernmental outreach to local tribes and individuals; and (4) an intensive pedestrian survey of the 18.2-acre Project area to identify archaeological and/or historical built environment cultural resources.

The SSJVIC records search identified no cultural resources within the Project area and only one cultural resource—the Enterprise Canal (P-10-005934/CA-FRE-3564H)—which runs southwest of the Project area. There have been four previous cultural resource investigations that overlap the Project area and one within the 0.25-mile search radius. A search of the NAHC's Sacred Land File did not identify Native American cultural resources within or near the Project area, and no specific information was gleaned from outreach with local tribal representatives.

Æ's intensive pedestrian survey of the Project area, conducted on August 23, 2023, covered the entirety of the 18.2-acre Project area. No cultural resources were identified in the Project area.

Æ's inventory efforts found no historical resources within the Project area. However, if cultural resources are discovered during Project activities, all work should halt until a qualified archaeologist can assess the find. Additionally, if human remains are uncovered during construction, the Project operator shall immediately halt work within 50 feet of the find, contact the Fresno County Coroner to evaluate the remains, and follow the procedures and protocols set forth in CEQA Guidelines Section 15064.4(e)(1). If the remains are identified on the basis of archaeological context, age, cultural associations, or biological traits to be those of a Native American, then the California Health and Safety Code 7050.5 and Public Resource Code 5097.98 require that the county coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendant, who will be afforded the opportunity to recommend treatment of the human remains following protocols in California Public Resources Code 5097.98.

Field notes and photographs for this Project are on file at Æ’s office in Fresno, California. A copy of this report will be transmitted to the SSJVIC at California State University, Bakersfield, for inclusion in the CHRIS.

CONTENTS

FIGURES AND TABLES

1
INTRODUCTION

Applied EarthWorks, Inc. (Æ) prepared this cultural resource study in support of Lennar Central Valley's proposed Tract 6452 Residential Development Project (Project) in the city of Clovis, Fresno County, California (Figure 1-1). The property is directly north of Perrin Road between Clovis Avenue and North Sunnyside Avenue, within Section 20 of Township 12 South, Range 21 East, as depicted on the U.S. Geological Survey (USGS) Clovis (1981), California 7.5-minute topographic quadrangle (Figure 1-2).

1.1 PROJECT DESCRIPTION

Lennar Central Valley proposes to construct 153 single-family lots on 18.2 acres of vacant land between Clovis Avenue and North Sunnyside Avenue in the city of Clovis (Figure 1-3). The proposed zoning for the Project will be M/L – Medium and Low Density Residential, while the current Fresno County zoning is AE-20. The property is currently in the County of Fresno, though it will be annexed to the City of Clovis (City). This residential development will be within the City of Clovis (City) Heritage Grove Master Plan and will be subject to design development standards of the plan.

1.2 REGULATORY CONTEXT

The Project is subject to the California Environmental Quality Act (CEQA), with guidelines for implementation codified in the California Code of Regulations (CCR), Title 14, Chapter 3, Section 15000 et seq. Historical resources are considered part of the environment and are subject to review under CEQA. Per CEQA, the lead agency, in this case the City, is required to determine whether a project may have a significant effect on historical resources, and therefore cause a significant effect on the environment (Public Resources Code [PRC] Section 5024.1[b]). CEQA defines a substantial adverse change to a historical resource as the "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired" (14 CCR Section 15064.5[b][1]). Where substantial adverse change is unavoidable and the historical resource cannot be preserved in an undisturbed state, the lead agency shall require mitigation measures to minimize substantial adverse changes to the resource's significance (PRC Section 21083.2[c]). It is further stipulated that the "lead agency shall ensure that any adopted measures to mitigate or avoid significant adverse changes are fully enforceable through permit conditions, agreements, or other measures" (14 CCR Section 15064.5[b][4]; PRC Section 5020.1[q]).

For the purposes of this report, a cultural resource is defined as a prehistoric or historic-era archaeological site or a historic-era building, structure, or object. The importance or significance of a cultural resource depends on whether it qualifies for inclusion in the California Register of Historical Resources (CRHR). Cultural resources determined eligible for listing in the CRHR are called "historical resources." (Title 14, Chapter 3, Article 5, Section 15064.5 of the CCR). The determination of eligibility is based on a set of significance criteria (14 CCR 15064.5).

Figure 1-1 Project vicinity in Fresno County, California.

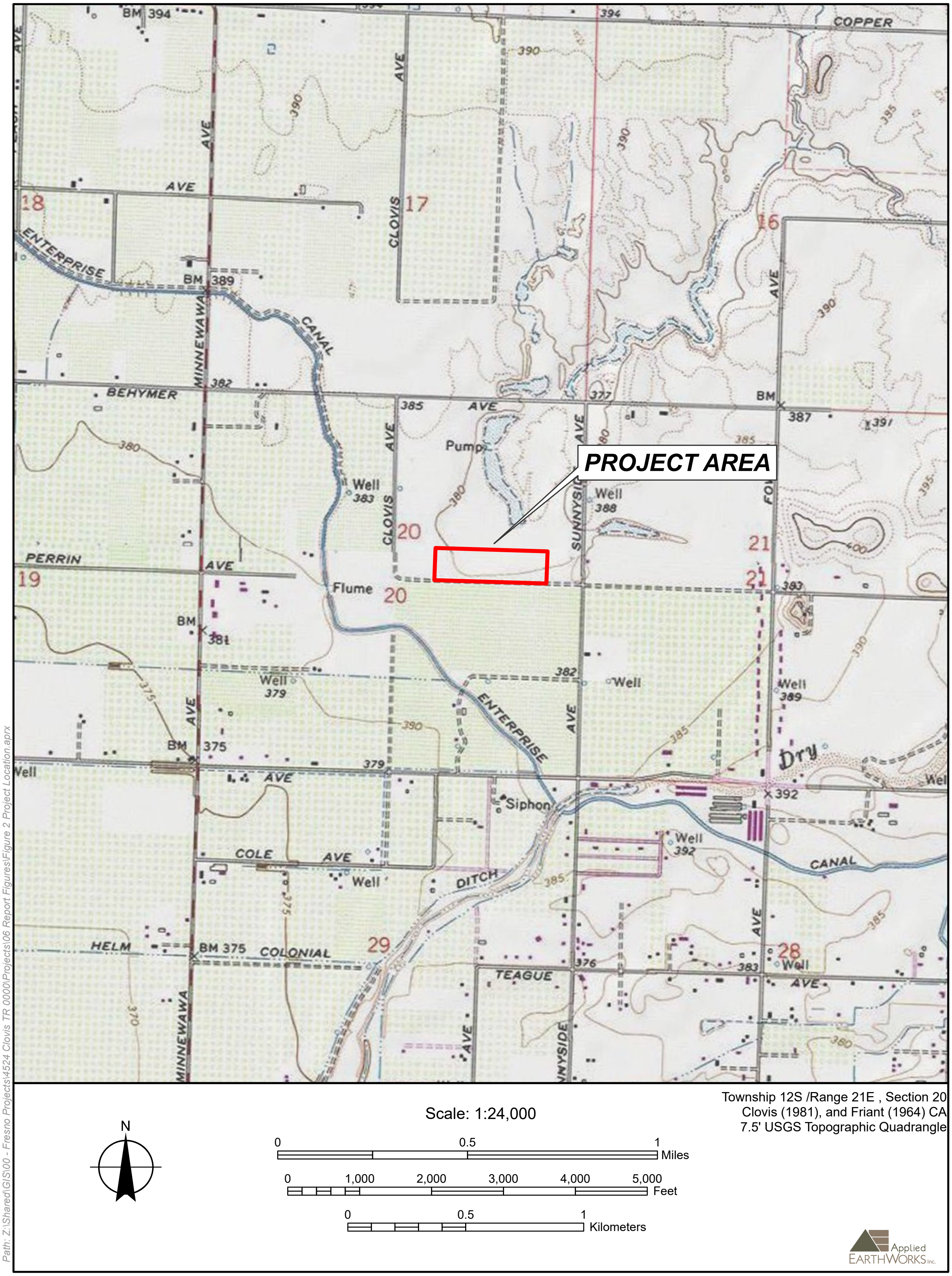

Figure 1-2 Project location on USGS Clovis and Friant 7.5-minute topographic quadrangles.

Path: Z:\Shared\GIS\00 - Fresno Projects\4524 Clovis TR 0000\Projects\06 Report Figures\Figure 2 Project Location.aprx

Figure 1-3 Aerial view of the Project area.

1.3 PROJECT PERSONNEL

Æ Managing Principal Archaeologist Erin Enright (M.A. Registered Professional Archaeologist [RPA] 16575) served as principal investigator for the project. Æ Principal Archaeologist Anna Hoover (M.S., RPA 28576661) served as project manager, overseeing the study efforts and technical reporting. Field Technician Charles Pansarosa (B.A.) conducted the pedestrian survey. This report was prepared by Staff Anthropologist Nicole Saenz (M.S.) and Principal Archaeologist Emerita Mary Baloian (Ph.D., RPA 15189) reviewed the report for technical accuracy. Résumés for key personnel are provided in Appendix A.

1.4 REPORT ORGANIZATION

This document consists of six chapters. Following this introduction, Chapter 2 describes the environmental and cultural context of the Project area. Chapter 3 presents Æ's methods for the study, including the records search, background research, Native American outreach, and pedestrian surveys, while Chapter 4 discusses the study results. Chapter 5 contains a summary and provides recommendations. A complete listing of references cited is in Chapter 6. Appendix A contains résumés of Project personnel. Appendix B presents results of the records search, and Appendix C contains documentation of communication with the NAHC and local tribal representatives.

Field notes, maps, and a complete set of photographs from the current investigation are on file at Æ's office in Fresno, California. A copy of the final version of this report will be submitted to the SSJVIC at California State University, Bakersfield.

2
NATURAL AND CULTURAL SETTING

2.1 PHYSICAL ENVIRONMENT

The Project area lies on the eastern margin of the San Joaquin Valley near the base of the Sierra Nevada foothills. In general, the valley is bordered on the east by the Sierra Nevada, on the west by the Coast Ranges, and on the south by the Tehachapi Range. The north-south orientation of the Sierra Nevada greatly influences the general hydrology of the region by directing the flow of rivers and streams westward into the San Joaquin Valley.

The complex geology of the adjacent foothills and the Sierra Nevada is reflected in the primary and secondary soils in the valley. Primary soils are developed by weathering the underlying granitic parent material. Secondary soils are formed by a combination of eolian and alluvial forces transporting a variety of granitic and assorted metamorphic and metavolcanic materials from mountain streams (Weir 1956). Quaternary and recent alluvium covers most of the valley basin.

The natural vegetation of the San Joaquin Valley has been severely compromised as a result of farming and ranching. Originally, the area was covered with native annual and perennial grasses such as needlegrass (*Stipa* spp.), bluegrass (*Poa* spp.), and three awn (*Aristida divaricata)* commonly found in the Valley Grassland Community (Munz and Keck 1973). Prior to Euro-American colonization, the valley floor was occupied by a diverse population of resident and migratory mammals and birds, which along with fish and other aquatic species provided a rich resource base for aboriginal subsistence. Historical and modern land use has greatly reduced the size and number of native habitats, eliminating numerous indigenous species. Most commonly found in the study vicinity today are jackrabbits, ground squirrels, field mice, snakes, and frogs, along with jays, mourning doves, crows, and red-tailed hawks.

The San Joaquin Valley lies within the Mediterranean climate zone typified by hot, dry summers and cool, wet winters. Temperatures range from highs of 90–100°F in the summer months to lows of 40–50°F in the winter (Weir 1956), although temperatures exceeding 100°F in the summer and dropping below freezing in the winter are not uncommon. Annual precipitation averages 10 inches per year, with most of the rain falling between October and March. Thick “tule” fog is common in the valley during December and January.

The natural topography of the proposed development is flat at 400 feet above mean sea level. The natural watercourse closest to the Project area is Dry Creek, which flows directly southeast of the Project area.

2.2 PREHISTORY AND ARCHAEOLOGY

Archaeological evidence suggests that the valley’s initial occupants settled mostly in lakeshore and streamside environments and used the foothills seasonally. Early (“Paleoindian”) sites are typified by fluted points, stemmed dart points, scrapers, and flaked stone crescents. The middle and late Holocene witnessed mobile hunters and gatherers. As compared with their predecessors, Archaic groups utilized a broad resource base, including both large and small game and hard seeds. Manos, milling slabs, mortars, and pestles are common in Archaic assemblages, as are atlatl dart points. Favorable climatic conditions between 3,000 and 3,500 years ago fostered widespread settlement along the Sierran west slope. The late Holocene witnessed various technological and social changes, including the adoption of the bow and arrow, expansion of trade, increasing use of acorns, and improved food storage techniques. As populations grew, social relations became more complex. Economic stress and social instability became more pronounced during a period of xeric climates between circa A.D. 450 and 1250. Thereafter, new levels of population growth were achieved, resulting in part from movement of new Sierran groups. By circa A.D. 1600–1700, most groups claimed the territories that would identify them ethnographically. The Project lies in the territory of the Gashowu, a tribelet of the Foothill Yokuts (see Section 3.3).

A number of prehistoric sites have been identified in Gashowu territory (Price 1992). Located in the foothills northeast of Clovis, these sites are primarily either extensive midden deposits found along both small ephemeral drainages and larger permanent watercourses or multiple bedrock milling features, sometimes with numerous individual stations.

Investigations at CA-FRE-1671, which may have formed the core of the *Pohoniu* village community, yielded radiocarbon dates showing that Yokuts settlement of the area extended from A.D. 1300 well into the historic period. An earlier occupation phase at the site was dated between circa 700 B.C. and A.D. 300 but could not be linked directly to the Gashowu or any other Yokuts group (Moratto 1988).

At CA-FRE-64, investigations showed that the Yokuts may have occupied the area as early as A.D. 1100–1200, with continuing occupation to around A.D. 1600. An even earlier component lacked the data to attribute it to the Gashowu but suggested that the steatite industry in the area may have begun as early as A.D. 800 (Wallace et al. 1989).

CA-FRE-1154 and -1155 are in the foothills east of the Project area. CA-FRE-1154, the Sharer Site, lies "along an abandoned oxbow bend associated with a channelized-stream"(Langenwalter et al. 1989). This site, interpreted as a seasonal procurement campsite, appears to have been used during a long temporal span from 850 B.C. to A.D. 1850. It consists of a midden ranging from 60 to 160 centimeters deep and a large bedrock boulder containing 76 mortars, cups, cupules, and slicks. Artifacts included ground and flaked stone tools, steatite bowl fragments, ornaments, crystals, daub, and ochre. Additionally, the remains of a juvenile burial were encountered.

CA-FRE-1155, the Harlan Site, contains a small but well-developed midden with thickness varying between 80 and 190 centimeters as well as five bedrock features. Artifacts similar to those from CA-FRE-1154 indicate that CA-FRE-1155 was used as a seasonal procurement site. It appears to have been sporadically occupied between 850 B.C. and A.D. 300, with intensive occupation from A.D. 300 to 1500 (Langenwalter et al. 1989).

Surveys east of the current Project area have shown that many small processing stations and temporary camps occur along seasonal channels near the lower foothills (Meighan and Dillon 1987), suggesting a pattern of widespread but relatively ephemeral use of the area during the late Holocene (McGuire 1992).

In the first half of the nineteenth century, the Gashowu population was decimated by disease, missionization, and military action. This led to a radical change in settlement: the surviving peoples abandoned the residential sites that they had occupied prehistorically and congregated at a small number of locations. Glass trade beads and other historical artifacts recovered from CA-FRE-687 and CA-FRE-1671 may be evidence of these postcontact settlements (Price 1992:32–33).

2.3 ETHNOGRAPHY

At the time of first contact with the Spanish missionaries, the Yokuts people collectively inhabited the San Joaquin Valley, as well as the eastern foothills of the Sierra Nevada from the Calaveras River southward to the Kern River. The Yokuts language belongs to the broader Penutian family, which subsumes a relatively diverse assemblage of languages that also includes Miwok, Costanoan, Maiduan, and Wintuan (Silverstein 1978). Compared to other Penutian languages, however, Yokuts shows considerable internal linguistic homogeneity, especially given its relatively wide geographic distribution. Dialects differed minimally and were mutually intelligible, at least among speakers of contiguous groups. This relative lack of linguistic differentiation suggests that ancestors of the Yokuts entered California after the arrival and subsequent radiation of the more linguistically diverse Penutian groups such as the Miwok and Costanoan (Moratto 1984:554).

Linguists and ethnographers have traditionally divided the Yokuts into Northern Valley, Southern Valley, and Foothill categories based primarily on linguistic similarities and differences. Yet such broad groupings were not mirrored in the larger structure of Yokuts society. Instead, the Yokuts were organized into relatively small autonomous tribes or tribelets, which maintained a fluid territory containing multiple semipermanent settlements.

Gayton (1945, 1948), Kroeber (1976), Spier (1978), and Wallace (1978, 1987) have produced primary source material on Yokuts ethnography. Secondary works on this subject include those authored by Langenwalter et al. (1989) Moratto (1984, 1988), and Wallace et al. (1989). The following discussion about Yokuts lifeways is drawn from these sources.

The Project area lies within the territory of the Gashowu, a tribelet of the Kings River Group of the Foothill Division; that occupied the drainages of Big Dry Creek and Little Dry Creek. Two major settlements are attributed to the Gashowu: *Pohoniu*, below Letcher on Big Dry Creek, and *Yokau*, on Little Dry Creek in Auberry Valley(Kroeber 1976:481, plate 47). These villages appear to have been central year-round settlements that were occupied more densely in the winter. At these locations, the Gashowu built conical structures 15–20 feet tall over excavated pits, each with a central rock-lined hearth. Other structures probably included acorn granaries, sweat houses, roofed ramadas, sunshades, and large communal houses. During the summer, residents moved with extended families or family groups to base camps within a day's walk of the central village. These stations served as summer villages and temporary storage places for food until it was transferred to the main village. Summer villages contained smaller structures and are most commonly recognized archaeologically by midden deposits and multiple bedrock milling features. Seed-gathering forays in the spring or summer expanded the Gashowu range to the lowlands of present-day Clovis and Fresno.

Acorns were a Gashowu staple, with additional nutrition culled from other nuts and seeds, berries, fruit, and game. These dietary items as well as tool stone and a variety of other resources were gathered at summer camps. Procurement loci survive today as scatters of lithic artifacts and as bedrock milling stations where plants and seeds were processed. In addition to these features, artifacts used to process procured resources (such as mortars, pestles, and manos) and the remains of resources gathered (such as bone and acorn shell) also may be found.

Steatite is available locally, and items made from this material (including cooking bowls, beads, and ornaments) are often found at Yokuts sites. Steatite goods also were traded with neighbors for obsidian, pine nuts, shell beads and ornaments, and other exotic commodities.

2.4 HISTORIC CONTEXT

2.4.1 Early Settlement in the Clovis Area (1853–1874)

The first Euro-American settlements in the greater Clovis area occurred not within the swampy "hog wallows" that once dotted the landscape of the present city limits but in the grassy plains around Dry Creek where the stream flows down from the foothills into the valley (Clough and Secrest 1984). A small outpost was established at the current intersection of Shepherd and Thompson avenues in 1853 and later became a stop along the Stockton to Los Angeles stage route (Smith 1991). For many years the lonely station, which eventually became known as Collins Corner, stood by itself with no other buildings in sight. After the Civil War, sheepherders, many from the southern United States, began to trickle into the area.

During the 1860s, homesteaders came to the valley to graze their herds or flocks in the pastures around the San Joaquin River and its drainages. The local cattle industry continued to grow until at least 1870, when, according to Vandor (1919), it reached its peak. There were, however, some bumps along the way. The erratic climate patterns of the 1860s—a decade that experienced alternating periods of severe flooding and drought—had considerable impact on the makeup of the Central Valley's agrarian base. In particular, the 2-year-long drought that followed the great flood of 1862 decimated remaining old Spanish cattle that had escaped the deluge (Byron 1951). In response, cattlemen restocked their herds with other varieties, including longhorns that had been driven from Texas Vandor (1919). For their part, shepherds adopted the annual cycle of Old World pastoralists: during the summer months they drove their flocks into the Sierra Nevada high country to conserve the lowland grasses for fall and winter grazing. The floods and droughts similarly wreaked havoc on production of agricultural goods, causing dramatic swings in commodity values. In the wake of the 1864 drought, crop failures depleted the supply of grain as the price of wheat on the San Francisco Market soared to $5.00 per cental (100 pounds) in March 1865 (Elliott 1883). By comparison, the price rarely breeched the $3.00 mark during the entire 1870s.

Along with the climate, political factors had a major hand in shaping the economic landscape. Although the 1874 enactment of the "no fence" laws did not necessarily deal a death blow to valley ranching, the statute greatly curtailed the influence and importance of this industry. The law had both operational and monetary repercussions:

> The "no fence" law obligated the stock owner to herd his cattle and sheep, whereas before the stock roamed at will and was not assembled except for the annual rodeo. He

> was also made responsible for damage done by his beasts. The farmer was not required to fence his holdings, though . . . he occasionally did so (Vandor 1919:163).

Without the entire extent of the San Joaquin Valley at his disposal and burdened by the continual task of containing his herds and flocks, the rancher found himself increasingly marginalized in the developing valley economy.

2.4.2 Initial Development of Agriculture in the Fresno-Clovis Area (1875–1900)

In addition to pro-agriculture legislation and the arrival of the Southern Pacific Railroad in 1872, the development of irrigation systems greatly contributed to the growth of agriculture in Fresno County. Built in the early and mid-1870s, the first major water conveyance systems in the Fresno-Clovis area included the canals of the Fresno Canal and Irrigation Company (FCIC), the Kings River and Fresno Canal Company (KRFCC), and the Enterprise Canal Company (ECC). These same systems, which use the waters of the Kings River, remain essential parts of the area's agricultural industry today.

In local history, Moses Church—a former sheepherder from Napa County—is considered the chief developer of water conveyance in Fresno County. As early as 1870, Church began acquiring water rights along the Kings River; in February 1871, he and two business associates incorporated the FCIC (Elliott 1882; Willison 1980). His first objective was to deliver appropriated water to the farm of A. Y. Easterby, located in the present-day Sunnyside neighborhood of Fresno (Vandor 1919). In 1872, the company completed construction of the first main head gate on the Kings River that allowed 2,000 feet of water to be diverted into the irrigation system (Elliott 1882). The Fresno Canal was the FCIC's primary channel. Although it runs a relatively short 12 miles, the Fresno Canal is the source of numerous large branch canals that still irrigate the fields south, west, and east of the Fresno-Clovis metropolitan area.

The KRFCC, also established in 1871, intended to build a similar system, although the project was not completed until 1873 when L. A. Gould purchased interest in the company (Clough and Secrest 1984; Willison 1980). By August of the same year, Gould's farm was receiving irrigation water from the KRFCC Gould Canal, which taps the Kings River about 1.5 miles above the head gate of the Fresno Canal. The Gould Canal and its primary branch, the Helm Canal, irrigated the former agricultural lands in what is today the heart of the Fresno-Clovis metropolitan area.

While local sources are not specific about the incorporation of the ECC or the dates of its major conveyance, the Enterprise Canal, circumstantial evidence suggests that construction began sometime after 1875 and continued episodically until the early twentieth century when the canal appears to have reached its present-day length of 36.5 miles. According to Willison's (1980) account, the KRFCC agreed to supply water to the ECC following the completion of the Gould Canal in 1873. This agreement was the basis for the eventual creation of the Enterprise Canal. Although the Enterprise Canal is not represented on an 1875 map of the county, construction might have begun shortly after (Willison 1980). Moreover, Hall's (1885) serial maps depicting irrigation in Fresno County as well as later county atlases suggest that the canal was built in stages. Whereas the first 15 miles of the Enterprise Canal (or "Enterprise Ditch") as well as its head gate on the Gould Canal are shown and labeled on the Centerville and Kingsburg Sheet of the series, the lower reaches of the canal do not appear on the Fresno Sheet. Taken at face value, Hall's (1885) maps indicate that in 1885 the Enterprise Canal terminated at Frolic Creek (present-day Dog Creek), southeast of the Project area. By the time of the 1891 Fresno County atlas, the canal had been lengthened another 9.5 miles through the Clovis area (directly west of the Project area) to its northernmost extent (in Section 18 of Township 12 South, Range 21 East); however, the canal's existing southwesterly leg through what is today north Fresno had not been built yet (Thompson 1891).

Whatever the specific date(s) of the canal's construction, the ECC's dependence on the KRFCC and its Gould Canal clearly proved to be its undoing. In 1875, the KRFCC won a court battle with the FCIC that left KRFCC's water rights intact (Willison 1980:77–83). Ten years later, however, the companies faced off again, but this time the FCIC succeeded in enjoining the KRFCC by drawing water from the Kings River (Mead 1901:277; Willison 1980:84). Without access to water from the river, the KRFCC and ECC were forced to sell their canals to the FCIC. The court decision thus left the FCIC in control of all three canal systems.

Under the ownership of the FCIC, the Enterprise Canal continued to irrigate the farmlands north and east of the Fresno-Clovis area. It gave rise to several secondary canals along its route, including such Clovis-area branches as the Maupin Ditch, the Jefferson Canal, the Clovis Ditch, the Teague Ditch, and Helm Colonial Ditch as well as numerous unnamed laterals (Willison 1980). As early as 1900, the canal and its branches irrigated about 15,000 acres. By 1913, the lower portion of the canal appears to have been completed, bringing irrigation water to the area historically known as Forkner's Fig Gardens (Progressive Map Service 1913:19). The Enterprise Canal, along with the rest of the FCIC's system, was acquired by the Fresno Irrigation District in 1920 (Willison 1980).

For Church and other land promoters, the intended effect of irrigation was to increase the value of their properties so that they could be subdivided and sold to newly arriving homesteaders at a hefty profit. While this primary purpose was certainly achieved, the advent of intensive irrigation additionally led to a shift in both the types of crops grown and the size of a typical farm. Grain farming generally requires substantial acreage, but as irrigation water became more readily available, individual farmers realized that premium crops like grapes, citrus, and tree fruit could be profitably grown on lots as small as 20 acres.

Vandor's history includes a commentary from (probably Charles) Nordoff, who describes how, with irrigation, bigger is not necessarily better.

> Big ranches there are yet but they are hazardous ventures, and the fact is that in the big valley the twenty, forty and eighty-acre farmers brought the lasting and real agricultural prosperity. There, where wheat was once the big and only crop, the man with less than 320 acres classed himself as a humble small farmer. Slowly but gradually the conviction forced itself that eighty acres with water on a good location was a little too much, forty a liberal plenty with which to make a fair start in life, and twenty just enough for one man on which to make a comfortable living for self and family and have something over with industry and health for the proverbial rainy day. Wonders have been accomplished with ten acres by men who were not overambitious, not overburdened with money and hesitated not to combine brain and brawn in the labor in the field. Intelligent twenty-acre men are laying up what eastern farmers would consider a fortune . . . (Vandor 1919:261).

Much like the “no fence” laws, the 1887 Wright Act, which provided for the creation of irrigation districts, is also seen as an important step in solidifying the interests of agriculture. In practice, it took some years before newly formed districts could gain the necessary legal and financial traction for operation, and these public cooperatives did not begin replacing private irrigation companies until the early twentieth century. At its passage, the Wright Act was, nevertheless, another legislative expression of the growing need for appropriated water. Another important development in the late nineteenth century was construction of the San Francisco & San Joaquin Valley Railroad in 1896, which provided Fresno with another rail line. Before then, farmers had complained about the Southern Pacific Railroad’s “ruinous” rates and were continually looking for alternative ways to ship their products to the Bay Area. This second railroad was acquired by the Atchison, Topeka, and Santa Fe Railway around 1900.

Agricultural growth in the San Joaquin Valley generally was accompanied by consistent population growth and urbanization, and with the rise in residential, commercial, and infrastructural development came an increase in demand for building materials. The one-man milling operations of the gold rush era had given way to late nineteenth-century lumber companies with the financial and technological means to harvest vast stands of timber in the nearby Sierra Nevada. It was primarily in this context that the town of Clovis arose.

Clovis originated in 1891 as a stop along the San Joaquin Valley Railroad, which extended from Fresno to the aspiring community of Pollasky (formerly called Hamptonville and later renamed Friant), located on the south bank of the San Joaquin River (Clough and Secrest 1984). Although Pollasky never fully materialized and the railroad was eventually sold off to the Southern Pacific, the new transportation link had opened the area northeast of Fresno for settlement and other ventures. Shortly afterward, the Fresno Flume and Irrigation Company, a combination lumber and irrigation venture, located its sawmill on a 60-acre parcel at the current site of Clark Intermediate School and the Clovis Rodeo Grounds. The mill was the end point of a 45-mile wooden flume from Shaver Lake. By its second year of operation in 1895, between 300 and 500 employees worked at the mill (Clough and Secrest 1984; Johnston 1997).

2.4.3 Diversification and Water Issues (1900–1950)

The trend toward smaller farms continued well into the new century. Between 1900 and 1920, 45,000 new farms were established in California, of which about 85 percent were less than 50 acres (Hall 1986). Yet whether a farm is small or large, the decision of which crop(s) to grow from year to year has historically been a speculative one for valley farmers. Given the decentralized nature of the industry, the market for a particular product was capable of unpredictable and dramatic changes. Oversupply of the previous year’s crop and the prospect of low prices have often compelled growers to look for other, more profitable alternatives. Out of this instability, many new fruit and vegetable varieties have been introduced to the valley.

The steady growth of the San Joaquin Valley’s agricultural base and its reliance on irrigation were beginning to erode the state’s water supply. In the period between 1909 and 1919, newly irrigated lands were placed under production at a rate of 155,000 acres per year (Hall 1986). Established in 1920, the Fresno Irrigation District acquired the aging conveyance system of the FCIC, and immediately set out to revamp and add to the existing canals and structures (Willison 1980). Technological improvements to electric water pump technology allowed wells to extend even deeper into the aquifer, and by the mid-1920s the proliferation of wells had caused the water table to drop to alarmingly low levels. Among the most threatened were farmers who relied solely on wells for irrigation water. Along with a falling water table, California's water issues included reducing the danger of flooding along the major rivers, providing for more dependable navigation on the Sacramento River, and improving the water quality in the East Bay area (Jackson 1977).

The solution was the Central Valley Project (CVP), a statewide multicomponent water conveyance system to control and redistribute the tremendous supply of water flowing from the Sierra Nevada. The CVP, which began at the state level, became part of the New Deal project in the mid-1930s because of the massive financing required for the project. Partially due to labor shortages created by World War II, the entire system was not completed until the early 1950s. The Friant-Kern Canal, an original component of the CVP, flows about 5.5 miles east of the Project area.

In many ways, the Dry Creek drainage was a microcosm of the water issues facing the state during the 1920s and 1930s. Winding southwest from the foothills, Dry Creek disappears into a natural sink near the Old Fig Garden area in north-central Fresno. The natural flow from the creek raises the underground water table, which has been an important source of well irrigation water. Since the earliest days of Fresno, however, the annual flooding of the waterway caused traffic hazards, material damage, and even loss of life (Wilson 1932).

2.4.4 Modern Water Management (1950–Present)

Beginning in the mid-twentieth century, water management methods became more diverse and presently involve the storage of runoff in reservoirs for hydroelectric power and flood control and maintenance of underground water tables for such uses as irrigation and drinking water. As part of this larger process, the Dry Creek Project has sought to control the stream's natural runoff by channeling the water into reservoirs (Fresno Bee 1948). Since beginning operation in 1948, the Dry Creek Project has expanded its scope to prevent flooding while managing the groundwater level (Clovis Unified School District 1984; Fresno Metropolitan Flood Control District 2004).

When it reached fruition in the 1950s, the CVP sparked a new wave of agricultural growth by providing an ample supply of federally subsidized water across the valley floor. The Friant-Kern Canal flows through the Dry Creek District and its primary function is to convey irrigation water to the counties of the southern San Joaquin Valley. Nevertheless, water from the channel does not pass through the greater Fresno area completely untouched; along with the City of Fresno, the Garfield Irrigation District and Harlan Ranch established the right to divert water from the Friant-Kern Canal (Clovis Unified School District 1984).

3
METHODS

This chapter describes methods used to complete the cultural resource inventory of the Project area. This includes a records search to identify previous resources and studies within and adjacent to the Project area, background research, a search of the NAHC Sacred Lands File and contact with Native Americans who may have knowledge about the area, and an intensive pedestrian survey.

3.1 RECORDS SEARCH

At Æ's request, the SSJVIC of the CHRIS at California State University, Bakersfield, performed a records search on June 31, 2023, to identify previously recorded resources and prior surveys within the Project area and surrounding 0.25-mile search radius. SSJVIC staff consulted cultural resource location and survey base maps, reports of previous investigations, and cultural resource records (Appendix B).

3.2 BACKGROUND RESEARCH

Prior to conducting a pedestrian archaeological survey, Æ conducted background research to identify areas within the Project area where extant historic-aged buildings, structures, or objects might be present, or where archaeological deposits might exist. Desktop and online library research focused on historical maps, aerial images, atlases, and photographs. Æ reviewed and compiled information from various sources including:

- General Land Office (GLO) maps (https://glorecords.blm.gov/default.aspx; 1856 and 1901);
- HistoricAerials.com administered by NETRonline topographic maps (https://www.historicaerials.com/viewer; T1922, T1923, T1946, T1955, T1965, T1974, T1975, T1982, T1995, T2012, T2015, T2018, and T2021);
- Aerial photographs, accessed through the Map Aerial Locator Tool maintained by California State University, Fresno (http://malt.lib.csufresno.edu/MALT/; 1937 and 1964); FrameFinder administered by the University of California, Santa Barbara (http://mil.library.ucsb.edu/ap_indexes/FrameFinder/); and
- HistoricAerials.com administered by NETRonline (1957, 1962, 1972, 1984, 1998, 2002, 2005, 2009, 2010, 2012, 2014, 2016, 2018, and 2020).

The result of Æ's background research is discussed in Section 4.2.

3.3 NATIVE AMERICAN OUTREACH

Pursuant to California PRC Section 5097.9, state and local agencies cooperate with and assist the NAHC in its efforts to preserve and protect locations of sacred or special cultural and spiritual significance to Native Americans. On June 6, 2023, Æ contacted the NAHC to request a search of its Sacred Lands File to identify Native American resources in the Project area and obtain the names and contact information for individuals knowledgeable of such resources.

The NAHC responded on September 12, 2023, with its findings and attached a list of Native American tribes and individuals culturally affiliated with the Project area. Æ mailed a letter to each of the contacts identified by the NAHC. The letter summarized the Project and requested information about known cultural resources within the Project area and surrounding region. Æ additionally telephoned each contact to ensure they received the letter and to solicit information. Outreach with the Native American tribes and individuals is standard best practices to complete a cultural resource inventory and is not part of formal government-to-government consultation under Assembly Bill (AB) 52. Æ's record of tribal outreach is included in Appendix C.

3.4 PEDESTRIAN SURVEY

Æ Field Technician Charles Pansarosa performed an intensive pedestrian survey of the Project area using interval transects spaced 10 meters apart. Æ collected locational information on the survey coverage and photographed overviews of the Project area documenting the ground visibility and other conditions. All field records and photographs are archived at Æ's office in Fresno, California.

4
FINDINGS

This chapter provides results of the SSJVIC records search, Æ's background research, the NAHC's search of the Sacred Land's File and Æ's outreach to local Native American tribal representatives, and describes the pedestrian survey, including observations of field conditions and findings within the Project area.

4.1 RECORDS SEARCH

On July 31, 2023, the SSJVIC responded to Æ's records search request (Records Search File No. 23-286). In its response, the SSJVIC identified four previous cultural resource investigations within the Project area and one previous investigation in the 0.25-mile search radius. In addition, the records search identified no cultural resources within the Project area and one previously recorded cultural resource within the 0.25-mile records search radius.

4.1.1 Previous Studies

There have been four studies previously conducted within the Project area and one study within the 0.25-mile radius (Table 4-1; Appendix B). The entirety of the Project area has been surveyed previously, portions of which were surveyed most recently in 2006, more than 15 years ago. All other previous studies were conducted more than 30 years ago.

Table 4-1
Previous Studies in the Project Area and Surrounding 0.25-Mile Radius

CHRIS Report No.	Author(s)	Year	Title
Within the Project Area			
FR-00534	Jones & Stokes Associates, Inc.	1991	*Archaeological Survey Report for the Behymer Lake Storm Drainage and Flood Control Project Initial Study*
FR-01219	Bissonnette, L.D.	1993	*Fresno Metropolitan Flood Control District Drainage Area "BY" Facilities*
FR-02203	Varner, D.M.	2006	*A Cultural Resource Study of the Battlin Brooks Property, Fresno County, California*
FR-02289	Nettles, W.M. and R. Baloian	2006	*Cultural Resources Reconnaissance Survey of the City of Clovis Northwest Urban Center Specific Plan Area, Fresno County, California*
Within the 0.25-Mile Radius			
FR-03067	Stanley, W., R. Baloian, and M. Baloian.	2018	*Cultural Resource Inventory and Evaluation for the Tract 6200 Development in the City of Clovis, Fresno County, California*

4.1.2 Previously Recorded Resources

The records search identified no previously recorded resources within the Project area, and only one resource, the Enterprise Canal (P-10-005934), within the 0.25-mile records search radius. As discussed in Section 2.4.2, the Enterprise Canal was constructed in the mid-to-late 1870s to provide bulk irrigation water to the greater Clovis and North Fresno areas. The entire canal is 36.5 miles long.

4.2 BACKGROUND RESEARCH

Æ's review of historical topographic maps and aerial photographs revealed moderate development in the area over the last 100 years. An 1856 map from the GLO depicts Big Dry Creek running southeast of the Project area (Figure 4-1). Big Dry Creek was present on the 1923 topographic map but on the 1947 map had been replaced with "Colonial Ditch." The 1856 GLO shows "Road from Stockton to Kings River" and "Old Road" on either side of the Project area. There were no remnants of these roads on the 1923 topographic map: all roads depicted on that map reflect their current state.

Figure 4-1 1856 GLO map showing transport routes and Big Dry Creek.

Æ's review of historical atlases, aerials, and maps dating from 1891 to the present concluded that no structures have been built in the Project area. Two houses were built directly east of the Project area prior to 1957 and remained extant until circa 2000. Large, isolated buildings began appearing in the area in 1998, followed by housing developments east of Sunnyside Avenue between 1984 and 1998 and south of Shephard Avenue between 2005 and 2009. The Pacific Gas and Electric Shephard Substation was built directly south of the Project area between 2012 and 2014. The Project area and a significant portion of the surrounding area remain agricultural land.

4.3 NATIVE AMERICAN OUTREACH

On August 17, 2023, the NAHC stated in its search of the Sacred Lands File was negative for the presence of cultural resources in the Project area. The NAHC also supplied a list of individuals to be contacted for information regarding locations of sacred or special sites of cultural or spiritual significance in the Project area.

On September 14, 2023, Æ sent a letter describing the Project and its location to:

- Chairperson Elizabeth Kipp of Big Sandy Rancheria of Western Mono Indians;
- Tribal Administrator Tom Zizzo of Big Sandy Rancheria of Western Mono Indians;
- Vice Chairperson Joel Marvin of Big Sandy Rancheria of Western Mono Indians;
- Jared Aldern of Cold Springs Rancheria of Mono Indians;
- Chairperson Carol Bill of Cold Springs Rancheria of Mono Indians;
- Chairperson Robert Ledger of Dumna Wo-Wah Tribal Government;
- Chairperson Ron Goode of North Fork Mono Tribe;
- Tribal Secretary Anna Phipps of North Fork Mono Tribe;
- Council Member and Archaeological Director Jesse Valdez of North Fork Mono Tribe;
- Timothy Perez of North Valley Yokuts Tribe;
- Chairperson Katherine Perez of North Valley Yokuts Tribe;
- Tribal Administrator Michael Wynn of Picayune Rancheria of the Chukchansi Indians;
- Tribal Historic Preservation Officer Heather Airey of the Picayune Rancheria of the Chukchansi Indians;
- Chairperson Janet Bill of the Picayune Rancheria of the Chukchansi Indians;
- Cultural Resource Director Bob Pennell of Table Mountain Rancheria;
- Chairperson Brenda Lavell of Table Mountain Rancheria;
- Chairperson David Alvarez of the Traditional Choinumni Tribe;
- Chairperson Neil Peyron of the Tule River Indian Tribe;
- Environmental Department Kerri Vera of the Tule River Indian Tribe;
- Tribal Archaeologist Joey Garfield of the Tule River Indian Tribe; and
- Chairperson Kenneth Woodrow of the Wuksachi Indian Tribe/Eshom Valley Band.

Æ also distributed these letters via email on September 13, 2023, and followed up with all tribes by telephone on October 19, 2023. To date, Æ has received six responses from this outreach.

- Big Sandy Rancheria of Mono Indians requested to be informed of any discoveries.
- The North Fork Mono Tribe requested that work crews remain cognizant of the fact that there are several sites known through oral history in the area that have not yet been located.
- Table Mountain Rancheria requested a copy of the cultural resources report and a meeting to discuss the Project; this communication is being conducted by Lennar Central Valley.
- Picayune Rancheria of the Chukchansi Indians, Traditional Choinumni Tribe, and Tule River Indian Tribe all declined interest in the Project.

A log detailing the outreach efforts and responses is provided in Appendix C. Æ did not facilitate government-to-government consultation on behalf of the City.

4.4 PEDESTRIAN SURVEY

Æ conducted an intensive archaeological pedestrian survey on August 23, 2023, encompassing the entire 18.2 acres of the Project area. The Project area is an open vacant field. Ground visibility varied across the Project area (Figures 4-2 and 4-3). Portions of the Project area were clear and void of vegetation, whereas other portions were entirely obscured by overgrown vegetation with grasses reaching waist height. In addition to grasses, vegetation in the area includes sunflower, jimson weed, and lupine.

Figure 4-2 Cleared and sparsely vegetated ground surface with high visibility; facing northeast.

Figure 4-3 Waist-high grass and star thistle with zero percent ground visibility; facing west.

Æ noted that the Project area appears to have been disked in the last year, and there also has been subsurface infrastructure improvements such as fire suppression, irrigation, and utilities in areas along the southern and western boundaries, likely associated with the adjacent development. Æ observed a graded dirt access road along the southern border. Modern debris including paper, plastic, polyvinyl chloride pipe segments, and fragments of concrete were also observed by the surveyor throughout the property. No cultural resources were identified in the Project area during the pedestrian survey.

5
CONCLUSIONS AND RECOMMENDATIONS

Æ provided cultural resource services for the proposed Tract 6452 Residential Development Project in Fresno County, California for Lennar Central Valley. The Project proposes to construct 153 single-family lots on 18.2 acres of vacant land between Clovis Avenue and North Sunnyside Avenue, north of Perrin Road, in the city of Clovis. The proposed zoning for the Project will be M/L – Medium and Low Density Residential, while the current Fresno County zoning is AE-20. The property is currently in the County of Fresno and will need to be annexed to the City. This residential development will be within the City's Heritage Grove Master Plan and will be subject to design development standards of the plan.

Æ conducted a cultural resource study to determine if archaeological or historical built environment cultural resources are present within the 18.2-acre Project area. Accordingly, Æ performed background research, obtained a records search from the SSJVIC of the CHRIS, requested a search of the NAHC Sacred Lands File, contacted local tribal representatives, and performed an intensive pedestrian survey of the Project area.

The SSJVIC records search identified four previous cultural resource investigations within the Project area and one previous investigation in the 0.25-mile search radius. In addition, the records search reported no previously recorded cultural resources within the Project area and one previously recorded cultural resource within the 0.25-mile records search radius. A search of the NAHC's Sacred Lands File did not identify Native American cultural resources within or near the Project area and no specific information was gleaned from outreach with local tribal representative. No cultural resource sites were identified in the Project area from Æ's survey efforts.

5.1 RECOMMENDATIONS

This study concludes that there are no historical resources within the Project area. Based on the results of this cultural resource inventory, Æ recommends the following management practices be adopted for the proposed Project.

5.1.1 Inadvertent Discovery of Archaeological Resources

If unknown prehistoric or historic-era cultural resources are encountered during Project activities, all ground-disturbing activities within 50 feet of the find shall cease until a qualified archaeologist can evaluate the significance of the resource and recommend appropriate treatment measures. If necessary, per CEQA Guidelines Section 15126.4(b)(3)(A), project redesign and preservation in place shall be the preferred means to avoid impacts to significant cultural resources (i.e., historical resources). Consistent with CEQA Guidelines Section 15126.4(b)(3)(C), if it is demonstrated that a historical resource cannot be avoided, the qualified archaeologist shall develop mitigation practices in consultation with the City, which may include data recovery or other appropriate measures. The City also shall consult with interested Native American representatives in determining appropriate mitigation for unearthed cultural resources if the resources are prehistoric or Native American in nature. If preservation in place is not possible and additional studies or data recovery mitigation is necessary, the qualified archaeologist shall prepare a report documenting these studies and/or additional mitigation of the resource. A copy of the report shall be provided to the City and to the SSJVIC. Construction can recommence based on the direction of the qualified archaeologist and with concurrence from the City.

5.1.2 Inadvertent Discovery of Human Remains

Æ advises that in the event human remains are uncovered during Project activities, the Fresno County Coroner is to be notified to evaluate the remains and follow the procedures and protocols set forth in CEQA Guidelines Section 15064.4 (e)(1). If the remains are identified to be those of a Native American, California Health and Safety Code 7050.5 requires that the county coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendant, who will be afforded the opportunity to recommend means for treatment of the human remains following protocols in California Public Resources Code 5097.98.

6
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APPENDIX A

Personnel Qualifications

Mary Clark Baloian

Principal Archaeologist

Areas of Expertise

- Cultural resource management
- Prehistoric archaeology
- Project management

Years of Experience

- 30

Education

Ph.D., Anthropology, Southern Methodist University, 2003

M.A., Anthropology, Southern Methodist University, 1995

B.A., Anthropology, University of California, Davis, 1989

Registrations/Certifications

- Registered Professional Archaeologist 15189

Permits/Licensure

- Principal Investigator, California BLM Statewide Cultural Resources Use Permit CA-18-22

Professional Affiliations

- Society for American Archaeology
- Society for California Archaeology

Professional Experience

2021–2023	Principal Archaeologist, subconsultant for Applied EarthWorks, Inc., Fresno, California
2000–2020	President (2015–2020), Managing Principal (2015–2020), Regional Manager (2012–2014), Assistant Division Manager (2010–2011), Principal Archaeologist/Project Manager (2016–present), Senior Archaeologist/Project Manager (2000–2015), Applied EarthWorks, Inc., Fresno, California
1998–2001	Adjunct Faculty Member, Fresno City College, Fresno, California
1995–1996	Staff Archaeologist, Applied EarthWorks, Inc., Fresno, California
1994–1995	Staff Archaeologist, INFOTEC Research, Inc., Fresno, California
1992–1994	Teaching Assistant, Southern Methodist University, Dallas, Texas
1989–1991	Archaeological Project Leader, California Department of Transportation, Sacramento

Technical Qualifications

Dr. Clark Baloian has been involved in archaeology in California and the western United States since 1987. Her areas of expertise include the prehistory of the San Joaquin Valley, Sierra Nevada, Great Basin, central California coast, and the Iron Age of West Africa. Dr. Baloian has served as Principal Investigator/Project Manager, Field Supervisor, Crew Chief, or Field Technician for projects throughout California, Oregon, Nevada, New Mexico, Texas, Hawaii, and West Africa. Her experience in cultural resource management includes research design, data acquisition, laboratory analysis, and preparation of technical reports and compliance documents; she also has completed the Advisory Council on Historic Preservation course in National Historic Preservation Act (NHPA) Section 106 compliance policies and procedures. Her analytic skills include lithic and ceramic analyses as well as settlement pattern studies and spatial analysis, which were the foci of her doctoral research. As a Principal Archaeologist and subconsultant for Applied EarthWorks, Dr. Baloian provides quality assurance, high-level technical review, CEQA and Section 106 oversight, and overall professional guidance for project work, as needed.

Erin Enright

Vice President/Principal Archaeologist/Project Manager

Areas of Expertise

- Cultural resource management
- Project management
- Archaeological field work/ Supervision
- GIS analysis and desktop site assessments
- Faunal analysis
- Prehistory and history of California and the Southwest

Years of Experience

- 22

Education

M.A., Anthropology and Applied Archaeology, Eastern New Mexico University, Portales, 2008

B.A., Classical and Near Eastern Archaeology, Bryn Mawr College, Pennsylvania, 2000

Registrations/Certifications

- Register of Professional Archaeologists 16575 (2009)
- OSHA 40-hour HAZWOPER (2019)

Permits/Licensure

- Principal Investigator, California BLM Statewide Cultural Resources Use Permit CA-21-21

Professional Affiliations

- Society for American Archaeology
- Society for California Archaeology

Professional Experience

2021–	Vice President/Managing Principal/Principal Archaeologist, Applied EarthWorks, Inc., San Luis Obispo and Fresno, California
2019–2021	Managing Principal/Principal Archaeologist, Applied EarthWorks, Inc., San Luis Obispo, California
2014–2018	Senior Archaeologist/Project Manager, Applied EarthWorks, Inc., San Luis Obispo, California
2008–2014	Associate Archaeologist/Faunal Analyst, Applied EarthWorks, Inc., Lompoc, California
2004–2008	Faunal Analyst/Student Supervisor/ Educational Outreach, Blackwater Draw Archaeological Site and Museum, Eastern New Mexico University, Portales
2001–2004	Staff Archaeologist, Cultural Resource Management Services, Paso Robles, California
2000	Field Archaeologist, Princeton Expedition, Polis Chrysochous, Cyprus
1999	Archaeological Field School, Anathica Field School, Petras, Crete, Greece

Technical Qualifications

Ms. Enright is an experienced professional archaeologist, principal investigator, project manager, and field supervisor/director who has managed projects throughout California and the Southwest. She has participated at all levels within the cultural resource management industry with projects ranging from survey and site recording; testing and data recovery; National Register eligibly excavations; buried site testing (backhoe trenching); development of monitoring plans; database creation and maintenance; curation management; GIS; technical report production; and compliance assistance for NHPA and CEQA projects. Ms. Enright has developed close relationships with tribal groups and individuals throughout the Central Coast and Central Valley. She has played a critical role in providing consultation support between agencies and Native American groups for AB 52, CEQA, and Section 106. Additionally, she has experience managing large on-call contracts and complicated cultural resource management efforts with complex regulatory requirements. Several of these efforts have been in support of energy projects. Ms. Enright has authored or co-authored more than 70 technical reports and other NHPA, NEPA, and CEQA compliance documents, and presented research at state and national archaeological meetings.

ANNA HOOVER

Principal Archaeologist

Areas of Expertise

- Cultural resources management
- Prehistoric archaeology of southern California
- Indigenous archaeology and Native American/descendant community coordination
- Federal, state, local environmental laws and regulations
- Training, capacity building
- Traditional Cultural Property and Landscape analysis

Years of Experience

- 24

Education

M.S., Anthropology, focus Archaeology, 2003, University of California, Riverside

B.S., Anthropology, 2000, University of California, Riverside

B.A., Linguistics, 2000, University of California, Riverside

A.A., English, 1996, Long Beach City College

Registrations/Certifications

- Registered Professional Archaeologist 28576661 (current)
- Cultural Consultant, Riverside County #171 (current)

Permits/Licensure

- Field Director, California BLM Statewide Cultural Resources Use Permit CA-21-21

Professional Associations

- Society of California Archaeology

Professional Experience

2023–	Principal Archaeologist, Applied EarthWorks, Inc.
2020–2022	Senior Archaeologist, Applied EarthWorks, Inc.
2017–2023	Senior Ethnoarchaeologist, Cultural Geographics Consulting
2007–2017	Deputy Tribal Historic Preservation Officer, Pechanga Band of Luiseño Mission Indians
2001–2015	Archaeological Assistant, San Bernardino County Coroner
2002–2007	Senior Archaeologist, L&L Environmental, Inc.

Technical Qualifications

Ms. Hoover has more than 24 years of experience in archaeological, cultural, and tribal resource management in southern California, Alta and Baja California, and Yucatan, Mexico. Ms. Hoover has collaborated with governmental agencies, environmental consultants, and indigenous communities to develop sustainable and practical applications for the identification and preservation of archaeological and tribal cultural resources, including landscapes and large, geographical features. As a capable Project Manager, she has coordinated dozens of CRM projects during all phases of development, including managing logistics and communications with various clients, lead agencies, Tribal communities, and project staff. Ms. Hoover is the designated archaeologist of record for three Native American Tribal Historic Preservation Offices (THPOs) in southern California.

Ms. Hoover has authored, co-authored, reviewed, and contributed to hundreds of California Environmental Quality Act (CEQA), Section 106 of the National Historic Preservation Act (NHPA), and National Environmental Policy Act (NEPA) technical reports; Programmatic, Memoranda, and Master Agreements; THPO development applications and associated tribal ordinances and historic preservation guidance; ethnographic studies and National Register of Historic Places eligibility forms; and other compliance and mitigation documents.

Ms. Hoover has presented collaborative projects, personal research, cultural resources education, and environmental regulation guidance trainings to a wide variety of audiences, including topics such as AB 52, SB 18 and CEQA guidance, cultural and tribal consultation best practices, and Tribal Monitoring Program trainings. She has contributed to CalTHPO organizational committees, participated in development of California and Federal archaeological and tribal consultation policies, and contributed to a published book on Tribal GIS applications.

Applied EARTHWORKS Inc.

NICOLE SAENZ

Staff Anthropologist

Areas of Expertise

- Forensic anthropology
- Human osteology
- Faunal analysis/zooarchaeology
- Project administration

Years of Experience

- 6

Education

M.S., Forensic Anthropology, Boston University Chobanian and Avedisian School of Medicine, 2023

B.A., Anthropology, University of California, Santa Cruz, 2012

Professional Experience

2023–	Staff Anthropologist, Applied EarthWorks, Inc.
2022–	Forensic Anthropology Consultant and Peer Reviewer, Puerto Rico Institute of Forensic Sciences
2022–2023	Field Technician, Applied EarthWorks, Inc.
2008–2012	Zooarchaeology Preparations and Curation Intern, University of California, Santa Cruz

Technical Qualifications

Ms. Saenz is a Staff Anthropologist at Applied EarthWorks, Inc. She received her Bachelor of Arts degree in Anthropology from the University of California, Santa Cruz and her Master of Science degree in Forensic Anthropology from the Boston University Chobanian and Avedisian School of Medicine. In addition, Ms. Saenz has completed internships in zooarchaeological preparation and curation, thermally altered scene analysis and remains recovery, and currently serves as a forensic anthropological consultant and peer reviewer for the Puerto Rico Institute of Forensic Sciences. Ms. Saenz's professional responsibilities include project administration, osteological assessments, outreach with the Native American Heritage Commission and its recommendations, pre-field project preparations, writing technical reports, completing California Department of Parks and Recreation 523-series forms, and assisting with project proposals.

APPENDIX B

Records Search Results

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

7/31/2023

Milo Honsberger
Applied EarthWorks, Inc.
1391 W. Shaw Ave.
Fresno, CA 93711

Re: 4524 Clovis TR 0000
Records Search File No.: 23-286

The Southern San Joaquin Valley Information Center received your record search request for the project area referenced above, located on the Clovis & Friant USGS 7.5' quads. The following reflects the results of the records search for the project area and the 0.25 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:	None
Resources within 0.25 mile radius:	P-10-005934
Reports within project area:	FR-00534, 01219, 02203, 02289
Reports within 0.25 mile radius:	FR-03067

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).

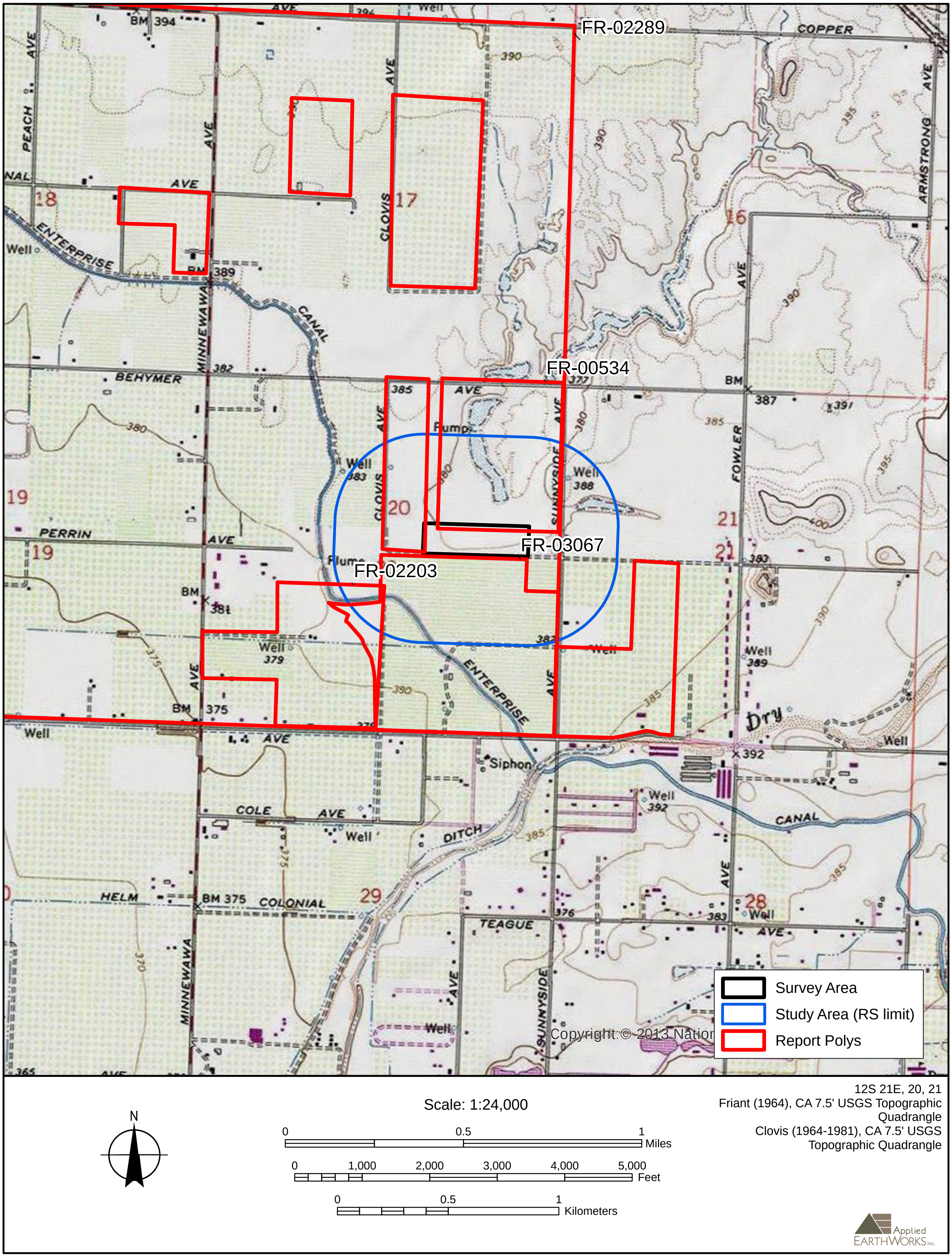
Sincerely,

Celeste M. Thomson
Coordinator

Report List

SSJVIC Record Search 23-286

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
FR-00534		1991	Jones & Stokes Associates, Inc.	Archaeological Survey Report for the Behymer Lake Storm Drainage and Flood Control Project Initial Study	Jones & Stokes Associates, Inc.	
FR-01219		1993	Bissonnette, Linda Dick	Fresno Metropolitan Flood Control District Drainage Area "BY" Facilities	Cultural Resources Consulting	
FR-02203		2006	Varner, Dudley M.	A Cultural Resource Study of the Battlin Brooks Property, Fresno County, California	Varner Associates	
FR-02289		2006	Nettles, Wendy M. and Baloian, Randy	Cultural Resources Reconnaissance Survey of the City of Clovis Northwest Urban Center Specific Plan Area, Fresno County, California	Applied EarthWorks, Inc.	10-006109
FR-03067		2018	Stanley, Ward, Baloian, Randy, and Baloian, Mary	Cultural Resource Inventory and Evaluation for the Tract 6200 Development in the City of Clovis, Fresno County, California	Applied EarthWorks, Inc.	10-005934

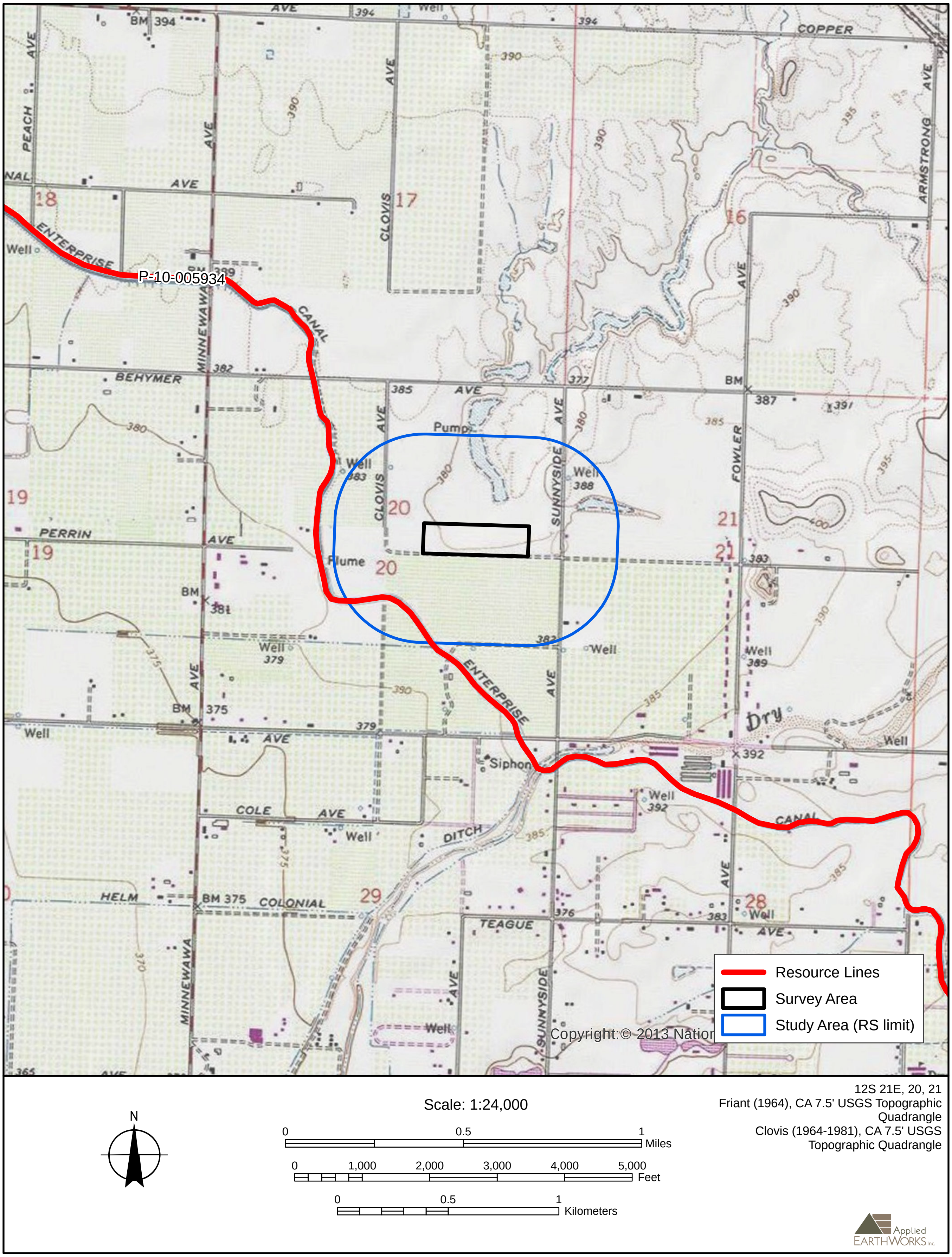


Record Search Results Map: Reports

Resource List

SSJVIC Record Search 23-286

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-10-005934	CA-FRE-003564H	Resource Name - Enterprise Canal; OTIS Resource Number - 534499; OHP Property Number - 163775	Structure	Historic	HP20	2007 (R. Baloian, Applied EarthWorks, Inc.); 2013 (Randy Baloian, Applied EarthWorks, Inc.); 2017 (Ward Stanley and Randy Baloian, Applied EarthWorks, Inc.)	FR-02615, FR-02919, FR-03067



Record Search Results Map: Resources

APPENDIX C

Native American Outreach

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission
1550 Harbor Boulevard, Suite 100
West Sacramento, CA 95691
916-373-3710
916-657-5390 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Date: 7/17/23

Project: 4524 Clovis Tract 0000

County: Fresno

USGS Quadrangle Name: Fresno & Clovis

TRS: 12S 21E, 20, 21

Company/Firm/Agency: Applied EarthWorks, Inc.

Contact Person: Milo Honsberger

Street Address: 1391 W. Shaw Ave., Suite C

City: Fresno **Zip:** 93711

Phone: (559) 229-1856 x

Fax: (559) 229-2019

Email: mhonsberger@appliedearthworks.com

Project Description:

Applied Earthworks will be conducting a survey in Clovis CA.

STATE OF CALIFORNIA Gavin Newsom, *Governor*

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

September 12, 2023

Milo Honsberger
Applied EarthWorks, Inc.

Via Email to: mhonsberger@appliedearthworks.com

Re: 4524 Clovis Tract 0000 Project, Fresno County

Dear Mr. Honsberger:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Cameron.vela@nahc.ca.gov.

Sincerely,

Cameron Vela

Cameron Vela
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Fresno County
9/12/2023

Tribe Name	Fed (F) Non-Fed (N)	Contact Person	Cultural Affiliation
Dumna Wo-Wah Tribal Government	N	Robert Ledger, Chairperson	Foothill Yokut Mono
North Valley Yokuts Tribe	N	Katherine Perez, Chairperson	Costanoan Northern Valley Yokut
North Valley Yokuts Tribe	N	Timothy Perez,	Costanoan Northern Valley Yokut
Picayune Rancheria of the Chukchansi Indians	F	Michael Wynn, Tribal Administrator	Foothill Yokut
Picayune Rancheria of the Chukchansi Indians	F	Janet Bill, Chairperson	Foothill Yokut
Picayune Rancheria of the Chukchansi Indians	F	Heather Airey, Tribal Historic Preservation Officer	Foothill Yokut
Santa Rosa Rancheria Tachi Yokut Tribe	F	Leo Sisco, Chairperson	Southern Valley Yokut
Table Mountain Rancheria	F	Brenda Lavell, Chairperson	Yokut
Table Mountain Rancheria	F	Bob Pennell, Cultural Resource Director	Yokut
Traditional Choinumni Tribe	N	David Alvarez, Chairperson	Foothill Yokut
Tule River Indian Tribe	F	Joey Garfield, Tribal Archaeologist	Yokut
Tule River Indian Tribe	F	Kerri Vera, Environmental Department	Yokut
Tule River Indian Tribe	F	Neil Peyron, Chairperson	Yokut
Wuksachi Indian Tribe/Eshom Valley Band	N	Kenneth Woodrow, Chairperson	Foothill Yokut Mono

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

Applied EARTHWORKS Inc.

1391 W. Shaw Ave., Suite C
Fresno, CA 93711-3600
O: (559) 229-1856 | F: (559) 229-2019
www.appliedearthworks.com

September 13, 2023

Joel Marvin, Vice Chairperson
Big Sandy Rancheria of Western Mono Indians
P.O. Box 337
Auberry, CA, 93602
(559) 374-0066
Transmitted via USPS and email (jmarvin@bsrnation.com)

RE: Clovis Tracts 6375 and 6452 Housing Development Projects in Clovis, Fresno County, California

Dear Joel Marvin,

Applied EarthWorks, Inc. (Æ) is providing cultural resource services, including archaeological survey, in support of proposed housing development. The development includes two separate projects on adjacent plots of land, the boundaries of which are just north of the City of Clovis.

The project areas are a combined 77 acres, one 18.23-acre parcel and one 58.9-acre parcel, as shown on the Friant and Clovis 7.5-minute U.S. Geological Survey topographic quadrangles (see enclosed maps). The project does involve new construction, including multiple ground-breaking activities related to construction and development. Therefore, a cultural resource study is required.

On behalf of the City of Clovis, Æ is conducting Native American outreach and performing other tasks related to cultural resource management. The project is subject to the requirements of the California Environmental Quality Act and, as lead agency, the City of Clovis is responsible for any formal government-to-government consultation required. This communication is not intended to initiate Assembly Bill 52 consultation.

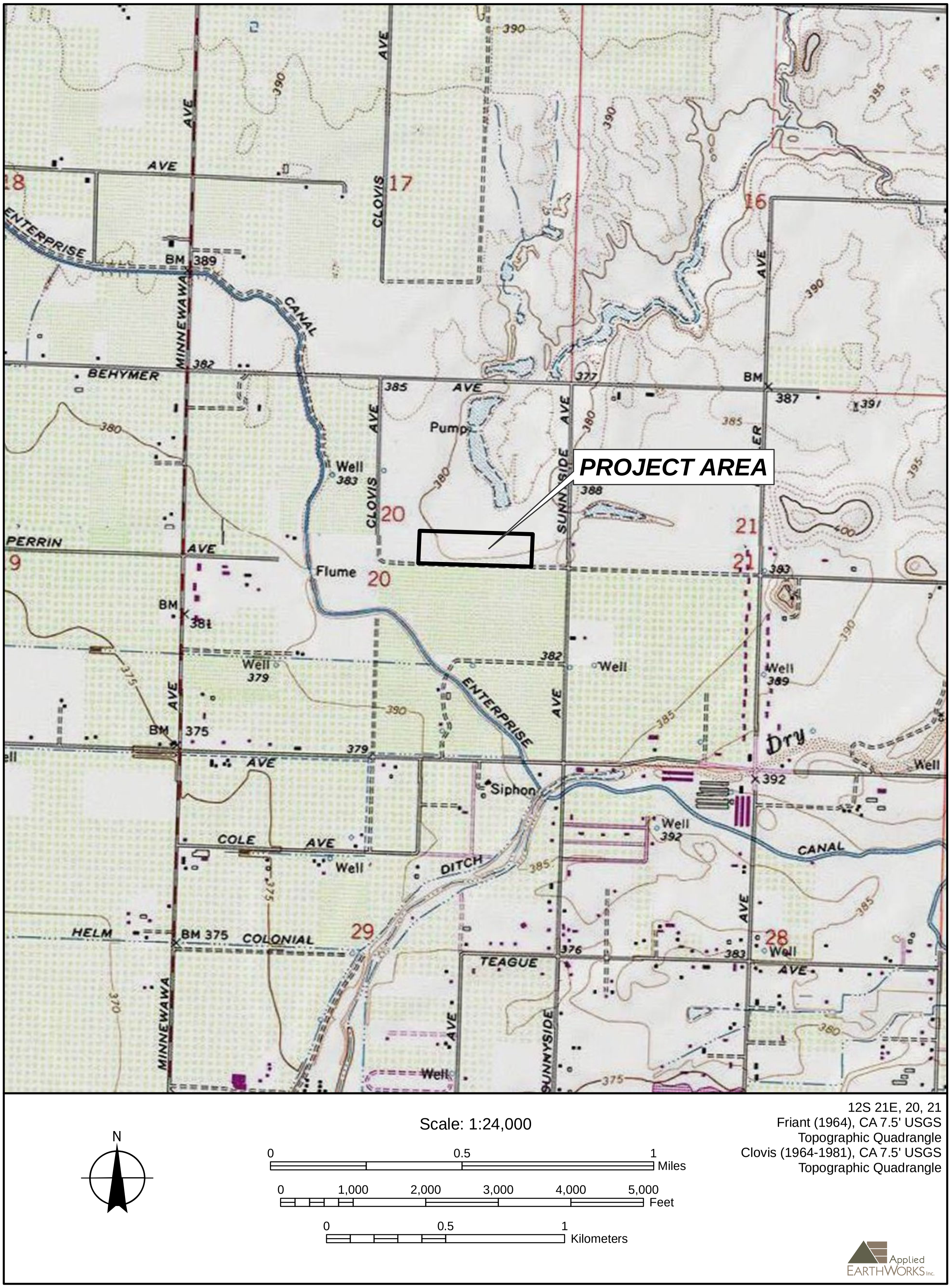
Æ has requested a sacred lands file search from the Native American Heritage Commission. The results were received on September 12, 2023 and indicated a negative result. Your name and address were provided to us by the NAHC as someone who may have additional information and/or concerns about the project.

If you have information about tribal or cultural resources in the area or if you have any interest in the project, please email/phone me or send a letter to my attention. Your comments will be included in our cultural resource report unless noted otherwise. You can contact me during normal business hours (559-229-1856 ext. 121) or via email at nsaenz@appliedearthworks.com if you have any questions or need additional information.

Sincerely,

Nicole Saenz, M.S.
Project Administrator, Fresno Office
Applied EarthWorks, Inc.

encl.: Project Maps



Project location map for the *Project - AE4524*.

TABLE MOUNTAIN RANCHERIA
TRIBAL GOVERNMENT OFFICE

CERTIFIED 4066 1535

October 18, 2023

Nicole Saenz, M.S., Project Administrator, Fresno Office
Applied EarthWorks Inc.
1391 W. Shaw Ave., Suite C
Fresno, CA 93711

RE: Clovis Tracts 6375 and 6452 Housing Development Projects

Dear: Nicole Saenz

Table Mountain Rancheria is responding to your letter dated September 13, 2023, regarding Clovis Tracts 6375 and 6452 Housing Development Projects. Thank you for notifying Table Mountain Rancheria of the potential development and request for consultation. The Rancheria is very interested in this project as it lies within our cultural area of interest.

If you have already conducted a record search, please provide Table Mountain Rancheria with copies of any cultural resource report you may have.

At this time, please contact our office at (559) 325-0351 or rpennell@tmr.org to coordinate a discussion and meeting date regarding your project.

Sincerely,

Robert Pennell
Tribal Cultural Resources Director

23736
Sky Harbour Road
Post Office
Box 410
Friant
California
93626
(559) 822-2587
Fax
(559) 822-2693

ESOP
Est. 2009
Applied EarthWorks Employee Stock Ownership Plan
100% Employee Owned

Nicole Saenz <nsaenz@appliedearthworks.com>

City of Clovis Archaeology Project

2 messages

Nicole Saenz <nsaenz@appliedearthworks.com> Wed, Sep 13, 2023 at 3:40 PM
To: "lkipp@bsrnation.com" <lkipp@bsrnation.com>
Cc: Anna Hoover <ahoover@appliedearthworks.com>

Dear Elizabeth Kipp

Applied EarthWorks, Inc. is providing archaeological services for two projects in Clovis, Fresno County, CA. As a result of a recent Native American Heritage Commission (NAHC) Sacred Lands Search for these projects, your name and contact information was provided by the NAHC as someone who may have additional information and/or concerns about this project.

Please kindly review the attached letter and project area map and respond with any comments or concerns you may have. Please note that our outreach is not formal government to government consultation, but an opportunity for you to provide information for the archaeological report.

We appreciate your time and consideration.

--

Nicole Saenz M.S. | **Applied EarthWorks, Inc.**
Project Administrator - Osteologist - Field Technician | (She/Her)

1391 W. Shaw Ave., Suite C
Fresno, CA 93711-3600
Office 559-229-1856 x121
www.appliedearthworks.com

Archaeology | Paleontology | Historical Architecture | GIS

2 attachments

NAHC_Map_4522.pdf
725K

Big Sandy Rancheria Chairperson.pdf
139K

Liz Kipp <LKipp@bsrnation.com> Thu, Sep 14, 2023 at 2:51 PM
To: Nicole Saenz <nsaenz@appliedearthworks.com>
Cc: Anna Hoover <ahoover@appliedearthworks.com>

On behalf of Big Sandy Rancheria, we have no comments or concerns with the City of Clovis Archaeology Project. If at any time anything of cultural significance is discovered, we request to be notified. Thank you and have a great day.

Respectfully,

Elizabeth D. Hutchins-Kipp

Tribal Chairperson

Big Sandy Rancheria

PO Box 337

37387 Auberry Mission Rd.

Auberry, California 93602

559-374-0066 ext. 212

559-374-0055 fax

Lkipp@bsrnation.com

Applied EARTHWORKS Inc.

Native American Outreach

Clovis Tract 6452 Project

Organization	Name	Letter	Email	Phone	Summary of Contact
Big Sandy Rancheria of Western Mono Indians	Elizabeth Kipp	09/14/23	09/13/23	Message left 10/19/2023	No response to date
Big Sandy Rancheria of Western Mono Indians	Tom Zizzo	9/14/2023	9/13/2023	Message left 10/19/2023	No response to date
Big Sandy Rancheria of Western Mono Indians	Joel Marvin	9/14/2023	9/13/2023	10/19/2023	Requested to be informed of any discoveries
Cold Springs Rancheria of Mono Indians	Jared Aldern	09/14/23	09/13/23	10/19/23	No longer affiliated with tribal management
Cold Springs Rancheria of Mono Indians	Carol Bill	09/14/23	09/13/23	10/19/23	No longer affiliated with tribal management
Dumna Wo-Wah Tribal Government	Robert Ledger	09/14/23	09/13/23	Called 10/19/23;	No response to date
North Fork Mono Tribe	Ron Goode	09/14/23	09/13/23	10/19/23	Requested that crews remain cognisant of the fact that there are several known sites in the area that have not been located.
North Fork Mono Tribe	Anna Phipps	09/14/23	09/13/23	Message left 10/19/2023	No response to date
North Fork Mono Tribe	Jesse Valdez	09/14/23	09/13/23	Message left 10/19/2023	No response to date
North Valley Yokuts Tribe	Timothy Perez	09/14/23	09/13/23	Message left 10/19/2023	No response to date
North Valley Yokuts Tribe	Katherine Perez	09/14/23	09/13/23	Message left 10/19/2023	No response to date
Picayune Rancheria of the Chukchansi Indians	Michael Wynn	09/14/23	09/13/23	Message left 10/19/2023	No response to date
Picayune Rancheria of the Chukchansi Indians	Heather Airey	09/14/23	09/13/23	10/19/23	Declined interest in the project
Picayune Rancheria of the Chukchansi Indians	Janet Bill	09/14/23	09/13/23	—	—
Table Mountain Rancheria	Bob Pennell	09/14/23	09/13/23	10/19/23	Received e-mail response on 10/19, 2023 expressing interest and requesting a copy of the cultural resources report and meeting to discuss the project
Table Mountain Rancheria	Brenda Lavell	09/14/23	no email address	—	—
Traditional Choinumni Tribe	David Alvarez	09/14/23	09/13/23	10/19/23	Declined interest in the project
Tule River Indian Tribe	Neil Peyron	09/14/23	09/13/23	Message left 10/19/2023	No response to date
Tule River Indian Tribe	Kerri Vera	09/14/23	09/13/23	10/19/23	Deferred interest to Table Mountain Rancheria
Tule River Indian Tribe	Joey Garfield	09/14/23	09/13/23	—	—
Wuksachi Indian Tribe/Eshom Valley Band	Kenneth Woodrow	09/14/23	09/13/23	Message left 10/19/2023	No response to date

ACOUSTICAL ANALYSIS

TRACT 6452
CLOVIS, CALIFORNIA

WJVA Project No. 23-26

PREPARED FOR

LENNAR HOMES OF CALIFORNIA, INC.
8080 NORTH PALM AVENUE, SUITE 110
FRESNO, CALIFORNIA 93711

PREPARED BY

WJV ACOUSTICS, INC.
VISALIA, CALIFORNIA

MARCH 14, 2024

INTRODUCTION

The project, Tract 6452, is a proposed 153-lot single-family residential development to be located in Clovis, California. The project site is located north of (and adjacent to) the future alignment of Perrin Avenue, between the future alignment of N. Clovis Avenue and the future alignment of N. Sunnyside Avenue. The City of Clovis has requested an acoustical analysis to quantify project site noise exposure and determine noise mitigation requirements. This analysis, prepared by WJV Acoustics, Inc. (WJVA), is based upon a project site plan prepared by Yamabe & Horn Engineering (dated 8-14-23), traffic data provided by the Fresno Council of Governments (Fresno COG) and the findings of on-site noise level measurements. Revisions to the site plan may affect the findings and recommendations of this report. The site plan is provided as Figure 1.

Appendix A provides a description of the acoustical terminology used in this report. Unless otherwise stated, all sound levels reported are in A-weighted decibels (dB). A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilize A-weighting, as it provides a high degree of correlation with human annoyance and health effects. Appendix B provides typical A-weighted sound levels for common noise sources.

NOISE EXPOSURE CRITERIA

General Plan

The Noise Element of the City of Clovis General Plan establishes noise level standards for both transportation and non-transportation (stationary) noise sources. Table I provides the maximum interior and exterior noise level standards for various land use categories, in terms of the CNEL. The CNEL (Community Noise Equivalent Level) is the time-weighted average noise level for a 24-hour day with penalties of 4.77 dB added to noise levels occurring during the evening hours (7:00 p.m-10:00 p.m.) and 10 dB added to noise levels occurring during the nighttime hours (10:00 p.m-7:00 a.m.). Table II provides the Land Use Compatibility Matrix. The City of Clovis applies Table II as guidance to approve development and require mitigation measures to ensure existing and future land use compatibility.

The noise element establishes an exterior noise standard of 65 dB CNEL for exterior noise exposure within outdoor activity areas of residential land uses. Outdoor activity areas include backyards of single-family residences, individual patios or decks of multi-family developments and common outdoor recreation areas of multi-family developments. The intent of the exterior noise level requirement is to provide an acceptable noise environment for outdoor activities and recreation. There is no applicable exterior noise level standard for commercial or office land uses provided in the General Plan Noise Element.

The Noise Element also requires that interior noise levels attributable to exterior noise sources not exceed 45 dB CNEL. The intent of the interior noise level standard is to provide an acceptable noise environment for indoor communication and sleep.

TABLE I

MAXIMUM NOISE STANDARDS
CITY OF CLOVIS GENERAL PLAN NOISE ELEMENT

Land Use Categories		Energy Average (CNEL)	
Primary Land Use	Additional Uses Allowed	Interior[1]	Exterior[2]
Residential	Single Family, Multi Family	45[3]/55[4]	65[7]
	Mobile Home	--	65[5]
Commercial/Industrial	Hotel, Motel, Transient Lodging	45	65[6]
	Commercial, Retail, Bank, Restaurant	55	--
	Office Building, Professional Office, Research & Development	50	--
	Gymnasium (Multipurpose)	50	--
	Health Clubs	55	--
	Manufacturing, Warehousing, Wholesale, Utilities	65	--
	Hospital, School Classroom	45	65
Institutional	Church Library	45	--
Open Space	Parks	--	65

Source: City of Clovis General 2-12 Plan Environmental and Safety Element, 2014.
Notes:
[1] Interior environment excludes bathrooms, toilets, closets, and corridors.
[2] Outdoor environment limited to private yard of single family or multifamily residences private patio which is accessed by a means of exit from inside the unit; mobile home park; hospital patio; park picnic area; school playground; and hotel and motel recreation area.
[3] Noise level requirement with closed windows. Mechanical ventilating system or other means of natural ventilation shall be provided pursuant to Appendix Chapter 12, Section 1208 of UBC.
[4] Noise level requirement with open windows, if they are used to meet natural ventilation requirement.
[5] Multi-family developments with balconies that do not meet the 65 CNEL are required to provide occupancy disclosure notices to all future tenants regarding potential noise impacts.
[6] Exterior noise level shall be such that interior noise level will not exceed 45 CNEL.
[7] Except those areas affected by aircraft noise.

TABLE II

LAND USE AND NOISE COMPATABILITY MATRIX
CITY OF CLOVIS GENERAL PLAN NOISE ELEMENT

LAND USES	ENERGY AVERAGE (CNEL)						
Example Land Uses	**<**	**55**	**60**	**65**	**70**	**75**	**80>**
Amphitheater, concert hall, auditorium, meeting hall	B	B	C	C	D	D	D
Mobile Home	A	A	B	C	C	D	D
Hospital, library, school, faith/religious uses	A	A	B	C	C	D	D
Hotel, motel, transient lodging	A	A	B	B	C	C	D
Single-family, multi-family	A	A	B	B	C	D	D
Parks	A	A	A	B	C	D	D
Office buildings, research & development, professional office, city office building	A	A	A	B	B	C	D
Amusement park, miniature golf, go-cart track, health club, equestrian center	A	A	A	B	B	D	D
Golf courses, nature centers, cemeteries, wildlife reserves, wildlife habitat	A	A	A	A	B	C	C
Commercial retail, bank, restaurant, movie theater	A	A	A	A	B	B	C
Automobile service station, auto dealer, manufacturing, warehousing, wholesale, utilities	A	A	A	A	B	B	B
Agriculture	A	A	A	A	A	A	A

Notes: Compatibility zones indicate the degree to which the land uses listed are compatible with the noise levels (CNEL) shown in the table.
Zone A. Clearly Compatible. Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
Zone B. Normally Compatible. New construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.
Zone C. Normally Incompatible. New construction or development should normally be discouraged. If new construction or development does proceed, a detailed analysis or noise reduction requirements must be made and needed noise insulation features must be included in the design.
Zone D. Clearly Incompatible. New construction or development should generally not be undertaken.

Municipal Code

Additionally, the City of Clovis Municipal Code provides noise level standards applicable to the project. Section 9.22.080 (Noise) of the City's Municipal Code provides maximum allowable exterior and interior noise level standards for specific land use types. Noise level standards are provided as energy average (L_{eq}) noise levels and apply to any 15-minute interval of time. Table III provides the maximum allowable exterior noise level standards and Table IV provides the maximum allowable interior noise level standards. The Municipal Code also states that *"If the ambient noise level exceeds the resulting standard, the ambient shall be the standard".*

TABLE III MAXIMUM EXTERIOR NOISE STANDARDS CITY OF CLOVIS MUNICIPAL CODE			
Noise Zone	Type of Land Use	A-Weighted Decibels, L_{eq} dBA Sources	
		7:00 a.m. to 10:00 p.m.	10:00 p.m. to 7:00 a.m.
I	Single-, two- or multi-family residential	55	50
II	Commercial	65	60
III	Residential portions of mixed-use properties	60	50
IV	Industrial or manufacturing	70	70

Source: City of Clovis Municipal Code

TABLE IV MAXIMUM INTERIOR NOISE STANDARDS CITY OF CLOVIS MUNICIPAL CODE			
Noise Zone	Type of Land Use	A-Weighted Decibels, L_{eq} dBA Sources	
		7:00 a.m. to 10:00 p.m.	10:00 p.m. to 7:00 a.m.
I	Residential	45	40
II	Administrative/professional office	50	--
III	Residential portions of mixed-use properties	45	40

Source: City of Clovis Municipal Code

PROJECT SITE NOISE EXPOSURE

The project site is located north of (and adjacent to) the future alignment of Perrin Avenue, between the future alignment of N. Clovis Avenue and the future alignment of N. Sunnyside Avenue, in Clovis, California. The project site will be exposed traffic noise associated with vehicles on these future roadways. The distance from center of the backyards of the closest proposed lots to the centerline of Perrin Avenue is approximately 60 feet. Additionally, the future alignment of N. Clovis Avenue would be located approximately 500 feet west of the closest proposed residential lots.

Traffic Noise Exposure

Noise exposure from traffic on Perrin Avenue and N. Clovis Avenue was calculated for future (2046) conditions using the FHWA Traffic Noise Model and traffic data obtained from Fresno COG. A description of the noise model, applied data, methodology and findings is provided below. Future traffic volumes for the future alignment of N. Sunnyside Avenue, in the project vicinity, were below the threshold for inclusion in the Fresno COG traffic projection model.

WJVA utilized the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA Model is a standard analytical method used for roadway traffic noise calculations. The model is based upon reference energy emission levels for automobiles, medium trucks (2 axles) and heavy trucks (3 or more axles), with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model was developed to predict hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within ±1.5 dB. To predict CNEL values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Annual Average Daily Traffic (AADT) data for Perrin Avenue N. Clovis Avenue, in the project vicinity was obtained from Fresno COG. Truck percentages and the day/evening/night distribution of traffic were estimated by WJVA, based upon previous studies conducted in the project vicinity since project-specific data were not available from government sources. A speed limit of 45 mph was assumed for both roadways. Table IV summarizes annual average traffic data used to model noise exposure within the project site.

TABLE IV TRAFFIC NOISE MODELING ASSUMPTIONS TRACT 6452, CLOVIS		
	Perrin Avenue	N. Clovis Avenue
	2046	2046
Annual Avenue Daily Traffic (AADT)	3,609	7,249
Day/Evening/Night Split (%)	83/7/10	
Assumed Vehicle Speed (mph)	45	
% Medium Trucks (% AADT)	2	
% Heavy Trucks (% AADT)	2	

Sources: Fresno COG
WJV Acoustics, Inc.

Using data from Table IV, the FHWA Model, annual average traffic noise exposure was calculated for the closest proposed backyards from Perrin Avenue and from N. Clovis Avenue. Table V provides the noise exposure levels for these two roadways, at the closest proposed residential lots to the roadway.

TABLE V MODELED TRAFFIC NOISE LEVELS, W. MINNEWAWA AVENUE, dB, CNEL TRACT 6452, CLOVIS	
Roadway	2046 Conditions
Perrin Avenue	61
N. Clovis Avenue	51

Source: WJV Acoustics
Fresno COG

Reference to Table V indicates that the traffic noise exposure at the closest proposed lots to Perrin Avenue would be approximately 61 dB CNEL for future (2046) traffic conditions, and approximately 51 dB CNEL for the closest proposed lots to N. Clovis Avenue. Such noise exposure levels do not exceed the City's 65 dB CNEL exterior noise level standard and mitigation measures are therefore not required for compliance with the City's exterior noise level standard.

Interior Noise Exposure:

The City of Clovis interior noise level standard is 45 dB CNEL. The worst-case noise exposure within the proposed residential development would be approximately 61 dB CNEL (2046 conditions). This means that the proposed residential construction must be capable of providing a minimum outdoor-to-indoor noise level reduction (NLR) of approximately 16 dB (61-45=16).

A specific analysis of interior noise levels was not performed. However, it may be assumed that residential construction methods complying with current building code requirements will reduce exterior noise levels by approximately 25 dB if windows and doors are closed. This will be sufficient for compliance with the City's 45 dB CNEL interior standard at all proposed lots. Requiring that it be possible for windows and doors to remain closed for sound insulation means that air conditioning or mechanical ventilation will be required.

CONCLUSIONS AND RECOMMENDATIONS

The proposed 153-lot single-family residential development will comply with all City of Clovis exterior and interior noise level standards, provided the following mitigation measures are incorporated into final project design.

- Mechanical ventilation or air conditioning must be provided for all homes so that windows and doors can remain closed for sound insulation purposes.

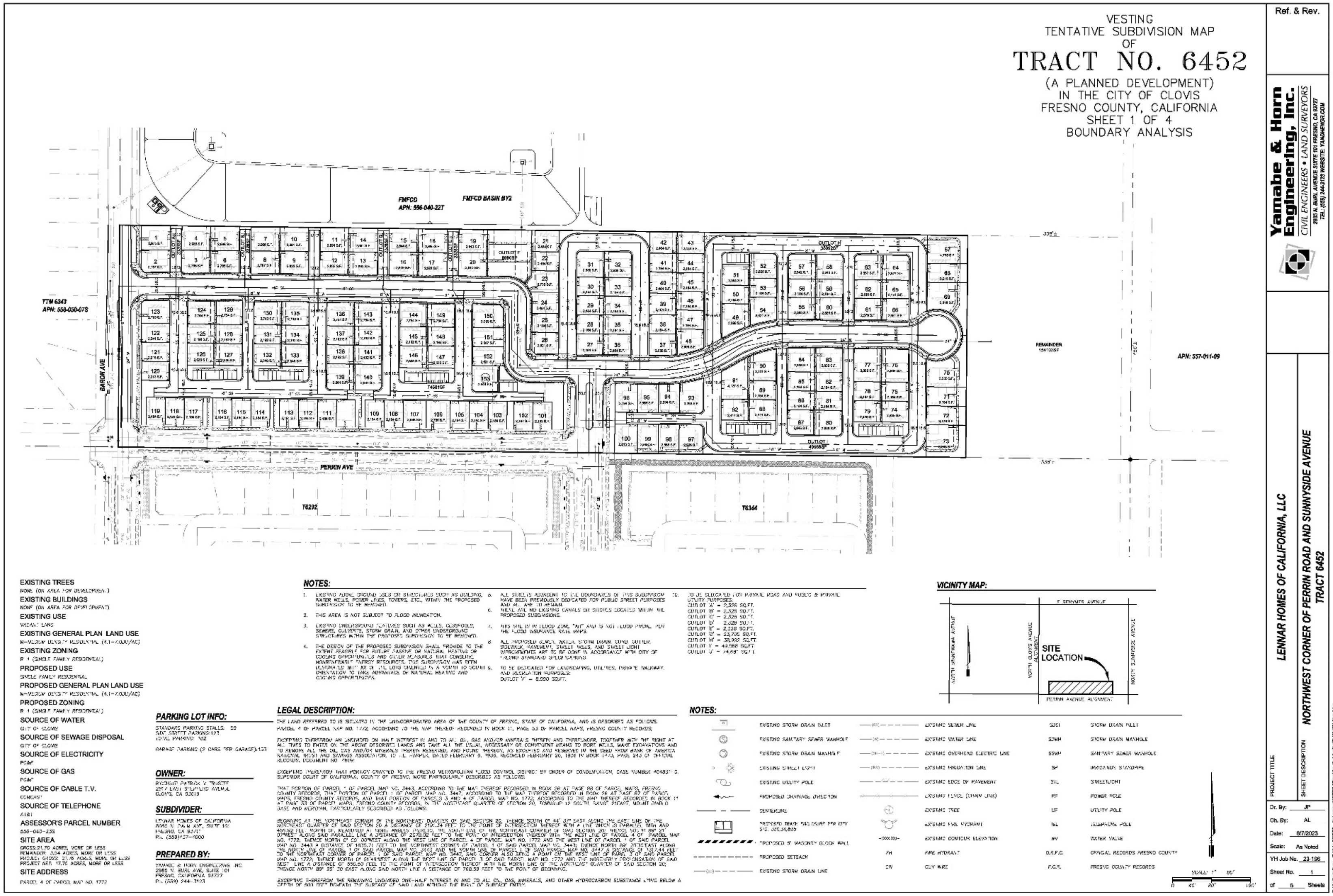
The conclusions and recommendations of this acoustical analysis are based upon the best information known to WJV Acoustics Inc. (WJVA) at the time the analysis was prepared concerning the proposed lot layout plan, project site elevation, traffic volumes and roadway configurations. Any significant changes in these factors will require a reevaluation of the findings of this report. Additionally, any significant future changes in motor vehicle technology, noise regulations or other factors beyond WJVA's control may result in long-term noise results different from those described by this analysis.

Respectfully submitted,

Walter J. Van Groningen
President

WJV:wjv

FIGURE 1: SITE PLAN



APPENDIX A

ACOUSTICAL TERMINOLOGY

AMBIENT NOISE LEVEL: The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

CNEL: Community Noise Equivalent Level. The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

DECIBEL, dB: A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

DNL/L_{dn}: Day/Night Average Sound Level. The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.

L_{eq}: Equivalent Sound Level. The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24-hour sample periods.

NOTE: The CNEL and DNL represent daily levels of noise exposure averaged on an annual basis, while L_{eq} represents the average noise exposure for a shorter time period, typically one hour.

L_{max}: The maximum noise level recorded during a noise event.

L_n: The sound level exceeded "n" percent of the time during a sample interval (L_{90}, L_{50}, L_{10}, etc.). For example, L_{10} equals the level exceeded 10 percent of the time.

ACOUSTICAL TERMINOLOGY

NOISE EXPOSURE CONTOURS: Lines drawn about a noise source indicating constant levels of noise exposure. CNEL and DNL contours are frequently utilized to describe community exposure to noise.

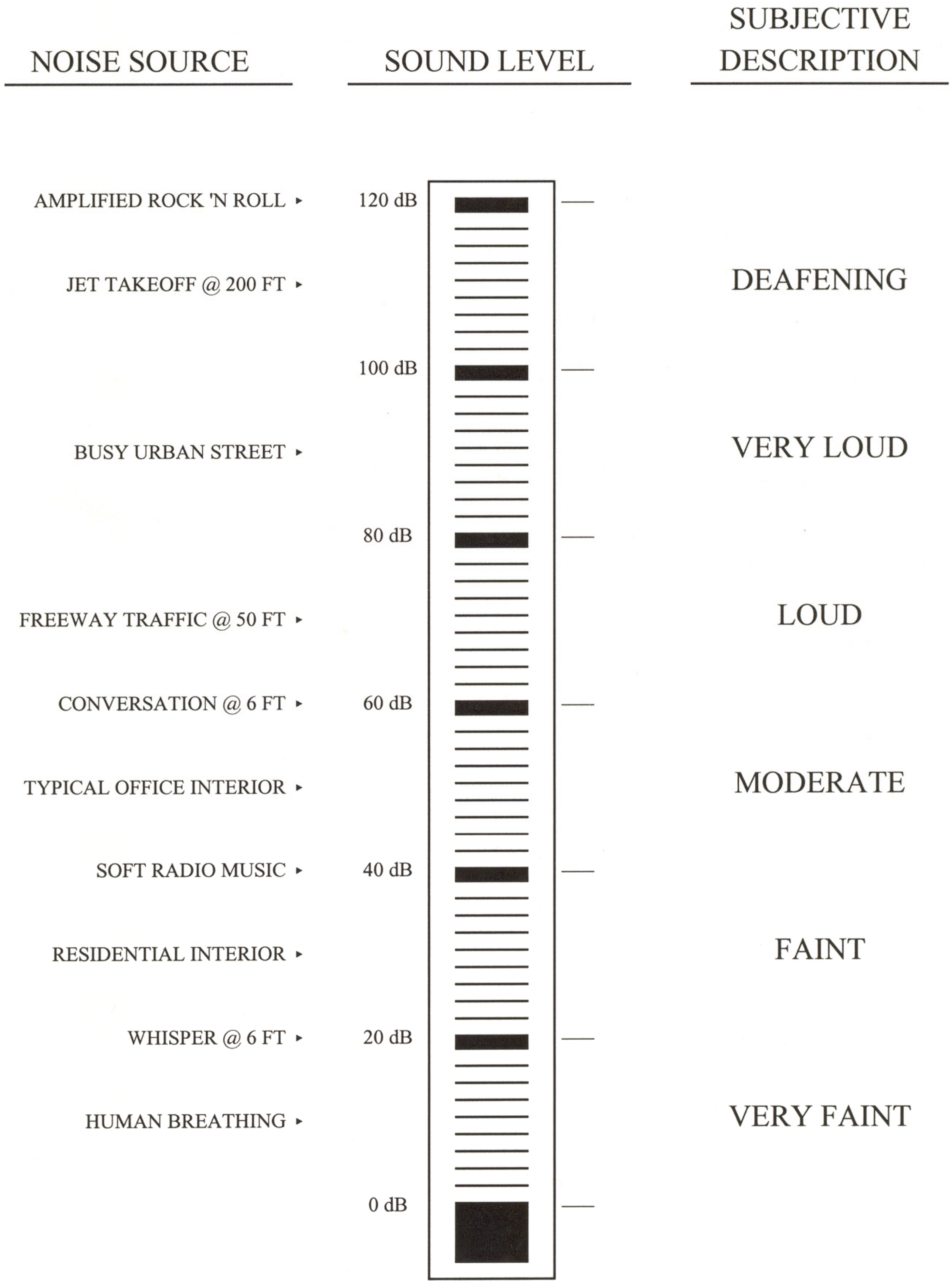
NOISE LEVEL REDUCTION (NLR): The noise reduction between indoor and outdoor environments or between two rooms that is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of "noise level reduction" combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

SEL or SENEL: Sound Exposure Level or Single Event Noise Exposure Level. The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on a reference pressure of 20 micropascals and a reference duration of one second.

SOUND LEVEL: The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

SOUND TRANSMISSION CLASS (STC): The single-number rating of sound transmission loss for a construction element (window, door, etc.) over a frequency range where speech intelligibility largely occurs.

APPENDIX B
EXAMPLES OF SOUND LEVELS



TRANSPORTATION IMPACT ANALYSIS

Proposed Tract 6452

Northeast of the Intersection of Perrin and Baron Avenues

Clovis, California

Prepared For:

Lennar Homes, Inc.
8080 North Palm Avenue, Suite 110
Fresno, California 93711

Date:

February 8, 2024

Job No.:

23-039.01

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION

EXECUTIVE SUMMARY

This report presents the results of a Transportation Impact Analysis for proposed Tract 6452 in Clovis, California. This analysis focuses on the anticipated effect of vehicle traffic resulting from the Project. The Transportation Impact Analysis was performed in general conformance with the City of Clovis *Transportation Impact Analysis Guidelines* dated September 15, 2022 (City Guidelines).

The Project site covers approximately 18.23 acres northeast of the intersection of Perrin and Baron Avenues (APN 556-040-23) in Clovis, California. The Project will include 153 single-family residential lots. Site access is proposed via Marion Avenue at Perrin Avenue and Eclipse Avenue connecting to Baron Avenue. Sunnyside Avenue will be accessible via Heirloom Avenue.

This report includes analysis of the following intersections:

1. Minnewawa Avenue / Behymer Avenue
2. Baron Avenue / Behymer Avenue
3. Baron Avenue / Perrin Avenue
4. Clovis Avenue / Baron Avenue
5. Clovis Avenue / Shepherd Avenue
6. Sunnyside Avenue / Shepherd Avenue

This report includes an estimate of the number or Project trips that will occur at the following freeway interchanges:

1. State Route (SR) 168 interchange at Herndon Avenue
2. SR 168 interchange at Fowler 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 are analyzed for the following conditions:

- Existing Conditions;
- Existing-Plus-Project Conditions;
- Near-Term With-Project Conditions (includes pending and approved projects not yet occupied);
- Cumulative (Year 2045) With-Project Conditions.

Standard traffic engineering principles and methods were employed to establish the existing conditions, to estimate the number of trips expected to be generated by the Project, and to analyze the traffic conditions that are expected to occur in the future. The conclusions of the study are summarized in the following sections.

Trip Generation

The Project is expected to generate approximately 1,444 vehicle trips per day (722 trips entering the site and 722 trips exiting the site). Peak-hour traffic volumes are expected to be on the order of 108 trips during the a.m. peak hour and 144 trips during the p.m. peak hour.

CEQA Impact Analysis (VMT)

Project-specific traffic modeling indicates a calculated Project VMT of 17.9 VMT per capita, which is greater than the threshold of 14.1 VMT per capita. Therefore, the Project would create a significant transportation impact.

The Project will implement feasible mitigation measures such as constructing sidewalk and trails. These Project design features can help offset a portion of the VMT impact of the Project but will not reduce the impact to less than significant. Therefore, the Project will have a significant and unavoidable transportation impact under CEQA.

It is recommended that the proposed Project, consistent with the General Plan, tier its environmental review from the General Plan SEIR, which has disclosed the VMT impacts of land use development consistent with the General Plan. Therefore, the Project's significant transportation impact does not need to be disclosed in a Project-specific EIR.

Existing Conditions

The study intersections are currently operating at acceptable levels of service with calculated 95th-percentile queues contained within the available storage capacity, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: LOS E during the a.m. peak hour and LOS F during the p.m. peak hour with all-way stop control.
- Sunnyside Avenue / Shepherd Avenue: LOS E during the p.m. peak hour with all-way stop control.

Existing-Plus-Project Conditions

The existing-plus-Project-conditions analyses represent conditions that would occur after construction of the Project if none of the pending and approved projects were constructed. This scenario isolates the specific effects of the Project. The study intersections are expected to continue to operate at levels of service similar to the existing conditions. The Project will not cause any intersections currently operating at acceptable LOS to operate worse than the target LOS, and the calculated 95th-percentile queues are within the available storage capacity.

The Project is expected to increase delays at the intersection of Minnewawa and Behymer Avenues, which operates at LOS E during the a.m. peak hour and LOS F during the p.m. peak hour. It should be noted that the Project's contribution to the level of service issue is relatively minimal, as the Project's percentage of the overall traffic volume in the existing-plus-Project conditions is less on the order of one to two percent during the peak hours.

The Project is expected to increase delays at the intersection of Sunnyside and Shepherd Avenues during the p.m. peak hour, causing the LOS to drop from LOS E to LOS F. However, construction of a traffic signal at the intersection is currently underway.

Existing-Plus-Project Improved Conditions

In order for the intersection of Minnewawa and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, dedicated left-turn lanes with protected left-turn phasing would be required on the northbound and southbound approaches. With signalization, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours.

Near-Term With-Project Conditions

The near-term with-Project conditions analyses represent conditions that are expected after construction of the Project and the known pending and approved projects. This scenario isolates the near-term cumulative effects of the Project and other known projects. The study intersections are expected to continue to operate at acceptable levels of service, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: LOS F during the a.m. and p.m. peak hours with all-way stop control.
- Clovis Avenue / Baron Avenue: LOS E during the p.m. peak hour with one-way stop control.

Calculated 95th-percentile queues are contained within the existing storage capacity, with the following exceptions:

- Clovis Avenue / Shepherd Avenue: left-turn lane on the northbound approach, right-turn lanes on the eastbound and northbound approaches.

Near-Term With-Project Improved Conditions

In order for the intersection of Minnewawa and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, dedicated left-turn lanes with protected left-turn phasing would be required on the northbound and southbound approaches. With signalization, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours.

In order for the intersection of Clovis and Baron Avenues to operate at acceptable LOS, the intersection would require signalization. With signalization, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours. It should be noted that signalization of the intersection by the Project alone is not recommended, as the intersection will not require signalization until Clovis Avenue is extended north of Baron Avenue.

In order to better accommodate queues at the intersection of Clovis and Shepherd Avenues, the intersection striping may be modified to open the second left-turn lane on the northbound approach. With the modification, the intersection is expected to operate at LOS C during the a.m. and p.m. peak hours.

Cumulative Year 2045 With-Project Conditions

The year 2045 cumulative with-Project conditions analyses are based on the assumption that the Project has been constructed, the pending and approved projects have been constructed, and that 20 years of growth has occurred in the Clovis, Fresno, and Fresno County region as incorporated into the adopted Fresno County travel model.

The study intersections are expected to continue to operate at acceptable levels of service, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: LOS F during the a.m. and p.m. peak hours with all-way stop control.
- Baron Avenue / Behymer Avenue: LOS F during the a.m. peak hour and LOS E during the p.m. peak hour on the northbound approach with one-way stop control.
- Baron Avenue / Perrin Avenue: LOS F during the p.m. peak hour on the eastbound and westbound approaches with two-way stop control.
- Sunnyside Avenue / Shepherd Avenue: LOS E during the a.m. peak hour and LOS F during the p.m. peak hour with traffic signals.

Calculated 95th-percentile queues are contained within the existing storage capacity, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: excessive queues on the westbound and southbound approaches.
- Clovis Avenue / Shepherd Avenue: left-turn lane on the northbound approach, right-turn lanes on the eastbound, northbound, and southbound approaches.
- Sunnyside Avenue / Shepherd Avenue: excessive queues in the left-turn lanes on the eastbound, northbound, and southbound approaches, the eastbound through lane, and the right-turn lanes on the westbound, northbound, and southbound approaches.

Cumulative Year 2045 With-Project Improved Conditions

In order for the intersection of Minnewawa and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, dedicated left-turn lanes with protected left-turn phasing would be required on all four approaches and a dedicated right-turn lane would be required on the westbound approach. With signalization, the intersection is expected to operate at LOS D during the a.m. and p.m. peak hours.

In order for the intersection of Baron and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, a dedicated left-turn lane with protected left-turn phasing would be required on the westbound approach. With signalization, the intersection is expected to operate at LOS B during the a.m. peak hour and LOS A during the p.m. peak hour.

In order for the intersection of Baron and Perrin Avenues to operate at acceptable LOS, all-way stop control may be installed. With all-way stop control, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours.

In order to better accommodate queues at the intersection of Clovis and Shepherd Avenues, the intersection striping may be modified to open the second left-turn lane on the northbound approach. With the modification, the intersection is expected to operate at LOS C during the a.m. and p.m. peak hours.

In order for the intersection of Sunnyside and Shepherd Avenues to operate at acceptable LOS, the intersection would require modification from the planned signalized lane configurations to the following:

Eastbound: two left-turn lanes, two through lanes, and one right-turn lane

Westbound: one left-turn lane, two through lanes, and one right-turn lane

Northbound: one left-turn lane, one through lane, and one right-turn lane

Southbound: two left-turn lanes, one through lane, and one right-turn lane

With the recommended widening, the intersection is expected to operate at LOS C during the a.m. peak hour and LOS D during the p.m. peak hour.

Mr. Jeff Callaway
Lennar Homes, Inc.
8080 North Palm Avenue, Suite 110
Fresno, California 93711

February 8, 2024

Subject: Transportation Impact Analysis
Proposed Tract 6452
Northeast of the Intersection of Perrin and Baron Avenues
Clovis, California

Dear Mr. Callaway:

1.0 INTRODUCTION

This report presents the results of a Transportation Impact Analysis for proposed Tract 6452 in Clovis, California. This analysis focuses on the anticipated effect of vehicle traffic resulting from the Project. The Transportation Impact Analysis was performed in general conformance with the City of Clovis *Transportation Impact Analysis Guidelines* dated September 15, 2022 (City Guidelines).

2.0 PROJECT DESCRIPTION

The Project site covers approximately 18.23 acres northeast of the intersection of Perrin and Baron Avenues (APN 556-040-23) in Clovis, California. The Project will include 153 single-family residential lots. Site access is proposed via Marion Avenue at Perrin Avenue and Eclipse Avenue connecting to Baron Avenue. Sunnyside Avenue will be accessible via Heirloom Avenue. A site vicinity map is presented in the attached Figure 1, Site Vicinity Map, following the text of this report. A site plan is presented in Figure 2, Site Plan.

3.0 STUDY AREA AND TIME PERIOD

This report includes analysis of the following intersections:

1. Minnewawa Avenue / Behymer Avenue
2. Baron Avenue / Behymer Avenue
3. Baron Avenue / Perrin Avenue
4. Clovis Avenue / Baron Avenue
5. Clovis Avenue / Shepherd Avenue
6. Sunnyside Avenue / Shepherd Avenue

This report includes an estimate of the number or Project trips that will occur at the following freeway interchanges:

1. State Route (SR) 168 interchange at Herndon Avenue
2. SR 168 interchange at Fowler 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 are analyzed for the following conditions:

- Existing Conditions;
- Existing-Plus-Project Conditions;
- Near-Term With-Project Conditions (includes pending and approved projects not yet occupied);
- Cumulative (Year 2045) With-Project Conditions.

4.0 LANE CONFIGURATIONS AND INTERSECTION CONTROL

The existing lane configurations and intersection control at the study intersections are illustrated in Figure 3, Existing Lane Configurations and Intersection Control. The lane configurations and intersection control assumed for the near-term and year 2045 analyses are presented in Figure 4, Year 2045 Lane Configurations and Intersection Control.

5.0 CITY OF CLOVIS GENERAL PLAN

The City of Clovis General Plan designates the streets at the study locations as follows:

Minnewawa Avenue: Arterial south of Behymer Avenue and Collector north of Behymer Avenue

Baron Avenue: Collector

Perrin Avenue: Collector east of Baron Avenue and west of Clovis Avenue. Not designated between

Clovis Avenue: Arterial

Beyhmer Avenue: Arterial west of Clovis Avenue and Collector east of Clovis Avenue

Shepherd Avenue: Arterial west of Clovis Avenue and Expressway east of Clovis Avenue

Sunnyside Avenue: Collector south of Perrin Avenue

6.0 CEQA IMPACT ANALYSIS

6.1 Background and Significance Threshold

The City Guidelines provide guidance relative to analyzing vehicle miles traveled (VMT) for purposes of determining transportation impacts in accordance with the California Environmental Quality Act (CEQA).

The City Guidelines indicate that Projects that generate or attract fewer than 500 vehicle trips per day are presumed to cause a less-than-significant transportation impact. For residential projects, the City Guidelines indicate a significant transportation impact occurs if the Project VMT per capita is greater than a level of 13 percent below the existing average VMT per capita in Fresno County. The regional average is 16.1 VMT per capita, and the impact threshold is 14.1 VMT per capita.

6.2 Project-Specific VMT Analysis

The Project will generate more than 500 trips per day (see the Trip Generation section of this report) and the Project site lies within a red area on Figure B1 of the City Guidelines. Therefore, the Project is not be screened out with respect to transportation impacts and a Project-specific VMT analysis has been performed.

Project-specific traffic modeling was performed by a COG-approved traffic modeling consultant and the results are presented in Appendix A. The modeling indicates a calculated Project VMT of 17.9 VMT per capita, which is greater than the threshold of 14.1 VMT per capita. Therefore, the Project would create a significant transportation impact.

6.3 Feasible Mitigation Measures

Feasible mitigation measures must be identified to avoid or substantially reduce a significant impact under CEQA. Mitigation measures can be incorporated as a part of plans, policies, regulations, or project designs. Mitigation of VMT impacts typically requires changes in habits and behaviors of residents. Project design features that encourage mode shift from automobiles to transit or nonmotorized modes can potentially reduce project-specific VMT.

VMT reduction and benefits from project design features are typically not accounted for in the project-specific VMT calculations conducted using the regional travel demand model. Therefore, VMT reduction credit can be taken for Project design features that encourage the desired mode shift. Descriptions of such project design features and the corresponding potential VMT reduction are presented below. The potential VMT reduction was estimated using the California Air Pollution Control Officers Association's (CAPCOA) "*Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity – Designed for Local Governments, Communities, and Project Developers*" dated December 2021.

The Project proposes to provide pedestrian facilities both internal to the Project site and along the project frontage. Providing such improvements encourages people to walk instead of drive and thereby reduces VMT. CAPCOA transportation measure "T-18: Provide Pedestrian Network Improvement" provides an estimate of the VMT reduction due to project related enhancements in pedestrian access and connectivity. The Project study area includes approximately three miles of existing sidewalk. The Project proposes to add approximately one mile of sidewalk/pedestrian access. Utilizing the CAPCOA VMT reduction calculation, construction of sidewalk may reduce the Project's VMT by approximately 1.7 percent.

The Project proposes to construct less than one mile of Class II Bike Lane on Baron Avenue and on Perrin Avenue. CAPCOA transportation measure "T-19A: Construct or Improve Bike Facility" suggests the Project bicycle design features have a potential to reduce up to 0.04 percent of the project VMT.

Implementation of the Project design features described above reduces the calculated Project VMT by up to approximately 1.7 percent. The Project design features can help offset a portion of the VMT impact of the Project but will not reduce the impact to less than significant. Therefore, the Project will have a significant and unavoidable transportation impact under CEQA.

6.4 Findings

On October 17, 2022 the Clovis City Council certified a supplemental environmental impact report (SEIR) with a statement of overriding considerations applicable to significant transportation impacts based on VMT for projects that conform to the General Plan and that have implemented feasible mitigation measures.

It is recommended that the proposed Project, consistent with the General Plan, tier its environmental review from the General Plan SEIR, which has disclosed the VMT impacts of land use development consistent with the General Plan. Therefore, the Project's significant transportation impact does not need to be disclosed in a project-specific EIR.

7.0 LEVEL OF SERVICE

The Transportation Research Board *Highway Capacity Manual*, 7*th 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 1 and 2.

Table 1
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 2
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 1 and 2: *Highway Capacity Manual, 7th Edition,* Transportation Research Board, 2022

The City of Clovis General Plan requires a minimum LOS D at intersections under the City's jurisdiction. The City Guidelines state the following: *"All City intersections and roadway segments shall operate at a LOS D or better under the near-term conditions, unless a finding of overriding consideration was adopted in the General Plan EIR. Under long-term conditions, all City intersections and roadway segments shall operate at a LOS D or better, except for the roadway segments adopted in the General Plan EIR to operate at LOS E or F. Exceptions to this standard may be allowed on a case by case basis where lower levels of service would result in other public benefits, such as:*

a) Preserving agriculture or open space land
b) Preserving the rural/historic character of a neighborhood
c) Preserving or creating a pedestrian-friendly environment in Old Town or mixed-use village districts
d) Avoiding adverse impacts to pedestrians, cyclists, and transit riders
e) Where right-of-way constraints would make capacity expansion infeasible"

For purposes of this study, a traffic issue may be identified if the addition of the traffic generated by the Project results in any one of the following:

- Triggers an intersection operating at acceptable LOS to operate at unacceptable levels of service;
- Increases the average delay for a study intersection that is already operating at unacceptable LOS.

8.0 EXISTING TRAFFIC VOLUMES

Existing traffic volumes were determined by performing manual turning movement counts between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. on a weekday. The traffic count data sheets are presented in Appendix B. The existing peak-hour turning movement volumes are presented in Figure 5, Existing Peak-Hour Traffic Volumes.

9.0 PROJECT TRIP GENERATION AND DISTRIBUTION

9.1 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 3 presents the vehicle trip generation estimates for the Project.

Table 3
Project Trip Generation Estimate

Land Use	Units	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Single Family Detached Housing (210)	153	9.43	1,444	0.70	26:74	28	80	108	0.94	63:37	91	53	144

Reference: *Trip Generation Manual*, *11th Edition*, Institute of Transportation Engineers 2021
Rates are reported in trips per dwelling unit.

9.2 Student Generation

For purposes of estimating trip distribution for students attending nearby schools, Table 4 presents the student generation estimates for the Project utilizing rates presented in the Clovis Unified School District *School Facilities Needs Analysis* by Odell Planning & Research, Inc. dated April 2023.

Table 4
Student Generation Estimate – Single-Family Homes

Grade Level	Rate	Homes	Students
Elementary School (TK-6)	0.3324 students per home	153	51
Intermediate School (7-8)	0.0766 students per home	153	12
High School (9-12)	0.1421 students per home	153	22
TOTAL:	0.5511 students per home	153	85

9.3 Project Trip Distribution and Assignment

The regional distribution of Project trips was estimated using the results of a select zone analysis utilizing the Fresno County travel model maintained by the Fresno Council of Governments (COG), engineering judgment based on our knowledge of the area, available traffic counts, the location and configuration of site access points, and available travel routes. A COG-approved traffic modeling consultant performed the Project-specific traffic modeling and the results are presented in Appendix A.

The estimated percentage distribution of Project trips is presented in Figure 6, Peak-Hour Project Traffic Distribution Percentages. The peak-hour trips presented in Table 3 were assigned to the adjacent road network in accordance with the trip distribution percentages in Figure 6. The peak-hour Project traffic volumes at the study intersections for existing-plus-

Project conditions are presented in Figure 7, Peak-Hour Project Traffic Volumes (Existing-Plus-Project Scenario). In the near-term and future conditions, when Baron Avenue has been extended to Behymer Avenue, the Project trips are expected to be as presented in Figure 8, Peak-Hour Project Traffic Volumes (Near-Term and Future Scenarios).

Caltrans requested that the volume of Project trips (trip trace) expected at the SR 168 interchanges at Herndon Avenue and Fowler Avenue be presented in the traffic study. The Project trips were assigned to the interchange and ramp locations based on the criteria described above and the results are presented in Tables 5 and 6.

Table 5
Project Trips on State Facilities – SR 168 and Herndon Avenue Interchange

Location	A.M. Peak Hour Trips	P.M. Peak Hour Trips
Westbound off ramp	1	1
Westbound on ramp from eastbound Herndon	0	0
Westbound loop on ramp from westbound Herndon	7	6
Eastbound off ramp	2	8
Eastbound loop on ramp from eastbound Herndon	0	0
Eastbound on ramp from westbound Herndon	1	1
Herndon Avenue westbound through the interchange	4	3
Herndon Avenue eastbound through the interchange	1	4

Table 6
Project Trips on State Facilities – SR 168 and Fowler Avenue Interchange

Location	A.M. Peak Hour Trips	P.M. Peak Hour Trips
Westbound off ramp	1	4
Westbound on ramp	0	0
Eastbound off ramp	0	1
Eastbound on ramp	3	2
Fowler Avenue northbound through the interchange	2	2
Fowler Avenue southbound through the interchange	3	2

10.0 EXISTING-PLUS-PROJECT TRAFFIC VOLUMES

Existing-Plus-Project traffic volumes are presented in Figure 9, Existing-Plus-Project Peak-Hour Traffic Volumes. The values in Figure 9 were determined by adding the values in Figures 5 and 7.

11.0 CUMULATIVE PROJECTS

Projects that were pending or not yet occupied when the traffic counts were performed. The following projects are considered in the near-term analyses:

- Tract 6205: 605 single-family homes northeast of the intersection of Shepherd and Sunnyside Avenues
- Tract 6343: 590 single-family homes northeast of the intersection of Behymer and Baron Avenues
- Tract 6406: 51 single-family homes southwest of the intersection of Perrin and Baron Avenues
- Tract 6375: 387 single-family homes west of the intersection of Clovis and Baron Avenues
- Heritage Grove: 18-acre mixed-use development southeast of the intersection of Willow and Shepherd Avenues. It is acknowledged that a master plan covering a much larger area has been proposed. However, a traffic study has not been prepared and it is unlikely that large portions of the master plan will be developed in the near-term condition.
- Signalization of the intersection of Shepherd and Sunnyside Avenues is currently in progress. The signalization will include widening the intersection to the following lane configuration:

  Eastbound: one left-turn lane, one through lane, and one right-turn lane

  Westbound: one left-turn lane, two through lanes, and one right-turn lane

  Northbound: one left-turn lane, one through lane, and one right-turn lane

  Southbound: one left-turn lane, one through lane, and one right-turn lane

12.0 NEAR-TERM TRAFFIC VOLUMES

Peak-hour near-term with-Project traffic volumes are presented in Figure 10, Near-Term With-Project Peak-Hour Traffic Volumes.

13.0 CUMULATIVE YEAR 2045 TRAFFIC VOLUMES

Cumulative traffic volumes for the year 2045 were estimated based on information available from the COG travel model. The base year and horizon year model output is presented in Appendix A. Future weekday turning movements were estimated based on the methods presented in Chapter 8 of the Transportation Research Board National Cooperative Highway Research Program Report 255 entitled *"Highway Traffic Data for Urbanized Area Project Planning and Design."* Cumulative With-Project traffic volumes are presented in Figure 11, Cumulative (Year 2045) With-Project Peak-Hour Traffic Volumes.

14.0 INTERSECTION ANALYSES

The intersection levels of service were determined using the computer program Synchro 11, which incorporates HCM procedures for calculating levels of service. The intersection analysis sheets are presented in Appendix C.

Tables 7 through 10 present the results of the intersection analyses. For signalized and all-way stop-controlled intersections, the overall intersection LOS and the average delay per vehicle are presented. For one-way and two-way stop-controlled intersections, the HCM does not define an overall intersection LOS; therefore, the average delay and LOS for the approach with the greatest delay is presented. Delays and LOS worse than the target LOS are presented in bold type and are underlined.

Table 7
Intersection LOS Summary – Existing Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Minnewawa / Behymer	All-way stop	**38.0**	**E**	**54.7**	**F**
Baron / Behymer	Does Not Exist				
Baron / Perrin	Does Not Exist				
Clovis / Baron	All-way stop	7.7	A	7.4	A
Clovis / Shepherd	Signals	16.3	B	16.2	B
Sunnyside / Shepherd	All-way stop	20.2	C	**35.2**	**E**

Table 8
Intersection LOS Summary – Existing-Plus-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Minnewawa / Behymer	All-way stop	**43.6**	**E**	**59.8**	**F**
Baron / Behymer	Does Not Exist				
Baron / Perrin	One-Way Stop	7.2	A	7.1	A
Clovis / Baron	All-way stop	8.0	A	7.4	A
Clovis / Shepherd	Signals	16.6	B	16.6	B
Sunnyside / Shepherd	All-way stop	23.4	C	**53.7**	**F**

Table 9
Intersection LOS Summary – Near-Term With-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Minnewawa / Behymer	All-way stop	**106.9**	**F**	**127.5**	**F**
Baron / Behymer	One-way stop	16.6	C	15.5	C
Baron / Perrin	Two-way stop	13.3	B	18.1	C
Clovis / Baron	All-way stop	17.8	C	**37.9**	**E**
Clovis / Shepherd	Signals	24.2	C	26.2	C
Sunnyside / Shepherd	Signals	20.3	C	43.2	D

Table 10
Intersection LOS Summary – Year 2045 Cumulative With-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Minnewawa / Behymer	All-way stop	**>300**	**F**	**295.2**	**F**
Baron / Behymer	One-way stop	**125.9**	**F**	**36.0**	**E**
Baron / Perrin	Two-way stop	28.6	D	**63.3**	**F**
Clovis / Baron	All-way stop	**84.1**	**F**	**272.1**	**F**
Clovis / Shepherd	Signals	34.5	C	36.0	D
Sunnyside / Shepherd	Signals	**78.8**	**E**	**98.0**	**F**

The results of the intersection operational analyses include an estimate of the 95th-percentile queue lengths. The existing storage capacity (where applicable) and the calculated 95th-percentile queue lengths are presented in Tables 11 through 14. The storage capacities reported in Tables 11 through 14 are based on measurements from available aerial photographs. Calculated 95th-percentile queue lengths that exceed the storage capacity by more than 25 (approximate space required for one vehicle) or that are considered to be excessive are indicated in bold type and are underlined.

Notes and abbreviations for Tables 11 through 14:

* Storage length exceeds 1,000 feet

+ Additional storage available – connects to a through lane or two-way left-turn lane

S: Shared movement

DNS: Does not stop

TBD: To be determined per City standards or year 2045 queues

Table 11
Intersection Queuing Summary – Existing Conditions

Intersection		Number of Lanes, Storage (feet), and Queue Length (feet)											
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minnewawa/ Behymer	Lanes	S	1	S	S	1	S	S	1	S	S	1	S
	Storage		*			*			*			*	
	A.M.		73			278			158			188	
	P.M.		123			290			193			308	
Baron/ Behymer	Lanes												
	Storage												
	A.M.												
	P.M.												
Baron/ Perrin	Lanes												
	Storage												
	A.M.												
	P.M.												
Clovis/ Baron	Lanes				1		1	1		1			
	Storage				600		105	*		*			
	A.M.				0		0	10		0			
	P.M.				0		0	3		0			
Clovis/ Shepherd	Lanes	2	2	1	2	2	1	1	2	1	2	2	1
	Storage	250	*	50	250	*	255	235	*	65	255	*	100
	A.M.	29	118	53	47	182	0	132	20	6	16	24	0
	P.M.	26	133	40	34	130	0	134	23	16	10	16	0
Sunnyside/ Shepherd	Lanes	S	1	S	S	1	S	S	1	S	S	1	S
	Storage		*			*			*			*	
	A.M.		125			198			28			5	
	P.M.		273			293			33			8	

Table 12
Intersection Queuing Summary – Existing-Plus-Project Conditions

Intersection		Number of Lanes, Storage (feet), and Queue Length (feet)											
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minnewawa/ Behymer	Lanes	S	1	S	S	1	S	S	1	S	S	1	S
	Storage		*			*			*			*	
	A.M.		78			305			183			205	
	P.M.		128			288			205			345	
Baron/ Behymer	Lanes												
	Storage												
	A.M.												
	P.M.												
Baron/ Perrin	Lanes				1		1		1	S	1	1	
	Storage				250		*		*		250	*	
	A.M.				5		0		3		0	0	
	P.M.				3		0		5		0	0	
Clovis/ Baron	Lanes				1		1	1		1			
	Storage				600		105	*		*			
	A.M.				5		0	10		3			
	P.M.				5		0	3		5			
Clovis/ Shepherd	Lanes	2	2	1	2	2	1	1	2	1	2	2	1
	Storage	250	*	50	250	*	255	235	*	65	255	*	100
	A.M.	33	121	54	51	187	0	133	22	7	20	29	0
	P.M.	37	137	40	36	137	0	136	26	20	12	19	0
Sunnyside/ Shepherd	Lanes	S	1	S	S	1	S	S	1	S	S	1	S
	Storage		*			*			*			*	
	A.M.		150			225			30			13	
	P.M.		358			405			38			13	

Table 13
Intersection Queuing Summary – Near-Term With-Project Conditions

Intersection		Number of Lanes, Storage (feet), and Queue Length (feet)											
		EBL	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Minnewawa/ Behymer	Lanes	S	1	S	S	1	S	S	1	S	S	1	S
	Storage		*			*			*			*	
	A.M.		100			653			275			278	
	P.M.		180			428			313			560	
Baron/ Behymer	Lanes		1	S	S	1		1		S			
	Storage		*			*		*					
	A.M.		DNS			0		13					
	P.M.		DNS			0		10					
Baron/ Perrin	Lanes	1	1	S	1	1	S	1	1	S	1	1	S
	Storage	TBD	*		TBD	*		TBD	*		TBD	*	
	A.M.	3	13		5	3		3	DNS		0	DNS	
	P.M.	3	8		5	0		8	DNS		0	DNS	
Clovis/ Baron	Lanes				1		1	1	2	S	1	2	
	Storage				600		105	TBD	*		TBD	*	
	A.M.				165		0	15	53		0	23	
	P.M.				153		0	5	368		0	23	
Clovis/ Shepherd	Lanes	2	2	1	2	2	1	1	2	1	2	2	1
	Storage	250	*	50	250	*	255	235	*	65	255	*	100
	A.M.	80	278	**82**	124	392	4	219	77	35	104	181	63
	P.M.	126	368	73	94	386	44	**261**	176	**96**	86	140	55
Sunnyside/ Shepherd	Lanes	1	1	1	1	2	1	1	1	1	1	1	1
	Storage	275	*	275+	150	*	25	105	*	105	175	*	100
	A.M.	83	424	38	90	231	0	**176**	37	0	51	68	28
	P.M.	205	899	46	136	400	0	**301**	69	17	65	99	47

Table 14
Intersection Queuing Summary – Year 2045 Cumulative With-Project Conditions

Intersection		Number of Lanes, Storage (feet), and Queue Length (feet)											
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minnewawa/ Behymer	Lanes	S	1	S	S	1	S	S	1	S	S	1	S
	Storage		*			*			*			*	
	A.M.		133			**>1,000**			283			**958**	
	P.M.		496			445			800			491	
Baron/ Behymer	Lanes		1	S	S	1		1		S			
	Storage		*			*		*					
	A.M.		DNS			3		300					
	P.M.		DNS			3		90					
Baron/ Perrin	Lanes	1	1	S	1	1	S	1	1	S	1	1	S
	Storage	TBD	*		TBD	*		TBD	*		TBD	*	
	A.M.	5	13		30	25		3	DNS		13	DNS	
	P.M.	8	8		35	15		8	DNS		23	DNS	
Clovis/ Baron	Lanes				1		1	1	2	S	1	2	
	Storage				600		105	TBD	*		TBD	*	
	A.M.				383		8	23	233		8	478	
	P.M.				240		3	8	**>1,000**		15	165	
Clovis/ Shepherd	Lanes	2	2	1	2	2	1	1	2	1	2	2	1
	Storage	250	*	50	250	*	255	235	*	65	255	*	100
	A.M.	84	370	**110**	184	394	49	**268**	97	51	123	323	**201**
	P.M.	135	448	**82**	167	437	52	**287**	350	**289**	117	167	35
Sunnyside/ Shepherd	Lanes	1	1	1	1	2	1	1	1	1	1	1	1
	Storage	275	*	275+	150	*	25	105	*	105	175	*	100
	A.M.	**318**	**1,015**	85	159	380	18	**283**	128	0	**522**	568	**508**
	P.M.	**629**	**1,211**	66	155	593	**295**	**382**	476	**133**	**315**	229	**158**

15.0 DISCUSSION

15.1 Existing Conditions

The results of the analyses indicate that the study intersections are currently operating at acceptable levels of service with calculated 95th-percentile queues contained within the available storage capacity, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: LOS E during the a.m. peak hour and LOS F during the p.m. peak hour with all-way stop control.
- Sunnyside Avenue / Shepherd Avenue: LOS E during the p.m. peak hour with all-way stop control.

15.2 Existing-Plus-Project Conditions

The existing-plus-Project-conditions analyses represent conditions that would occur after construction of the Project if none of the pending and approved projects were constructed. This scenario isolates the specific effects of the Project.

The results of the analyses indicate that the study intersections are expected to continue to operate at levels of service similar to the existing conditions. The Project will not cause any intersections currently operating at acceptable LOS to operate worse than the target LOS, and the calculated 95th-percentile queues are within the available storage capacity.

The Project is expected to increase delays at the intersection of Minnewawa and Behymer Avenues, which operates at LOS E during the a.m. peak hour and LOS F during the p.m. peak hour.

The Project is expected to increase delays at the intersection of Sunnyside and Shepherd Avenues during the p.m. peak hour, causing the LOS to drop from LOS E to LOS F. However, construction of a traffic signal at the intersection is currently underway.

15.2.1 Existing-Plus-Project Improved Conditions

In order for the intersection of Minnewawa and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, dedicated left-turn lanes with protected left-turn phasing would be required on the northbound and southbound approaches. With signalization, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours. The improved conditions are presented in Tables 15 and 16. The intersection analysis sheets for the improved conditions are presented in Appendix D.

It should be noted that the Project's contribution to the level of service issue is relatively minimal, as the Project is expected to generate 17 trips during the a.m. peak hour and 24 trips during the p.m. peak hour. These values represent approximately 1.2 percent of the a.m. peak hour existing-plus-Project volumes and 1.9 percent of the p.m. peak hour existing-plus-Project volumes.

Table 15
Intersection LOS Summary – Improved Existing-Plus-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Minnewawa / Behymer	Signals	15.4	B	15.8	B

Table 16
Intersection Queuing Summary – Improved Existing-Plus-Project Conditions

Intersection		Number of Lanes, Storage (feet), and Queue Length (feet)											
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minnewawa/ Behymer	Lanes	S	1	S	S	1	S	1	1	S	1	1	S
	Storage		*			*		TBD	*		TBD	*	
	A.M.		99			239		81	124		104	117	
	P.M.		129			198		60	131		138	110	

TBD: To be determined based on Year 2045 analyses. S: Shared movement
*: Storage length exceeds 1,000 feet

15.3 Near-Term With-Project Conditions

The near-term with-Project conditions analyses represent conditions that are expected after construction of the Project and the known pending and approved projects. This scenario isolates the near-term cumulative effects of the Project and other known projects.

The results of the analyses indicate that the study intersections are expected to continue to operate at acceptable levels of service, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: LOS F during the a.m. and p.m. peak hours with all-way stop control.
- Clovis Avenue / Baron Avenue: LOS E during the p.m. peak hour with one-way stop control.

Calculated 95th-percentile queues are contained within the existing storage capacity, with the following exceptions:

- Clovis Avenue / Shepherd Avenue: left-turn lane on the northbound approach, right-turn lanes on the eastbound and northbound approaches.

15.3.1 Near-Term With-Project Improved Conditions

In order for the intersection of Minnewawa and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, dedicated left-turn lanes with protected left-turn phasing would be required on the northbound and southbound approaches. With signalization, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours. The improved conditions are presented in Tables 17 and 18. The intersection analysis sheets for the improved conditions are presented in Appendix D.

In order for the intersection of Clovis and Baron Avenues to operate at acceptable LOS, the intersection would require signalization. With signalization, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours. The improved conditions are presented in Tables 17 and 18. The intersection analysis sheets for the improved conditions are presented in Appendix D. It should be noted that signalization of the intersection by the Project alone is not recommended, as the intersection will not require signalization until Clovis Avenue is extended north of Baron Avenue.

In order to better accommodate queues at the intersection of Clovis and Shepherd Avenues, the intersection striping may be modified to open the second left-turn lane on the northbound approach. With the modification, the intersection is expected to operate at LOS C during the a.m. and p.m. peak hours. The improved conditions are presented in Tables 17 and 18. The intersection analysis sheets for the improved conditions are presented in Appendix D.

Table 17
Intersection LOS Summary – Improved Near-Term With-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Minnewawa / Behymer	Signals	19.8	B	19.4	B
Clovis / Baron	Signals	10.2	B	10.8	B
Clovis / Shepherd	Signals	21.4	C	22.9	C

Table 18
Intersection Queuing Summary – Improved Near-Term With-Project Conditions

Intersection		Number of Lanes, Storage (feet), and Queue Length (feet)											
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minnewawa/ Behymer	Lanes	S	1	S	S	1	S	1	1	S	1	1	S
	Storage		*			*		TBD	*		TBD	*	
	A.M.		106			336		105	143		136	131	
	P.M.		151			267		64	155		168	137	
Clovis / Baron	Lanes				1		1	1	2	S	1	2	
	Storage				600		105	TBD	*		TBD	*	
	A.M.				161		4	62	43		7	60	
	P.M.				166		3	33	83		4	51	
Clovis/ Shepherd	Lanes	2	2	1	2	2	1	2	2	1	2	2	1
	Storage	250	*	50	250	*	255	235	*	65	255	*	100
	A.M.	70	233	83	107	324	14	100	77	30	90	154	55
	P.M.	124	331	65	93	356	41	133	195	120	84	135	53

TBD: To be determined based on Year 2045 analyses. S: Shared movement
*: Storage length exceeds 1,000 feet

15.4 Cumulative Year 2045 With-Project Conditions

The year 2045 cumulative with-Project conditions analyses are based on the assumption that the Project has been constructed, the pending and approved projects have been constructed, and that 20 years of growth has occurred in the Clovis, Fresno, and Fresno County region as incorporated into the adopted Fresno County travel model.

The results of the analyses indicate that the study intersections are expected to continue to operate at acceptable levels of service, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: LOS F during the a.m. and p.m. peak hours with all-way stop control.
- Baron Avenue / Behymer Avenue: LOS F during the a.m. peak hour and LOS E during the p.m. peak hour on the northbound approach with one-way stop control.
- Baron Avenue / Perrin Avenue: LOS F during the p.m. peak hour on the eastbound and westbound approaches with two-way stop control.
- Sunnyside Avenue / Shepherd Avenue: LOS E during the a.m. peak hour and LOS F during the p.m. peak hour with traffic signals.

Calculated 95th-percentile queues are contained within the existing storage capacity, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: excessive queues on the westbound and southbound approaches.
- Clovis Avenue / Shepherd Avenue: left-turn lane on the northbound approach, right-turn lanes on the eastbound, northbound, and southbound approaches.
- Sunnyside Avenue / Shepherd Avenue: excessive queues in the left-turn lanes on the eastbound, northbound, and southbound approaches, the eastbound through lane, and the right-turn lanes on the westbound, northbound, and southbound approaches.

15.4.1 Cumulative Year 2045 With-Project Improved Conditions

In order for the intersection of Minnewawa and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, dedicated left-turn lanes with protected left-turn phasing would be required on all four approaches and a dedicated right-turn lane would be required on the westbound approach. With signalization, the intersection is expected to operate at LOS D during the a.m. and p.m. peak hours. The improved conditions are presented in Tables 19 and 20. The intersection analysis sheets for the improved conditions are presented in Appendix D.

In order for the intersection of Baron and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, a dedicated left-turn lane with protected left-turn phasing would be required on the westbound approach. With signalization, the intersection is expected to operate at LOS B during the a.m. peak hour and LOS A during the p.m. peak hour. The improved conditions are presented in Tables 19 and 20. The intersection analysis sheets for the improved conditions are presented in Appendix D.

In order for the intersection of Baron and Perrin Avenues to operate at acceptable LOS, all-way stop control may be installed. With all-way stop control, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours. The improved conditions are presented in Tables 19 and 20. The intersection analysis sheets for the improved conditions are presented in Appendix D.

In order to better accommodate queues at the intersection of Clovis and Shepherd Avenues, the intersection striping may be modified to open the second left-turn lane on the northbound approach. With the modification, the intersection is expected to operate at LOS C during the a.m. and p.m. peak hours. The improved conditions are presented in Tables 19 and 20. The intersection analysis sheets for the improved conditions are presented in Appendix D.

In order for the intersection of Sunnyside and Shepherd Avenues to operate at acceptable LOS, the intersection would require modification from the planned signalized lane configurations described in Section 11.0 of this report to the following:

Eastbound: two left-turn lanes, two through lanes, and one right-turn lane

Westbound: one left-turn lane, two through lanes, and one right-turn lane

Northbound: one left-turn lane, one through lane, and one right-turn lane

Southbound: two left-turn lanes, one through lane, and one right-turn lane

With the recommended widening, the intersection is expected to operate at LOS C during the a.m. peak hour and LOS D during the p.m. peak hour. The improved conditions are presented in Tables 19 and 20. The intersection analysis sheets for the improved conditions are presented in Appendix D.

Table 19
Intersection LOS Summary – Improved Year 2045 With-Project Conditions

Intersection	Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
Minnewawa / Behymer	Signals	37.7	D	38.0	D
Baron / Behymer	Signals	11.1	B	9.0	A
Baron / Perrin	All-way stop	11.4	B	13.7	B
Clovis / Baron	Signals	10.9	B	19.1	B
Clovis / Shepherd	Signals	28.2	C	33.6	C
Sunnyside / Shepherd	Signals	34.0	C	43.5	D

Table 20
Intersection Queuing Summary – Improved Year 2045 With-Project Conditions

Intersection		Number of Lanes, Storage (feet), and Queue Length (feet)											
		EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minnewawa/ Behymer	Lanes	1	1	S	1	1	1	1	1	S	1	1	S
	Storage	TBD	*		TBD	*	TBD	TBD	*		TBD	*	
	A.M.	10	213		75	512	138	187	233		189	566	
	P.M.	28	499		38	180	55	181	487		267	222	
Baron/ Behymer	Lanes		1	S	1	1		1		S			
	Storage		*		TBD	*		*					
	A.M.		282		27	228		143					
	P.M.		396		27	111		96					
Baron/ Perrin	Lanes	1	1	S	1	1	S	1	1	S	1	1	S
	Storage	TBD	*		TBD	*		TBD	*		TBD	*	
	A.M.	3	18		10	43		5	18		40	13	
	P.M.	0	13		5	20		23	93		73	23	
Clovis/ Baron	Lanes				1		1	1	2	S	1	2	
	Storage				600		105	TBD	*		TBD	*	
	A.M.				244		18	85	137		34	226	
	P.M.				300		12	45	522		78	132	
Clovis/ Shepherd	Lanes	2	2	1	2	2	1	2	2	1	2	2	1
	Storage	250	*	50	250	*	255	235	*	65	255	*	100
	A.M.	81	356	132	180	375	47	125	104	54	123	311	198
	P.M.	135	448	82	167	437	52	137	350	289	117	151	58
Sunnyside/ Shepherd	Lanes	1	1	1	1	2	1	1	1	1	1	1	1
	Storage	TBD	*	TBD	TBD	*	TBD	TBD	*	TBD	TBD	*	TBD
	A.M.	123	354	54	105	344	13	189	79	0	146	330	336
	P.M.	230	348	43	95	454	157	275	260	60	94	157	250

TBD: To be designed based on City standards and 95th-percentile queues. S: Shared movement
*: Storage length exceeds 1,000 feet

16.0 CONCLUSIONS AND RECOMMENDATIONS

Standard traffic engineering principles and methods were employed to establish the existing conditions, to estimate the number of trips expected to be generated by the Project, and to analyze the traffic conditions that are expected to occur in the future. The conclusions of the study are summarized in the following sections.

Trip Generation

The Project is expected to generate approximately 1,444 vehicle trips per day (722 trips entering the site and 722 trips exiting the site). Peak-hour traffic volumes are expected to be on the order of 108 trips during the a.m. peak hour and 144 trips during the p.m. peak hour.

CEQA Impact Analysis (VMT)

Project-specific traffic modeling indicates a calculated Project VMT of 17.9 VMT per capita, which is greater than the threshold of 14.1 VMT per capita. Therefore, the Project would create a significant transportation impact.

The Project will implement feasible mitigation measures such as constructing sidewalk and trails. These Project design features can help offset a portion of the VMT impact of the Project but will not reduce the impact to less than significant. Therefore, the Project will have a significant and unavoidable transportation impact under CEQA.

It is recommended that the proposed Project, consistent with the General Plan, tier its environmental review from the General Plan SEIR, which has disclosed the VMT impacts of land use development consistent with the General Plan. Therefore, the Project's significant transportation impact does not need to be disclosed in a Project-specific EIR.

Existing Conditions

The study intersections are currently operating at acceptable levels of service with calculated 95^{th}-percentile queues contained within the available storage capacity, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: LOS E during the a.m. peak hour and LOS F during the p.m. peak hour with all-way stop control.
- Sunnyside Avenue / Shepherd Avenue: LOS E during the p.m. peak hour with all-way stop control.

Existing-Plus-Project Conditions

The existing-plus-Project-conditions analyses represent conditions that would occur after construction of the Project if none of the pending and approved projects were constructed. This scenario isolates the specific effects of the Project. The study intersections are expected to continue to operate at levels of service similar to the existing conditions. The Project will not cause any intersections currently operating at acceptable LOS to operate worse than the target LOS, and the calculated 95^{th}-percentile queues are within the available storage capacity.

The Project is expected to increase delays at the intersection of Minnewawa and Behymer Avenues, which operates at LOS E during the a.m. peak hour and LOS F during the p.m. peak hour.

The Project is expected to increase delays at the intersection of Sunnyside and Shepherd Avenues during the p.m. peak hour, causing the LOS to drop from LOS E to LOS F. However, construction of a traffic signal at the intersection is currently underway.

Existing-Plus-Project Improved Conditions

In order for the intersection of Minnewawa and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, dedicated left-turn lanes with protected left-turn phasing would be required on the northbound and southbound approaches. With signalization, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours. It should be noted that the Project's contribution to the level of service issue is relatively minimal, as the Project's percentage of the overall traffic volume in the existing-plus-Project conditions is less on the order of one to two percent during the peak hours.

Near-Term With-Project Conditions

The near-term with-Project conditions analyses represent conditions that are expected after construction of the Project and the known pending and approved projects. This scenario isolates the near-term cumulative effects of the Project and other known projects. The study intersections are expected to continue to operate at acceptable levels of service, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: LOS F during the a.m. and p.m. peak hours with all-way stop control.
- Clovis Avenue / Baron Avenue: LOS E during the p.m. peak hour with one-way stop control.

Calculated 95th-percentile queues are contained within the existing storage capacity, with the following exceptions:

- Clovis Avenue / Shepherd Avenue: left-turn lane on the northbound approach, right-turn lanes on the eastbound and northbound approaches.

Near-Term With-Project Improved Conditions

In order for the intersection of Minnewawa and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, dedicated left-turn lanes with protected left-turn phasing would be required on the northbound and southbound approaches. With signalization, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours.

In order for the intersection of Clovis and Baron Avenues to operate at acceptable LOS, the intersection would require signalization. With signalization, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours. It should be noted that signalization of the intersection by the Project alone is not recommended, as the intersection will not require signalization until Clovis Avenue is extended north of Baron Avenue.

In order to better accommodate queues at the intersection of Clovis and Shepherd Avenues, the intersection striping may be modified to open the second left-turn lane on the northbound approach. With the modification, the intersection is expected to operate at LOS C during the a.m. and p.m. peak hours.

Cumulative Year 2045 With-Project Conditions

The year 2045 cumulative with-Project conditions analyses are based on the assumption that the Project has been constructed, the pending and approved projects have been constructed, and that 20 years of growth has occurred in the Clovis, Fresno, and Fresno County region as incorporated into the adopted Fresno County travel model. The study intersections are expected to continue to operate at acceptable levels of service, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: LOS F during the a.m. and p.m. peak hours with all-way stop control.
- Baron Avenue / Behymer Avenue: LOS F during the a.m. peak hour and LOS E during the p.m. peak hour on the northbound approach with one-way stop control.
- Baron Avenue / Perrin Avenue: LOS F during the p.m. peak hour on the eastbound and westbound approaches with two-way stop control.
- Sunnyside Avenue / Shepherd Avenue: LOS E during the a.m. peak hour and LOS F during the p.m. peak hour with traffic signals.

Calculated 95th-percentile queues are contained within the existing storage capacity, with the following exceptions:

- Minnewawa Avenue / Behymer Avenue: excessive queues on the westbound and southbound approaches.
- Clovis Avenue / Shepherd Avenue: left-turn lane on the northbound approach, right-turn lanes on the eastbound, northbound, and southbound approaches.
- Sunnyside Avenue / Shepherd Avenue: excessive queues in the left-turn lanes on the eastbound, northbound, and southbound approaches, the eastbound through lane, and the right-turn lanes on the westbound, northbound, and southbound approaches.

Cumulative Year 2045 With-Project Improved Conditions

In order for the intersection of Minnewawa and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, dedicated left-turn lanes with protected left-turn phasing would be required on all four approaches and a dedicated right-turn lane would be required on the westbound approach. With signalization, the intersection is expected to operate at LOS D during the a.m. and p.m. peak hours.

In order for the intersection of Baron and Behymer Avenues to operate at acceptable LOS, the intersection may be signalized. At a minimum, a dedicated left-turn lane with protected left-turn phasing would be required on the westbound approach. With signalization, the intersection is expected to operate at LOS B during the a.m. peak hour and LOS A during the p.m. peak hour.

In order for the intersection of Baron and Perrin Avenues to operate at acceptable LOS, all-way stop control may be installed. With all-way stop control, the intersection is expected to operate at LOS B during the a.m. and p.m. peak hours.

In order to better accommodate queues at the intersection of Clovis and Shepherd Avenues, the intersection striping may be modified to open the second left-turn lane on the northbound approach. With the modification, the intersection is expected to operate at LOS C during the a.m. and p.m. peak hours.

In order for the intersection of Sunnyside and Shepherd Avenues to operate at acceptable LOS, the intersection would require modification from the planned signalized lane configurations to the following:

Eastbound: two left-turn lanes, two through lanes, and one right-turn lane

Westbound: one left-turn lane, two through lanes, and one right-turn lane

Northbound: one left-turn lane, one through lane, and one right-turn lane

Southbound: two left-turn lanes, one through lane, and one right-turn lane

With the recommended widening, the intersection is expected to operate at LOS C during the a.m. peak hour and LOS D during the p.m. peak hour.

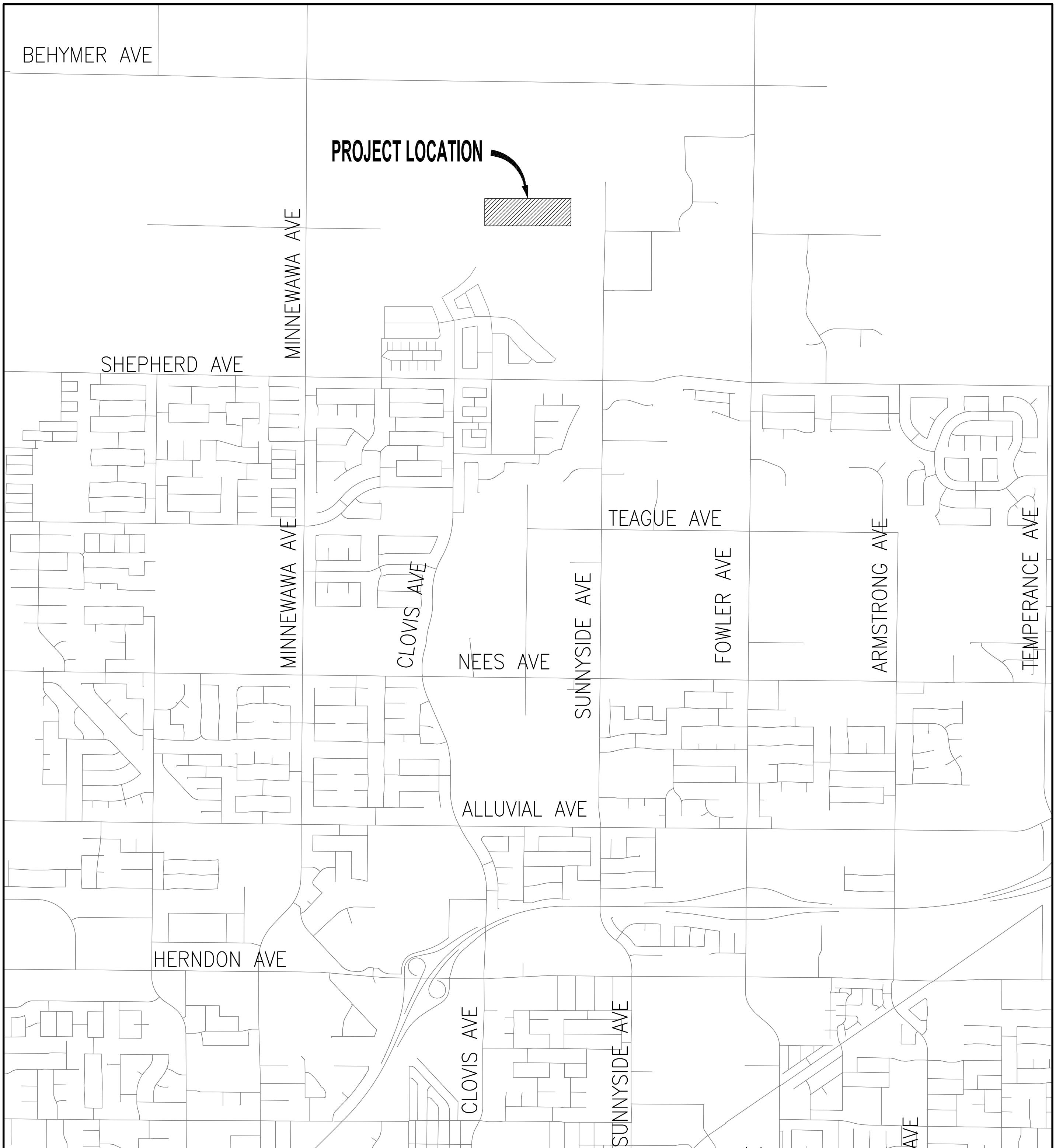
Thank you for the opportunity to perform this Transportation Impact Analysis. Please feel free to contact me if you have any questions.

PETERS ENGINEERING GROUP

John Rowland, PE, TE

Attachments: Figures 1 through 11
Appendix A - Traffic Modeling
Appendix B - Traffic Count Data Sheets
Appendix C - Intersection Analyses
Appendix D - Improved Intersection Analyses

FIGURES



Proposed Tract 6452
Clovis, California

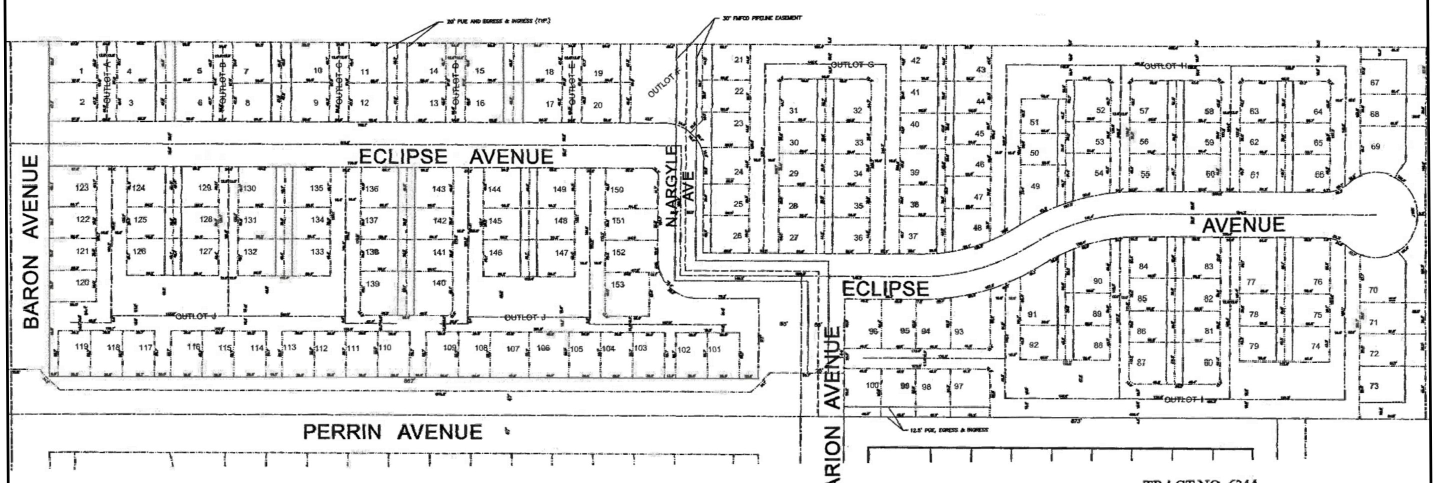
LEGEND

PROJECT SITE

VICINITY MAP

PETERS ENGINEERING GROUP

Figure 1



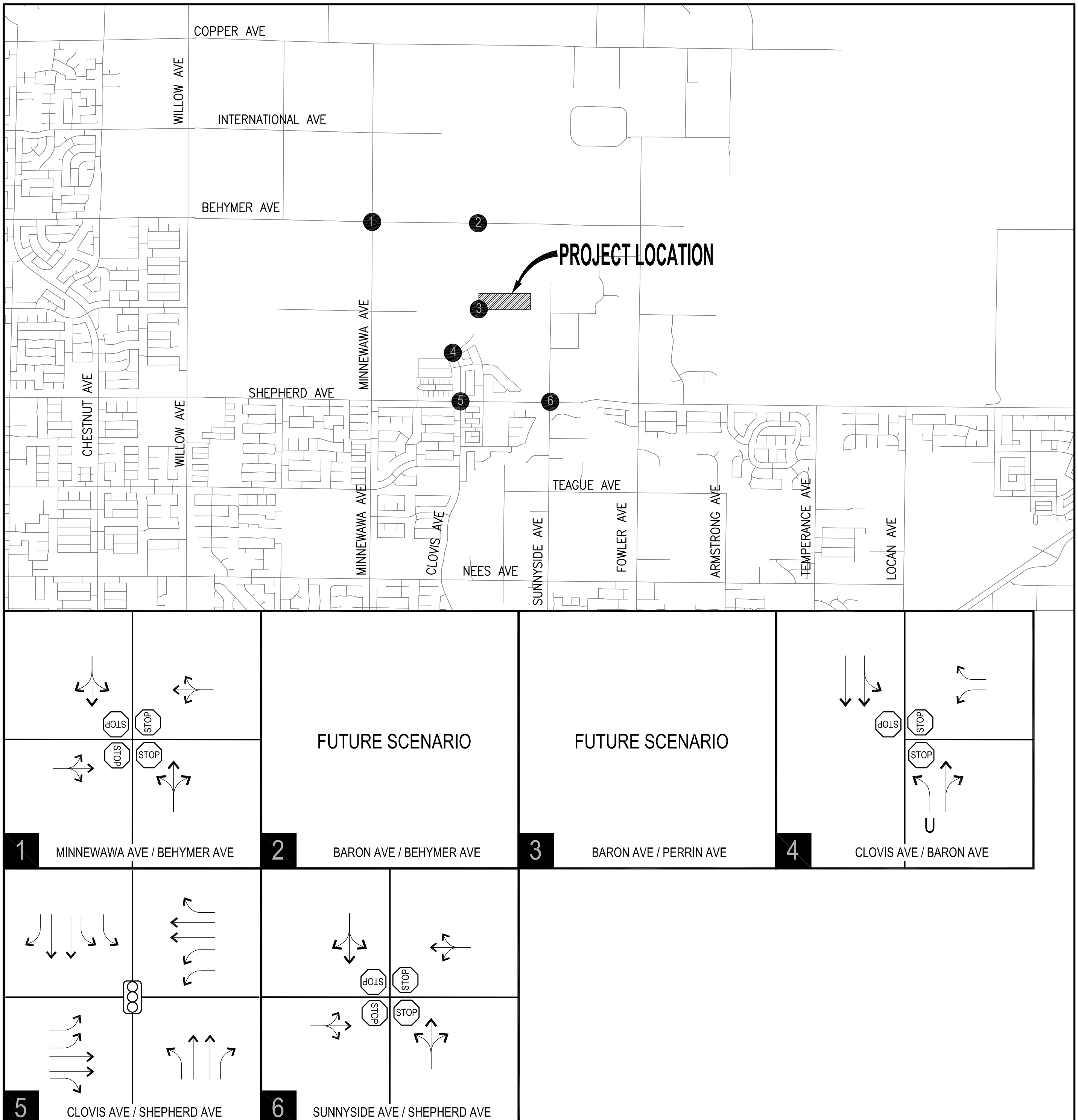
Proposed Tract 6452
Clovis, California

SITE PLAN

Not to Scale

PETERS ENGINEERING GROUP

Figure 2



LEGEND

- XX STUDY AREA INTERSECTIONS
- PROJECT SITE
- SIGNALIZED INTERSECTION
- STOP SIGN
- DIRECTION OF TRAVEL
- U U-TURN

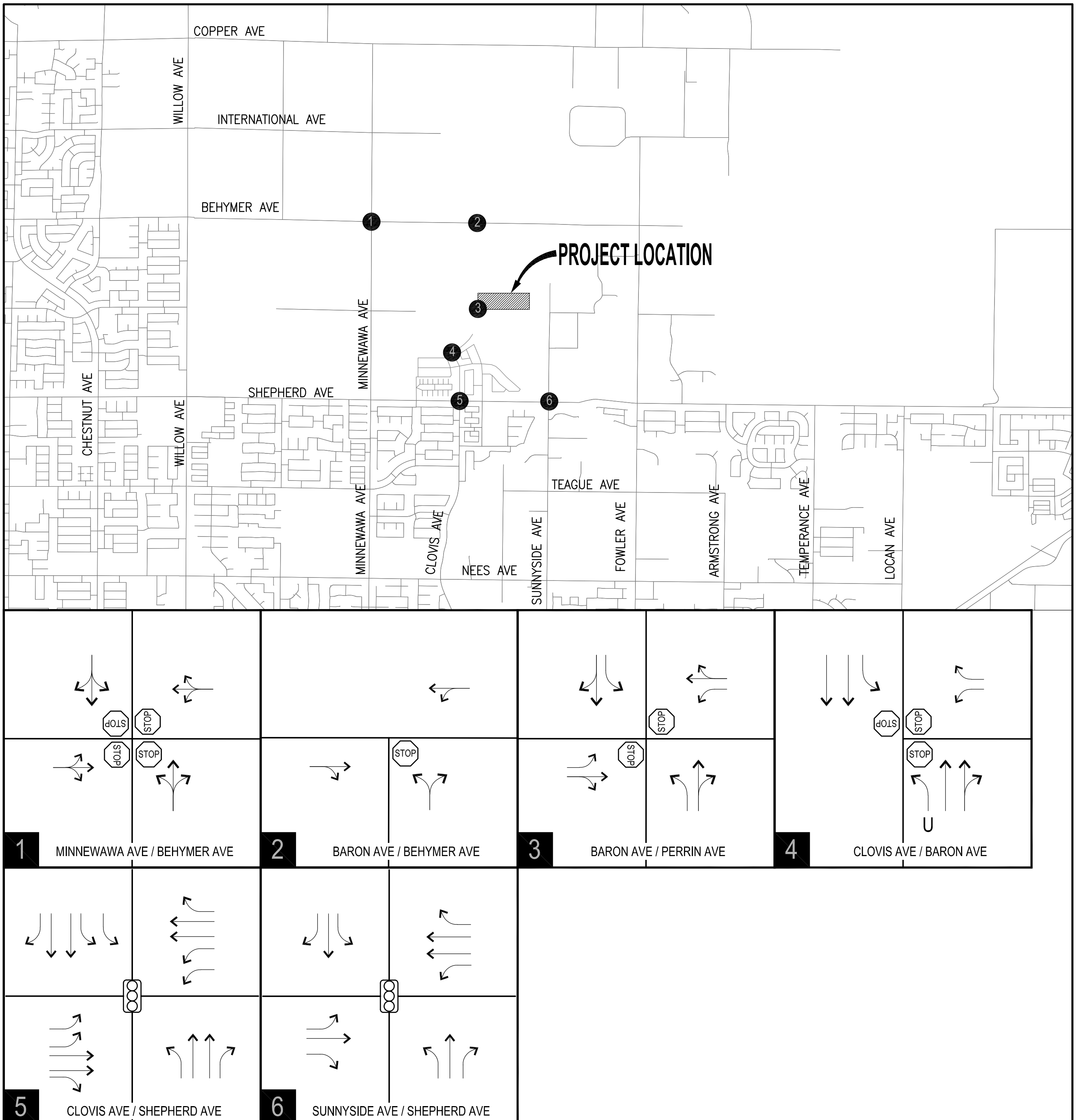
Proposed Tract 6452
Clovis, California

EXISTING LANE CONFIGURATIONS AND INTERSECTION CONTROL

Not to Scale

PETERS ENGINEERING GROUP

Figure 3



LEGEND

- XX STUDY AREA INTERSECTIONS
- PROJECT SITE
- SIGNALIZED INTERSECTION
- STOP STOP SIGN
- DIRECTION OF TRAVEL
- U U-TURN

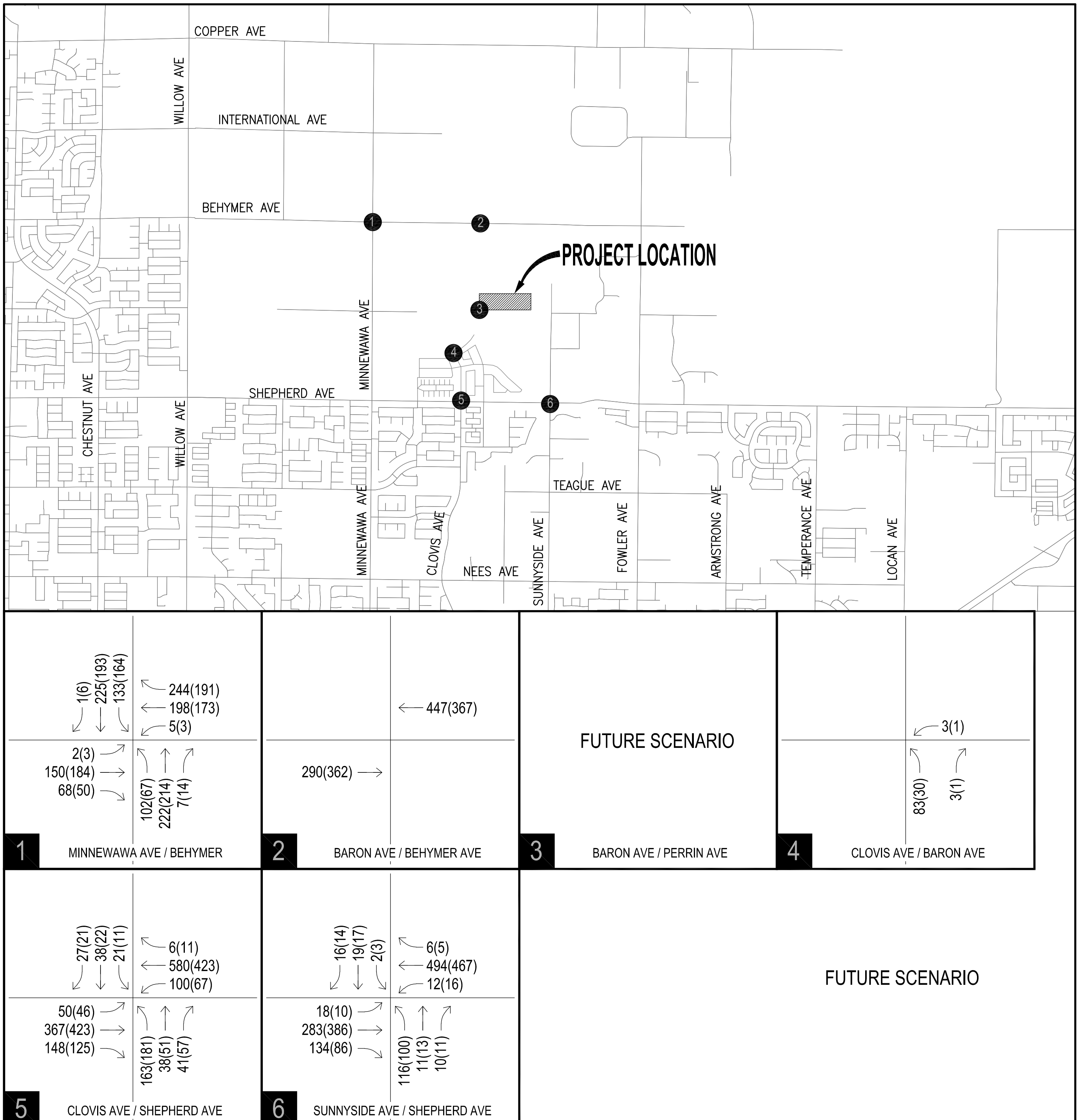
Proposed Tract 6452
Clovis, California

YEAR 2045 LANE CONFIGURATIONS AND INTERSECTION CONTROL

Not to Scale

PETERS ENGINEERING GROUP

Figure 4



LEGEND

X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) PEAK HOUR VOLUMES
	PROJECT SITE

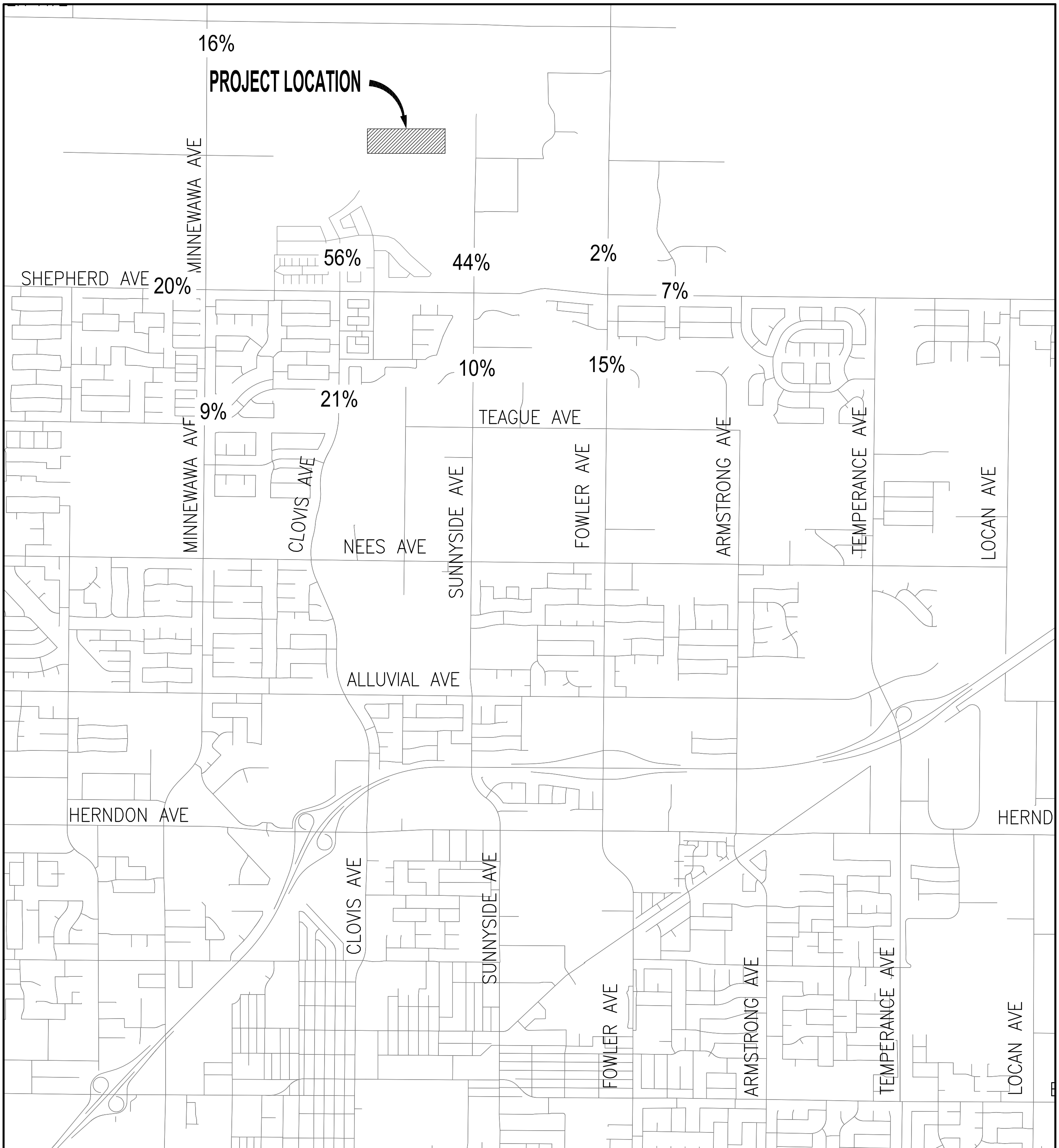
Proposed Tract 6452
Clovis, California

EXISTING PEAK-HOUR TRAFFIC VOLUMES

Not to Scale

Peters Engineering Group

Figure 5



Proposed Tract 6452
Clovis, California

LEGEND

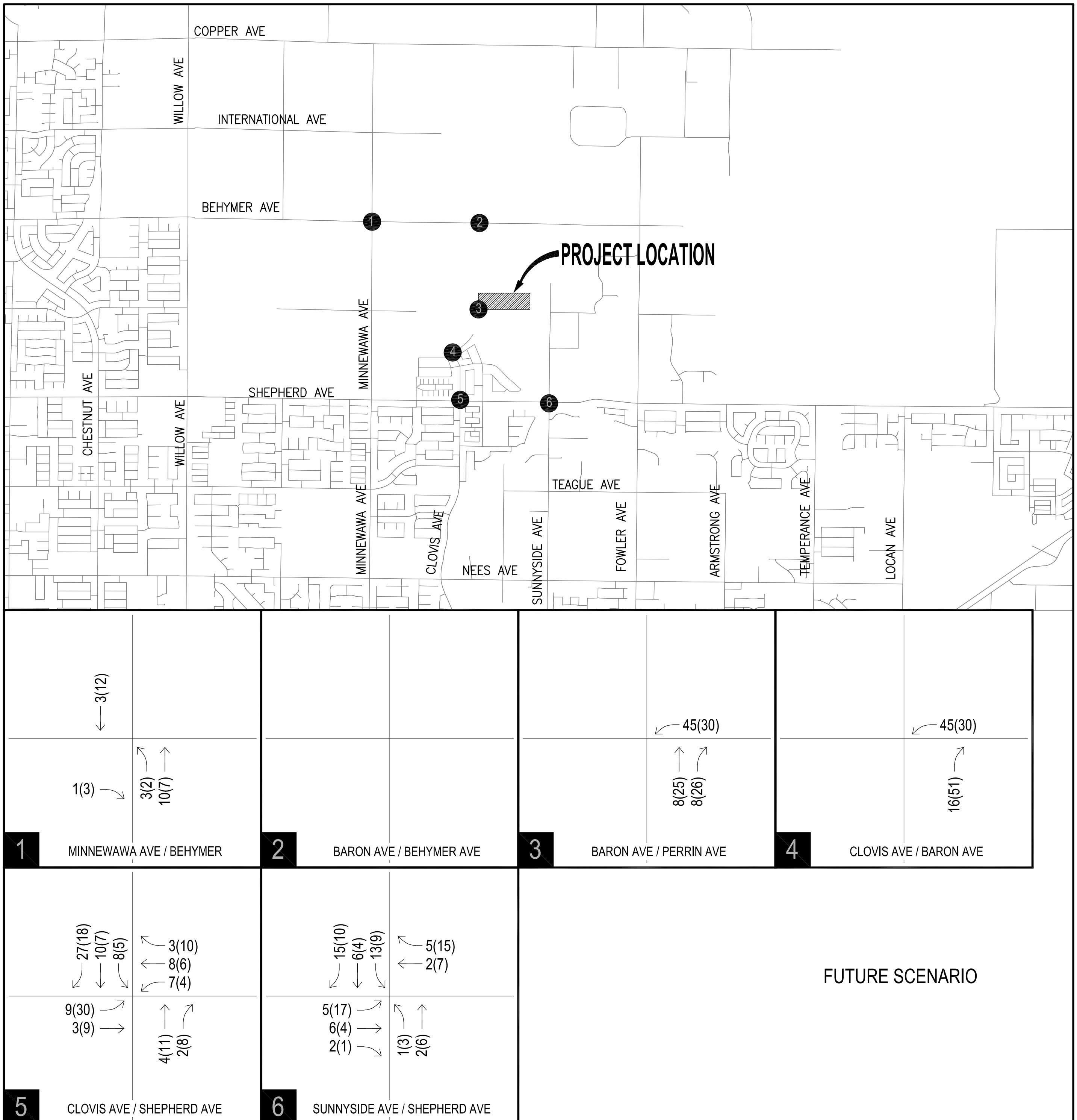
PROJECT SITE

PEAK HOUR PROJECT TRAFFIC TRIP DISTRIBUTION PERCENTAGES

Not to Scale

PETERS ENGINEERING GROUP

Figure 6



LEGEND

X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) PEAK HOUR VOLUMES
	PROJECT SITE

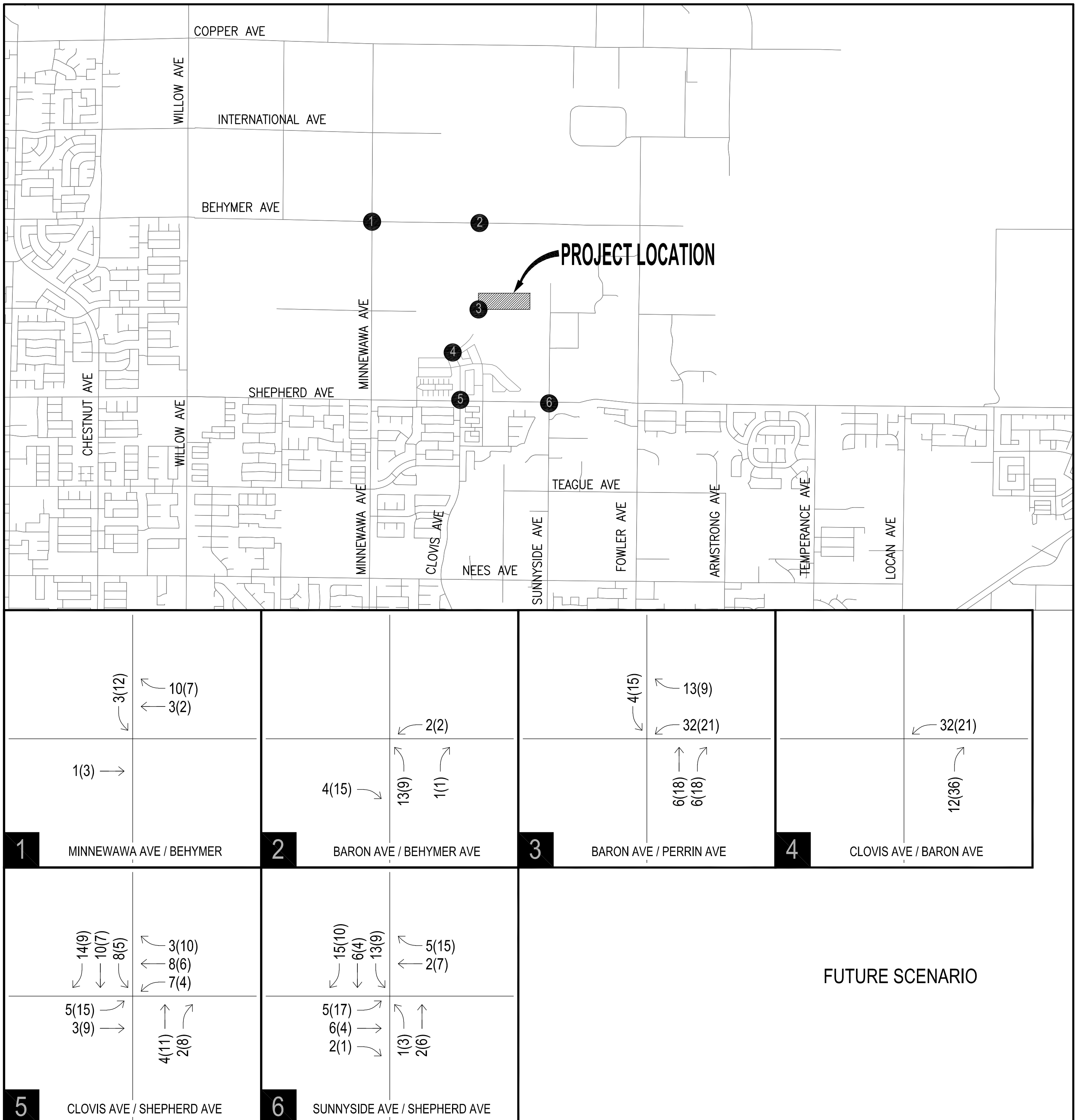
Proposed Tract 6452
Clovis, California

PEAK-HOUR PROJECT TRAFFIC VOLUMES

Not to Scale

PE Peters Engineering Group

Figure 7



FUTURE SCENARIO

LEGEND

X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) PEAK HOUR VOLUMES
	PROJECT SITE

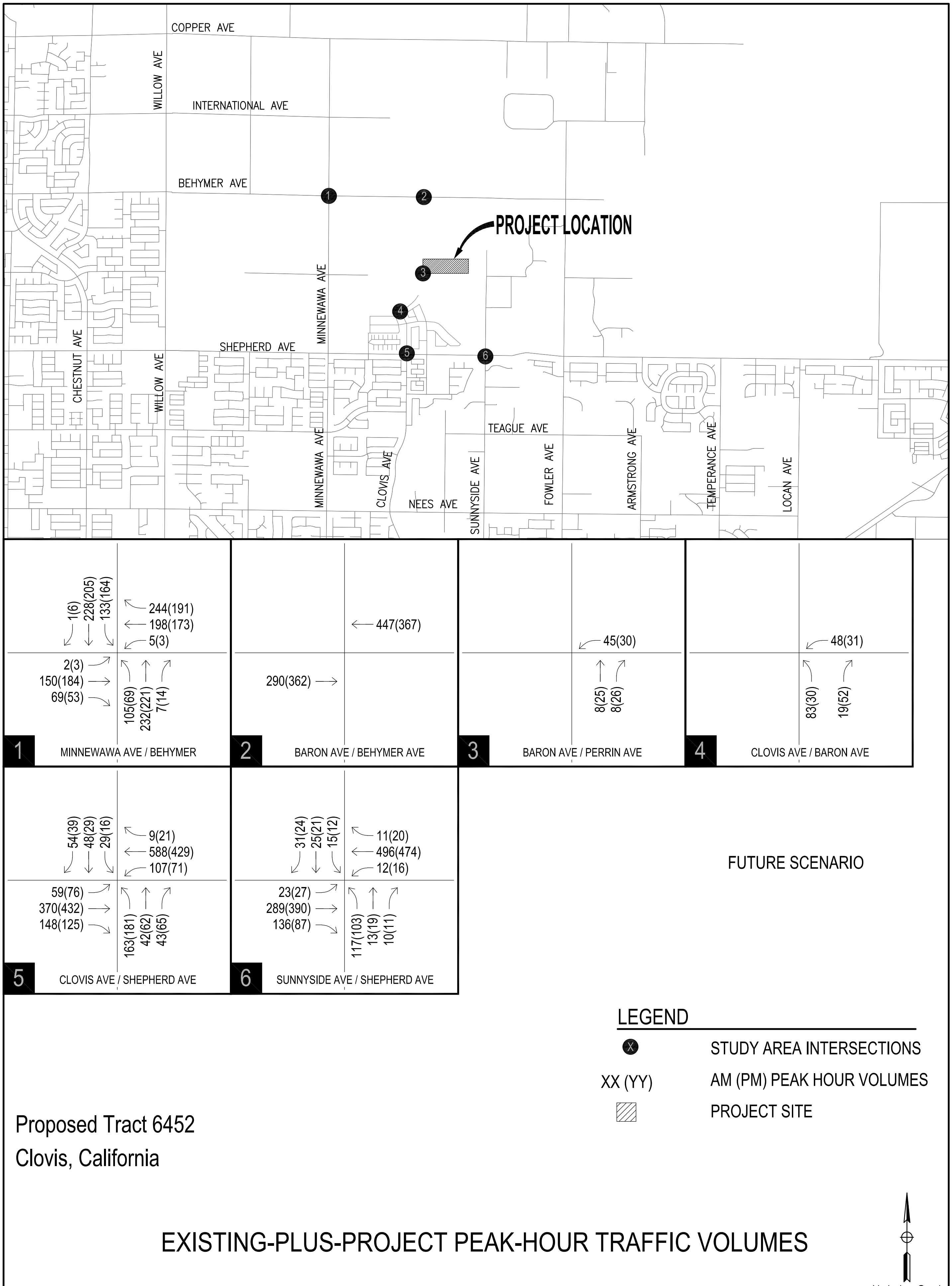
Proposed Tract 6452
Clovis, California

Not to Scale

PEAK-HOUR PROJECT TRAFFIC VOLUMES
(NEAR-TERM AND FUTURE SCENARIOS)

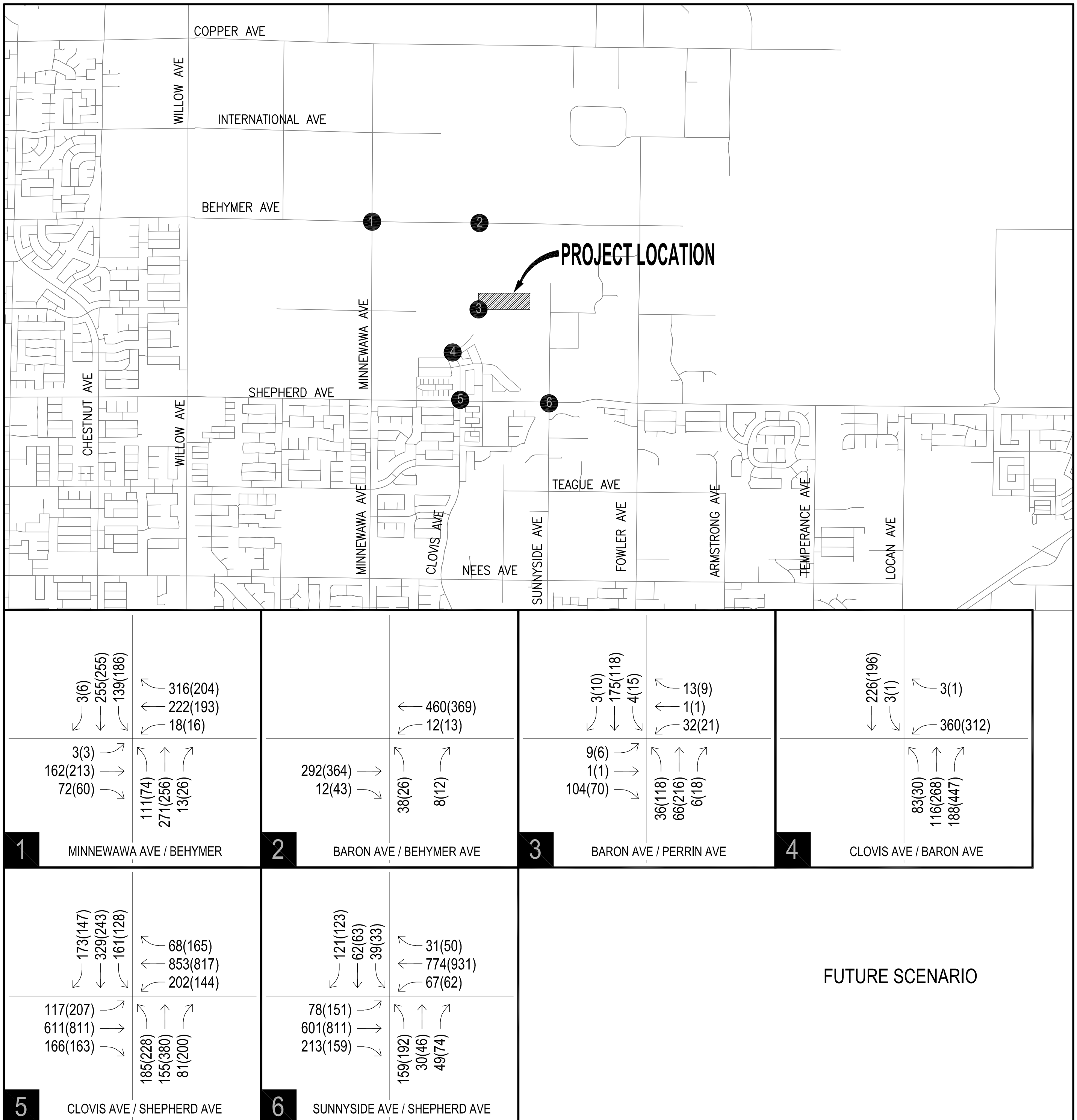
PETERS ENGINEERING GROUP

Figure 8



Proposed Tract 6452
Clovis, California

EXISTING-PLUS-PROJECT PEAK-HOUR TRAFFIC VOLUMES



LEGEND

X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) PEAK HOUR VOLUMES
	PROJECT SITE

Proposed Tract 6452
Clovis, California

NEAR-TERM WITH-PROJECT PEAK-HOUR TRAFFIC VOLUMES

Not to Scale

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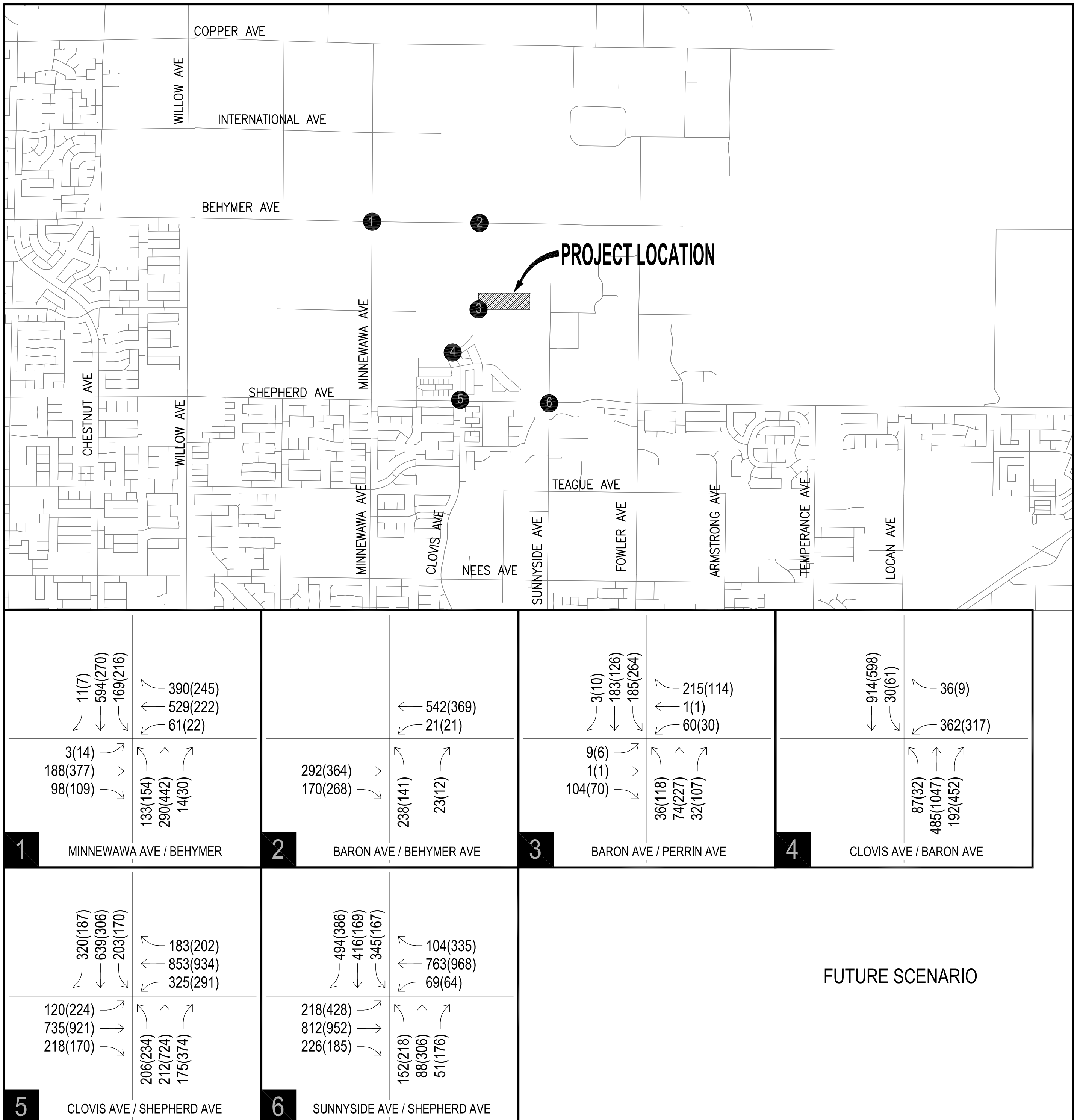
Figure 10



LEGEND

X	STUDY AREA INTERSECTIONS
XX (YY)	AM (PM) PEAK HOUR VOLUMES
	PROJECT SITE

Proposed Tract 6452
Clovis, California

CUMULATIVE (YEAR 2045) WITH-PROJECT PEAK-HOUR TRAFFIC VOLUMES

Not to Scale

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Figure 11

APPENDIX A

TRAFFIC MODELING

VMT Results

Tract 6452, City of Clovis - VMT Analysis

Tract 6452 (project)	Region (Fresno County)[1]	Difference	Percentage Difference
17.9	14.1	3.8	27.3%

Source: Fresno Council of Governments' Activity-Based Model

VMT = Vehicle Miles Traveled

[1]*The Fresno County VMT per capita was obtained from the Interim Transportation Impact Guidelines, City of Clovis - July 14, 2020*

Appendix - Detailed VMT Calculations

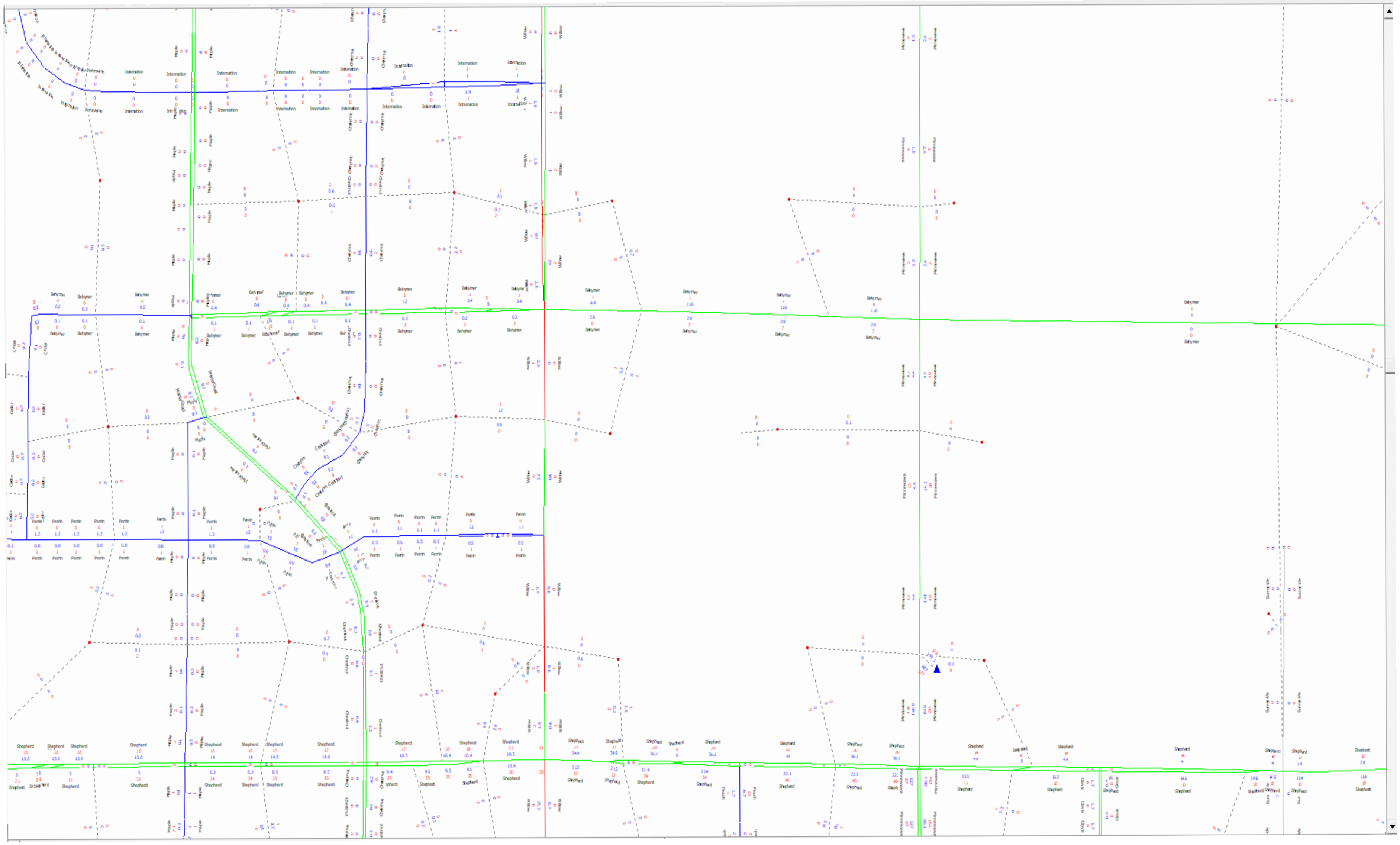
Total project households	153
Total project population (a)	527
Percent Population traveling to outside (b) *	7.79%
Project Population traveling to outside (c=b*a)	41
Total Internal-Internal (II) Project VMT (d) **	7,921
Internal project population (e=a-c)	486
II VMT per capita (f=d/e)	16.31
IX VMT per capita (g) ***	20.2
Total IX VMT (h=g*c)	829
Total project VMT (i=d+h)	8,750
VMT per capita (j=i/a)	16.6
VMT adjustment factor for new base model (k)	1.08
Adjusted project VMT per capita (l = k*j)	17.9

** : Obtained from "Fresno_worker_ixxifractions.dat" from model inputs. Used same percentages/values as the parent TAZ (2771)*

***: Includes all tours and all sub-tours from the ABM model run for VMT estimation*

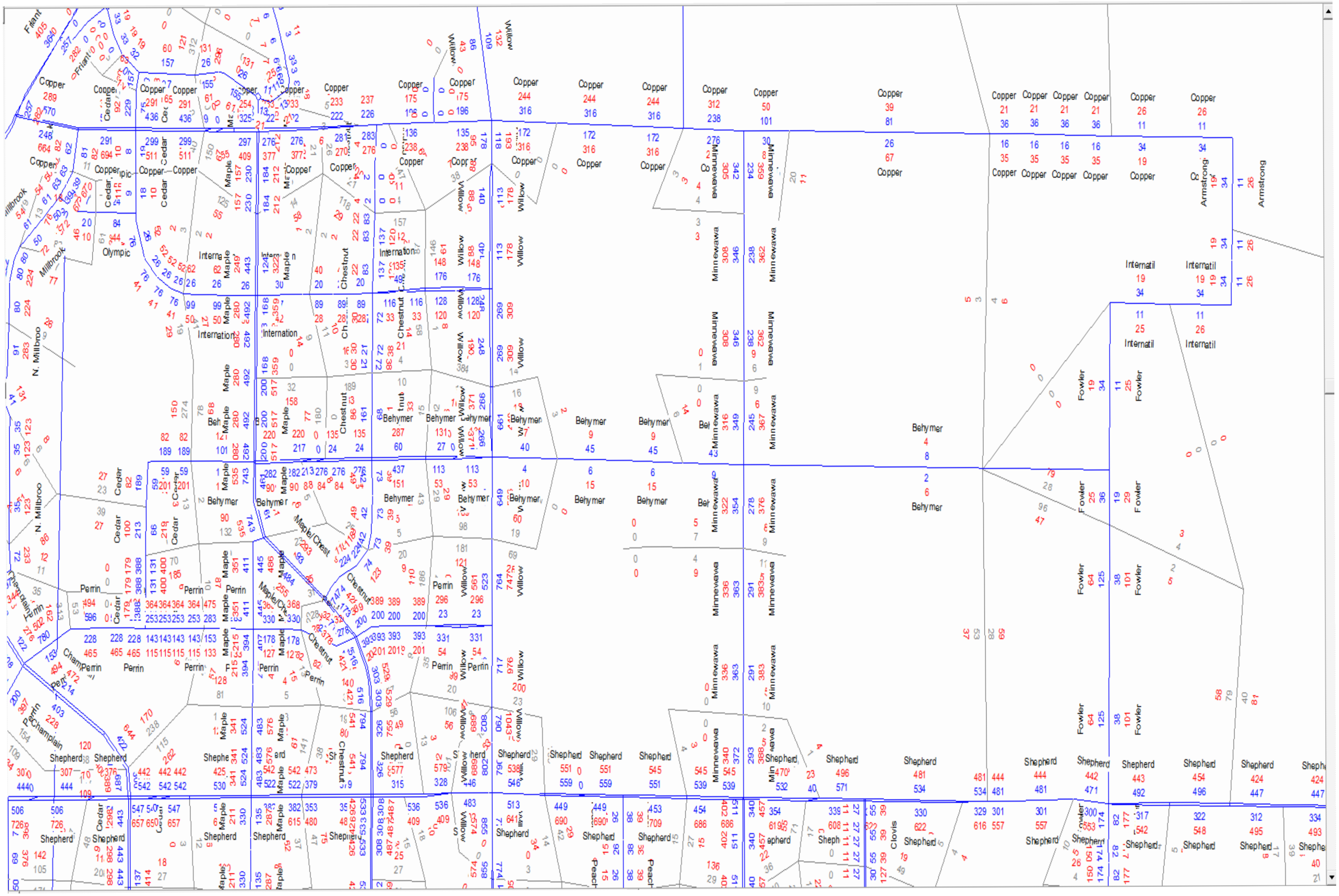
****: IX VMT per capita was estimated as average for all TAZs in the CSTDM Zone 2569*

Select Zone Analysis

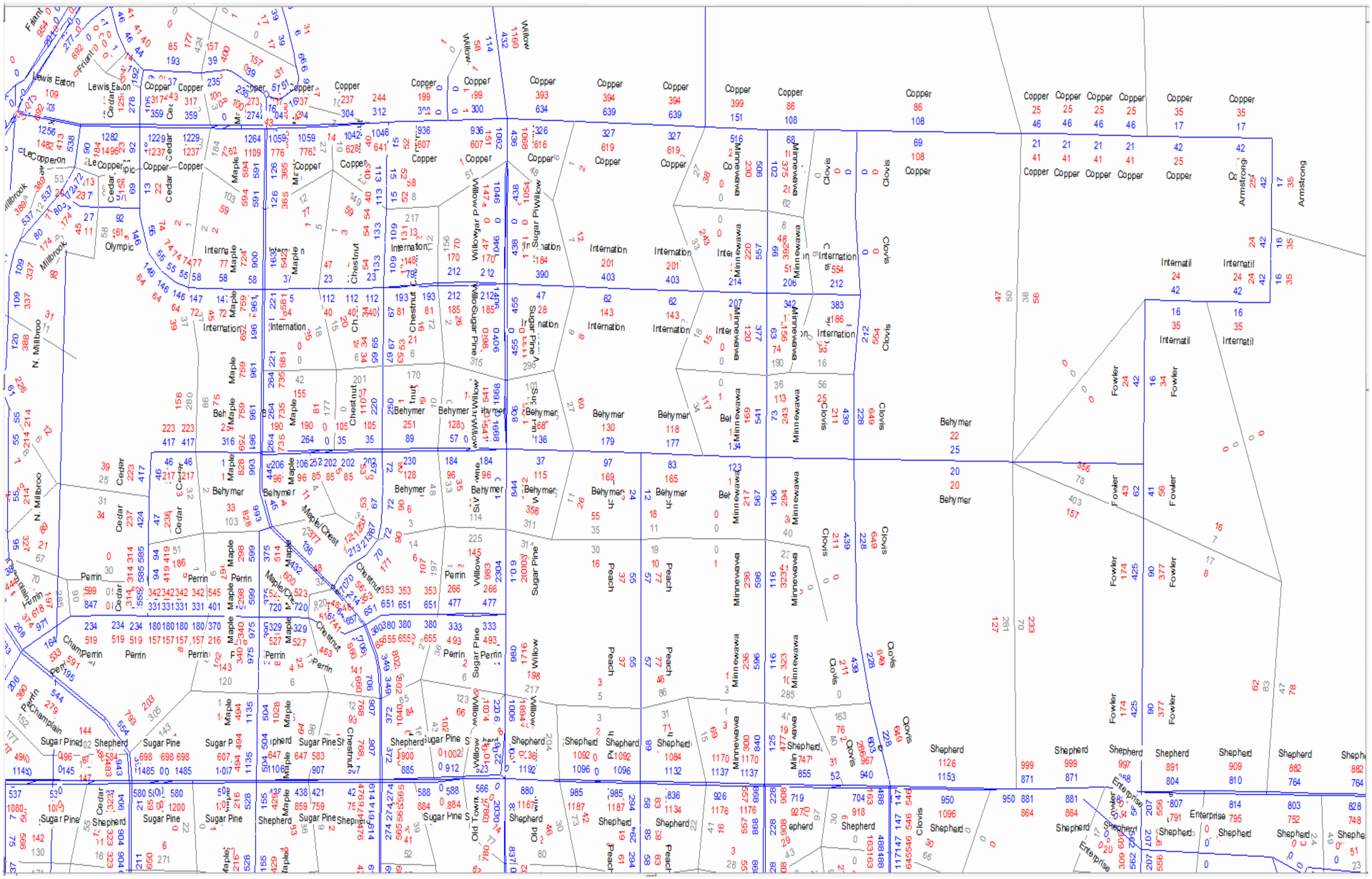


Select Zone Analysis Fresno County Travel Model
AM and PM Peak-Hour Traffic Volumes

Baseline and Future Model Output



2019 Fresno County Travel Model
AM and PM Peak-Hour Traffic Volumes



2035 Fresno County Travel Model
AM and PM Peak-Hour Traffic Volumes

APPENDIX B

TRAFFIC COUNT DATA SHEETS

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

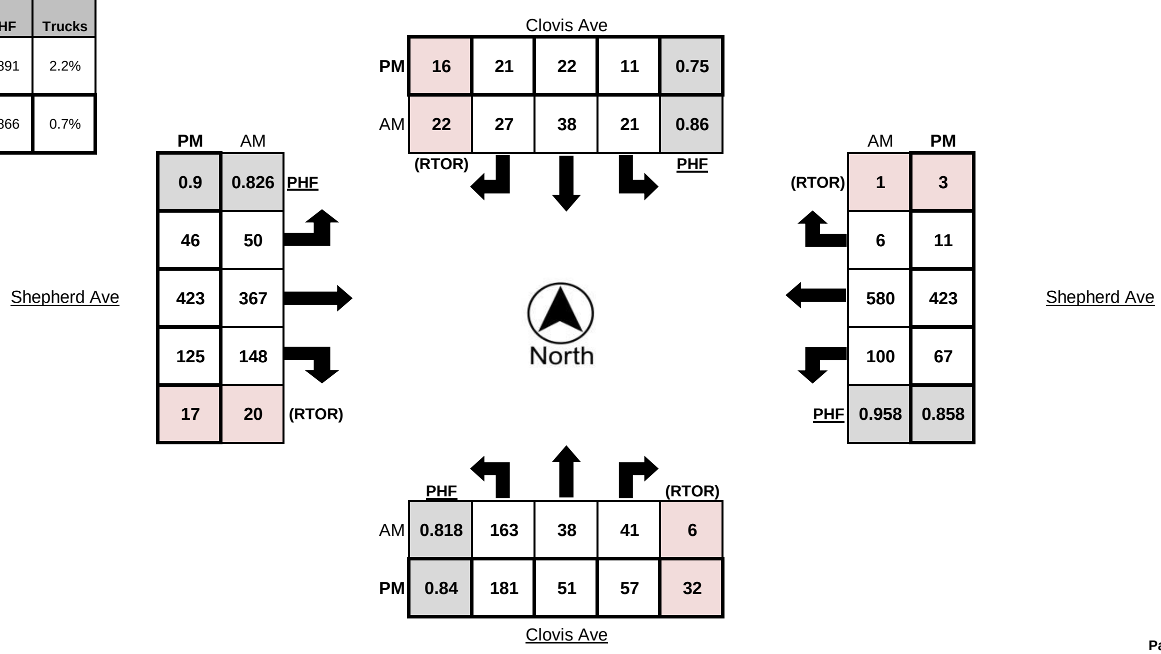
LOCATION	Clovis Ave @ Shepherd Ave	**LATITUDE**	36.8666
COUNTY	Fresno	**LONGITUDE**	-119.7021
COLLECTION DATE	Thursday, November 2, 2023	**WEATHER**	Clear

	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	23	4	9	2	2	6	8	0	0	0	2	48	27	5	1	8	56	2	1	3
7:15 AM - 7:30 AM	14	6	4	0	0	4	14	10	6	0	1	88	28	5	3	13	81	4	0	4
7:30 AM - 7:45 AM	39	13	14	1	1	5	9	9	5	1	5	75	32	1	2	22	145	0	0	2
7:45 AM - 8:00 AM	51	11	12	3	3	6	9	10	8	0	14	108	49	9	2	27	143	3	1	2
8:00 AM - 8:15 AM	37	6	7	1	1	7	12	2	4	0	20	107	32	7	4	23	155	1	0	3
8:15 AM - 8:30 AM	36	8	8	1	1	3	8	6	5	0	11	77	35	3	8	28	137	2	0	4
8:30 AM - 8:45 AM	27	8	20	1	1	3	3	4	3	0	10	102	39	5	8	9	87	2	1	2
8:45 AM - 9:00 AM	30	5	4	0	0	5	8	4	3	1	13	67	26	7	0	16	78	1	0	1
TOTAL	**257**	**61**	**78**	**9**	**9**	**39**	**71**	**45**	**34**	**2**	**76**	**672**	**268**	**42**	**28**	**146**	**882**	**15**	**3**	**21**

	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	51	4	13	6	1	4	11	6	4	0	11	94	26	14	4	9	79	0	0	3
4:15 PM - 4:30 PM	35	11	9	6	1	1	4	1	1	0	12	119	20	4	4	22	104	1	1	1
4:30 PM - 4:45 PM	41	18	15	6	1	1	7	6	1	0	11	101	30	6	2	13	92	2	0	1
4:45 PM - 5:00 PM	47	9	15	6	0	3	6	4	3	1	14	108	27	5	0	14	99	0	0	0
5:00 PM - 5:15 PM	30	12	15	10	0	2	3	4	2	0	11	91	35	3	3	13	102	1	1	1
5:15 PM - 5:30 PM	58	13	15	11	0	1	8	9	7	0	11	123	31	2	1	22	116	8	2	2
5:30 PM - 5:45 PM	46	17	12	5	1	5	5	4	4	0	10	101	32	7	0	18	106	2	0	1
5:45 PM - 6:00 PM	48	14	6	5	0	5	9	5	5	0	8	101	38	2	0	17	87	2	0	0
TOTAL	**356**	**98**	**100**	**55**	**4**	**22**	**53**	**39**	**27**	**1**	**88**	**838**	**239**	**43**	**14**	**128**	**785**	**16**	**4**	**9**

	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	163	38	41	6	6	21	38	27	22	1	50	367	148	20	16	100	580	6	1	11
4:45 PM - 5:45 PM	181	51	57	32	1	11	22	21	16	1	46	423	125	17	4	67	423	11	3	4

	PHF	Trucks
AM	0.891	2.2%
PM	0.866	0.7%



Metro Traffic Data Inc.
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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

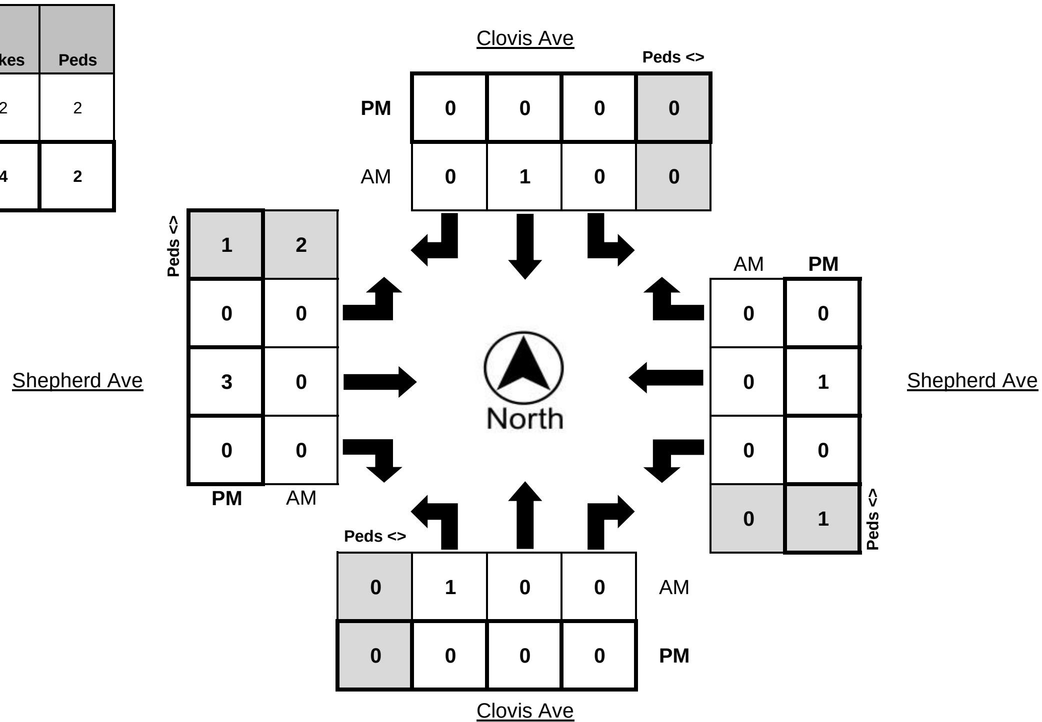
LOCATION Clovis Ave @ Shepherd Ave
LATITUDE 36.8666
COUNTY Fresno
LONGITUDE -119.7021
COLLECTION DATE Thursday, November 2, 2023
WEATHER Clear

	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	0	0	1	0	1	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	1	0	0
TOTAL	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**3**	**0**	**4**

	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	0	0	0	0	0	0	1	0	2	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0	0	1
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	2	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	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	2	1	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**5**	**1**	**1**	**0**	**2**

	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	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
4:45 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	3	0	1	0	1	0	1

	Bikes	Peds
AM Peak Total	2	2
PM Peak Total	4	2



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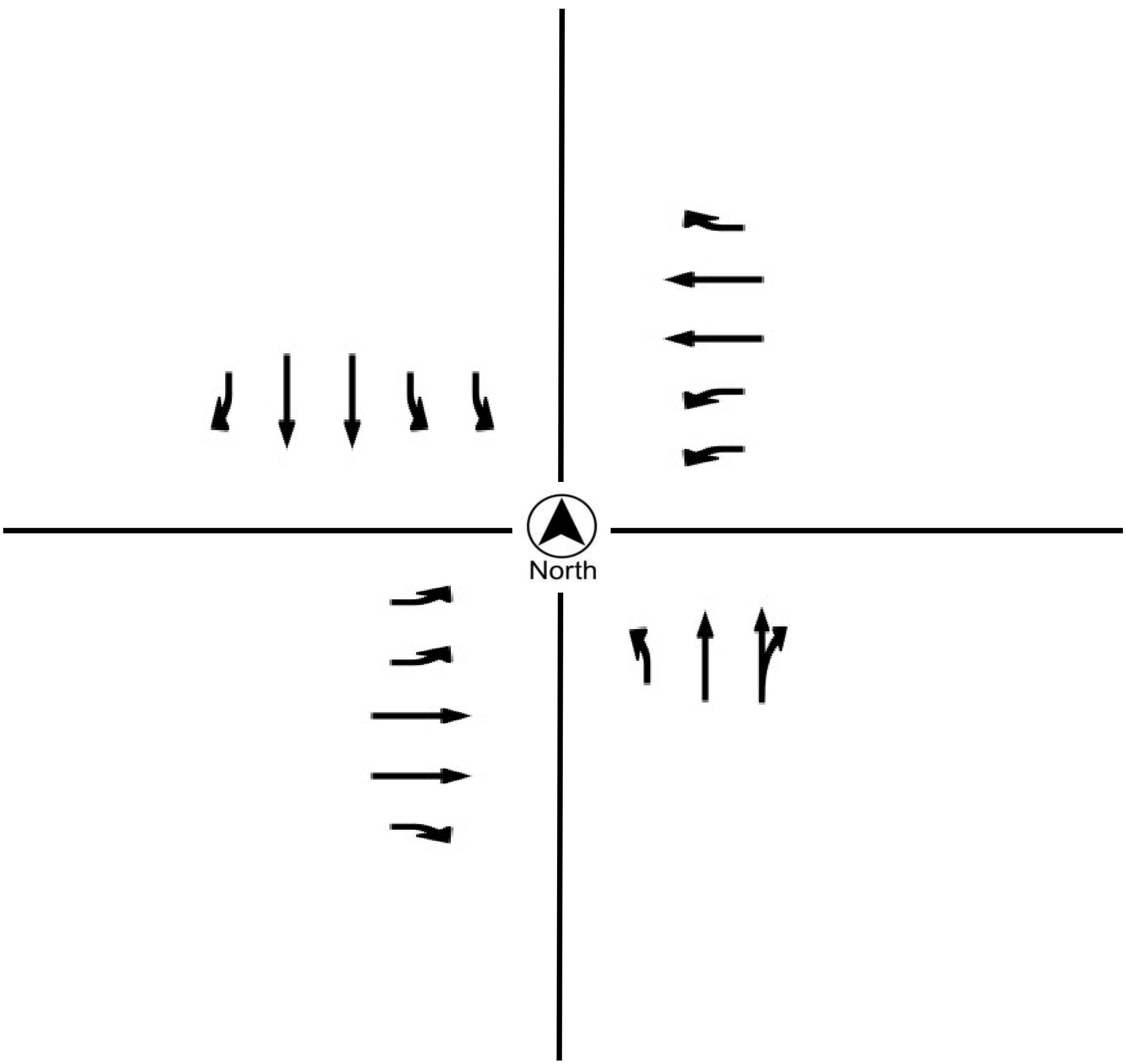
Turning Movement Report

Prepared For:
Peters Engineering Group
862 Pollasky Ave
Clovis, CA 93612

LOCATION	Clovis Ave @ Shepherd Ave	**N/S STREET**	Clovis Ave
COUNTY	Fresno	**E/W STREET**	Shepherd Ave
COLLECTION DATE	Thursday, November 2, 2023	**WEATHER**	Clear
CYCLE TIME	116 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

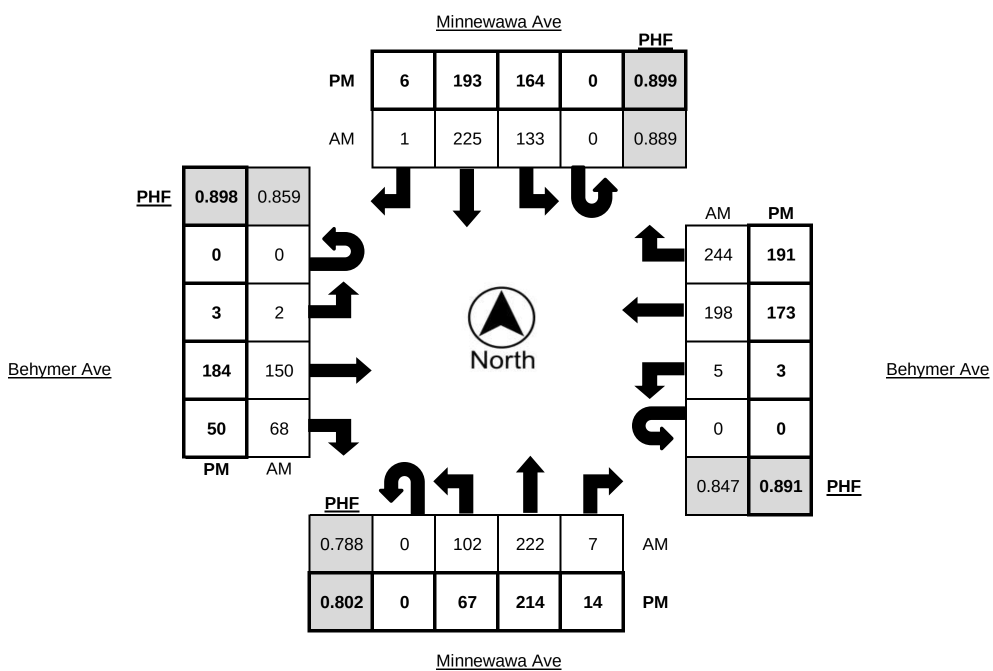
LOCATION	Minnewawa Ave @ Behymer Ave	**LATITUDE**	36.8812
COUNTY	Fresno	**LONGITUDE**	-119.7112
COLLECTION DATE	Thursday, September 14, 2023	**WEATHER**	Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	2	33	1	2	0	26	36	0	2	0	0	26	9	0	0	3	32	45	1
7:15 AM - 7:30 AM	0	9	40	2	1	0	36	39	0	1	0	0	27	9	1	0	3	46	44	3
7:30 AM - 7:45 AM	0	33	42	1	2	0	35	48	0	2	0	0	37	10	1	0	3	72	48	1
7:45 AM - 8:00 AM	0	28	47	1	2	0	25	51	0	0	0	2	36	26	1	0	2	54	76	5
8:00 AM - 8:15 AM	0	14	59	1	2	0	33	68	0	3	0	0	36	16	2	0	0	34	68	3
8:15 AM - 8:30 AM	0	27	74	4	3	0	40	58	1	3	0	0	41	16	1	0	0	38	52	1
8:30 AM - 8:45 AM	0	8	44	3	3	0	36	52	1	3	0	2	24	16	4	0	1	32	41	4
8:45 AM - 9:00 AM	0	9	42	2	2	0	22	36	0	3	0	1	15	11	0	0	4	43	36	3
TOTAL	**0**	**130**	**381**	**15**	**17**	**0**	**253**	**388**	**2**	**17**	**0**	**5**	**242**	**113**	**10**	**0**	**16**	**351**	**410**	**21**

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	16	55	2	0	0	26	45	0	0	0	0	46	14	0	0	0	35	30	2
4:15 PM - 4:30 PM	0	11	49	2	1	0	34	52	1	2	0	4	25	6	1	0	3	37	32	1
4:30 PM - 4:45 PM	0	14	57	1	1	0	37	36	0	2	0	0	40	10	0	0	0	22	39	0
4:45 PM - 5:00 PM	0	10	56	3	0	0	39	59	0	1	0	2	26	1	0	0	1	38	39	1
5:00 PM - 5:15 PM	0	11	51	1	0	0	38	40	3	2	0	0	39	11	0	0	1	41	56	0
5:15 PM - 5:30 PM	0	27	59	6	0	0	40	61	0	2	0	0	56	10	0	0	1	47	55	0
5:30 PM - 5:45 PM	0	20	61	4	1	0	45	43	1	0	0	2	55	7	1	0	1	42	46	0
5:45 PM - 6:00 PM	0	9	43	3	0	0	41	49	2	1	0	1	34	22	1	0	0	43	34	0
TOTAL	**0**	**118**	**431**	**22**	**3**	**0**	**300**	**385**	**7**	**10**	**0**	**9**	**321**	**81**	**3**	**0**	**7**	**305**	**331**	**4**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	0	102	222	7	9	0	133	225	1	8	0	2	150	68	5	0	5	198	244	10
5:00 PM - 6:00 PM	0	67	214	14	1	0	164	193	6	5	0	3	184	50	2	0	3	173	191	0

	PHF	Trucks
AM	0.967	2.4%
PM	0.872	0.6%



Metro Traffic Data Inc.
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Turning Movement Report

Prepared For:
Peters Engineering Group
862 Pollasky Ave
Clovis, CA 93612

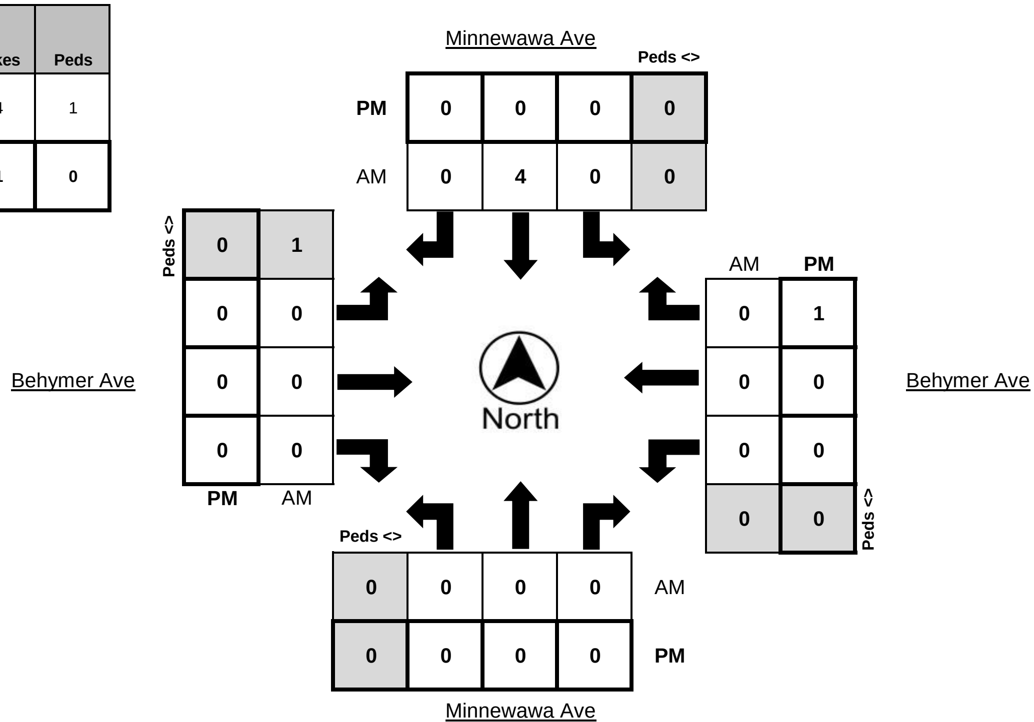
LOCATION	Minnewawa Ave @ Behymer Ave	**LATITUDE**	36.8812
COUNTY	Fresno	**LONGITUDE**	-119.7112
COLLECTION DATE	Thursday, September 14, 2023	**WEATHER**	Clear

	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	2	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
8:00 AM - 8:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	2	0	0	0	0	0	0	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	0	0	0	0	0	0	0
TOTAL	**0**	**1**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**

	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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0	0	0	0	0	0	0
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	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

	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	0	0	4	0	0	0	0	0	0	0	0	0	1
5:00 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

	Bikes	Peds
AM Peak Total	4	1
PM Peak Total	**1**	**0**



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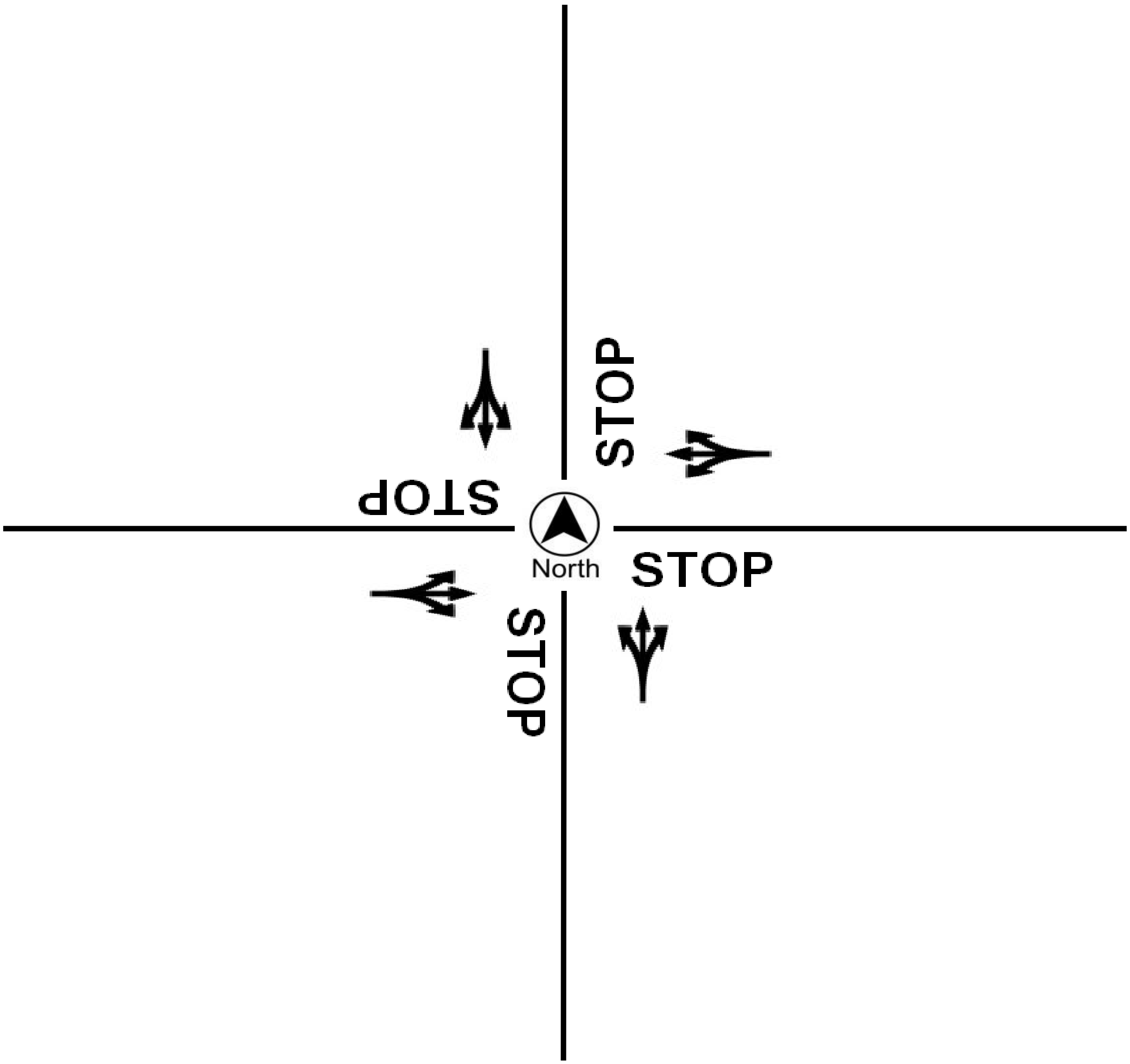
Turning Movement Report

Prepared For:
Peters Engineering Group
862 Pollasky Ave
Clovis, CA 93612

LOCATION	Minnewawa Ave @ Behymer Ave	**N/S STREET**	Minnewawa Ave / Minnewawa Ave
COUNTY	Fresno	**E/W STREET**	Behymer Ave / Behymer Ave
COLLECTION DATE	Thursday, September 14, 2023	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	All-Way Stop

COMMENTS



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Turning Movement Report

Prepared For:
Peters Engineering Group
862 Pollasky Ave
Clovis, CA 93612

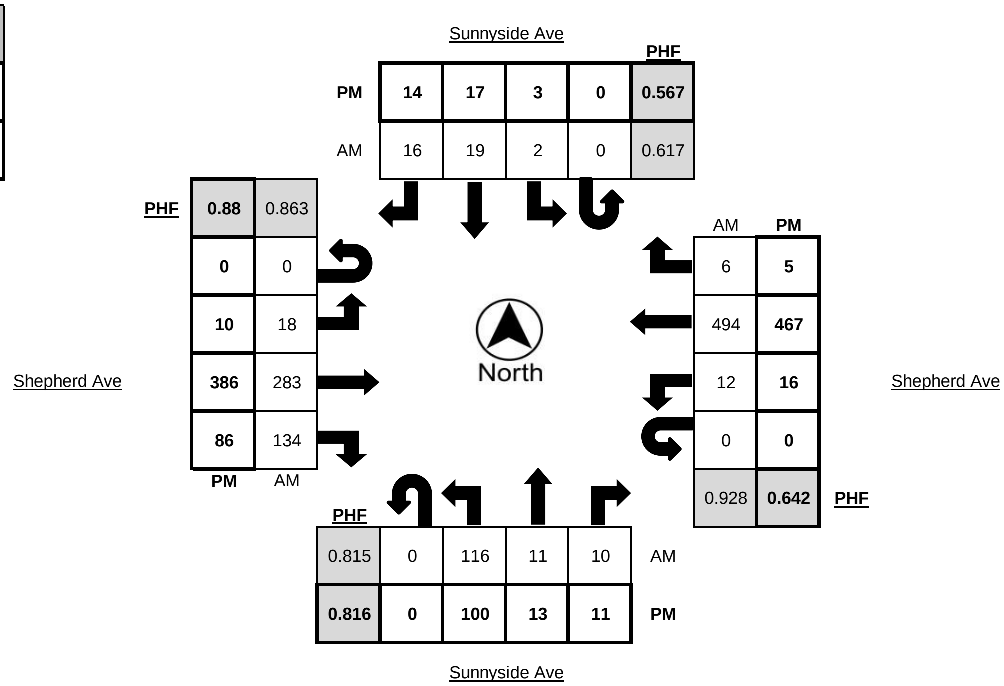
LOCATION	Sunnyside Ave @ Shepherd Ave	**LATITUDE**	36.8666
COUNTY	Fresno	**LONGITUDE**	-119.6930
COLLECTION DATE	Thursday, November 2, 2023	**WEATHER**	Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	7	5	2	1	0	0	3	1	0	0	7	40	13	2	0	3	55	3	2
7:15 AM - 7:30 AM	0	16	0	0	1	0	0	1	3	0	0	3	63	21	2	0	2	70	1	1
7:30 AM - 7:45 AM	0	27	5	2	4	0	1	5	2	0	0	6	72	32	1	0	2	122	1	1
7:45 AM - 8:00 AM	0	37	2	3	1	0	0	3	2	1	0	5	80	41	1	0	5	117	1	2
8:00 AM - 8:15 AM	0	30	3	3	0	0	1	5	3	1	0	6	64	32	4	0	3	131	4	4
8:15 AM - 8:30 AM	0	22	1	2	1	0	0	6	9	1	0	1	67	29	6	0	2	124	0	1
8:30 AM - 8:45 AM	0	12	2	1	0	0	0	3	2	0	0	6	87	33	5	0	3	73	0	2
8:45 AM - 9:00 AM	0	13	3	2	1	0	1	3	0	0	0	3	46	25	0	0	0	66	1	1
TOTAL	**0**	**164**	**21**	**15**	**9**	**0**	**3**	**29**	**22**	**3**	**0**	**37**	**519**	**226**	**21**	**0**	**20**	**758**	**11**	**14**

	Northbound					Southbound					Eastbound					Westbound				
Time	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	23	0	9	4	0	1	5	1	0	0	3	80	26	5	0	2	69	1	0
4:15 PM - 4:30 PM	0	29	5	7	0	0	2	0	4	0	0	1	96	20	3	0	3	80	2	1
4:30 PM - 4:45 PM	0	22	3	6	0	0	0	3	4	2	0	2	93	23	3	0	6	56	0	1
4:45 PM - 5:00 PM	0	24	3	3	1	0	0	4	3	0	0	2	98	23	1	0	3	88	1	0
5:00 PM - 5:15 PM	0	26	2	4	0	0	1	8	6	1	0	5	79	22	1	0	6	180	4	1
5:15 PM - 5:30 PM	0	31	4	3	0	0	1	1	4	0	0	3	115	19	0	0	3	104	0	1
5:30 PM - 5:45 PM	0	19	4	1	1	0	1	4	1	0	0	0	94	22	1	0	4	95	0	1
5:45 PM - 6:00 PM	0	14	2	6	0	0	0	5	3	0	0	0	98	21	0	0	6	79	0	0
TOTAL	**0**	**188**	**23**	**39**	**6**	**0**	**6**	**30**	**26**	**3**	**0**	**16**	**753**	**176**	**14**	**0**	**33**	**751**	**8**	**5**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks	U-Turn	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	0	116	11	10	6	0	2	19	16	3	0	18	283	134	12	0	12	494	6	8
4:45 PM - 5:45 PM	0	100	13	11	2	0	3	17	14	1	0	10	386	86	3	0	16	467	5	3

	PHF	Trucks
AM	0.947	2.6%
PM	0.822	0.8%



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862 Pollasky Ave
Clovis, CA 93612

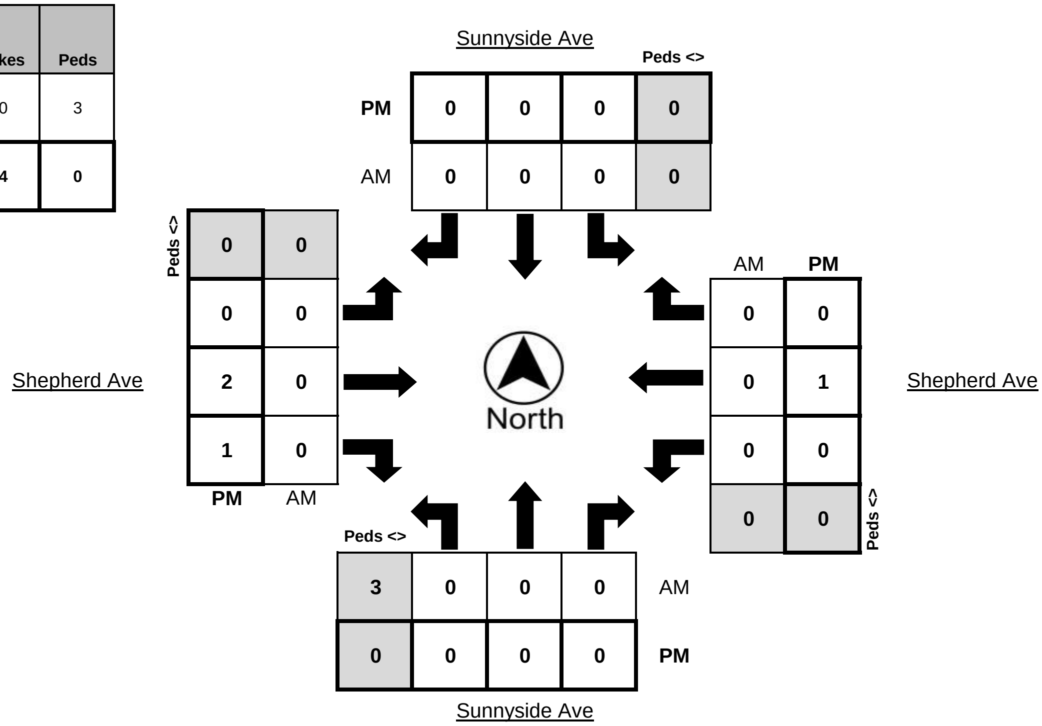
LOCATION	Sunnyside Ave @ Shepherd Ave	**LATITUDE**	36.8666
COUNTY	Fresno	**LONGITUDE**	-119.6930
COLLECTION DATE	Thursday, November 2, 2023	**WEATHER**	Clear

	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	0	0	0	0	1	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
TOTAL	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**

	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	0	0	0	0	0	0	1	0	0	0	0	0	0
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	0	0	1	1	0	0	0	0	0	0	0	0	0
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	2	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**3**	**1**	**0**	**0**	**2**	**0**	**0**

	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	0	0	0	0	3	0	0	0	0	0	0	0	0
4:45 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	2	1	0	0	1	0	0

	Bikes	Peds
AM Peak Total	0	3
PM Peak Total	4	0



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Prepared For:

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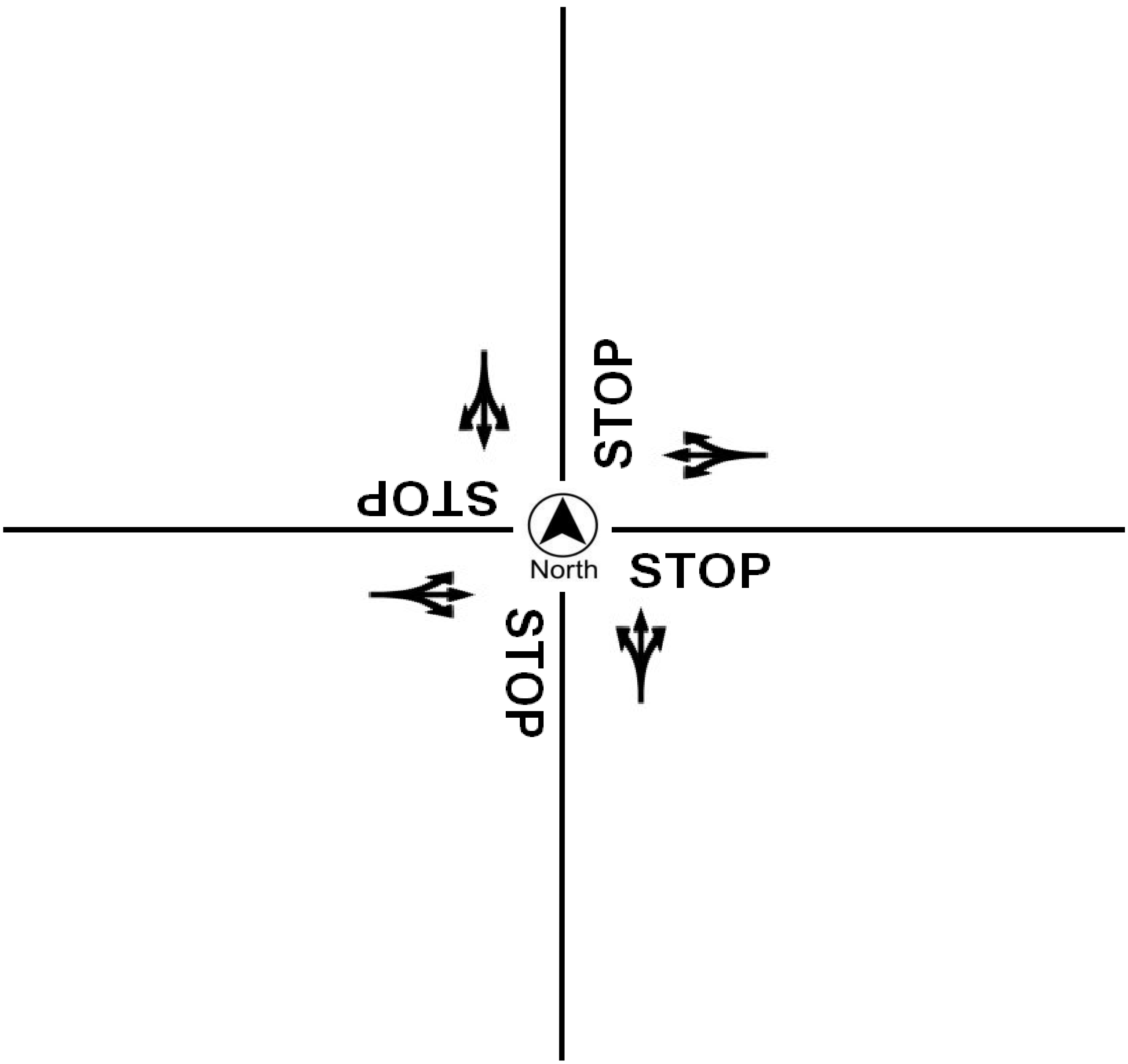
862 Pollasky Ave
Clovis, CA 93612

LOCATION	Sunnyside Ave @ Shepherd Ave	**N/S STREET**	Sunnyside Ave
COUNTY	Fresno	**E/W STREET**	Shepherd Ave
COLLECTION DATE	Thursday, November 2, 2023	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	All-Way Stop

COMMENTS



APPENDIX C

INTERSECTION ANALYSES

Intersection	
Intersection Delay, s/veh	38
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	2	150	68	5	198	244	102	222	7	133	225	1
Future Vol, veh/h	2	150	68	5	198	244	102	222	7	133	225	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	155	70	5	204	252	105	229	7	137	232	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	20	52	31.9	37.1
HCM LOS	C	F	D	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	31%	1%	1%	37%
Vol Thru, %	67%	68%	44%	63%
Vol Right, %	2%	31%	55%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	331	220	447	359
LT Vol	102	2	5	133
Through Vol	222	150	198	225
RT Vol	7	68	244	1
Lane Flow Rate	341	227	461	370
Geometry Grp	1	1	1	1
Degree of Util (X)	0.755	0.519	0.929	0.811
Departure Headway (Hd)	7.967	8.245	7.261	7.887
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	454	435	498	459
Service Time	6.053	6.344	5.337	5.97
HCM Lane V/C Ratio	0.751	0.522	0.926	0.806
HCM Control Delay	31.9	20	52	37.1
HCM Lane LOS	D	C	F	E
HCM 95th-tile Q	6.3	2.9	11.1	7.5

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	3	1	83	1	3	1	1
Future Vol, veh/h	3	1	83	1	3	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	3	1	90	1	3	1	1
Number of Lanes	1	1	1	1	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	7.7	7.7	7.6
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	75%	0%
Vol Thru, %	100%	25%	0%	0%	25%	100%
Vol Right, %	0%	75%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	83	4	3	1	1	1
LT Vol	0	0	3	0	1	0
Through Vol	83	1	0	0	0	1
RT Vol	0	3	0	1	0	0
Lane Flow Rate	90	4	3	1	1	1
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.114	0.005	0.005	0.001	0.002	0.001
Departure Headway (Hd)	4.543	4.018	5.198	3.997	4.961	4.586
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	793	895	684	886	722	781
Service Time	2.247	1.722	2.966	1.765	2.684	2.309
HCM Lane V/C Ratio	0.113	0.004	0.004	0.001	0.001	0.001
HCM Control Delay	7.8	6.7	8	6.8	7.7	7.3
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.4	0	0	0	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	367	148	100	580	6	163	38	41	21	38	27
Future Volume (veh/h)	50	367	148	100	580	6	163	38	41	21	38	27
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		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	56	412	144	112	652	6	183	43	39	24	43	5
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	191	963	420	285	1059	462	244	832	363	99	446	193
Arrive On Green	0.06	0.27	0.27	0.08	0.30	0.30	0.14	0.23	0.23	0.03	0.13	0.13
Sat Flow, veh/h	3456	3554	1551	3456	3554	1552	1781	3554	1549	3456	3554	1534
Grp Volume(v), veh/h	56	412	144	112	652	6	183	43	39	24	43	5
Grp Sat Flow(s),veh/h/ln	1728	1777	1551	1728	1777	1552	1781	1777	1549	1728	1777	1534
Q Serve(g_s), s	0.7	4.4	3.5	1.4	7.3	0.1	4.6	0.4	0.9	0.3	0.5	0.1
Cycle Q Clear(g_c), s	0.7	4.4	3.5	1.4	7.3	0.1	4.6	0.4	0.9	0.3	0.5	0.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	191	963	420	285	1059	462	244	832	363	99	446	193
V/C Ratio(X)	0.29	0.43	0.34	0.39	0.62	0.01	0.75	0.05	0.11	0.24	0.10	0.03
Avail Cap(c_a), veh/h	596	2843	1241	820	3073	1342	1075	3226	1406	596	1693	731
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	21.0	13.9	13.6	20.2	14.0	11.5	19.2	13.8	13.9	22.0	17.9	17.8
Incr Delay (d2), s/veh	0.8	0.3	0.5	0.9	0.6	0.0	4.6	0.0	0.1	1.2	0.1	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	0.3	1.3	0.9	0.5	2.2	0.0	1.9	0.1	0.3	0.1	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.9	14.2	14.1	21.1	14.6	11.5	23.8	13.8	14.1	23.3	18.0	17.8
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		612			770			265			72	
Approach Delay, s/veh		14.9			15.5			20.7			19.8	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.3	15.8	7.8	17.5	10.4	10.7	6.6	18.7
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	8.0	42.1	11.0	37.1	28.0	22.1	8.0	40.1
Max Q Clear Time (g_c+I1), s	2.3	2.9	3.4	6.4	6.6	2.5	2.7	9.3
Green Ext Time (p_c), s	0.0	0.3	0.2	3.0	0.4	0.1	0.0	4.2

Intersection Summary	
HCM 6th Ctrl Delay	16.3
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	56	412	166	112	652	7	183	43	46	24	43	30
v/c Ratio	0.14	0.43	0.32	0.24	0.57	0.01	0.49	0.04	0.08	0.07	0.11	0.10
Control Delay	28.9	20.5	8.3	28.1	19.9	0.0	27.8	19.2	1.4	29.8	29.1	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.9	20.5	8.3	28.1	19.9	0.0	27.8	19.2	1.4	29.8	29.1	0.7
Queue Length 50th (ft)	9	64	10	19	107	0	60	5	0	4	7	0
Queue Length 95th (ft)	29	118	53	47	182	0	132	20	6	16	24	0
Internal Link Dist (ft)		1249			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	497	2380	1081	684	2520	1137	898	2610	1164	497	1418	695
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.17	0.15	0.16	0.26	0.01	0.20	0.02	0.04	0.05	0.03	0.04

Intersection Summary

Intersection	
Intersection Delay, s/veh	20.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	18	283	134	12	494	6	116	11	10	2	19	16
Future Vol, veh/h	18	283	134	12	494	6	116	11	10	2	19	16
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	19	301	143	13	526	6	123	12	11	2	20	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	17.9	25.1	12.2	10.2
HCM LOS	C	D	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	85%	4%	2%	5%
Vol Thru, %	8%	65%	96%	51%
Vol Right, %	7%	31%	1%	43%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	137	435	512	37
LT Vol	116	18	12	2
Through Vol	11	283	494	19
RT Vol	10	134	6	16
Lane Flow Rate	146	463	545	39
Geometry Grp	1	1	1	1
Degree of Util (X)	0.269	0.664	0.79	0.072
Departure Headway (Hd)	6.643	5.169	5.222	6.626
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	539	699	692	537
Service Time	4.711	3.218	3.268	4.714
HCM Lane V/C Ratio	0.271	0.662	0.788	0.073
HCM Control Delay	12.2	17.9	25.1	10.2
HCM Lane LOS	B	C	D	B
HCM 95th-tile Q	1.1	5	7.9	0.2

Intersection	
Intersection Delay, s/veh	54.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	3	184	50	3	173	191	67	214	14	164	193	6
Future Vol, veh/h	3	184	50	3	173	191	67	214	14	164	193	6
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	211	57	3	199	220	77	246	16	189	222	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	29.7	63.6	42.5	71.8
HCM LOS	D	F	E	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	23%	1%	1%	45%
Vol Thru, %	73%	78%	47%	53%
Vol Right, %	5%	21%	52%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	295	237	367	363
LT Vol	67	3	3	164
Through Vol	214	184	173	193
RT Vol	14	50	191	6
Lane Flow Rate	339	272	422	417
Geometry Grp	1	1	1	1
Degree of Util (X)	0.828	0.683	0.964	0.992
Departure Headway (Hd)	8.891	9.132	8.223	8.558
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	410	398	443	426
Service Time	6.891	7.132	6.26	6.599
HCM Lane V/C Ratio	0.827	0.683	0.953	0.979
HCM Control Delay	42.5	29.7	63.6	71.8
HCM Lane LOS	E	D	F	F
HCM 95th-tile Q	7.7	4.9	11.6	12.3

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	1	1	30	1	1	1	1
Future Vol, veh/h	1	1	30	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	1	1	33	1	1	1	1
Number of Lanes	1	1	1	1	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	7.2	7.4	7.5
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	75%	0%
Vol Thru, %	100%	50%	0%	0%	25%	100%
Vol Right, %	0%	50%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	2	1	1	1	1
LT Vol	0	0	1	0	1	0
Through Vol	30	1	0	0	0	1
RT Vol	0	1	0	1	0	0
Lane Flow Rate	33	2	1	1	1	1
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.041	0.003	0.002	0.001	0.002	0.001
Departure Headway (Hd)	4.539	4.189	5.097	3.897	4.929	4.554
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	793	859	703	918	729	789
Service Time	2.241	1.891	2.823	1.623	2.638	2.263
HCM Lane V/C Ratio	0.042	0.002	0.001	0.001	0.001	0.001
HCM Control Delay	7.4	6.9	7.8	6.6	7.6	7.3
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0	0	0	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	423	125	67	423	11	181	51	57	11	22	21
Future Volume (veh/h)	46	423	125	67	423	11	181	51	57	11	22	21
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		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	486	124	77	486	10	208	59	29	13	25	6
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	186	882	385	238	935	408	278	955	417	58	460	199
Arrive On Green	0.05	0.25	0.25	0.07	0.26	0.26	0.16	0.27	0.27	0.02	0.13	0.13
Sat Flow, veh/h	3456	3554	1550	3456	3554	1551	1781	3554	1551	3456	3554	1535
Grp Volume(v), veh/h	53	486	124	77	486	10	208	59	29	13	25	6
Grp Sat Flow(s),veh/h/ln	1728	1777	1550	1728	1777	1551	1781	1777	1551	1728	1777	1535
Q Serve(g_s), s	0.7	5.3	2.9	1.0	5.2	0.2	5.0	0.6	0.6	0.2	0.3	0.2
Cycle Q Clear(g_c), s	0.7	5.3	2.9	1.0	5.2	0.2	5.0	0.6	0.6	0.2	0.3	0.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	186	882	385	238	935	408	278	955	417	58	460	199
V/C Ratio(X)	0.28	0.55	0.32	0.32	0.52	0.02	0.75	0.06	0.07	0.23	0.05	0.03
Avail Cap(c_a), veh/h	695	2707	1180	695	2707	1181	1313	3818	1666	540	1754	758
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	20.3	14.7	13.8	19.9	14.1	12.2	18.1	12.2	12.2	21.7	17.1	17.0
Incr Delay (d2), s/veh	0.8	0.5	0.5	0.8	0.4	0.0	4.0	0.0	0.1	2.0	0.0	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	0.2	1.6	0.8	0.3	1.6	0.1	1.9	0.2	0.2	0.1	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.2	15.2	14.2	20.6	14.5	12.3	22.1	12.2	12.3	23.7	17.1	17.1
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		663			573			296			44	
Approach Delay, s/veh		15.5			15.3			19.2			19.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	4.7	16.9	7.1	16.0	11.0	10.7	6.4	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	7.0	48.1	9.0	34.1	33.0	22.1	9.0	34.1
Max Q Clear Time (g_c+I1), s	2.2	2.6	3.0	7.3	7.0	2.3	2.7	7.2
Green Ext Time (p_c), s	0.0	0.4	0.1	3.3	0.5	0.1	0.0	2.9

Intersection Summary	
HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	486	144	77	486	13	208	59	66	13	25	24
v/c Ratio	0.13	0.54	0.29	0.18	0.46	0.02	0.52	0.04	0.10	0.04	0.06	0.08
Control Delay	27.3	21.8	7.1	26.9	19.2	0.1	26.3	15.2	3.3	28.4	28.0	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	21.8	7.1	26.9	19.2	0.1	26.3	15.2	3.3	28.4	28.0	0.6
Queue Length 50th (ft)	8	76	3	12	76	0	64	6	0	2	4	0
Queue Length 95th (ft)	26	133	40	34	130	0	134	23	16	10	16	0
Internal Link Dist (ft)		1249			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	580	2266	1035	580	2266	1035	1096	2953	1305	451	1468	715
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.21	0.14	0.13	0.21	0.01	0.19	0.02	0.05	0.03	0.02	0.03

Intersection Summary

Intersection	
Intersection Delay, s/veh	35.2
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	10	386	86	16	467	5	100	13	11	3	17	14
Future Vol, veh/h	10	386	86	16	467	5	100	13	11	3	17	14
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	12	471	105	20	570	6	122	16	13	4	21	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	36.7	40.9	13.4	11.1
HCM LOS	E	E	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	81%	2%	3%	9%
Vol Thru, %	10%	80%	96%	50%
Vol Right, %	9%	18%	1%	41%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	124	482	488	34
LT Vol	100	10	16	3
Through Vol	13	386	467	17
RT Vol	11	86	5	14
Lane Flow Rate	151	588	595	41
Geometry Grp	1	1	1	1
Degree of Util (X)	0.304	0.888	0.913	0.085
Departure Headway (Hd)	7.236	5.44	5.521	7.402
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	499	658	649	486
Service Time	5.238	3.53	3.609	5.414
HCM Lane V/C Ratio	0.303	0.894	0.917	0.084
HCM Control Delay	13.4	36.7	40.9	11.1
HCM Lane LOS	B	E	E	B
HCM 95th-tile Q	1.3	10.9	11.7	0.3

Intersection	
Intersection Delay, s/veh	43.6
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	2	150	69	5	198	244	105	232	7	133	228	1
Future Vol, veh/h	2	150	69	5	198	244	105	232	7	133	228	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	155	71	5	204	252	108	239	7	137	235	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	21.3	60.7	37.5	41.8
HCM LOS	C	F	E	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	31%	1%	1%	37%
Vol Thru, %	67%	68%	44%	63%
Vol Right, %	2%	31%	55%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	344	221	447	362
LT Vol	105	2	5	133
Through Vol	232	150	198	228
RT Vol	7	69	244	1
Lane Flow Rate	355	228	461	373
Geometry Grp	1	1	1	1
Degree of Util (X)	0.805	0.54	0.966	0.842
Departure Headway (Hd)	8.173	8.537	7.547	8.124
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	440	421	484	444
Service Time	6.253	6.627	5.547	6.203
HCM Lane V/C Ratio	0.807	0.542	0.952	0.84
HCM Control Delay	37.5	21.3	60.7	41.8
HCM Lane LOS	E	C	F	E
HCM 95th-tile Q	7.3	3.1	12.2	8.2

Intersection	
Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	45	1	8	8	1	1
Future Vol, veh/h	45	1	8	8	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	1	9	9	1	1
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.4	6.8	7.2
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	98%	50%
Vol Thru, %	50%	0%	50%
Vol Right, %	50%	2%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	16	46	2
LT Vol	0	45	1
Through Vol	8	0	1
RT Vol	8	1	0
Lane Flow Rate	17	50	2
Geometry Grp	1	1	1
Degree of Util (X)	0.018	0.058	0.002
Departure Headway (Hd)	3.722	4.15	4.134
Convergence, Y/N	Yes	Yes	Yes
Cap	960	867	865
Service Time	1.75	2.156	2.164
HCM Lane V/C Ratio	0.018	0.058	0.002
HCM Control Delay	6.8	7.4	7.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.2	0

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	48	1	83	1	19	1	1
Future Vol, veh/h	48	1	83	1	19	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	52	1	90	1	21	1	1
Number of Lanes	1	1	1	1	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	8.4	7.8	7.8
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	75%	0%
Vol Thru, %	100%	5%	0%	0%	25%	100%
Vol Right, %	0%	95%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	83	20	48	1	1	1
LT Vol	0	0	48	0	1	0
Through Vol	83	1	0	0	0	1
RT Vol	0	19	0	1	0	0
Lane Flow Rate	90	22	52	1	1	1
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.116	0.024	0.076	0.001	0.002	0.001
Departure Headway (Hd)	4.628	3.962	5.225	4.024	5.058	4.683
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	770	896	679	878	700	755
Service Time	2.387	1.721	3.004	1.802	2.844	2.469
HCM Lane V/C Ratio	0.117	0.025	0.077	0.001	0.001	0.001
HCM Control Delay	8	6.8	8.4	6.8	7.9	7.5
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.2	0	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	370	148	107	588	9	163	42	43	29	48	54
Future Volume (veh/h)	59	370	148	107	588	9	163	42	43	29	48	54
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		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	66	416	144	120	661	9	183	47	41	33	54	36
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	983	429	291	1064	465	244	795	346	129	441	190
Arrive On Green	0.06	0.28	0.28	0.08	0.30	0.30	0.14	0.22	0.22	0.04	0.12	0.12
Sat Flow, veh/h	3456	3554	1551	3456	3554	1552	1781	3554	1548	3456	3554	1533
Grp Volume(v), veh/h	66	416	144	120	661	9	183	47	41	33	54	36
Grp Sat Flow(s),veh/h/ln	1728	1777	1551	1728	1777	1552	1781	1777	1548	1728	1777	1533
Q Serve(g_s), s	0.9	4.5	3.5	1.6	7.5	0.2	4.7	0.5	1.0	0.4	0.6	1.0
Cycle Q Clear(g_c), s	0.9	4.5	3.5	1.6	7.5	0.2	4.7	0.5	1.0	0.4	0.6	1.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	212	983	429	291	1064	465	244	795	346	129	441	190
V/C Ratio(X)	0.31	0.42	0.34	0.41	0.62	0.02	0.75	0.06	0.12	0.26	0.12	0.19
Avail Cap(c_a), veh/h	587	2725	1190	881	3027	1322	1059	3178	1384	587	1668	720
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	21.1	13.9	13.6	20.5	14.2	11.6	19.5	14.4	14.6	22.0	18.3	18.5
Incr Delay (d2), s/veh	0.8	0.3	0.5	0.9	0.6	0.0	4.6	0.0	0.2	1.0	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	0.3	1.4	1.0	0.5	2.3	0.1	1.9	0.2	0.3	0.2	0.2	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.0	14.2	14.0	21.4	14.8	11.6	24.1	14.4	14.7	23.1	18.5	19.0
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		626			790			271			123	
Approach Delay, s/veh		15.0			15.8			21.0			19.8	
Approach LOS		B			B			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.8	15.4	8.0	17.9	10.5	10.7	6.9	19.0				
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	8.0	42.1	12.0	36.1	28.0	22.1	8.0	40.1				
Max Q Clear Time (g_c+I1), s	2.4	3.0	3.6	6.5	6.7	3.0	2.9	9.5				
Green Ext Time (p_c), s	0.0	0.4	0.2	3.0	0.4	0.3	0.1	4.3				
Intersection Summary												
HCM 6th Ctrl Delay			16.6									
HCM 6th LOS			B									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	66	416	166	120	661	10	183	47	48	33	54	61
v/c Ratio	0.17	0.42	0.31	0.26	0.63	0.02	0.50	0.04	0.08	0.09	0.14	0.21
Control Delay	29.5	20.3	8.2	28.8	22.1	0.1	28.7	19.5	1.6	29.9	29.5	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	20.3	8.2	28.8	22.1	0.1	28.7	19.5	1.6	29.9	29.5	1.6
Queue Length 50th (ft)	11	66	10	21	111	0	61	5	0	5	10	0
Queue Length 95th (ft)	33	121	54	51	187	0	133	22	7	20	29	0
Internal Link Dist (ft)		1249			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	485	2259	1033	728	2459	1113	876	2546	1137	485	1383	682
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.18	0.16	0.16	0.27	0.01	0.21	0.02	0.04	0.07	0.04	0.09

Intersection Summary

Intersection	
Intersection Delay, s/veh	23.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	23	289	136	12	496	11	117	13	10	15	25	31
Future Vol, veh/h	23	289	136	12	496	11	117	13	10	15	25	31
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	24	307	145	13	528	12	124	14	11	16	27	33
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	21	30.1	12.8	11.1
HCM LOS	C	D	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	84%	5%	2%	21%
Vol Thru, %	9%	65%	96%	35%
Vol Right, %	7%	30%	2%	44%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	448	519	71
LT Vol	117	23	12	15
Through Vol	13	289	496	25
RT Vol	10	136	11	31
Lane Flow Rate	149	477	552	76
Geometry Grp	1	1	1	1
Degree of Util (X)	0.29	0.714	0.834	0.146
Departure Headway (Hd)	7.001	5.396	5.44	6.942
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	515	662	657	519
Service Time	5.007	3.489	3.528	4.952
HCM Lane V/C Ratio	0.289	0.721	0.84	0.146
HCM Control Delay	12.8	21	30.1	11.1
HCM Lane LOS	B	C	D	B
HCM 95th-tile Q	1.2	6	9	0.5

Intersection	
Intersection Delay, s/veh	59.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	3	184	53	3	173	191	69	221	14	164	205	6
Future Vol, veh/h	3	184	53	3	173	191	69	221	14	164	205	6
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	211	61	3	199	220	79	254	16	189	236	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	30.8	64.4	46.4	84.7
HCM LOS	D	F	E	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	23%	1%	1%	44%
Vol Thru, %	73%	77%	47%	55%
Vol Right, %	5%	22%	52%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	304	240	367	375
LT Vol	69	3	3	164
Through Vol	221	184	173	205
RT Vol	14	53	191	6
Lane Flow Rate	349	276	422	431
Geometry Grp	1	1	1	1
Degree of Util (X)	0.853	0.693	0.964	1.039
Departure Headway (Hd)	9.021	9.312	8.445	8.675
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	405	392	434	422
Service Time	7.021	7.312	6.445	6.675
HCM Lane V/C Ratio	0.862	0.704	0.972	1.021
HCM Control Delay	46.4	30.8	64.4	84.7
HCM Lane LOS	E	D	F	F
HCM 95th-tile Q	8.2	5.1	11.5	13.8

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	30	1	25	26	1	1
Future Vol, veh/h	30	1	25	26	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	1	27	28	1	1
Number of Lanes	1	0	1	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	7.4	6.9	7.2
HCM LOS	A	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	0%	97%	50%
Vol Thru, %	49%	0%	50%
Vol Right, %	51%	3%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	51	31	2
LT Vol	0	30	1
Through Vol	25	0	1
RT Vol	26	1	0
Lane Flow Rate	55	34	2
Geometry Grp	1	1	1
Degree of Util (X)	0.057	0.039	0.002
Departure Headway (Hd)	3.689	4.208	4.135
Convergence, Y/N	Yes	Yes	Yes
Cap	972	853	866
Service Time	1.707	2.224	2.159
HCM Lane V/C Ratio	0.057	0.04	0.002
HCM Control Delay	6.9	7.4	7.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0.1	0

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	31	1	30	1	52	1	1
Future Vol, veh/h	31	1	30	1	52	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	34	1	33	1	57	1	1
Number of Lanes	1	1	1	1	0	0	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	2	2	0
HCM Control Delay	8.2	7.1	7.7
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	0%	100%	0%	75%	0%
Vol Thru, %	100%	2%	0%	0%	25%	100%
Vol Right, %	0%	98%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	53	31	1	1	1
LT Vol	0	0	31	0	1	0
Through Vol	30	1	0	0	0	1
RT Vol	0	52	0	1	0	0
Lane Flow Rate	33	58	34	1	1	1
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.042	0.063	0.049	0.001	0.002	0.001
Departure Headway (Hd)	4.596	3.909	5.189	3.988	5.015	4.64
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	777	913	688	892	710	767
Service Time	2.334	1.647	2.937	1.736	2.769	2.393
HCM Lane V/C Ratio	0.042	0.064	0.049	0.001	0.001	0.001
HCM Control Delay	7.5	6.9	8.2	6.7	7.8	7.4
HCM Lane LOS	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.2	0	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	432	125	71	429	21	181	62	65	16	29	39
Future Volume (veh/h)	76	432	125	71	429	21	181	62	65	16	29	39
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		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	497	124	82	493	21	208	71	38	18	33	27
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	254	892	389	246	884	385	277	930	406	77	456	197
Arrive On Green	0.07	0.25	0.25	0.07	0.25	0.25	0.16	0.26	0.26	0.02	0.13	0.13
Sat Flow, veh/h	3456	3554	1550	3456	3554	1550	1781	3554	1550	3456	3554	1534
Grp Volume(v), veh/h	87	497	124	82	493	21	208	71	38	18	33	27
Grp Sat Flow(s),veh/h/ln	1728	1777	1550	1728	1777	1550	1781	1777	1550	1728	1777	1534
Q Serve(g_s), s	1.1	5.5	2.9	1.0	5.5	0.5	5.0	0.7	0.8	0.2	0.4	0.7
Cycle Q Clear(g_c), s	1.1	5.5	2.9	1.0	5.5	0.5	5.0	0.7	0.8	0.2	0.4	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	254	892	389	246	884	385	277	930	406	77	456	197
V/C Ratio(X)	0.34	0.56	0.32	0.33	0.56	0.05	0.75	0.08	0.09	0.23	0.07	0.14
Avail Cap(c_a), veh/h	688	2681	1169	688	2681	1169	1300	3781	1650	535	1737	750
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	19.9	14.7	13.8	20.0	14.8	12.9	18.2	12.6	12.6	21.7	17.3	17.5
Incr Delay (d2), s/veh	0.8	0.5	0.5	0.8	0.6	0.1	4.1	0.0	0.1	1.5	0.1	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	0.4	1.7	0.8	0.4	1.7	0.1	2.0	0.2	0.2	0.1	0.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.7	15.3	14.2	20.8	15.4	13.0	22.3	12.6	12.7	23.2	17.4	17.8
LnGrp LOS	C	B	B	C	B	B	C	B	B	C	B	B
Approach Vol, veh/h		708			596			317			78	
Approach Delay, s/veh		15.8			16.0			19.0			18.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.0	16.7	7.2	16.2	11.0	10.7	7.3	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	7.0	48.1	9.0	34.1	33.0	22.1	9.0	34.1
Max Q Clear Time (g_c+I1), s	2.2	2.8	3.0	7.5	7.0	2.7	3.1	7.5
Green Ext Time (p_c), s	0.0	0.5	0.1	3.4	0.5	0.2	0.1	3.0

Intersection Summary	
HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	87	497	144	82	493	24	208	71	75	18	33	45
v/c Ratio	0.20	0.55	0.29	0.19	0.55	0.05	0.52	0.05	0.12	0.05	0.08	0.16
Control Delay	27.3	22.1	7.1	27.4	22.1	0.2	26.7	15.3	4.2	28.8	28.1	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	22.1	7.1	27.4	22.1	0.2	26.7	15.3	4.2	28.8	28.1	1.2
Queue Length 50th (ft)	14	79	3	13	78	0	65	7	0	3	5	0
Queue Length 95th (ft)	37	137	40	36	137	0	136	26	20	12	19	0
Internal Link Dist (ft)		1249			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	574	2244	1026	574	2244	1026	1086	2925	1293	446	1454	710
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.22	0.14	0.14	0.22	0.02	0.19	0.02	0.06	0.04	0.02	0.06

Intersection Summary

Intersection	
Intersection Delay, s/veh	53.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	27	390	87	16	474	20	103	19	11	12	21	24
Future Vol, veh/h	27	390	87	16	474	20	103	19	11	12	21	24
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	33	476	106	20	578	24	126	23	13	15	26	29
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	55.8	66.6	14.5	12.2
HCM LOS	F	F	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	77%	5%	3%	21%
Vol Thru, %	14%	77%	93%	37%
Vol Right, %	8%	17%	4%	42%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	133	504	510	57
LT Vol	103	27	16	12
Through Vol	19	390	474	21
RT Vol	11	87	20	24
Lane Flow Rate	162	615	622	70
Geometry Grp	1	1	1	1
Degree of Util (X)	0.337	0.981	1.023	0.147
Departure Headway (Hd)	7.689	5.888	5.92	7.869
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	470	621	616	459
Service Time	5.689	3.888	3.92	5.869
HCM Lane V/C Ratio	0.345	0.99	1.01	0.153
HCM Control Delay	14.5	55.8	66.6	12.2
HCM Lane LOS	B	F	F	B
HCM 95th-tile Q	1.5	14.3	16.2	0.5

Intersection	
Intersection Delay, s/veh	106.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	3	162	72	18	222	316	111	271	13	139	255	3
Future Vol, veh/h	3	162	72	18	222	316	111	271	13	139	255	3
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	167	74	19	229	326	114	279	13	143	263	3
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	29.3	189.4	71.5	73
HCM LOS	D	F	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	28%	1%	3%	35%
Vol Thru, %	69%	68%	40%	64%
Vol Right, %	3%	30%	57%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	395	237	556	397
LT Vol	111	3	18	139
Through Vol	271	162	222	255
RT Vol	13	72	316	3
Lane Flow Rate	407	244	573	409
Geometry Grp	1	1	1	1
Degree of Util (X)	0.971	0.627	1.333	0.977
Departure Headway (Hd)	9.669	10.362	8.374	9.684
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	379	352	441	377
Service Time	7.669	8.362	6.374	7.684
HCM Lane V/C Ratio	1.074	0.693	1.299	1.085
HCM Control Delay	71.5	29.3	189.4	73
HCM Lane LOS	F	D	F	F
HCM 95th-tile Q	11	4	26.1	11.1

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	292	12	12	460	38	8
Future Vol, veh/h	292	12	12	460	38	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	317	13	13	500	41	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	330	0	850	324
Stage 1	-	-	-	-	324	-
Stage 2	-	-	-	-	526	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1229	-	331	717
Stage 1	-	-	-	-	733	-
Stage 2	-	-	-	-	593	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1229	-	326	717
Mov Cap-2 Maneuver	-	-	-	-	326	-
Stage 1	-	-	-	-	733	-
Stage 2	-	-	-	-	584	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	16.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	360	-	-	1229	-
HCM Lane V/C Ratio	0.139	-	-	0.011	-
HCM Control Delay (s)	16.6	-	-	8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	1	104	32	1	13	36	66	6	4	175	3
Future Vol, veh/h	9	1	104	32	1	13	36	66	6	4	175	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	1	113	35	1	14	39	72	7	4	190	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	361	357	192	411	355	76	193	0	0	79	0	0
Stage 1	200	200	-	154	154	-	-	-	-	-	-	-
Stage 2	161	157	-	257	201	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	595	569	850	551	571	985	1380	-	-	1519	-	-
Stage 1	802	736	-	848	770	-	-	-	-	-	-	-
Stage 2	841	768	-	748	735	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	572	551	850	466	553	985	1380	-	-	1519	-	-
Mov Cap-2 Maneuver	572	551	-	466	553	-	-	-	-	-	-	-
Stage 1	780	734	-	824	748	-	-	-	-	-	-	-
Stage 2	804	746	-	646	733	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	12	2.6	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1380	-	-	572	846	466	933	1519	-	-
HCM Lane V/C Ratio	0.028	-	-	0.017	0.135	0.075	0.016	0.003	-	-
HCM Control Delay (s)	7.7	-	-	11.4	9.9	13.3	8.9	7.4	-	-
HCM Lane LOS	A	-	-	B	A	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.5	0.2	0.1	0	-	-

Intersection	
Intersection Delay, s/veh	17.8
Intersection LOS	C

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	360	3	83	116	188	3	226
Future Vol, veh/h	360	3	83	116	188	3	226
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	391	3	90	126	204	3	246
Number of Lanes	1	1	1	2	0	1	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	3	3
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	3	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	3	2	0
HCM Control Delay	28.2	12.3	10.8
HCM LOS	D	B	B

Lane	NBLn1	NBLn2	NBLn3	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	0%	0%	0%	100%	0%	100%	0%	0%
Vol Thru, %	100%	100%	17%	0%	0%	0%	100%	100%
Vol Right, %	0%	0%	83%	0%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	83	77	227	360	3	3	113	113
LT Vol	0	0	0	360	0	3	0	0
Through Vol	83	77	39	0	0	0	113	113
RT Vol	0	0	188	0	3	0	0	0
Lane Flow Rate	90	84	246	391	3	3	123	123
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.169	0.158	0.422	0.757	0.005	0.007	0.244	0.183
Departure Headway (Hd)	6.763	6.763	6.169	6.966	5.768	7.664	7.151	5.373
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	527	527	579	517	617	464	499	661
Service Time	4.55	4.55	3.956	4.733	3.534	5.462	4.948	3.167
HCM Lane V/C Ratio	0.171	0.159	0.425	0.756	0.005	0.006	0.246	0.186
HCM Control Delay	10.9	10.8	13.4	28.4	8.6	10.5	12.3	9.4
HCM Lane LOS	B	B	B	D	A	B	B	A
HCM 95th-tile Q	0.6	0.6	2.1	6.6	0	0	0.9	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	611	166	202	853	68	185	155	81	161	329	173
Future Volume (veh/h)	117	611	166	202	853	68	185	155	81	161	329	173
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		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	131	687	165	227	958	75	208	174	84	181	370	169
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	228	1175	514	333	1283	561	259	842	367	278	611	265
Arrive On Green	0.07	0.33	0.33	0.10	0.36	0.36	0.15	0.24	0.24	0.08	0.17	0.17
Sat Flow, veh/h	3456	3554	1554	3456	3554	1555	1781	3554	1549	3456	3554	1542
Grp Volume(v), veh/h	131	687	165	227	958	75	208	174	84	181	370	169
Grp Sat Flow(s),veh/h/ln	1728	1777	1554	1728	1777	1555	1781	1777	1549	1728	1777	1542
Q Serve(g_s), s	2.6	11.2	5.5	4.4	16.4	2.3	7.9	2.7	3.0	3.5	6.7	7.1
Cycle Q Clear(g_c), s	2.6	11.2	5.5	4.4	16.4	2.3	7.9	2.7	3.0	3.5	6.7	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	228	1175	514	333	1283	561	259	842	367	278	611	265
V/C Ratio(X)	0.57	0.58	0.32	0.68	0.75	0.13	0.80	0.21	0.23	0.65	0.61	0.64
Avail Cap(c_a), veh/h	446	1994	872	645	2198	962	614	1785	778	551	1127	489
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	31.6	19.3	17.5	30.4	19.5	14.9	28.8	21.3	21.5	31.1	26.7	26.8
Incr Delay (d2), s/veh	2.3	0.5	0.4	2.5	0.9	0.1	5.7	0.1	0.3	2.6	1.0	2.5
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	1.0	4.0	1.7	1.8	5.8	0.7	3.5	1.0	1.0	1.5	2.7	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.8	19.8	17.8	32.9	20.4	15.1	34.5	21.5	21.8	33.6	27.6	29.4
LnGrp LOS	C	B	B	C	C	B	C	C	C	C	C	C
Approach Vol, veh/h		983			1260			466			720	
Approach Delay, s/veh		21.3			22.3			27.3			29.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.6	21.4	10.7	27.9	14.1	16.9	8.6	30.1
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	11.1	35.0	13.0	39.1	24.0	22.1	9.0	43.1
Max Q Clear Time (g_c+I1), s	5.5	5.0	6.4	13.2	9.9	9.1	4.6	18.4
Green Ext Time (p_c), s	0.2	1.3	0.4	4.9	0.5	2.3	0.1	6.7

Intersection Summary			
HCM 6th Ctrl Delay			24.2
HCM 6th LOS			C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	131	687	187	227	958	76	208	174	91	181	370	194
v/c Ratio	0.41	0.61	0.32	0.54	0.78	0.12	0.65	0.20	0.20	0.49	0.60	0.46
Control Delay	48.1	29.7	10.7	46.2	32.1	0.8	47.5	28.9	7.4	47.0	41.2	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	29.7	10.7	46.2	32.1	0.8	47.5	28.9	7.4	47.0	41.2	9.9
Queue Length 50th (ft)	37	175	23	64	257	0	114	42	0	51	105	2
Queue Length 95th (ft)	80	278	82	124	392	4	219	77	35	104	181	63
Internal Link Dist (ft)		1249			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	355	1589	765	512	1751	830	487	1422	676	437	898	533
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.43	0.24	0.44	0.55	0.09	0.43	0.12	0.13	0.41	0.41	0.36

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	601	213	67	774	31	159	30	49	39	62	121
Future Volume (veh/h)	78	601	213	67	774	31	159	30	49	39	62	121
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	83	639	181	71	823	27	169	32	41	41	66	103
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	110	757	622	102	1423	615	213	371	302	73	224	183
Arrive On Green	0.06	0.41	0.41	0.06	0.40	0.40	0.12	0.20	0.20	0.04	0.12	0.12
Sat Flow, veh/h	1767	1856	1525	1767	3526	1524	1767	1856	1507	1767	1856	1520
Grp Volume(v), veh/h	83	639	181	71	823	27	169	32	41	41	66	103
Grp Sat Flow(s),veh/h/ln	1767	1856	1525	1767	1763	1524	1767	1856	1507	1767	1856	1520
Q Serve(g_s), s	2.8	18.9	4.8	2.4	11.0	0.7	5.6	0.9	1.4	1.4	2.0	3.9
Cycle Q Clear(g_c), s	2.8	18.9	4.8	2.4	11.0	0.7	5.6	0.9	1.4	1.4	2.0	3.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	110	757	622	102	1423	615	213	371	302	73	224	183
V/C Ratio(X)	0.76	0.84	0.29	0.70	0.58	0.04	0.79	0.09	0.14	0.56	0.30	0.56
Avail Cap(c_a), veh/h	288	1103	907	175	1870	808	320	724	588	186	584	478
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	28.0	16.2	12.1	28.1	14.1	11.0	26.0	19.8	20.0	28.6	24.3	25.2
Incr Delay (d2), s/veh	10.1	4.1	0.3	8.4	0.4	0.0	7.7	0.1	0.2	6.7	0.7	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	6.9	1.3	1.1	3.4	0.2	2.6	0.3	0.4	0.7	0.8	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.1	20.3	12.3	36.5	14.5	11.0	33.7	19.9	20.2	35.3	25.1	27.9
LnGrp LOS	D	C	B	D	B	B	C	B	C	D	C	C
Approach Vol, veh/h		903			921			242			210	
Approach Delay, s/veh		20.4			16.1			29.6			28.4	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	17.0	7.5	29.7	11.3	12.2	7.8	29.4
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	6.4	23.7	6.0	36.1	11.0	19.1	9.9	32.2
Max Q Clear Time (g_c+I1), s	3.4	3.4	4.4	20.9	7.6	5.9	4.8	13.0
Green Ext Time (p_c), s	0.0	0.2	0.0	3.9	0.1	0.5	0.1	5.0

Intersection Summary	
HCM 6th Ctrl Delay	20.3
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	83	639	227	71	823	33	169	32	52	41	66	129
v/c Ratio	0.40	0.82	0.30	0.46	0.60	0.05	0.64	0.07	0.11	0.26	0.31	0.40
Control Delay	38.3	29.1	3.3	46.2	20.1	0.1	44.8	27.4	0.5	38.9	36.0	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	29.1	3.3	46.2	20.1	0.1	44.8	27.4	0.5	38.9	36.0	6.6
Queue Length 50th (ft)	37	251	0	33	157	0	78	13	0	19	30	0
Queue Length 95th (ft)	83	#424	38	#90	231	0	#176	37	0	51	68	28
Internal Link Dist (ft)		1248			771			1086			1554	
Turn Bay Length (ft)	275		275	150		25	105		105	175		100
Base Capacity (vph)	258	993	917	157	1684	812	287	652	610	167	525	556
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.64	0.25	0.45	0.49	0.04	0.59	0.05	0.09	0.25	0.13	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Intersection Delay, s/veh	127.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	3	213	60	16	193	204	74	256	26	186	255	6
Future Vol, veh/h	3	213	60	16	193	204	74	256	26	186	255	6
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	245	69	18	222	234	85	294	30	214	293	7
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	52	135	95.8	192.3
HCM LOS	F	F	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	21%	1%	4%	42%
Vol Thru, %	72%	77%	47%	57%
Vol Right, %	7%	22%	49%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	356	276	413	447
LT Vol	74	3	16	186
Through Vol	256	213	193	255
RT Vol	26	60	204	6
Lane Flow Rate	409	317	475	514
Geometry Grp	1	1	1	1
Degree of Util (X)	1.046	0.835	1.175	1.324
Departure Headway (Hd)	10.702	11.239	9.986	10.047
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	344	324	366	365
Service Time	8.702	9.239	7.986	8.047
HCM Lane V/C Ratio	1.189	0.978	1.298	1.408
HCM Control Delay	95.8	52	135	192.3
HCM Lane LOS	F	F	F	F
HCM 95th-tile Q	12.5	7.2	17.1	22.4

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	364	43	13	369	26	12
Future Vol, veh/h	364	43	13	369	26	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	396	47	14	401	28	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	443	0	849	420
Stage 1	-	-	-	-	420	-
Stage 2	-	-	-	-	429	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1117	-	331	633
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	657	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1117	-	326	633
Mov Cap-2 Maneuver	-	-	-	-	326	-
Stage 1	-	-	-	-	663	-
Stage 2	-	-	-	-	646	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	15.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	385	-	-	1117	-
HCM Lane V/C Ratio	0.107	-	-	0.013	-
HCM Control Delay (s)	15.5	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

Intersection												
Int Delay, s/veh	3.8											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	1	70	21	1	9	118	216	18	15	118	10
Future Vol, veh/h	6	1	70	21	1	9	118	216	18	15	118	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	76	23	1	10	128	235	20	16	128	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	673	677	134	705	672	245	139	0	0	255	0	0
Stage 1	166	166	-	501	501	-	-	-	-	-	-	-
Stage 2	507	511	-	204	171	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	369	375	915	351	377	794	1445	-	-	1310	-	-
Stage 1	836	761	-	552	543	-	-	-	-	-	-	-
Stage 2	548	537	-	798	757	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	336	338	915	297	339	794	1445	-	-	1310	-	-
Mov Cap-2 Maneuver	336	338	-	297	339	-	-	-	-	-	-	-
Stage 1	762	752	-	503	495	-	-	-	-	-	-	-
Stage 2	492	489	-	722	748	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	9.9			15.6			2.6			0.8		
HCM LOS	A			C								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1445	-	-	336	894	297	700	1310	-	-
HCM Lane V/C Ratio	0.089	-	-	0.019	0.086	0.077	0.016	0.012	-	-
HCM Control Delay (s)	7.7	-	-	15.9	9.4	18.1	10.2	7.8	-	-
HCM Lane LOS	A	-	-	C	A	C	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	0.3	0.2	0	0	-	-

Intersection	
Intersection Delay, s/veh	37.9
Intersection LOS	E

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	312	1	30	268	447	1	196
Future Vol, veh/h	312	1	30	268	447	1	196
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	339	1	33	291	486	1	213
Number of Lanes	1	1	1	2	0	1	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	3	3
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	3	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	3	2	0
HCM Control Delay	30.3	48.1	11.6
HCM LOS	D	E	B

Lane	NBLn1	NBLn2	NBLn3	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	0%	0%	0%	100%	0%	100%	0%	0%
Vol Thru, %	100%	100%	17%	0%	0%	0%	100%	100%
Vol Right, %	0%	0%	83%	0%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	30	179	536	312	1	1	98	98
LT Vol	0	0	0	312	0	1	0	0
Through Vol	30	179	89	0	0	0	98	98
RT Vol	0	0	447	0	1	0	0	0
Lane Flow Rate	33	194	583	339	1	1	107	107
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.061	0.365	1	0.745	0.002	0.003	0.236	0.183
Departure Headway (Hd)	6.771	6.771	6.174	7.907	6.705	8.497	7.981	6.192
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	530	532	589	458	533	429	458	586
Service Time	4.504	4.504	3.907	5.639	4.449	6.098	5.596	3.856
HCM Lane V/C Ratio	0.062	0.365	0.99	0.74	0.002	0.002	0.234	0.183
HCM Control Delay	9.9	13.4	61.8	30.4	9.5	11.1	13	10.2
HCM Lane LOS	A	B	F	D	A	B	B	B
HCM 95th-tile Q	0.2	1.7	14.7	6.1	0	0	0.9	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	811	163	144	817	165	228	380	200	128	243	147
Future Volume (veh/h)	207	811	163	144	817	165	228	380	200	128	243	147
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	238	932	167	166	939	187	262	437	193	147	279	151
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	336	1316	576	253	1231	538	312	914	399	230	527	228
Arrive On Green	0.10	0.37	0.37	0.07	0.35	0.35	0.18	0.26	0.26	0.07	0.15	0.15
Sat Flow, veh/h	3456	3554	1555	3456	3554	1554	1781	3554	1550	3456	3554	1539
Grp Volume(v), veh/h	238	932	167	166	939	187	262	437	193	147	279	151
Grp Sat Flow(s),veh/h/ln	1728	1777	1555	1728	1777	1554	1781	1777	1550	1728	1777	1539
Q Serve(g_s), s	5.1	17.1	5.8	3.6	18.0	6.8	10.9	8.0	8.1	3.2	5.6	7.1
Cycle Q Clear(g_c), s	5.1	17.1	5.8	3.6	18.0	6.8	10.9	8.0	8.1	3.2	5.6	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	336	1316	576	253	1231	538	312	914	399	230	527	228
V/C Ratio(X)	0.71	0.71	0.29	0.66	0.76	0.35	0.84	0.48	0.48	0.64	0.53	0.66
Avail Cap(c_a), veh/h	587	1988	870	465	1863	815	605	1645	717	438	887	384
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	33.5	20.5	17.0	34.5	22.2	18.6	30.5	24.1	24.1	34.8	30.1	30.8
Incr Delay (d2), s/veh	2.8	0.7	0.3	2.9	1.0	0.4	6.0	0.4	0.9	2.9	0.8	3.3
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	6.2	1.8	1.5	6.6	2.2	4.8	3.1	2.7	1.3	2.3	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	21.3	17.3	37.4	23.2	19.0	36.5	24.5	25.0	37.7	30.9	34.0
LnGrp LOS	D	C	B	D	C	B	D	C	C	D	C	C
Approach Vol, veh/h		1337			1292			892			577	
Approach Delay, s/veh		23.4			24.4			28.1			33.5	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	24.6	9.6	33.2	17.4	16.2	11.4	31.4				
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	9.7	35.4	10.3	42.8	26.0	19.1	13.0	40.1				
Max Q Clear Time (g_c+I1), s	5.2	10.1	5.6	19.1	12.9	9.1	7.1	20.0				
Green Ext Time (p_c), s	0.2	3.3	0.2	6.8	0.6	1.5	0.4	6.5				
Intersection Summary												
HCM 6th Ctrl Delay			26.2									
HCM 6th LOS			C									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	238	932	187	166	939	190	262	437	230	147	279	169
v/c Ratio	0.58	0.73	0.29	0.49	0.78	0.29	0.73	0.50	0.46	0.46	0.56	0.47
Control Delay	48.7	30.8	9.4	49.7	34.1	5.0	50.3	33.2	13.6	49.9	45.0	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.7	30.8	9.4	49.7	34.1	5.0	50.3	33.2	13.6	49.9	45.0	11.3
Queue Length 50th (ft)	73	257	23	51	270	0	154	124	34	45	87	0
Queue Length 95th (ft)	126	368	73	94	386	44	261	176	96	86	140	55
Internal Link Dist (ft)		1249			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	487	1653	791	386	1549	782	502	1367	695	363	738	454
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.56	0.24	0.43	0.61	0.24	0.52	0.32	0.33	0.40	0.38	0.37

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	151	811	159	62	931	50	192	46	74	33	63	123
Future Volume (veh/h)	151	811	159	62	931	50	192	46	74	33	63	123
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		0.96
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	184	989	155	76	1135	49	234	56	72	40	77	120
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	211	1022	842	92	1705	739	259	410	334	54	194	159
Arrive On Green	0.12	0.55	0.55	0.05	0.48	0.48	0.15	0.22	0.22	0.03	0.10	0.10
Sat Flow, veh/h	1767	1856	1529	1767	3526	1527	1767	1856	1511	1767	1856	1515
Grp Volume(v), veh/h	184	989	155	76	1135	49	234	56	72	40	77	120
Grp Sat Flow(s),veh/h/ln	1767	1856	1529	1767	1763	1527	1767	1856	1511	1767	1856	1515
Q Serve(g_s), s	12.5	62.7	6.2	5.2	30.0	2.1	15.9	3.0	4.8	2.7	4.7	9.4
Cycle Q Clear(g_c), s	12.5	62.7	6.2	5.2	30.0	2.1	15.9	3.0	4.8	2.7	4.7	9.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	211	1022	842	92	1705	739	259	410	334	54	194	159
V/C Ratio(X)	0.87	0.97	0.18	0.82	0.67	0.07	0.90	0.14	0.22	0.75	0.40	0.76
Avail Cap(c_a), veh/h	257	1048	864	92	1705	739	260	447	364	104	284	232
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	52.9	26.4	13.7	57.4	24.0	16.8	51.3	38.3	39.0	58.8	51.2	53.2
Incr Delay (d2), s/veh	22.8	20.1	0.1	42.4	1.0	0.0	31.7	0.2	0.3	18.3	1.3	8.0
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	6.7	30.0	2.0	3.3	11.7	0.7	9.2	1.4	1.7	1.5	2.2	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.7	46.5	13.8	99.8	25.0	16.9	83.0	38.4	39.3	77.1	52.5	61.3
LnGrp LOS	E	D	B	F	C	B	F	D	D	E	D	E
Approach Vol, veh/h		1328			1260			362			237	
Approach Delay, s/veh		46.8			29.2			67.4			61.1	
Approach LOS		D			C			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	31.9	10.4	72.3	21.9	17.7	18.6	64.1
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	7.2	29.5	6.4	69.1	18.0	18.7	17.8	57.7
Max Q Clear Time (g_c+I1), s	4.7	6.8	7.2	64.7	17.9	11.4	14.5	32.0
Green Ext Time (p_c), s	0.0	0.4	0.0	2.7	0.0	0.4	0.1	8.3

Intersection Summary	
HCM 6th Ctrl Delay	43.2
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	184	989	194	76	1135	61	234	56	90	40	77	150
v/c Ratio	0.79	0.94	0.21	0.83	0.67	0.08	0.90	0.16	0.23	0.41	0.49	0.56
Control Delay	74.7	43.1	4.9	113.2	26.8	0.2	87.8	43.5	4.9	69.1	63.6	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.7	43.1	4.9	113.2	26.8	0.2	87.8	43.5	4.9	69.1	63.6	16.6
Queue Length 50th (ft)	140	690	19	60	356	0	183	38	0	31	59	0
Queue Length 95th (ft)	#205	#899	46	#136	400	0	#301	69	17	65	99	47
Internal Link Dist (ft)		1248			771			1086			1554	
Turn Bay Length (ft)	275		275	150		25	105		105	175		100
Base Capacity (vph)	256	1047	913	92	1706	808	259	447	451	103	283	360
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.94	0.21	0.83	0.67	0.08	0.90	0.13	0.20	0.39	0.27	0.42

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Intersection Delay, s/veh	462
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	3	188	98	61	529	390	133	290	14	169	594	11
Future Vol, veh/h	3	188	98	61	529	390	133	290	14	169	594	11
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	194	101	63	545	402	137	299	14	174	612	11
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	68.2	692.6	148.1	494.2
HCM LOS	F	F	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	1%	6%	22%
Vol Thru, %	66%	65%	54%	77%
Vol Right, %	3%	34%	40%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	437	289	980	774
LT Vol	133	3	61	169
Through Vol	290	188	529	594
RT Vol	14	98	390	11
Lane Flow Rate	451	298	1010	798
Geometry Grp	1	1	1	1
Degree of Util (X)	1.132	0.78	2.464	2.004
Departure Headway (Hd)	17.2	19.063	11.685	13.63
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	216	194	323	279
Service Time	15.2	17.063	9.685	11.63
HCM Lane V/C Ratio	2.088	1.536	3.127	2.86
HCM Control Delay	148.1	68.2	692.6	494.2
HCM Lane LOS	F	F	F	F
HCM 95th-tile Q	11.3	5.3	61	38.3

Intersection						
Int Delay, s/veh	25.7					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	292	170	21	542	238	23
Future Vol, veh/h	292	170	21	542	238	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	317	185	23	589	259	25

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	502	0	1045	410
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	635	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1062	-	~ 253	642
Stage 1	-	-	-	-	670	-
Stage 2	-	-	-	-	528	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1062	-	~ 245	642
Mov Cap-2 Maneuver	-	-	-	-	~ 245	-
Stage 1	-	-	-	-	670	-
Stage 2	-	-	-	-	511	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	125.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	259	-	-	1062	-
HCM Lane V/C Ratio	1.095	-	-	0.021	-
HCM Control Delay (s)	125.9	-	-	8.5	0
HCM Lane LOS	F	-	-	A	A
HCM 95th %tile Q(veh)	12	-	-	0.1	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	1	104	60	1	215	36	74	32	185	183	3
Future Vol, veh/h	9	1	104	60	1	215	36	74	32	185	183	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	1	113	65	1	234	39	80	35	201	199	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	896	796	201	836	780	98	202	0	0	115	0	0
Stage 1	603	603	-	176	176	-	-	-	-	-	-	-
Stage 2	293	193	-	660	604	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	261	320	840	287	327	958	1370	-	-	1474	-	-
Stage 1	486	488	-	826	753	-	-	-	-	-	-	-
Stage 2	715	741	-	452	488	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	173	269	840	217	275	958	1370	-	-	1474	-	-
Mov Cap-2 Maneuver	173	269	-	217	275	-	-	-	-	-	-	-
Stage 1	472	422	-	803	732	-	-	-	-	-	-	-
Stage 2	524	720	-	337	422	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	14.1	2	3.9
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1370	-	-	173	823	217	947	1474	-	-
HCM Lane V/C Ratio	0.029	-	-	0.057	0.139	0.301	0.248	0.136	-	-
HCM Control Delay (s)	7.7	-	-	27.1	10.1	28.6	10.1	7.8	-	-
HCM Lane LOS	A	-	-	D	B	D	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.5	1.2	1	0.5	-	-

Intersection	
Intersection Delay, s/veh	84.1
Intersection LOS	F

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	362	36	87	485	192	30	914
Future Vol, veh/h	362	36	87	485	192	30	914
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	393	39	95	527	209	33	993
Number of Lanes	1	1	1	2	0	1	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	3	3
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	3	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	3	2	0
HCM Control Delay	117.1	47.5	99.9
HCM LOS	F	E	F

Lane	NBLn1	NBLn2	NBLn3	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	0%	0%	0%	100%	0%	100%	0%	0%
Vol Thru, %	100%	100%	46%	0%	0%	0%	100%	100%
Vol Right, %	0%	0%	54%	0%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	87	323	354	362	36	30	457	457
LT Vol	0	0	0	362	0	30	0	0
Through Vol	87	323	162	0	0	0	457	457
RT Vol	0	0	192	0	36	0	0	0
Lane Flow Rate	95	351	384	393	39	33	497	497
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.231	0.859	0.899	1.144	0.101	0.084	1.208	0.969
Departure Headway (Hd)	9.536	9.536	9.138	10.846	9.622	9.922	9.397	7.578
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	379	383	400	338	375	363	392	482
Service Time	7.236	7.236	6.838	8.546	7.322	7.622	7.097	5.278
HCM Lane V/C Ratio	0.251	0.916	0.96	1.163	0.104	0.091	1.268	1.031
HCM Control Delay	15.1	49	54	127.4	13.4	13.5	144.3	61.2
HCM Lane LOS	C	E	F	F	B	B	F	F
HCM 95th-tile Q	0.9	8.2	9.3	15.3	0.3	0.3	19.1	12.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	735	218	325	853	183	206	212	175	203	639	320
Future Volume (veh/h)	120	735	218	325	853	183	206	212	175	203	639	320
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		0.98	1.00		0.98
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	130	799	215	353	927	198	224	230	183	221	695	324
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	196	980	428	437	1228	537	262	1135	496	300	921	402
Arrive On Green	0.06	0.28	0.28	0.13	0.35	0.35	0.15	0.32	0.32	0.09	0.26	0.26
Sat Flow, veh/h	3456	3554	1551	3456	3554	1554	1781	3554	1553	3456	3554	1550
Grp Volume(v), veh/h	130	799	215	353	927	198	224	230	183	221	695	324
Grp Sat Flow(s),veh/h/ln	1728	1777	1551	1728	1777	1554	1781	1777	1553	1728	1777	1550
Q Serve(g_s), s	3.4	19.5	10.8	9.2	21.5	8.9	11.4	4.4	8.5	5.8	16.8	18.2
Cycle Q Clear(g_c), s	3.4	19.5	10.8	9.2	21.5	8.9	11.4	4.4	8.5	5.8	16.8	18.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	196	980	428	437	1228	537	262	1135	496	300	921	402
V/C Ratio(X)	0.66	0.81	0.50	0.81	0.75	0.37	0.85	0.20	0.37	0.74	0.75	0.81
Avail Cap(c_a), veh/h	260	1226	535	594	1569	686	383	1424	622	475	1149	501
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	43.0	31.5	28.3	39.5	27.0	22.8	38.7	23.0	24.4	41.5	31.8	32.3
Incr Delay (d2), s/veh	3.8	3.5	0.9	5.9	1.6	0.4	11.9	0.1	0.5	3.5	2.2	7.6
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	8.2	3.8	4.0	8.5	3.0	5.6	1.7	2.9	2.5	7.0	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.8	35.0	29.2	45.4	28.6	23.3	50.6	23.1	24.9	45.0	34.0	39.9
LnGrp LOS	D	D	C	D	C	C	D	C	C	D	C	D
Approach Vol, veh/h		1144			1478			637			1240	
Approach Delay, s/veh		35.3			31.9			33.3			37.5	
Approach LOS		D			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.1	34.6	15.8	30.6	17.7	29.0	9.3	37.1				
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	12.8	37.3	16.0	32.1	20.0	30.1	7.0	41.1				
Max Q Clear Time (g_c+I1), s	7.8	10.5	11.2	21.5	13.4	20.2	5.4	23.5				
Green Ext Time (p_c), s	0.3	1.9	0.5	4.1	0.3	3.9	0.0	6.2				
Intersection Summary												
HCM 6th Ctrl Delay			34.5									
HCM 6th LOS			C									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	799	237	353	927	199	224	230	190	221	695	348
v/c Ratio	0.57	0.83	0.44	0.74	0.76	0.30	0.77	0.21	0.31	0.59	0.78	0.65
Control Delay	61.3	45.5	13.6	55.7	36.0	4.9	62.2	28.3	5.6	54.1	44.7	21.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.3	45.5	13.6	55.7	36.0	4.9	62.2	28.3	5.6	54.1	44.7	21.9
Queue Length 50th (ft)	50	293	39	132	316	0	160	65	0	82	252	96
Queue Length 95th (ft)	#84	370	110	184	394	49	#268	97	51	123	323	201
Internal Link Dist (ft)		1249			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	233	1101	595	532	1409	734	343	1280	679	425	1032	591
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.73	0.40	0.66	0.66	0.27	0.65	0.18	0.28	0.52	0.67	0.59

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)	218	812	226	69	763	104	152	88	51	345	416	494
Future Volume (veh/h)	218	812	226	69	763	104	152	88	51	345	416	494
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		0.95	1.00		0.98
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	232	864	194	73	812	105	162	94	43	367	443	500
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	258	858	706	83	1281	553	169	271	219	367	480	398
Arrive On Green	0.15	0.46	0.46	0.05	0.36	0.36	0.10	0.15	0.15	0.21	0.26	0.26
Sat Flow, veh/h	1767	1856	1526	1767	3526	1522	1767	1856	1495	1767	1856	1538
Grp Volume(v), veh/h	232	864	194	73	812	105	162	94	43	367	443	500
Grp Sat Flow(s),veh/h/ln	1767	1856	1526	1767	1763	1522	1767	1856	1495	1767	1856	1538
Q Serve(g_s), s	16.8	60.1	10.2	5.3	24.8	6.1	11.9	5.9	3.3	27.0	30.2	33.6
Cycle Q Clear(g_c), s	16.8	60.1	10.2	5.3	24.8	6.1	11.9	5.9	3.3	27.0	30.2	33.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	258	858	706	83	1281	553	169	271	219	367	480	398
V/C Ratio(X)	0.90	1.01	0.27	0.88	0.63	0.19	0.96	0.35	0.20	1.00	0.92	1.26
Avail Cap(c_a), veh/h	295	858	706	83	1281	553	169	271	219	367	480	398
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	54.6	35.0	21.5	61.6	34.2	28.3	58.6	49.9	48.8	51.5	47.0	48.2
Incr Delay (d2), s/veh	26.4	32.5	0.2	60.9	1.0	0.2	57.7	0.8	0.4	47.0	23.7	135.0
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	9.1	32.7	3.5	3.7	10.3	2.2	7.9	2.8	1.2	16.5	16.8	27.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.0	67.4	21.7	122.5	35.2	28.5	116.2	50.7	49.2	98.5	70.6	183.2
LnGrp LOS	F	F	C	F	D	C	F	D	D	F	E	F
Approach Vol, veh/h		1290			990			299			1310	
Approach Delay, s/veh		63.0			41.0			86.0			121.4	
Approach LOS		E			D			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.0	23.9	10.1	65.0	16.4	38.5	23.0	52.1
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	27.0	19.0	6.1	60.1	12.4	33.6	21.7	44.5
Max Q Clear Time (g_c+I1), s	29.0	7.9	7.3	62.1	13.9	35.6	18.8	26.8
Green Ext Time (p_c), s	0.0	0.4	0.0	0.0	0.0	0.0	0.2	5.1

Intersection Summary	
HCM 6th Ctrl Delay	78.8
HCM 6th LOS	E

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	232	864	240	73	812	111	162	94	54	367	443	526
v/c Ratio	0.85	1.01	0.30	0.89	0.65	0.18	0.96	0.36	0.16	1.01	0.95	0.95
Control Delay	80.5	67.6	7.5	132.3	38.3	2.3	119.1	54.5	1.0	99.3	77.7	55.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.5	67.6	7.5	132.3	38.3	2.3	119.1	54.5	1.0	99.3	77.7	55.3
Queue Length 50th (ft)	190	~739	32	62	306	0	138	72	0	~316	366	277
Queue Length 95th (ft)	#318	#1015	85	#159	380	18	#283	128	0	#522	#568	#508
Internal Link Dist (ft)		1248			771			1086			1554	
Turn Bay Length (ft)	275		275	150		25	105		105	175		100
Base Capacity (vph)	294	857	790	82	1249	631	168	271	346	365	479	561
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	1.01	0.30	0.89	0.65	0.18	0.96	0.35	0.16	1.01	0.92	0.94

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.

Intersection	
Intersection Delay, s/veh	295.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	14	377	109	22	222	245	154	442	30	216	270	7
Future Vol, veh/h	14	377	109	22	222	245	154	442	30	216	270	7
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	410	118	24	241	266	167	480	33	235	293	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	254.2	226.9	409.4	259.6
HCM LOS	F	F	F	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	25%	3%	4%	44%
Vol Thru, %	71%	75%	45%	55%
Vol Right, %	5%	22%	50%	1%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	626	500	489	493
LT Vol	154	14	22	216
Through Vol	442	377	222	270
RT Vol	30	109	245	7
Lane Flow Rate	680	543	532	536
Geometry Grp	1	1	1	1
Degree of Util (X)	1.809	1.435	1.366	1.445
Departure Headway (Hd)	13.77	14.864	15.015	15.262
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	272	250	250	246
Service Time	11.77	12.864	13.015	13.262
HCM Lane V/C Ratio	2.5	2.172	2.128	2.179
HCM Control Delay	409.4	254.2	226.9	259.6
HCM Lane LOS	F	F	F	F
HCM 95th-tile Q	32	19.8	17.8	19.6

Intersection	
Int Delay, s/veh	4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	364	268	21	369	141	12
Future Vol, veh/h	364	268	21	369	141	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	396	291	23	401	153	13

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	687	0	989	542
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	907	-	274	540
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	644	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	907	-	265	540
Mov Cap-2 Maneuver	-	-	-	-	265	-
Stage 1	-	-	-	-	583	-
Stage 2	-	-	-	-	623	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	36
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	276	-	-	907	-
HCM Lane V/C Ratio	0.603	-	-	0.025	-
HCM Control Delay (s)	36	-	-	9.1	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	3.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	1	70	30	1	114	118	227	107	264	126	10
Future Vol, veh/h	6	1	70	30	1	114	118	227	107	264	126	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	76	33	1	124	128	247	116	287	137	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1341	1336	143	1316	1283	305	148	0	0	363	0	0
Stage 1	717	717	-	561	561	-	-	-	-	-	-	-
Stage 2	624	619	-	755	722	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	129	153	905	135	165	735	1434	-	-	1196	-	-
Stage 1	421	434	-	512	510	-	-	-	-	-	-	-
Stage 2	473	480	-	401	431	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	81	106	905	93	114	735	1434	-	-	1196	-	-
Mov Cap-2 Maneuver	81	106	-	93	114	-	-	-	-	-	-	-
Stage 1	384	330	-	466	465	-	-	-	-	-	-	-
Stage 2	357	437	-	278	328	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.3	22	2	5.9
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1434	-	-	81	818	93	702	1196	-	-
HCM Lane V/C Ratio	0.089	-	-	0.081	0.094	0.351	0.178	0.24	-	-
HCM Control Delay (s)	7.8	-	-	53.3	9.9	63.3	11.2	9	-	-
HCM Lane LOS	A	-	-	F	A	F	B	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.3	0.3	1.4	0.6	0.9	-	-

Intersection	
Intersection Delay, s/veh	272.1
Intersection LOS	F

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	317	9	32	1047	452	61	598
Future Vol, veh/h	317	9	32	1047	452	61	598
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	345	10	35	1138	491	66	650
Number of Lanes	1	1	1	2	0	1	2

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	3	3
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	3	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	3	2	0
HCM Control Delay	70.4	419.7	28.9
HCM LOS	F	F	D

Lane	NBLn1	NBLn2	NBLn3	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	0%	0%	0%	100%	0%	100%	0%	0%
Vol Thru, %	100%	100%	44%	0%	0%	0%	100%	100%
Vol Right, %	0%	0%	56%	0%	100%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	32	698	801	317	9	61	299	299
LT Vol	0	0	0	317	0	61	0	0
Through Vol	32	698	349	0	0	0	299	299
RT Vol	0	0	452	0	9	0	0	0
Lane Flow Rate	35	759	871	345	10	66	325	325
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.083	1.801	1.967	0.945	0.024	0.169	0.782	0.625
Departure Headway (Hd)	8.544	8.544	8.133	11.293	10.095	9.906	9.392	7.61
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	422	432	453	324	357	365	387	478
Service Time	6.244	6.244	5.833	8.993	7.795	7.606	7.092	5.31
HCM Lane V/C Ratio	0.083	1.757	1.923	1.065	0.028	0.181	0.84	0.68
HCM Control Delay	12	390	461.9	72	13	14.6	38.6	22.2
HCM Lane LOS	B	F	F	F	B	B	E	C
HCM 95th-tile Q	0.3	48.1	59	9.6	0.1	0.6	6.6	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	921	170	291	934	202	234	724	374	170	306	187
Future Volume (veh/h)	224	921	170	291	934	202	234	724	374	170	306	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	243	1001	167	316	1015	217	254	787	372	185	333	186
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	317	1193	522	394	1273	557	292	1043	455	254	722	314
Arrive On Green	0.09	0.34	0.34	0.11	0.36	0.36	0.16	0.29	0.29	0.07	0.20	0.20
Sat Flow, veh/h	3456	3554	1554	3456	3554	1555	1781	3554	1552	3456	3554	1546
Grp Volume(v), veh/h	243	1001	167	316	1015	217	254	787	372	185	333	186
Grp Sat Flow(s),veh/h/ln	1728	1777	1554	1728	1777	1555	1781	1777	1552	1728	1777	1546
Q Serve(g_s), s	6.7	25.3	7.8	8.7	24.9	10.1	13.5	19.5	21.6	5.1	8.0	10.6
Cycle Q Clear(g_c), s	6.7	25.3	7.8	8.7	24.9	10.1	13.5	19.5	21.6	5.1	8.0	10.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	317	1193	522	394	1273	557	292	1043	455	254	722	314
V/C Ratio(X)	0.77	0.84	0.32	0.80	0.80	0.39	0.87	0.75	0.82	0.73	0.46	0.59
Avail Cap(c_a), veh/h	427	1431	626	534	1541	674	422	1284	561	320	772	336
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	43.1	29.8	24.0	41.9	28.0	23.3	39.6	31.1	31.9	44.0	34.0	35.1
Incr Delay (d2), s/veh	5.8	4.0	0.4	6.2	2.5	0.4	12.8	2.1	7.6	6.1	0.5	2.5
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	3.0	10.5	2.7	3.8	10.1	3.5	6.7	8.1	8.4	2.3	3.3	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	33.8	24.4	48.1	30.5	23.7	52.4	33.2	39.5	50.1	34.5	37.5
LnGrp LOS	D	C	C	D	C	C	D	C	D	D	C	D
Approach Vol, veh/h		1411			1548			1413			704	
Approach Delay, s/veh		35.3			33.2			38.3			39.4	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.1	33.4	15.1	37.5	19.9	24.6	12.9	39.7
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	9.0	35.1	15.0	39.1	23.0	21.1	12.0	42.1
Max Q Clear Time (g_c+I1), s	7.1	23.6	10.7	27.3	15.5	12.6	8.7	26.9
Green Ext Time (p_c), s	0.1	4.9	0.4	5.3	0.4	1.7	0.2	6.3

Intersection Summary	
HCM 6th Ctrl Delay	36.0
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	243	1001	185	316	1015	220	254	787	407	185	333	203
v/c Ratio	0.67	0.85	0.31	0.72	0.81	0.32	0.79	0.77	0.73	0.65	0.50	0.45
Control Delay	57.7	42.2	10.8	56.0	37.6	4.9	60.7	41.2	29.8	61.1	43.4	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.7	42.2	10.8	56.0	37.6	4.9	60.7	41.2	29.8	61.1	43.4	9.2
Queue Length 50th (ft)	91	357	27	117	348	1	180	277	168	70	117	0
Queue Length 95th (ft)	135	448	82	167	437	52	#287	350	289	#117	167	65
Internal Link Dist (ft)		1249			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	393	1320	658	491	1422	751	388	1185	621	295	714	473
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.76	0.28	0.64	0.71	0.29	0.65	0.66	0.66	0.63	0.47	0.43

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)	428	952	185	64	968	335	218	306	176	167	169	386
Future Volume (veh/h)	428	952	185	64	968	335	218	306	176	167	169	386
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	465	1035	166	70	1052	353	237	333	175	182	184	393
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	459	986	812	80	1117	482	231	343	278	179	288	237
Arrive On Green	0.26	0.53	0.53	0.05	0.32	0.32	0.13	0.18	0.18	0.10	0.16	0.16
Sat Flow, veh/h	1767	1856	1528	1767	3526	1520	1767	1856	1505	1767	1856	1528
Grp Volume(v), veh/h	465	1035	166	70	1052	353	237	333	175	182	184	393
Grp Sat Flow(s),veh/h/ln	1767	1856	1528	1767	1763	1520	1767	1856	1505	1767	1856	1528
Q Serve(g_s), s	33.8	69.1	7.4	5.1	37.8	26.9	17.0	23.2	14.0	13.2	12.1	20.2
Cycle Q Clear(g_c), s	33.8	69.1	7.4	5.1	37.8	26.9	17.0	23.2	14.0	13.2	12.1	20.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	459	986	812	80	1117	482	231	343	278	179	288	237
V/C Ratio(X)	1.01	1.05	0.20	0.87	0.94	0.73	1.03	0.97	0.63	1.01	0.64	1.66
Avail Cap(c_a), veh/h	459	986	812	80	1117	482	231	343	278	179	288	237
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	48.1	30.4	16.0	61.7	43.2	39.5	56.5	52.7	48.9	58.4	51.5	54.9
Incr Delay (d2), s/veh	45.0	42.5	0.1	60.1	15.0	5.7	66.0	41.0	4.5	71.0	4.6	313.1
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	20.0	39.3	2.5	3.6	18.0	10.4	11.7	14.5	5.4	9.3	5.9	28.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.1	73.0	16.1	121.8	58.2	45.2	122.5	93.7	53.4	129.4	56.1	368.0
LnGrp LOS	F	F	B	F	E	D	F	F	D	F	E	F
Approach Vol, veh/h		1666			1475			745			759	
Approach Delay, s/veh		72.9			58.1			93.4			235.1	
Approach LOS		E			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.2	28.9	9.9	74.0	21.0	25.1	37.8	46.1
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	13.2	24.0	5.9	69.1	17.0	20.2	33.8	41.2
Max Q Clear Time (g_c+I1), s	15.2	25.2	7.1	71.1	19.0	22.2	35.8	39.8
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	98.0
HCM 6th LOS	F

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	465	1035	201	70	1052	364	237	333	191	182	184	420
v/c Ratio	1.02	1.06	0.23	0.89	0.95	0.66	1.03	0.98	0.51	1.03	0.64	0.76
Control Delay	95.2	75.2	6.0	134.4	60.6	31.8	123.4	96.6	24.4	131.8	62.9	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	95.2	75.2	6.0	134.4	60.6	31.8	123.4	96.6	24.4	131.8	62.9	17.9
Queue Length 50th (ft)	~415	~954	25	60	455	181	~214	282	54	~163	147	34
Queue Length 95th (ft)	#629	#1211	66	#155	#593	295	#382	#476	133	#315	229	158
Internal Link Dist (ft)		1248			771			1086			1554	
Turn Bay Length (ft)	275		275	150		25	105		105	175		100
Base Capacity (vph)	455	980	863	79	1110	555	229	340	371	177	286	552
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	1.06	0.23	0.89	0.95	0.66	1.03	0.98	0.51	1.03	0.64	0.76

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.

Warrant 3: Peak Hour

1: Minnewawa Ave & Behymer Ave - Existing Plus Proj

Intersection Information:

	Major Street	Minor Street
Street Name	Minnewawa Ave	Behymer Ave
Direction	NB/SB	EB/WB
Number of Lanes	1	1
Approach Speed	50	40

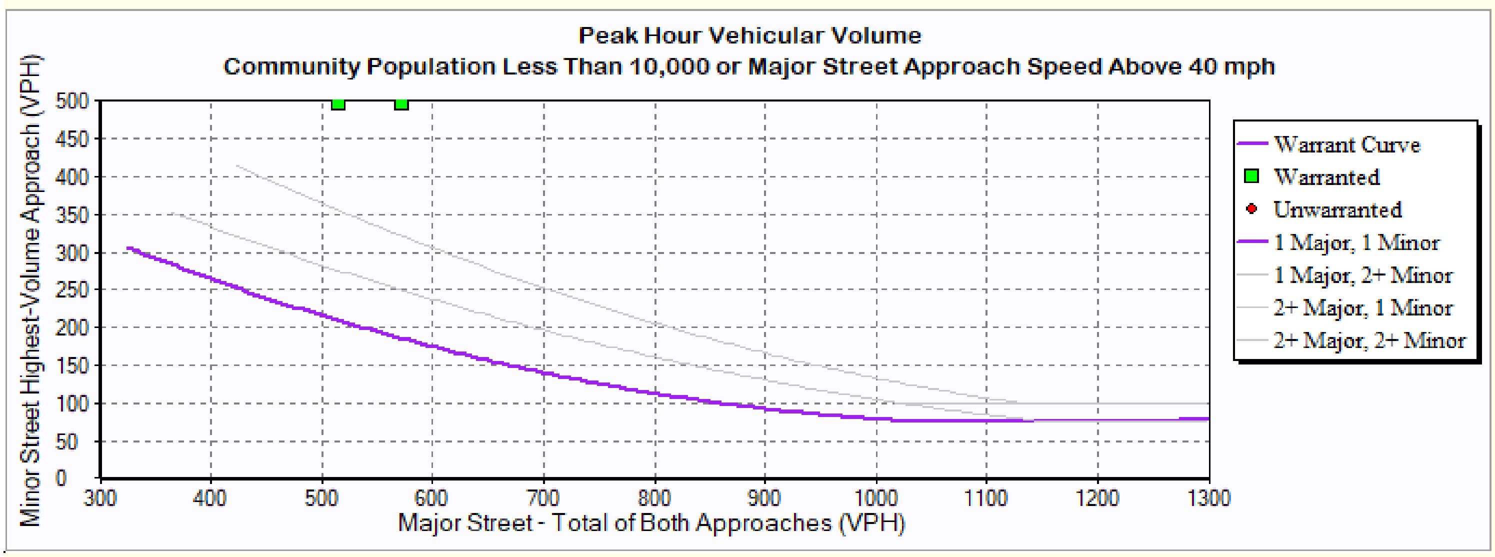
Warrant 3 Met? Yes

Details

Low Population? No

Condition A Met?	No	**Condition B Met?**	Yes
Notes	0 Hours met (1 required)	**Notes**	2 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

1: Minnewawa Ave & Behymer Ave - Existing Plus Proj

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
7:45	573	580
17:00	515	531

Warrant 3: Peak Hour

1: Minnewawa Ave & Behymer Ave - Near-Term With Proj

Intersection Information:

	Major Street	Minor Street
Street Name	Minnewawa Ave	Behymer Ave
Direction	NB/SB	EB/WB
Number of Lanes	1	1
Approach Speed	50	40

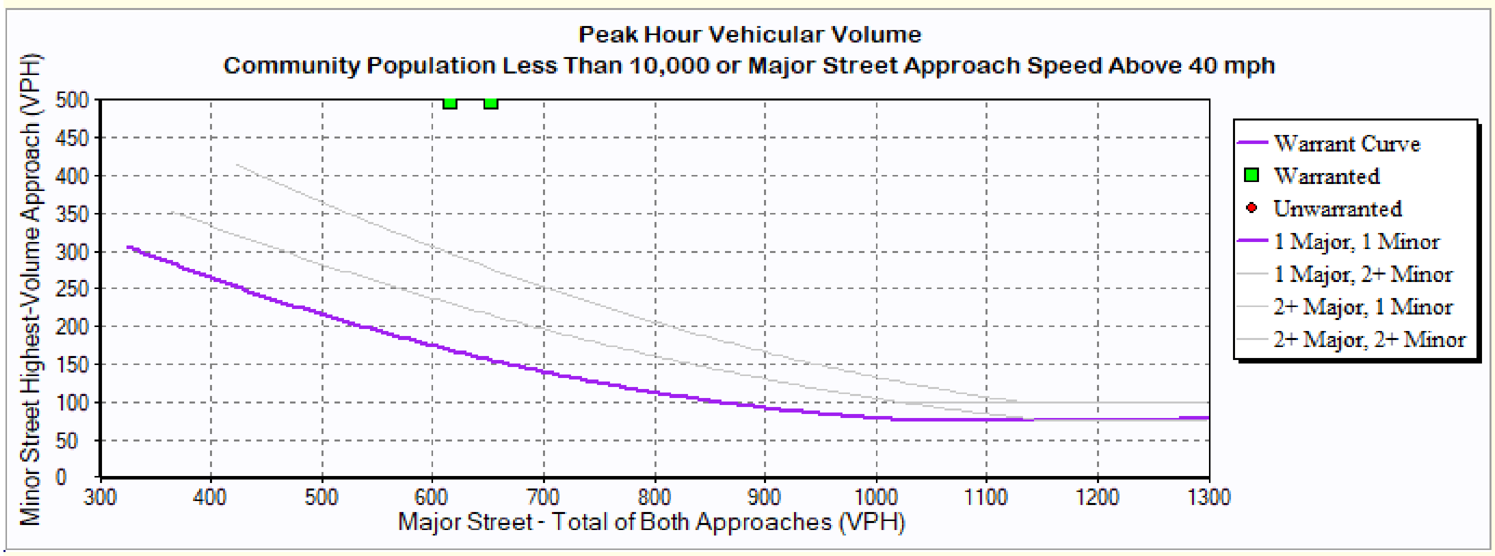
Warrant 3 Met? Yes

Details

Low Population? No

Condition A Met?	No	**Condition B Met?**	Yes
Notes	0 Hours met (1 required)	**Notes**	2 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

1: Minnewawa Ave & Behymer Ave - Near-Term With Proj

Hour	**Major Street** Total All Approaches (vph)	**Minor Street** Highest Volume Approach (vph)
7:45	653	695
17:00	617	599

Warrant 3: Peak Hour

4: Clovis Ave & Baron Ave - Near-Term With Proj

Intersection Information:

	Major Street	**Minor Street**
Street Name	Clovis Ave	Baron Ave
Direction	NB/SB	WB
Number of Lanes	2	2
Approach Speed	45	40

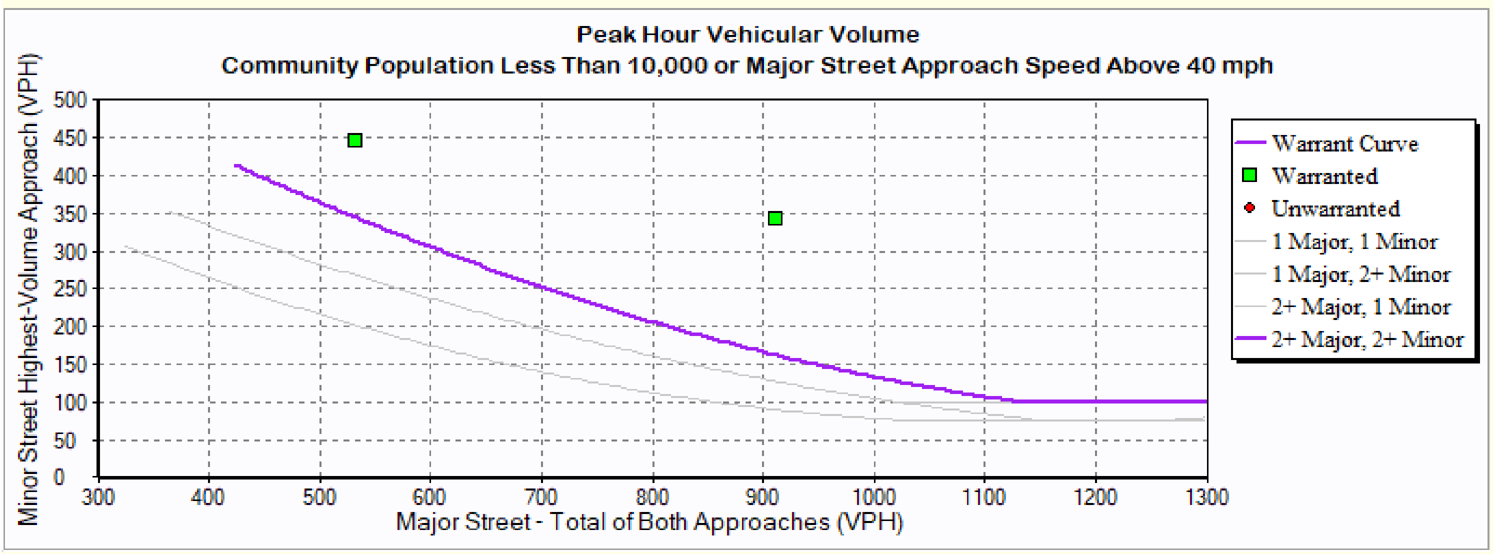
Warrant 3 Met? Yes

Details

Low Population? No

Condition A Met?	No	**Condition B Met?**	Yes
Notes	0 Hours met (1 required)	**Notes**	2 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

4: Clovis Ave & Baron Ave - Near-Term With Proj

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
0:00	0	0
7:15	533	446
17:00	912	343

Warrant 3: Peak Hour

1: Minnewawa Ave & Behymer Ave - 2045 With Proj

Intersection Information:

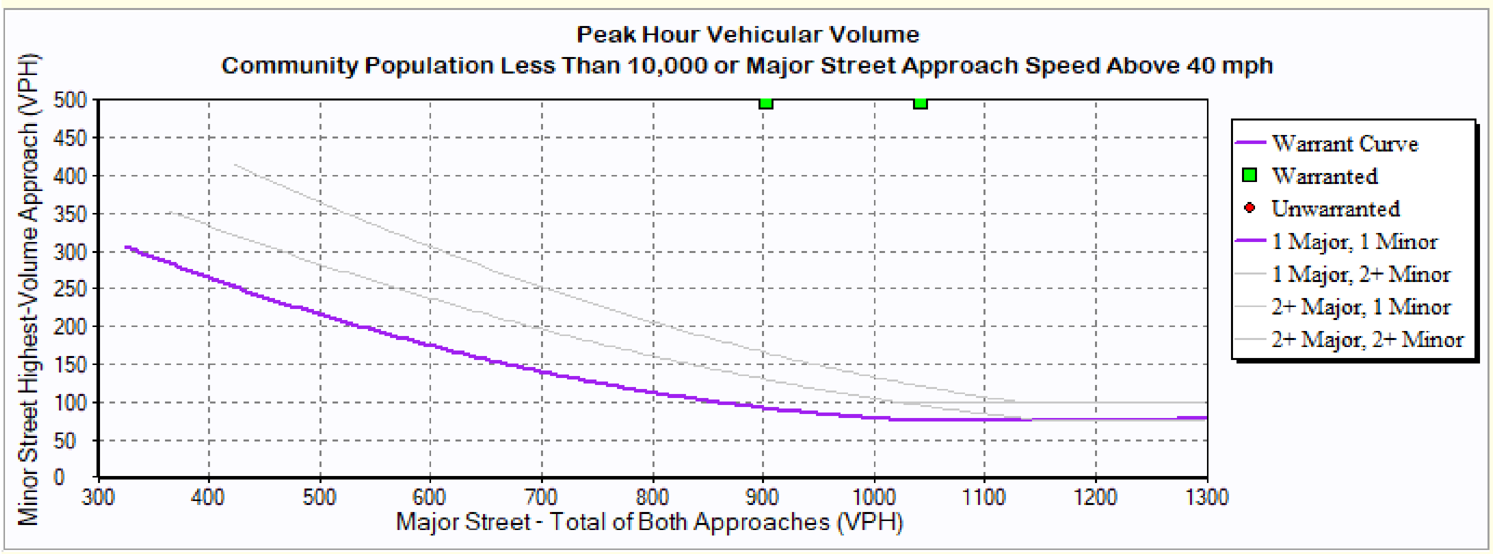
	Major Street	**Minor Street**
Street Name	Minnewawa Ave	Behymer Ave
Direction	NB/SB	EB/WB
Number of Lanes	1	1
Approach Speed	50	40

Warrant 3 Met? **Yes**

Details

Low Population?	No		
Condition A Met?	No	**Condition B Met?**	Yes
Notes	0 Hours met (1 required)	**Notes**	2 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

1: Minnewawa Ave & Behymer Ave - 2045 With Proj

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
7:45	1,042	1,149
17:00	903	716

Warrant 3: Peak Hour

2: Baron Ave & Behymer Ave - 2045 With Proj

Intersection Information:

	Major Street	**Minor Street**
Street Name	Behymer Ave	Baron Ave
Direction	EB/WB	NB
Number of Lanes	1	1
Approach Speed	45	40

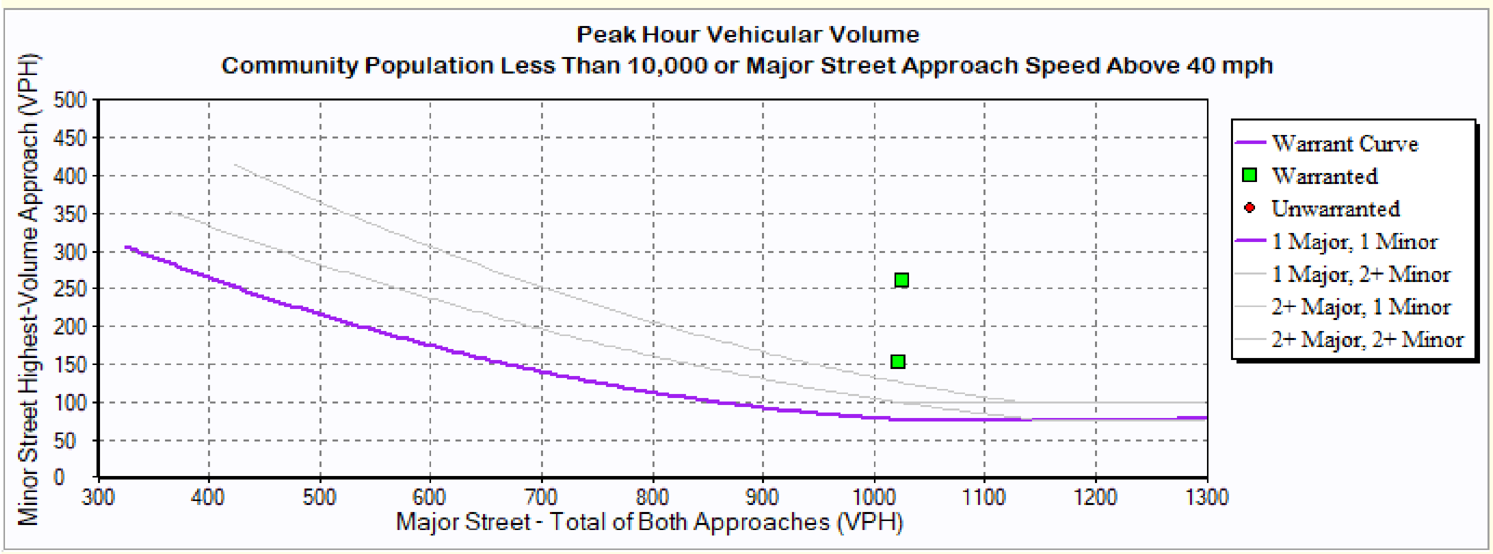
Warrant 3 Met? Yes

Details

Low Population? No

Condition A Met?	No	**Condition B Met?**	Yes
Notes	0 Hours met (1 required)	**Notes**	2 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

2: Baron Ave & Behymer Ave - 2045 With Proj

Hour	**Major Street** Total All Approaches (vph)	**Minor Street** Highest Volume Approach (vph)
7:15	1,025	261
17:15	1,022	153

Warrant 3: Peak Hour

4: Clovis Ave & Baron Ave - 2045 With Proj

Intersection Information:

	Major Street	Minor Street
Street Name	Clovis Ave	Baron Ave
Direction	NB/SB	WB
Number of Lanes	2	2
Approach Speed	45	40

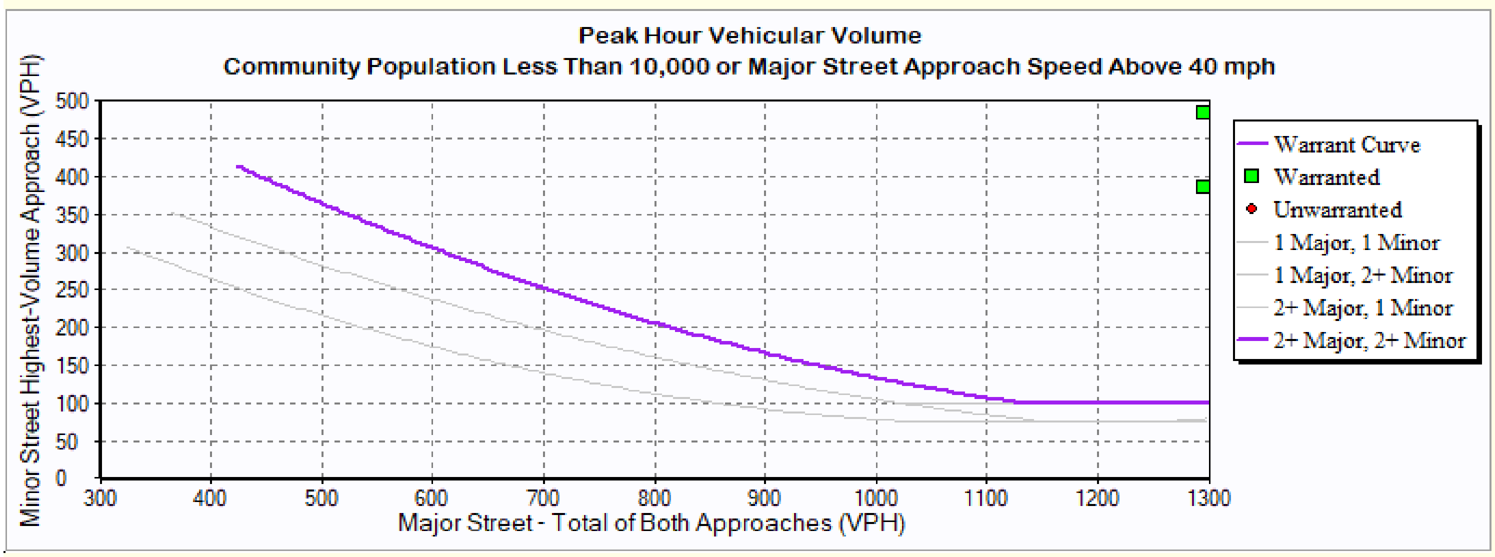
Warrant 3 Met? Yes

Details

Low Population? No

Condition A Met?	No	**Condition B Met?**	Yes
Notes	0 Hours met (1 required)	**Notes**	2 Hours met (1 required)

Minor Approach Time Delay Condition Met?	Not Met
Minor Approach Volume Condition Met?	Met
Total Entering Intersection Volume Condition Met?	Not Met



Warrant 3: Peak Hour

4: Clovis Ave & Baron Ave - 2045 With Proj

Hour	Major Street Total All Approaches (vph)	Minor Street Highest Volume Approach (vph)
0:00	0	0
7:15	1,621	485
17:00	2,129	387

APPENDIX D

IMPROVED INTERSECTION ANALYSES

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	150	69	5	198	244	105	232	7	133	228	1
Future Volume (veh/h)	2	150	69	5	198	244	105	232	7	133	228	1
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		0.96
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	2	155	71	5	204	252	108	239	7	137	235	1
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	92	416	189	93	260	316	156	375	11	177	409	2
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.09	0.21	0.21	0.10	0.22	0.22
Sat Flow, veh/h	3	1200	544	5	751	911	1781	1805	53	1781	1861	8
Grp Volume(v), veh/h	228	0	0	461	0	0	108	0	246	137	0	236
Grp Sat Flow(s),veh/h/ln	1748	0	0	1667	0	0	1781	0	1858	1781	0	1869
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	2.3	0.0	4.8	3.0	0.0	4.5
Cycle Q Clear(g_c), s	3.9	0.0	0.0	9.9	0.0	0.0	2.3	0.0	4.8	3.0	0.0	4.5
Prop In Lane	0.01		0.31	0.01		0.55	1.00		0.03	1.00		0.00
Lane Grp Cap(c), veh/h	697	0	0	669	0	0	156	0	386	177	0	410
V/C Ratio(X)	0.33	0.00	0.00	0.69	0.00	0.00	0.69	0.00	0.64	0.77	0.00	0.58
Avail Cap(c_a), veh/h	927	0	0	889	0	0	313	0	890	357	0	942
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.8	0.0	0.0	11.7	0.0	0.0	17.7	0.0	14.4	17.5	0.0	13.9
Incr Delay (d2), s/veh	0.3	0.0	0.0	1.4	0.0	0.0	5.4	0.0	1.8	7.0	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	2.7	0.0	0.0	1.0	0.0	1.6	1.3	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.1	0.0	0.0	13.2	0.0	0.0	23.1	0.0	16.2	24.6	0.0	15.2
LnGrp LOS	B	A	A	B	A	A	C	A	B	C	A	B
Approach Vol, veh/h		228			461			354			373	
Approach Delay, s/veh		10.1			13.2			18.3			18.6	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.0	13.2		18.7	7.5	13.7		18.7				
Change Period (Y+Rc), s	4.0	4.9		4.9	4.0	4.9		4.9				
Max Green Setting (Gmax), s	8.0	19.1		19.1	7.0	20.1		19.1				
Max Q Clear Time (g_c+I1), s	5.0	6.8		5.9	4.3	6.5		11.9				
Green Ext Time (p_c), s	0.1	0.9		1.0	0.1	0.9		1.7				
Intersection Summary												
HCM 6th Ctrl Delay			15.4									
HCM 6th LOS			B									

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	228	461	108	246	137	236
v/c Ratio	0.38	0.74	0.40	0.52	0.45	0.47
Control Delay	13.5	21.0	27.0	20.8	27.5	19.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.5	21.0	27.0	20.8	27.5	19.2
Queue Length 50th (ft)	41	88	30	63	38	59
Queue Length 95th (ft)	99	#239	#81	124	#104	117
Internal Link Dist (ft)	2658	1520		2614		1226
Turn Bay Length (ft)						
Base Capacity (vph)	817	820	293	840	335	885
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.56	0.37	0.29	0.41	0.27

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)	3	184	53	3	173	191	69	221	14	164	205	6
Future Volume (veh/h)	3	184	53	3	173	191	69	221	14	164	205	6
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		0.96
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	211	61	3	199	220	79	254	16	189	236	7
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	88	437	125	87	253	277	128	378	24	243	510	15
Arrive On Green	0.32	0.32	0.32	0.32	0.32	0.32	0.07	0.22	0.22	0.14	0.28	0.28
Sat Flow, veh/h	5	1379	395	3	799	873	1781	1736	109	1781	1805	54
Grp Volume(v), veh/h	275	0	0	422	0	0	79	0	270	189	0	243
Grp Sat Flow(s),veh/h/ln	1779	0	0	1675	0	0	1781	0	1845	1781	0	1858
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	5.6	4.3	0.0	4.5
Cycle Q Clear(g_c), s	5.2	0.0	0.0	9.6	0.0	0.0	1.8	0.0	5.6	4.3	0.0	4.5
Prop In Lane	0.01		0.22	0.01		0.52	1.00		0.06	1.00		0.03
Lane Grp Cap(c), veh/h	650	0	0	617	0	0	128	0	401	243	0	525
V/C Ratio(X)	0.42	0.00	0.00	0.68	0.00	0.00	0.62	0.00	0.67	0.78	0.00	0.46
Avail Cap(c_a), veh/h	853	0	0	809	0	0	293	0	818	403	0	939
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	0.0	13.1	0.0	0.0	18.9	0.0	15.0	17.5	0.0	12.4
Incr Delay (d2), s/veh	0.4	0.0	0.0	1.6	0.0	0.0	4.8	0.0	2.0	5.3	0.0	0.6
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	0.0	0.0	2.9	0.0	0.0	0.7	0.0	1.9	1.7	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	0.0	0.0	14.6	0.0	0.0	23.7	0.0	17.0	22.8	0.0	13.1
LnGrp LOS	B	A	A	B	A	A	C	A	B	C	A	B
Approach Vol, veh/h		275			422			349			432	
Approach Delay, s/veh		12.0			14.6			18.5			17.3	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.7	14.0		18.2	7.0	16.7		18.2				
Change Period (Y+Rc), s	4.0	4.9		4.9	4.0	4.9		4.9				
Max Green Setting (Gmax), s	9.5	18.6		18.1	6.9	21.2		18.1				
Max Q Clear Time (g_c+I1), s	6.3	7.6		7.2	3.8	6.5		11.6				
Green Ext Time (p_c), s	0.1	1.0		1.1	0.0	1.0		1.4				
Intersection Summary												
HCM 6th Ctrl Delay			15.8									
HCM 6th LOS			B									

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	275	422	79	270	189	243
v/c Ratio	0.49	0.72	0.31	0.55	0.55	0.37
Control Delay	17.5	21.7	26.4	21.2	29.5	15.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.5	21.7	26.4	21.2	29.5	15.3
Queue Length 50th (ft)	61	86	22	72	54	59
Queue Length 95th (ft)	129	#198	60	131	#138	110
Internal Link Dist (ft)	2658	1520		2614		1226
Turn Bay Length (ft)						
Base Capacity (vph)	751	755	278	785	383	917
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.56	0.28	0.34	0.49	0.26

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)	3	162	72	18	222	316	111	271	13	139	255	3
Future Volume (veh/h)	3	162	72	18	222	316	111	271	13	139	255	3
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		0.96
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	167	74	19	229	326	114	279	13	143	263	3
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	78	472	206	87	268	363	146	391	18	182	445	5
Arrive On Green	0.39	0.39	0.39	0.39	0.39	0.39	0.08	0.22	0.22	0.10	0.24	0.24
Sat Flow, veh/h	5	1219	533	22	691	938	1781	1769	82	1781	1845	21
Grp Volume(v), veh/h	244	0	0	574	0	0	114	0	292	143	0	266
Grp Sat Flow(s),veh/h/ln	1757	0	0	1652	0	0	1781	0	1852	1781	0	1866
Q Serve(g_s), s	0.0	0.0	0.0	4.6	0.0	0.0	3.0	0.0	7.0	3.7	0.0	6.0
Cycle Q Clear(g_c), s	4.7	0.0	0.0	15.5	0.0	0.0	3.0	0.0	7.0	3.7	0.0	6.0
Prop In Lane	0.01		0.30	0.03		0.57	1.00		0.04	1.00		0.01
Lane Grp Cap(c), veh/h	757	0	0	718	0	0	146	0	409	182	0	450
V/C Ratio(X)	0.32	0.00	0.00	0.80	0.00	0.00	0.78	0.00	0.71	0.78	0.00	0.59
Avail Cap(c_a), veh/h	816	0	0	773	0	0	224	0	780	224	0	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.4	0.0	0.0	13.7	0.0	0.0	21.5	0.0	17.2	20.9	0.0	16.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	5.6	0.0	0.0	9.2	0.0	2.3	13.6	0.0	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	1.4	0.0	0.0	5.3	0.0	0.0	1.4	0.0	2.5	2.0	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.6	0.0	0.0	19.3	0.0	0.0	30.7	0.0	19.5	34.5	0.0	17.2
LnGrp LOS	B	A	A	B	A	A	C	A	B	C	A	B
Approach Vol, veh/h		244			574			406			409	
Approach Delay, s/veh		10.6			19.3			22.7			23.3	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.9	15.4		23.4	7.9	16.4		23.4				
Change Period (Y+Rc), s	4.0	4.9		4.9	4.0	4.9		4.9				
Max Green Setting (Gmax), s	6.0	20.1		20.1	6.0	20.1		20.1				
Max Q Clear Time (g_c+I1), s	5.7	9.0		6.7	5.0	8.0		17.5				
Green Ext Time (p_c), s	0.0	1.1		1.1	0.0	1.0		1.0				

Intersection Summary			
HCM 6th Ctrl Delay			19.8
HCM 6th LOS			B

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	244	574	114	292	143	266
v/c Ratio	0.37	0.85	0.55	0.62	0.69	0.47
Control Delay	13.0	28.4	37.1	23.1	46.2	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.0	28.4	37.1	23.1	46.2	19.6
Queue Length 50th (ft)	44	124	35	80	45	73
Queue Length 95th (ft)	106	#336	#105	143	#136	131
Internal Link Dist (ft)	2658	1520		2614		1226
Turn Bay Length (ft)						
Base Capacity (vph)	711	722	206	725	206	728
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.80	0.55	0.40	0.69	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	360	3	83	116	188	3	226
Future Volume (veh/h)	360	3	83	116	188	3	226
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			1.00	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	391	3		126	163	3	246
Peak Hour Factor	0.92	0.92		0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	515	458		363	324	7	1336
Arrive On Green	0.29	0.29		0.20	0.20	0.00	0.38
Sat Flow, veh/h	1781	1585		1870	1585	1781	3647
Grp Volume(v), veh/h	391	3		126	163	3	246
Grp Sat Flow(s),veh/h/ln	1781	1585		1777	1585	1781	1777
Q Serve(g_s), s	5.9	0.0		1.8	2.7	0.0	1.4
Cycle Q Clear(g_c), s	5.9	0.0		1.8	2.7	0.0	1.4
Prop In Lane	1.00	1.00			1.00	1.00	
Lane Grp Cap(c), veh/h	515	458		363	324	7	1336
V/C Ratio(X)	0.76	0.01		0.35	0.50	0.41	0.18
Avail Cap(c_a), veh/h	1223	1088		1226	1094	304	2319
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	9.5	7.4		10.0	10.3	14.5	6.1
Incr Delay (d2), s/veh	2.3	0.0		0.6	1.2	32.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0		0.5	0.6	0.1	0.2
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	11.8	7.4		10.5	11.5	47.2	6.2
LnGrp LOS	B	A		B	B	D	A
Approach Vol, veh/h	394			289			249
Approach Delay, s/veh	11.8			11.1			6.7
Approach LOS	B			B			A

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	5.0	10.9	15.9	13.4
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9
Max Green Setting (Gmax), s	5.0	20.2	19.1	20.1
Max Q Clear Time (g_c+I1), s	2.0	4.7	3.4	7.9
Green Ext Time (p_c), s	0.0	1.3	1.2	1.0

Intersection Summary	
HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

Notes

User approved ignoring U-Turning movement.

Lane Group	WBL	WBR	NBU	NBT	SBL	SBT
Lane Group Flow (vph)	391	3	90	330	3	246
v/c Ratio	0.61	0.01	0.32	0.27	0.01	0.29
Control Delay	16.4	7.3	22.4	5.7	20.3	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.4	7.3	22.4	5.7	20.3	16.2
Queue Length 50th (ft)	81	0	21	8	1	28
Queue Length 95th (ft)	161	4	62	43	7	60
Internal Link Dist (ft)	681			390		811
Turn Bay Length (ft)						
Base Capacity (vph)	959	859	291	1845	238	1822
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.00	0.31	0.18	0.01	0.14

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	611	166	202	853	68	185	155	81	161	329	173
Future Volume (veh/h)	117	611	166	202	853	68	185	155	81	161	329	173
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		0.97	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	131	687	165	227	958	75	208	174	84	181	370	169
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	248	1219	533	344	1317	576	321	671	292	287	636	276
Arrive On Green	0.07	0.34	0.34	0.10	0.37	0.37	0.09	0.19	0.19	0.08	0.18	0.18
Sat Flow, veh/h	3456	3554	1554	3456	3554	1555	3456	3554	1544	3456	3554	1543
Grp Volume(v), veh/h	131	687	165	227	958	75	208	174	84	181	370	169
Grp Sat Flow(s),veh/h/ln	1728	1777	1554	1728	1777	1555	1728	1777	1544	1728	1777	1543
Q Serve(g_s), s	2.3	9.8	4.9	3.9	14.5	2.0	3.6	2.6	2.9	3.2	5.9	6.3
Cycle Q Clear(g_c), s	2.3	9.8	4.9	3.9	14.5	2.0	3.6	2.6	2.9	3.2	5.9	6.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	248	1219	533	344	1317	576	321	671	292	287	636	276
V/C Ratio(X)	0.53	0.56	0.31	0.66	0.73	0.13	0.65	0.26	0.29	0.63	0.58	0.61
Avail Cap(c_a), veh/h	499	2058	900	721	2286	1000	665	1260	547	610	1203	522
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	27.9	16.7	15.1	27.0	16.9	13.0	27.3	21.6	21.7	27.7	23.5	23.6
Incr Delay (d2), s/veh	1.7	0.4	0.3	2.2	0.8	0.1	2.2	0.2	0.5	2.3	0.8	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	3.3	1.4	1.5	4.8	0.6	1.4	1.0	1.0	1.3	2.3	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.6	17.1	15.4	29.2	17.7	13.1	29.5	21.8	22.2	29.9	24.3	25.8
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		983			1260			466			720	
Approach Delay, s/veh		18.5			19.5			25.3			26.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	16.7	10.2	26.3	9.8	16.1	8.5	28.0
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	11.0	22.1	13.0	36.1	12.0	21.1	9.0	40.1
Max Q Clear Time (g_c+I1), s	5.2	4.9	5.9	11.8	5.6	8.3	4.3	16.5
Green Ext Time (p_c), s	0.3	1.1	0.4	4.9	0.3	2.2	0.1	6.6

Intersection Summary	
HCM 6th Ctrl Delay	21.4
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	131	687	187	227	958	76	208	174	91	181	370	194
v/c Ratio	0.38	0.59	0.32	0.50	0.75	0.12	0.48	0.26	0.24	0.45	0.57	0.44
Control Delay	40.8	25.3	11.4	38.9	27.1	2.1	39.4	30.4	6.6	39.8	35.1	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	25.3	11.4	38.9	27.1	2.1	39.4	30.4	6.6	39.8	35.1	8.6
Queue Length 50th (ft)	32	150	28	56	219	0	51	40	0	44	91	0
Queue Length 95th (ft)	70	233	83	107	324	14	100	77	30	90	154	55
Internal Link Dist (ft)		1234			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	399	1652	780	577	1836	854	532	1012	518	488	966	562
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.42	0.24	0.39	0.52	0.09	0.39	0.17	0.18	0.37	0.38	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	213	60	16	193	204	74	256	26	186	255	6
Future Volume (veh/h)	3	213	60	16	193	204	74	256	26	186	255	6
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		0.97	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	245	69	18	222	234	85	294	30	214	293	7
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	76	458	128	86	269	270	125	394	40	267	576	14
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.07	0.24	0.24	0.15	0.32	0.32
Sat Flow, veh/h	4	1397	390	26	819	824	1781	1662	170	1781	1817	43
Grp Volume(v), veh/h	317	0	0	474	0	0	85	0	324	214	0	300
Grp Sat Flow(s),veh/h/ln	1791	0	0	1669	0	0	1781	0	1832	1781	0	1861
Q Serve(g_s), s	0.0	0.0	0.0	3.7	0.0	0.0	2.3	0.0	7.9	5.6	0.0	6.4
Cycle Q Clear(g_c), s	7.0	0.0	0.0	12.9	0.0	0.0	2.3	0.0	7.9	5.6	0.0	6.4
Prop In Lane	0.01		0.22	0.04		0.49	1.00		0.09	1.00		0.02
Lane Grp Cap(c), veh/h	663	0	0	625	0	0	125	0	435	267	0	590
V/C Ratio(X)	0.48	0.00	0.00	0.76	0.00	0.00	0.68	0.00	0.75	0.80	0.00	0.51
Avail Cap(c_a), veh/h	743	0	0	699	0	0	261	0	722	331	0	806
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.3	0.0	0.0	15.2	0.0	0.0	22.0	0.0	17.1	19.9	0.0	13.5
Incr Delay (d2), s/veh	0.5	0.0	0.0	4.3	0.0	0.0	6.3	0.0	2.6	10.8	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	0.0	0.0	4.4	0.0	0.0	1.0	0.0	2.9	2.7	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.8	0.0	0.0	19.6	0.0	0.0	28.3	0.0	19.7	30.7	0.0	14.2
LnGrp LOS	B	A	A	B	A	A	C	A	B	C	A	B
Approach Vol, veh/h		317			474			409			514	
Approach Delay, s/veh		13.8			19.6			21.5			21.0	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.3	16.4		20.8	7.4	20.3		20.8				
Change Period (Y+Rc), s	4.0	4.9		4.9	4.0	4.9		4.9				
Max Green Setting (Gmax), s	9.0	19.1		18.1	7.1	21.0		18.1				
Max Q Clear Time (g_c+I1), s	7.6	9.9		9.0	4.3	8.4		14.9				
Green Ext Time (p_c), s	0.1	1.1		1.1	0.0	1.2		0.9				
Intersection Summary												
HCM 6th Ctrl Delay			19.4									
HCM 6th LOS			B									

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	317	474	85	324	214	300
v/c Ratio	0.56	0.83	0.38	0.66	0.72	0.41
Control Delay	19.5	30.3	28.8	24.5	40.4	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.5	30.3	28.8	24.5	40.4	16.1
Queue Length 50th (ft)	76	113	26	92	68	81
Queue Length 95th (ft)	151	#267	64	155	#168	137
Internal Link Dist (ft)	5395	1520		2614		2532
Turn Bay Length (ft)						
Base Capacity (vph)	634	632	239	672	303	773
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.75	0.36	0.48	0.71	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	312	1	30	268	447	1	196
Future Volume (veh/h)	312	1	30	268	447	1	196
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			1.00	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	339	1		291	389	1	213
Peak Hour Factor	0.92	0.92		0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	443	394		624	556	5	1663
Arrive On Green	0.25	0.25		0.35	0.35	0.00	0.47
Sat Flow, veh/h	1781	1585		1870	1585	1781	3647
Grp Volume(v), veh/h	339	1		291	389	1	213
Grp Sat Flow(s),veh/h/ln	1781	1585		1777	1585	1781	1777
Q Serve(g_s), s	6.1	0.0		4.4	7.3	0.0	1.2
Cycle Q Clear(g_c), s	6.1	0.0		4.4	7.3	0.0	1.2
Prop In Lane	1.00	1.00			1.00	1.00	
Lane Grp Cap(c), veh/h	443	394		624	556	5	1663
V/C Ratio(X)	0.77	0.00		0.47	0.70	0.19	0.13
Avail Cap(c_a), veh/h	1087	967		982	876	309	1963
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	12.1	9.8		8.7	9.7	17.2	5.2
Incr Delay (d2), s/veh	2.8	0.0		0.5	1.6	17.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.0		1.0	1.6	0.0	0.2
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	14.9	9.8		9.3	11.3	34.6	5.2
LnGrp LOS	B	A		A	B	C	A
Approach Vol, veh/h	340			680			214
Approach Delay, s/veh	14.8			10.4			5.4
Approach LOS	B			B			A

Timer - Assigned Phs	1	2	6	8
Phs Duration (G+Y+Rc), s	4.0	17.0	21.1	13.5
Change Period (Y+Rc), s	4.0	4.9	4.9	4.9
Max Green Setting (Gmax), s	6.0	19.1	19.1	21.1
Max Q Clear Time (g_c+I1), s	2.0	9.3	3.2	8.1
Green Ext Time (p_c), s	0.0	2.8	1.0	0.8

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Notes

User approved ignoring U-Turning movement.

Lane Group	WBL	WBR	NBU	NBT	SBL	SBT
Lane Group Flow (vph)	339	1	33	777	1	213
v/c Ratio	0.56	0.00	0.11	0.55	0.00	0.18
Control Delay	14.9	9.0	19.4	6.1	20.0	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.9	9.0	19.4	6.1	20.0	10.8
Queue Length 50th (ft)	42	0	5	17	0	12
Queue Length 95th (ft)	166	3	33	83	4	51
Internal Link Dist (ft)	681			390		811
Turn Bay Length (ft)						
Base Capacity (vph)	1087	972	309	1998	309	1967
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.00	0.11	0.39	0.00	0.11

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	811	163	144	817	165	228	380	200	128	243	147
Future Volume (veh/h)	207	811	163	144	817	165	228	380	200	128	243	147
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	238	932	167	166	939	187	262	437	193	147	279	151
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	352	1390	609	263	1298	568	381	707	308	240	562	244
Arrive On Green	0.10	0.39	0.39	0.08	0.37	0.37	0.11	0.20	0.20	0.07	0.16	0.16
Sat Flow, veh/h	3456	3554	1556	3456	3554	1555	3456	3554	1546	3456	3554	1540
Grp Volume(v), veh/h	238	932	167	166	939	187	262	437	193	147	279	151
Grp Sat Flow(s),veh/h/ln	1728	1777	1556	1728	1777	1555	1728	1777	1546	1728	1777	1540
Q Serve(g_s), s	4.5	14.6	4.9	3.1	15.4	5.8	4.9	7.6	7.7	2.8	4.8	6.2
Cycle Q Clear(g_c), s	4.5	14.6	4.9	3.1	15.4	5.8	4.9	7.6	7.7	2.8	4.8	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	352	1390	609	263	1298	568	381	707	308	240	562	244
V/C Ratio(X)	0.68	0.67	0.27	0.63	0.72	0.33	0.69	0.62	0.63	0.61	0.50	0.62
Avail Cap(c_a), veh/h	769	2590	1134	564	2379	1041	821	1430	622	564	1166	505
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	29.2	16.9	14.0	30.2	18.4	15.4	28.9	24.6	24.7	30.5	25.9	26.5
Incr Delay (d2), s/veh	2.3	0.6	0.2	2.5	0.8	0.3	2.2	0.9	2.1	2.5	0.7	2.6
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	4.9	1.5	1.3	5.3	1.8	2.0	2.9	2.6	1.1	1.9	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.4	17.5	14.2	32.7	19.2	15.8	31.1	25.5	26.8	33.0	26.6	29.0
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	C	C
Approach Vol, veh/h		1337			1292			892			577	
Approach Delay, s/veh		19.6			20.4			27.4			28.8	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.7	18.3	9.1	31.3	11.4	15.6	10.9	29.5
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	27.1	11.0	49.1	16.0	22.1	15.0	45.1
Max Q Clear Time (g_c+I1), s	4.8	9.7	5.1	16.6	6.9	8.2	6.5	17.4
Green Ext Time (p_c), s	0.2	3.0	0.2	7.4	0.6	1.8	0.5	7.3

Intersection Summary		
HCM 6th Ctrl Delay		22.9
HCM 6th LOS		C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	238	932	187	166	939	190	262	437	230	147	279	169
v/c Ratio	0.53	0.69	0.28	0.45	0.74	0.28	0.56	0.61	0.54	0.42	0.47	0.43
Control Delay	44.1	26.6	8.1	45.9	29.8	4.5	43.8	38.2	18.9	45.6	38.8	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	26.6	8.1	45.9	29.8	4.5	43.8	38.2	18.9	45.6	38.8	9.8
Queue Length 50th (ft)	64	225	20	45	236	0	71	118	40	40	75	0
Queue Length 95th (ft)	124	331	65	93	356	41	133	195	120	84	135	53
Internal Link Dist (ft)		1234			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	597	2017	937	438	1852	899	637	1113	585	438	908	520
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.46	0.20	0.38	0.51	0.21	0.41	0.39	0.39	0.34	0.31	0.33

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	188	98	61	529	390	133	290	14	169	594	11
Future Volume (veh/h)	3	188	98	61	529	390	133	290	14	169	594	11
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		0.97	1.00		0.97	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	3	194	71	63	545	281	137	299	14	174	612	11
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	7	356	130	84	596	488	170	597	28	212	661	12
Arrive On Green	0.00	0.28	0.28	0.05	0.32	0.32	0.10	0.34	0.34	0.12	0.36	0.36
Sat Flow, veh/h	1781	1292	473	1781	1870	1532	1781	1769	83	1781	1830	33
Grp Volume(v), veh/h	3	0	265	63	545	281	137	0	313	174	0	623
Grp Sat Flow(s),veh/h/ln	1781	0	1765	1781	1870	1532	1781	0	1852	1781	0	1863
Q Serve(g_s), s	0.1	0.0	10.3	2.8	22.6	12.3	6.1	0.0	10.9	7.7	0.0	25.9
Cycle Q Clear(g_c), s	0.1	0.0	10.3	2.8	22.6	12.3	6.1	0.0	10.9	7.7	0.0	25.9
Prop In Lane	1.00		0.27	1.00		1.00	1.00		0.04	1.00		0.02
Lane Grp Cap(c), veh/h	7	0	487	84	596	488	170	0	625	212	0	673
V/C Ratio(X)	0.42	0.00	0.54	0.75	0.91	0.58	0.81	0.00	0.50	0.82	0.00	0.93
Avail Cap(c_a), veh/h	130	0	554	170	629	515	172	0	625	274	0	725
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.1	0.0	24.9	38.0	26.4	22.9	35.7	0.0	21.3	34.7	0.0	24.7
Incr Delay (d2), s/veh	34.4	0.0	0.9	12.8	17.5	1.4	23.4	0.0	0.6	14.1	0.0	17.2
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	0.1	0.0	4.1	1.5	12.1	4.3	3.6	0.0	4.3	3.9	0.0	13.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.5	0.0	25.8	50.8	43.9	24.3	59.2	0.0	21.9	48.8	0.0	42.0
LnGrp LOS	E	A	C	D	D	C	E	A	C	D	A	D
Approach Vol, veh/h		268			889			450			797	
Approach Delay, s/veh		26.4			38.2			33.3			43.5	
Approach LOS		C			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.6	32.1	7.8	27.2	11.7	34.0	4.3	30.6
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	12.4	26.8	7.7	25.3	7.8	31.4	5.9	27.1
Max Q Clear Time (g_c+I1), s	9.7	12.9	4.8	12.3	8.1	27.9	2.1	24.6
Green Ext Time (p_c), s	0.1	1.3	0.0	1.1	0.0	1.2	0.0	1.1

Intersection Summary	
HCM 6th Ctrl Delay	37.7
HCM 6th LOS	D

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	3	295	63	545	402	137	313	174	623
v/c Ratio	0.02	0.62	0.41	0.84	0.56	0.82	0.52	0.71	0.91
Control Delay	39.0	32.0	46.0	40.0	9.9	75.4	27.3	52.2	45.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	32.0	46.0	40.0	9.9	75.4	27.3	52.2	45.2
Queue Length 50th (ft)	2	129	31	252	37	71	129	86	293
Queue Length 95th (ft)	10	213	75	#512	138	#187	233	#189	#566
Internal Link Dist (ft)		2658		1520			2614		1226
Turn Bay Length (ft)	250		250		150	250		250	
Base Capacity (vph)	126	562	165	647	722	167	606	266	707
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.52	0.38	0.84	0.56	0.82	0.52	0.65	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	292	170	21	542	238	23
Future Volume (veh/h)	292	170	21	542	238	23
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	317	148	23	589	259	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	415	194	51	949	357	34
Arrive On Green	0.34	0.34	0.03	0.51	0.22	0.22
Sat Flow, veh/h	1206	563	1781	1870	1602	155
Grp Volume(v), veh/h	0	465	23	589	285	0
Grp Sat Flow(s),veh/h/ln	0	1769	1781	1870	1762	0
Q Serve(g_s), s	0.0	8.5	0.5	8.2	5.4	0.0
Cycle Q Clear(g_c), s	0.0	8.5	0.5	8.2	5.4	0.0
Prop In Lane		0.32	1.00		0.91	0.09
Lane Grp Cap(c), veh/h	0	608	51	949	392	0
V/C Ratio(X)	0.00	0.76	0.45	0.62	0.73	0.00
Avail Cap(c_a), veh/h	0	1028	250	1602	927	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	10.6	17.4	6.4	13.1	0.0
Incr Delay (d2), s/veh	0.0	2.0	6.2	0.7	2.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.3	0.2	1.4	1.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	12.6	23.5	7.1	15.7	0.0
LnGrp LOS	A	B	C	A	B	A
Approach Vol, veh/h	465			612	285	
Approach Delay, s/veh	12.6			7.7	15.7	
Approach LOS	B			A	B	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	13.0	5.9	17.4	23.3
Change Period (Y+Rc), s	4.9	4.9	4.9	4.9
Max Green Setting (Gmax), s	19.1	5.1	21.1	31.1
Max Q Clear Time (g_c+I1), s	7.4	2.5	10.5	10.2
Green Ext Time (p_c), s	0.6	0.0	2.0	3.5

Intersection Summary	
HCM 6th Ctrl Delay	11.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	502	23	589	284
v/c Ratio	0.65	0.10	0.70	0.55
Control Delay	15.5	23.0	14.4	17.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	15.5	23.0	14.4	17.8
Queue Length 50th (ft)	65	5	93	51
Queue Length 95th (ft)	#282	27	228	143
Internal Link Dist (ft)	1543		1999	1602
Turn Bay Length (ft)				
Base Capacity (vph)	1009	234	1450	877
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.50	0.10	0.41	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Intersection Delay, s/veh	11.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	1	104	60	1	215	36	74	32	185	183	3
Future Vol, veh/h	9	1	104	60	1	215	36	74	32	185	183	3
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	10	1	113	65	1	234	39	80	35	201	199	3
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	10	11.4	10.3	12.3
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	70%	0%	1%	0%	0%	0%	98%
Vol Right, %	0%	30%	0%	99%	0%	100%	0%	2%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	36	106	9	105	60	216	185	186
LT Vol	36	0	9	0	60	0	185	0
Through Vol	0	74	0	1	0	1	0	183
RT Vol	0	32	0	104	0	215	0	3
Lane Flow Rate	39	115	10	114	65	235	201	202
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.075	0.197	0.019	0.187	0.124	0.366	0.363	0.336
Departure Headway (Hd)	6.876	6.154	7.113	5.899	6.824	5.611	6.492	5.975
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	520	582	502	606	525	639	555	600
Service Time	4.631	3.908	4.871	3.656	4.572	3.359	4.233	3.716
HCM Lane V/C Ratio	0.075	0.198	0.02	0.188	0.124	0.368	0.362	0.337
HCM Control Delay	10.2	10.4	10	10	10.5	11.6	12.9	11.7
HCM Lane LOS	B	B	A	A	B	B	B	B
HCM 95th-tile Q	0.2	0.7	0.1	0.7	0.4	1.7	1.6	1.5

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (veh/h)	362	36	87	485	192	30	914
Future Volume (veh/h)	362	36	87	485	192	30	914
Initial Q (Qb), veh	0	0		0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00			1.00	1.00	
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870
Adj Flow Rate, veh/h	393	31		527	168	33	993
Peak Hour Factor	0.92	0.92		0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2		2	2	2	2
Cap, veh/h	496	441		833	264	69	1633
Arrive On Green	0.28	0.28		0.31	0.31	0.04	0.46
Sat Flow, veh/h	1781	1585		2747	842	1781	3647
Grp Volume(v), veh/h	393	31		352	343	33	993
Grp Sat Flow(s),veh/h/ln	1781	1585		1777	1719	1781	1777
Q Serve(g_s), s	7.6	0.5		6.3	6.4	0.7	7.8
Cycle Q Clear(g_c), s	7.6	0.5		6.3	6.4	0.7	7.8
Prop In Lane	1.00	1.00			0.49	1.00	
Lane Grp Cap(c), veh/h	496	441		558	539	69	1633
V/C Ratio(X)	0.79	0.07		0.63	0.64	0.48	0.61
Avail Cap(c_a), veh/h	862	767		1055	1021	281	2101
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	12.5	9.9		11.0	11.0	17.6	7.6
Incr Delay (d2), s/veh	2.9	0.1		1.2	1.2	5.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.1		1.7	1.7	0.3	1.5
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	15.4	10.0		12.2	12.2	22.6	7.9
LnGrp LOS	B	A		B	B	C	A
Approach Vol, veh/h	424			695			1026
Approach Delay, s/veh	15.0			12.2			8.4
Approach LOS	B			B			A

Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	5.5	16.6				22.1		15.3
Change Period (Y+Rc), s	4.0	4.9				4.9		4.9
Max Green Setting (Gmax), s	5.9	22.2				22.1		18.1
Max Q Clear Time (g_c+I1), s	2.7	8.4				9.8		9.6
Green Ext Time (p_c), s	0.0	3.3				5.1		0.9

Intersection Summary			
HCM 6th Ctrl Delay			10.9
HCM 6th LOS			B

Notes

User approved ignoring U-Turning movement.

Lane Group	WBL	WBR	NBU	NBT	SBL	SBT
Lane Group Flow (vph)	393	39	95	736	33	993
v/c Ratio	0.76	0.08	0.47	0.47	0.17	0.74
Control Delay	29.8	6.4	34.6	11.0	27.0	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	6.4	34.6	11.0	27.0	19.7
Queue Length 50th (ft)	126	0	34	61	11	161
Queue Length 95th (ft)	#244	18	#85	137	34	226
Internal Link Dist (ft)	681			390		811
Turn Bay Length (ft)						
Base Capacity (vph)	625	584	207	1729	204	1526
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.07	0.46	0.43	0.16	0.65

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)	120	735	218	325	853	183	206	212	175	203	639	320
Future Volume (veh/h)	120	735	218	325	853	183	206	212	175	203	639	320
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		0.98	1.00		0.98
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	130	799	189	353	927	159	224	230	152	221	695	278
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	1040	454	458	1301	569	314	941	410	312	939	410
Arrive On Green	0.06	0.29	0.29	0.13	0.37	0.37	0.09	0.26	0.26	0.09	0.26	0.26
Sat Flow, veh/h	3456	3554	1552	3456	3554	1555	3456	3554	1551	3456	3554	1551
Grp Volume(v), veh/h	130	799	189	353	927	159	224	230	152	221	695	278
Grp Sat Flow(s),veh/h/ln	1728	1777	1552	1728	1777	1555	1728	1777	1551	1728	1777	1551
Q Serve(g_s), s	3.0	16.6	7.9	8.0	18.1	5.9	5.1	4.1	6.5	5.0	14.5	13.0
Cycle Q Clear(g_c), s	3.0	16.6	7.9	8.0	18.1	5.9	5.1	4.1	6.5	5.0	14.5	13.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	205	1040	454	458	1301	569	314	941	410	312	939	410
V/C Ratio(X)	0.63	0.77	0.42	0.77	0.71	0.28	0.71	0.24	0.37	0.71	0.74	0.68
Avail Cap(c_a), veh/h	371	1539	672	767	1947	852	512	1416	618	546	1451	633
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	37.3	26.1	23.1	34.0	22.0	18.1	35.8	23.4	24.3	35.8	27.3	26.7
Incr Delay (d2), s/veh	3.2	1.4	0.6	2.8	0.7	0.3	3.0	0.1	0.6	3.0	1.2	2.0
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	1.3	6.5	2.7	3.3	6.7	1.9	2.2	1.6	2.2	2.1	5.8	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.5	27.5	23.7	36.7	22.8	18.4	38.8	23.6	24.8	38.8	28.4	28.7
LnGrp LOS	D	C	C	D	C	B	D	C	C	D	C	C
Approach Vol, veh/h		1118			1439			606			1194	
Approach Delay, s/veh		28.4			25.7			29.5			30.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	26.4	14.7	28.6	11.4	26.3	8.8	34.6
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	12.8	32.3	18.0	35.1	12.0	33.1	8.7	44.4
Max Q Clear Time (g_c+I1), s	7.0	8.5	10.0	18.6	7.1	16.5	5.0	20.1
Green Ext Time (p_c), s	0.3	1.8	0.8	5.1	0.3	4.9	0.1	6.8

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	130	799	237	353	927	199	224	230	190	221	695	348
v/c Ratio	0.46	0.78	0.44	0.68	0.73	0.29	0.60	0.25	0.35	0.58	0.74	0.63
Control Delay	53.6	39.7	16.8	49.5	32.3	4.6	52.7	31.1	6.6	51.5	39.7	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.6	39.7	16.8	49.5	32.3	4.6	52.7	31.1	6.6	51.5	39.7	20.4
Queue Length 50th (ft)	44	258	54	118	280	0	75	64	0	74	225	88
Queue Length 95th (ft)	81	356	132	180	375	47	125	104	54	123	311	198
Internal Link Dist (ft)		1249			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	306	1276	640	634	1614	813	423	1174	638	451	1203	652
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.63	0.37	0.56	0.57	0.24	0.53	0.20	0.30	0.49	0.58	0.53

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	812	226	69	763	104	152	88	51	345	416	494
Future Volume (veh/h)	218	812	226	69	763	104	152	88	51	345	416	494
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		0.98	1.00		0.98	1.00		0.98
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	232	864	192	73	812	89	162	94	43	367	443	409
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	312	1073	462	93	938	409	198	527	438	468	572	475
Arrive On Green	0.09	0.30	0.30	0.05	0.27	0.27	0.11	0.28	0.28	0.14	0.31	0.31
Sat Flow, veh/h	3428	3526	1519	1767	3526	1538	1767	1856	1539	3428	1856	1541
Grp Volume(v), veh/h	232	864	192	73	812	89	162	94	43	367	443	409
Grp Sat Flow(s),veh/h/ln	1714	1763	1519	1767	1763	1538	1767	1856	1539	1714	1856	1541
Q Serve(g_s), s	5.3	18.1	8.1	3.3	17.6	3.6	7.2	3.1	1.6	8.3	17.4	20.0
Cycle Q Clear(g_c), s	5.3	18.1	8.1	3.3	17.6	3.6	7.2	3.1	1.6	8.3	17.4	20.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	312	1073	462	93	938	409	198	527	438	468	572	475
V/C Ratio(X)	0.74	0.81	0.42	0.78	0.87	0.22	0.82	0.18	0.10	0.78	0.77	0.86
Avail Cap(c_a), veh/h	342	1105	476	132	1017	444	243	586	486	676	697	579
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	35.5	25.7	22.2	37.5	28.0	22.9	34.7	21.6	21.1	33.4	25.2	26.1
Incr Delay (d2), s/veh	7.7	4.4	0.6	17.3	7.5	0.3	16.1	0.2	0.1	3.8	4.4	10.8
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	2.4	7.3	2.6	1.8	7.6	1.2	3.8	1.3	0.5	3.5	7.7	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	30.0	22.8	54.8	35.6	23.2	50.9	21.8	21.2	37.3	29.6	36.9
LnGrp LOS	D	C	C	D	D	C	D	C	C	D	C	D
Approach Vol, veh/h		1288			974			299			1219	
Approach Delay, s/veh		31.3			35.9			37.5			34.4	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	27.7	8.2	29.3	13.0	29.6	11.3	26.2
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	15.8	25.3	6.0	25.1	11.0	30.1	8.0	23.1
Max Q Clear Time (g_c+I1), s	10.3	5.1	5.3	20.1	9.2	22.0	7.3	19.6
Green Ext Time (p_c), s	0.6	0.5	0.0	2.6	0.1	2.7	0.1	1.7

Intersection Summary		
HCM 6th Ctrl Delay		34.0
HCM 6th LOS		C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	232	864	240	73	812	111	162	94	54	367	443	526
v/c Ratio	0.71	0.78	0.37	0.58	0.88	0.21	0.74	0.19	0.10	0.67	0.80	0.85
Control Delay	52.1	34.2	5.5	60.5	42.8	2.2	59.0	25.7	0.4	40.4	38.7	30.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	34.2	5.5	60.5	42.8	2.2	59.0	25.7	0.4	40.4	38.7	30.1
Queue Length 50th (ft)	65	239	0	40	228	0	88	40	0	99	218	158
Queue Length 95th (ft)	#123	#354	54	#105	#344	13	#189	79	0	146	330	#336
Internal Link Dist (ft)		1248			771			1086			1554	
Turn Bay Length (ft)	275		275	150		25	105		105	175		100
Base Capacity (vph)	325	1111	641	125	969	545	231	559	581	643	665	695
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.78	0.37	0.58	0.84	0.20	0.70	0.17	0.09	0.57	0.67	0.76

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)	14	377	109	22	222	245	154	442	30	216	270	7
Future Volume (veh/h)	14	377	109	22	222	245	154	442	30	216	270	7
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		0.97	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	15	410	82	24	241	186	167	480	23	235	293	7
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	32	451	90	46	577	472	205	526	25	274	611	15
Arrive On Green	0.02	0.30	0.30	0.03	0.31	0.31	0.12	0.30	0.30	0.15	0.34	0.34
Sat Flow, veh/h	1781	1503	301	1781	1870	1531	1781	1767	85	1781	1817	43
Grp Volume(v), veh/h	15	0	492	24	241	186	167	0	503	235	0	300
Grp Sat Flow(s),veh/h/ln	1781	0	1804	1781	1870	1531	1781	0	1852	1781	0	1861
Q Serve(g_s), s	0.7	0.0	21.0	1.1	8.2	7.7	7.3	0.0	21.0	10.3	0.0	10.2
Cycle Q Clear(g_c), s	0.7	0.0	21.0	1.1	8.2	7.7	7.3	0.0	21.0	10.3	0.0	10.2
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.05	1.00		0.02
Lane Grp Cap(c), veh/h	32	0	542	46	577	472	205	0	551	274	0	626
V/C Ratio(X)	0.48	0.00	0.91	0.52	0.42	0.39	0.82	0.00	0.91	0.86	0.00	0.48
Avail Cap(c_a), veh/h	134	0	602	134	624	511	272	0	604	298	0	635
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.9	0.0	26.9	38.5	22.0	21.8	34.6	0.0	27.1	33.0	0.0	21.0
Incr Delay (d2), s/veh	10.7	0.0	16.7	8.8	0.5	0.5	13.2	0.0	17.4	20.2	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	10.8	0.6	3.4	2.6	3.7	0.0	10.8	5.6	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.6	0.0	43.7	47.3	22.4	22.3	47.8	0.0	44.5	53.2	0.0	21.6
LnGrp LOS	D	A	D	D	C	C	D	A	D	D	A	C
Approach Vol, veh/h		507			451			670			535	
Approach Delay, s/veh		43.8			23.7			45.3			35.5	
Approach LOS		D			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.3	28.7	6.1	28.9	13.2	31.8	5.4	29.6				
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	13.4	26.1	6.0	26.7	12.2	27.3	6.0	26.7				
Max Q Clear Time (g_c+I1), s	12.3	23.0	3.1	23.0	9.3	12.2	2.7	10.2				
Green Ext Time (p_c), s	0.1	0.9	0.0	1.0	0.1	1.3	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay			38.0									
HCM 6th LOS			D									

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	15	528	24	241	266	167	513	235	301
v/c Ratio	0.12	0.90	0.19	0.38	0.38	0.70	0.90	0.83	0.49
Control Delay	41.1	48.9	42.5	23.5	4.8	52.4	50.3	61.4	26.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	48.9	42.5	23.5	4.8	52.4	50.3	61.4	26.6
Queue Length 50th (ft)	7	238	12	91	0	79	235	114	116
Queue Length 95th (ft)	28	#499	38	180	55	#181	#487	#267	222
Internal Link Dist (ft)		2658		1520			2614		1226
Turn Bay Length (ft)	250		250		150	250		250	
Base Capacity (vph)	128	586	128	641	699	260	582	286	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.90	0.19	0.38	0.38	0.64	0.88	0.82	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	364	268	21	369	141	12
Future Volume (veh/h)	364	268	21	369	141	12
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	396	232	23	401	153	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	496	290	51	1093	245	21
Arrive On Green	0.45	0.45	0.03	0.58	0.15	0.15
Sat Flow, veh/h	1106	648	1781	1870	1617	137
Grp Volume(v), veh/h	0	628	23	401	167	0
Grp Sat Flow(s),veh/h/ln	0	1754	1781	1870	1765	0
Q Serve(g_s), s	0.0	11.4	0.5	4.2	3.3	0.0
Cycle Q Clear(g_c), s	0.0	11.4	0.5	4.2	3.3	0.0
Prop In Lane		0.37	1.00		0.92	0.08
Lane Grp Cap(c), veh/h	0	786	51	1093	268	0
V/C Ratio(X)	0.00	0.80	0.45	0.37	0.62	0.00
Avail Cap(c_a), veh/h	0	1232	288	1817	907	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	8.8	17.8	4.1	14.8	0.0
Incr Delay (d2), s/veh	0.0	2.1	6.2	0.2	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.5	0.2	0.4	1.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	10.9	24.0	4.3	17.1	0.0
LnGrp LOS	A	B	C	A	B	A
Approach Vol, veh/h	628			424	167	
Approach Delay, s/veh	10.9			5.4	17.1	
Approach LOS	B			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		10.5	5.1	21.6				26.6
Change Period (Y+Rc), s		4.9	4.0	4.9				4.9
Max Green Setting (Gmax), s		19.1	6.0	26.1				36.1
Max Q Clear Time (g_c+I1), s		5.3	2.5	13.4				6.2
Green Ext Time (p_c), s		0.3	0.0	3.2				2.3

Intersection Summary	
HCM 6th Ctrl Delay	9.8
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	687	23	401	166
v/c Ratio	0.74	0.10	0.40	0.42
Control Delay	16.1	22.6	7.3	19.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	16.1	22.6	7.3	19.4
Queue Length 50th (ft)	88	5	47	34
Queue Length 95th (ft)	#396	27	111	96
Internal Link Dist (ft)	1543		1999	1602
Turn Bay Length (ft)				
Base Capacity (vph)	1168	252	1535	802
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.59	0.09	0.26	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	1	70	30	1	114	118	227	107	264	126	10
Future Vol, veh/h	6	1	70	30	1	114	118	227	107	264	126	10
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1	76	33	1	124	128	247	116	287	137	11
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	10.4	10.9	14.7	14.2
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	68%	0%	1%	0%	1%	0%	93%
Vol Right, %	0%	32%	0%	99%	0%	99%	0%	7%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	118	334	6	71	30	115	264	136
LT Vol	118	0	6	0	30	0	264	0
Through Vol	0	227	0	1	0	1	0	126
RT Vol	0	107	0	70	0	114	0	10
Lane Flow Rate	128	363	7	77	33	125	287	148
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.23	0.576	0.014	0.14	0.069	0.221	0.516	0.243
Departure Headway (Hd)	6.443	5.71	7.765	6.547	7.582	6.363	6.479	5.921
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	557	632	460	545	471	562	557	605
Service Time	4.19	3.457	5.536	4.317	5.346	4.126	4.23	3.672
HCM Lane V/C Ratio	0.23	0.574	0.015	0.141	0.07	0.222	0.515	0.245
HCM Control Delay	11.1	16	10.6	10.4	10.9	10.9	16	10.6
HCM Lane LOS	B	C	B	B	B	B	C	B
HCM 95th-tile Q	0.9	3.7	0	0.5	0.2	0.8	2.9	0.9

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	
Lane Configurations								
Traffic Volume (veh/h)	317	9	32	1047	452	61	598	
Future Volume (veh/h)	317	9	32	1047	452	61	598	
Initial Q (Qb), veh	0	0		0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00			1.00	1.00		
Parking Bus, Adj	1.00	1.00		1.00	1.00	1.00	1.00	
Work Zone On Approach	No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870		1870	1870	1870	1870	
Adj Flow Rate, veh/h	345	10		1138	393	66	650	
Peak Hour Factor	0.92	0.92		0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2		2	2	2	2	
Cap, veh/h	396	352		1368	463	93	2258	
Arrive On Green	0.22	0.22		0.53	0.53	0.05	0.64	
Sat Flow, veh/h	1781	1585		2699	883	1781	3647	
Grp Volume(v), veh/h	345	10		769	762	66	650	
Grp Sat Flow(s),veh/h/ln	1781	1585		1777	1711	1781	1777	
Q Serve(g_s), s	12.8	0.3		24.9	26.2	2.5	5.6	
Cycle Q Clear(g_c), s	12.8	0.3		24.9	26.2	2.5	5.6	
Prop In Lane	1.00	1.00			0.52	1.00		
Lane Grp Cap(c), veh/h	396	352		933	899	93	2258	
V/C Ratio(X)	0.87	0.03		0.82	0.85	0.71	0.29	
Avail Cap(c_a), veh/h	495	440		1062	1023	155	2258	
HCM Platoon Ratio	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	
Uniform Delay (d), s/veh	25.8	20.9		13.7	14.0	32.1	5.6	
Incr Delay (d2), s/veh	13.2	0.0		4.8	6.2	9.6	0.1	
Initial Q Delay(d3),s/veh	0.0	0.0		0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	6.4	0.1		8.7	9.1	1.2	1.4	
Unsig. Movement Delay, s/veh								
LnGrp Delay(d),s/veh	39.0	21.0		18.5	20.1	41.7	5.7	
LnGrp LOS	D	C		B	C	D	A	
Approach Vol, veh/h	355			1531			716	
Approach Delay, s/veh	38.5			19.3			9.0	
Approach LOS	D			B			A	
Timer - Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	7.6	41.0				48.6		20.2
Change Period (Y+Rc), s	4.0	4.9				4.9		4.9
Max Green Setting (Gmax), s	6.0	41.1				41.1		19.1
Max Q Clear Time (g_c+I1), s	4.5	28.2				7.6		14.8
Green Ext Time (p_c), s	0.0	7.9				4.4		0.4
Intersection Summary								
HCM 6th Ctrl Delay			19.1					
HCM 6th LOS			B					

Notes

User approved ignoring U-Turning movement.

Lane Group	WBL	WBR	NBU	NBT	SBL	SBT
Lane Group Flow (vph)	345	10	35	1629	66	650
v/c Ratio	0.82	0.03	0.24	0.89	0.46	0.33
Control Delay	46.0	13.2	39.5	23.0	46.9	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	13.2	39.5	23.0	46.9	10.7
Queue Length 50th (ft)	164	0	17	344	32	95
Queue Length 95th (ft)	#300	12	45	#522	#78	132
Internal Link Dist (ft)	681			390		811
Turn Bay Length (ft)						
Base Capacity (vph)	467	425	146	1973	146	2100
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.02	0.24	0.83	0.45	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)	224	921	170	291	934	202	234	724	374	170	306	187
Future Volume (veh/h)	224	921	170	291	934	202	234	724	374	170	306	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	243	1001	148	316	1015	177	254	787	325	185	333	163
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	320	1205	527	398	1286	562	335	1001	437	257	920	401
Arrive On Green	0.09	0.34	0.34	0.12	0.36	0.36	0.10	0.28	0.28	0.07	0.26	0.26
Sat Flow, veh/h	3456	3554	1554	3456	3554	1555	3456	3554	1552	3456	3554	1550
Grp Volume(v), veh/h	243	1001	148	316	1015	177	254	787	325	185	333	163
Grp Sat Flow(s),veh/h/ln	1728	1777	1554	1728	1777	1555	1728	1777	1552	1728	1777	1550
Q Serve(g_s), s	6.4	24.3	6.5	8.4	23.9	7.7	6.7	19.2	17.9	4.9	7.2	8.2
Cycle Q Clear(g_c), s	6.4	24.3	6.5	8.4	23.9	7.7	6.7	19.2	17.9	4.9	7.2	8.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	320	1205	527	398	1286	562	335	1001	437	257	920	401
V/C Ratio(X)	0.76	0.83	0.28	0.79	0.79	0.31	0.76	0.79	0.74	0.72	0.36	0.41
Avail Cap(c_a), veh/h	442	1482	648	553	1595	698	527	1330	581	332	1129	493
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	41.5	28.5	22.6	40.4	26.7	21.6	41.3	31.1	30.6	42.5	28.4	28.8
Incr Delay (d2), s/veh	5.0	3.4	0.3	5.4	2.2	0.3	3.5	2.3	3.6	5.3	0.2	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	9.9	2.2	3.6	9.5	2.6	2.9	8.0	6.6	2.2	2.9	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.5	32.0	22.9	45.8	28.9	21.9	44.8	33.4	34.2	47.8	28.7	29.4
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1392			1508			1366			681	
Approach Delay, s/veh		33.5			31.6			35.7			34.0	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	31.3	14.8	36.7	13.1	29.2	12.7	38.8
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	9.0	35.1	15.0	39.1	14.3	29.8	12.0	42.1
Max Q Clear Time (g_c+I1), s	6.9	21.2	10.4	26.3	8.7	10.2	8.4	25.9
Green Ext Time (p_c), s	0.1	5.2	0.5	5.5	0.4	2.4	0.3	6.4

Intersection Summary		
HCM 6th Ctrl Delay		33.6
HCM 6th LOS		C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	243	1001	185	316	1015	220	254	787	407	185	333	203
v/c Ratio	0.67	0.85	0.31	0.72	0.81	0.32	0.63	0.77	0.73	0.65	0.37	0.38
Control Delay	57.7	42.2	10.8	56.0	37.6	4.9	53.8	41.2	29.8	61.1	35.2	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.7	42.2	10.8	56.0	37.6	4.9	53.8	41.2	29.8	61.1	35.2	6.9
Queue Length 50th (ft)	91	357	27	117	348	1	93	277	168	70	107	0
Queue Length 95th (ft)	135	448	82	167	437	52	137	350	289	#117	151	58
Internal Link Dist (ft)		1249			1233			1070			873	
Turn Bay Length (ft)	250		50	250		255	235		65	255		100
Base Capacity (vph)	393	1320	658	491	1422	751	468	1185	621	295	1006	584
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.76	0.28	0.64	0.71	0.29	0.54	0.66	0.66	0.63	0.33	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)	428	952	185	64	968	335	218	306	176	167	169	386
Future Volume (veh/h)	428	952	185	64	968	335	218	306	176	167	169	386
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		0.98	1.00		0.98	1.00		0.98
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	465	1035	158	70	1052	277	237	333	148	182	184	290
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	498	1399	605	90	1067	466	257	519	431	253	387	320
Arrive On Green	0.15	0.40	0.40	0.05	0.30	0.30	0.15	0.28	0.28	0.07	0.21	0.21
Sat Flow, veh/h	3428	3526	1524	1767	3526	1540	1767	1856	1539	3428	1856	1534
Grp Volume(v), veh/h	465	1035	158	70	1052	277	237	333	148	182	184	290
Grp Sat Flow(s),veh/h/ln	1714	1763	1524	1767	1763	1540	1767	1856	1539	1714	1856	1534
Q Serve(g_s), s	12.0	22.4	6.2	3.5	26.6	13.7	11.9	14.1	6.9	4.7	7.8	16.5
Cycle Q Clear(g_c), s	12.0	22.4	6.2	3.5	26.6	13.7	11.9	14.1	6.9	4.7	7.8	16.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	498	1399	605	90	1067	466	257	519	431	253	387	320
V/C Ratio(X)	0.93	0.74	0.26	0.78	0.99	0.59	0.92	0.64	0.34	0.72	0.48	0.91
Avail Cap(c_a), veh/h	498	1399	605	124	1067	466	257	519	431	276	396	327
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	37.9	23.1	18.2	42.0	31.0	26.6	37.8	28.3	25.7	40.6	31.2	34.6
Incr Delay (d2), s/veh	25.0	2.1	0.2	18.8	24.1	2.0	36.4	2.7	0.5	8.0	0.9	27.3
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	6.4	8.6	2.0	1.9	13.7	4.8	7.5	6.3	2.4	2.2	3.4	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.9	25.2	18.4	60.8	55.2	28.6	74.2	31.0	26.2	48.6	32.1	61.9
LnGrp LOS	E	C	B	E	E	C	E	C	C	D	C	E
Approach Vol, veh/h		1658			1399			718			656	
Approach Delay, s/veh		35.1			50.2			44.3			49.8	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	30.0	8.5	40.5	17.0	23.6	17.0	32.0
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	7.2	24.9	6.3	33.8	13.0	19.1	13.0	27.1
Max Q Clear Time (g_c+I1), s	6.7	16.1	5.5	24.4	13.9	18.5	14.0	28.6
Green Ext Time (p_c), s	0.0	1.6	0.0	4.7	0.0	0.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	43.5
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	465	1035	201	70	1052	364	237	333	191	182	184	420
v/c Ratio	0.91	0.71	0.27	0.56	0.96	0.58	0.90	0.73	0.38	0.64	0.55	0.88
Control Delay	61.3	25.8	4.0	58.8	49.9	14.6	74.4	40.0	8.3	50.8	38.8	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.3	25.8	4.0	58.8	49.9	14.6	74.4	40.0	8.3	50.8	38.8	34.5
Queue Length 50th (ft)	137	269	0	39	312	64	135	167	10	53	92	93
Queue Length 95th (ft)	#230	348	43	#95	#454	157	#275	260	60	#94	157	#250
Internal Link Dist (ft)		1248			771			1086			1554	
Turn Bay Length (ft)	275		275	150		25	105		105	175		100
Base Capacity (vph)	511	1460	746	127	1098	628	263	531	560	283	407	531
Starvation Cap Reductn	0	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	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.71	0.27	0.55	0.96	0.58	0.90	0.63	0.34	0.64	0.45	0.79

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.