Exhibit M

State of California - Department of Fish and Wildlife

2022 ENVIRONMENTAL DOCUMENT FILING FEE CASH RECEIPT

DFW 753.5a (REV. 01/01/22) Previously DFG 753.5a

RECEIPT NUMBER:
E202210000226
STATE CLEARINGHOUSE NUMBER *(if applicable)*

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY.

LEAD AGENCY	LEAD AGENCY EMAIL	DATE
CITY OF FRESNO		08/12/2022

COUNTY/STATE AGENCY OF FILING	DOCUMENT NUMBER
FRESNO COUNTY	E202210000226

PROJECT TITLE

EA FOR T-6345/P22-00411/P22-00442

PROJECT APPLICANT NAME	PROJECT APPLICANT EMAIL		PHONE NUMBER
CITY OF FRESNO			
PROJECT APPLICANT ADDRESS	**CITY**	**STATE**	**ZIP CODE**
2600 FRESNO ST, 3RD FLOOR ROOM 3043	FRESNO	CA	93721

PROJECT APPLICANT *(Check appropriate box)*

☒ Local Public Agency ☐ School District ☐ Other Special District ☐ State Agency ☐ Private Entity

CHECK APPLICABLE FEES:

☐ Environmental Impact Report (EIR)	$3,539.25	$	0.00
☐ Mitigated/Negative Declaration (MND)(ND)	$2,548.00	$	0.00
☒ Certified Regulatory Program (CRP) document - payment due directly to CDFW	$1,203.25	$	0.00

☐ Exempt from fee

- ☐ Notice of Exemption (attach)
- ☐ CDFW No Effect Determination (attach)

☐ Fee previously paid (attach previously issued cash receipt copy)

☐ Water Right Application or Petition Fee (State Water Resources Control Board only)	$850.00	$	0.00
☐ County documentary handling fee	$50.00	$	0.00
☒ Other **NOI**		$	0.00

PAYMENT METHOD:

☐ Cash ☐ Credit ☐ Check ☐ Other **TOTAL RECEIVED** $ **0.00**

SIGNATURE	AGENCY OF FILING PRINTED NAME AND TITLE
X Jessica Munoz	**Jessica Munoz Deputy Clerk**

E202210000226

CITY OF FRESNO

NOTICE OF INTENT TO ADOPT A

MITIGATED NEGATIVE DECLARATION

Filed with the
FRESNO COUNTY CLERK
2220 Tulare Street, Fresno, CA 93721

FILED
AUG 12 2022 TIME 11:20am
By FRESNO COUNTY CLERK DEPUTY

ENVIRONMENTAL ASSESSMENT FOR T-6345/P22-00411/P22-00442

APPLICANT:

Ernie Escobedo
QK, Inc.
601 Pollasky Avenue, Suite 301
Clovis, CA 93612

PROJECT LOCATION:

2121 South Willow Avenue; Located on the southeast corner of the East California Avenue alignment (railroad) and South Willow Avenue in the City and County of Fresno, California (See Exhibit A - Vicinity Map)

APN: 481-020-01 (tentative tract map parcel), 481-060-02S, 473-030-63, 473-030-10 and 481-010-19

Site Latitude: 36°43'12" N & Site Longitude: 119°43'30" W Mount Diablo Base & Meridian, Township 14S, Range 21E, Sections 7 and 18

The full Initial Study and the Fresno General Plan Program Environmental Impact Report (PEIR) are on file in the Planning and Development Department, Fresno City Hall, 3rd Floor, Room 3043, 2600 Fresno Street, Fresno, CA 93721.

E20221000226

PROJECT DESCRIPTION:

Annexation Application No. P22-00411, Pre-zone Application No. P22-00442, and Vesting Tentative Tract Map No. 6345 was filed by D. R. Horton and pertains to approximately 123.74 acres of property.

Annexation Application No. P22-00411 to initiate annexation proceedings for the California-Willow No. 4 Reorganization proposing incorporation of the subject property within the City of Fresno; and, detachment from the Kings River Conservation District and Fresno County Fire Protection District.

Pre-zone Application No. P22-00442 proposing to pre-zone: approximately 38.37 acres of the subject property from the Fresno County AL20 (Limited Agriculture) zone district to the City of Fresno RS-5 (Single-Family Residential, Medium Density) zone district; approximately 37.90 acres of the subject property from the Fresno County AL20 (Limited Agriculture) zone district to the RS-5/ANX (Single-Family Residential, Medium Density/Annexed Rural Residential Transitional Overlay) zone district; and, approximately 41.70 acres of the subject property from the Fresno County AL20 (Limited Agriculture) zone district to the City of Fresno RM-2/ANX (Multi-Family Residential, Urban Neighborhood/Annexed Rural Residential Transitional Overlay) zone district.

Vesting Tentative Tract Map No. 6345, proposing to subdivide approximately 36.75 acres of the subject property into a 199-lot conventional single-family residential development.

The project will also require dedications for public street rights-of-way and utility easements as well as the construction of public facilities and infrastructure in accordance with the standards, specifications and policies of the City of Fresno in order to facilitate the future proposed development of the subject property.

The subject property is located within the boundaries of the Fresno General Plan and Roosevelt Community Plan.

The City of Fresno has prepared an Initial Study of the above-described project and proposes to adopt a Mitigated Negative Declaration.

Pursuant to the California Public Resources Code (PRC) §§ 21093 and 21094 and California Environmental Quality Act (CEQA) Guidelines §§ 15070 to 15075, 15150, and 15152, this project has been evaluated with respect to each item on the attached Appendix G/Initial Study Checklist to determine whether this project may cause any additional significant effect on the environment. After conducting a review of the adequacy of the Project Specific Mitigation Measure Checklist and CEQA Guidelines §§ 15151 and 15179(b), the Planning and Development Department, as lead agency, finds that no substantial changes have occurred with respect to the circumstances under which the PEIR was certified and that no new information, which was not known and could not have been known at the time that the PEIR was certified as complete, has become available.

E20221000226

The completed Appendix G/Initial Study Checklist, its associated narrative, technical studies and mitigation measures reflect applicable comments of responsible and trustee agencies and research and analyses conducted to examine the interrelationship between the proposed project and the physical environment. The information contained in the project application and its related environmental assessment application, responses to requests for comment, checklist, Initial Study narrative, and any attachments thereto, combine to form a record indicating that an Initial Study has been completed in compliance with the State CEQA Guidelines and the CEQA.

All new development activity and many non-physical projects contribute directly or indirectly toward cumulative impacts on the physical environment. It has been determined that the incremental effect contributed by this project toward cumulative impacts is not considered substantial or significant in itself and/or that cumulative impacts accruing from this project may be mitigated to less than significant with application of feasible mitigation measures.

With mitigation imposed under the Project Specific Mitigation Measure Checklist, there is no substantial evidence in the record that this project may have additional significant, direct, indirect or cumulative effects on the environment that are significant. The Planning and Development Department, as lead agency, finds that no substantial changes have occurred with respect to the circumstances under which the PEIR was certified and that no new information, which was not known and could not have been known at the time that the PEIR was certified as complete has become available.

Based upon the evaluation guided by the Appendix G/Initial Study Checklist, it was determined that there are project specific foreseeable impacts which require project level mitigation measures.

The Initial Study has concluded that the proposed project will not result in any adverse effects, which fall within the "Mandatory Findings of Significance" contained in § 15065 of the State CEQA Guidelines. The finding is, therefore, made that the proposed project will not have a significant adverse effect on the environment.

Public notice has been provided regarding staff's finding in the manner prescribed by § 15072 of the CEQA Guidelines and by § 21092 of the PRC Code (CEQA provisions).

Additional information on the proposed project, including the Project Specific Mitigation Measure Checklist, proposed environmental finding of a Mitigated Negative Declaration and the Initial Study may be obtained from the Planning and Development Department, Fresno City Hall, 2600 Fresno Street, 3rd Floor, Room 3043, Fresno, California 93721 3604. Please contact Rob Holt at (559) 621-8056 or via email at Robert.Holt@fresno.gov for more information.

ANY INTERESTED PERSON may comment on the proposed environmental finding. Comments must be in writing and must state (1) the commentor's name and address; (2) the commentor's interest in, or relationship to, the project; (3) the environmental determination being commented upon; and (4) the specific reason(s) why the proposed environmental determination should or should not be made. Any comments may be submitted at any time between the publication date of this notice and close of business on August 2, 2022. Please direct comments to Rob Holt, Planner III, City of Fresno Planning and Development Department, City Hall, 2600 Fresno Street, Room 3043, Fresno, California, 93721-3604; or by email to Robert.Holt@fresno.gov.

E20221000226

INITIAL STUDY PREPARED BY: Rob Holt, Planner III	SUBMITTED BY: Israel Trejo, Supervising Planner CITY OF FRESNO PLANING AND DEVELOPMENT DEPARTMENT
DATE: 08/12/2022	
Attachments: Exhibit A – Vicinity Map	

Exhibit A – Vicinity Map

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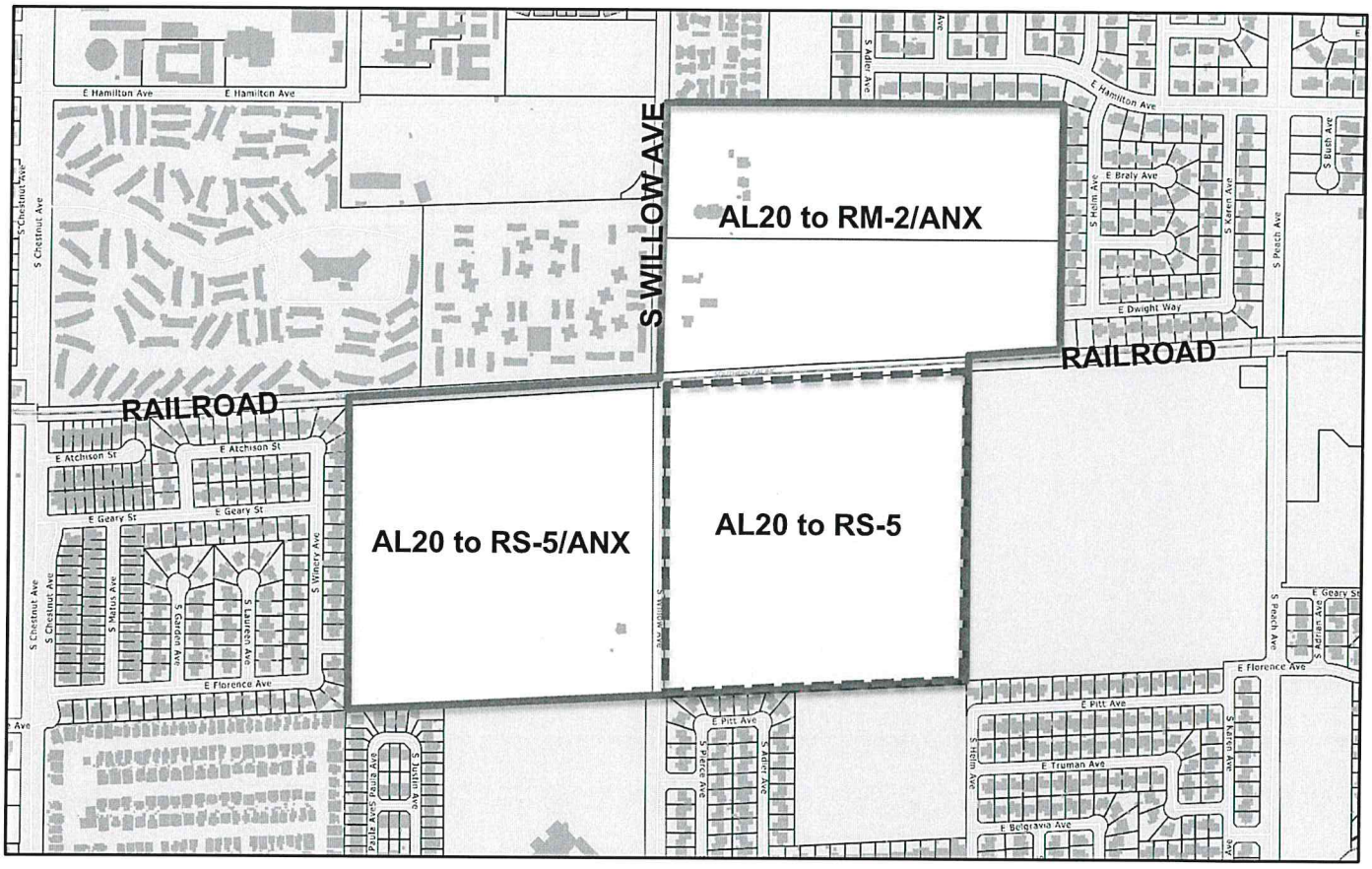

Legend

Annexation Area

T-6345 Subject Property

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NW
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W
E
SW
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APPENDIX G/INITIAL STUDY FOR A MITIGATED NEGATIVE DECLARATION

Environmental Checklist Form for:
Environmental Assessment No. T-6345/P22-00411/P22-00442

1.	**Project title:** Autumn Ridge (Annexation Application No. P22-00411, Plan Amendment-Rezone Application No. P22-00442, and Vesting Tentative Tract Map No. 6345 ("T-6345"))
2.	**Lead agency name and address:** City of Fresno Planning and Development Department 2600 Fresno Street Fresno, CA 93721
3.	**Contact person and phone number:** Rob Holt, Planner III City of Fresno Planning and Development Department 2600 Fresno Street, Room 3065 (559) 621-8056
4.	**Project location:** Located at 2121 South Willow Avenue in Fresno Site Latitude: 36°43'12.2" N Site Longitude: 119°43'31.4"W Mount Diablo Base & Meridian, Township 14S, Range 21E Section 18 – California Assessor's Parcel Numbers: 481-020-01 (Project Site for T-6345), 481-060-02S, 473-030-10, and 473-030-63
5.	**Project sponsor's name and address:** D.R. Horton 419 West Murray Avenue Visalia, CA 93291 **Landowner:** Ohanesian Holdings, LLC 3770 West Wathen Avenue Fresno, CA 93711

6.	**General & Community Plan Land Use Designation:** Current: Medium Density Residential Proposed: Medium Density Residential
7.	**Zoning:** Current: ±117.97 acres of Fresno County AL20 (*Limited Agricultural 20-acre minimum*) Proposed: ± 38.37 acres of City of Fresno RS-5 (*Residential Single-Family, Medium Density*) ± 37.90 acres of City of Fresno RS-5/ANX (*Residential Single-Family, Medium Density/Annexed Rural Residential Transitional Overlay*) ± 41.70 acres of City of Fresno RM-2/ANX (*Residential Multi-Family, Urban Neighborhood/Annexed Rural Residential Transitional Overlay*)
8.	**Description of Project:** 1. Annexation Application No. P22-00411 requests authorization to initiate annexation proceedings for the California-Willow No. 4 Reorganization proposing incorporation of the subject property within the City of Fresno; and, detachment from the Kings River Conservation District and Fresno County Fire Protection District. 2. Pre-zone Application No. P22-00442 proposing to pre-zone: approximately 38.37 acres of the subject property from the Fresno County AL20 (Limited Agriculture) zone district to the City of Fresno RS-5 (Single-Family Residential, Medium Density) zone district; approximately 37.90 acres of the subject property from the Fresno County AL20 (Limited Agriculture) zone district to the RS-5/ANX (Single-Family Residential, Medium Density/Annexed Rural Residential Transitional Overlay) zone district; and, approximately 41.70 acres of the subject property from the Fresno County AL20 (Limited Agriculture) zone district to the City of Fresno RM-2/ANX (Multi-Family Residential, Urban Neighborhood/Annexed Rural Residential Transitional Overlay) zone district. 3. Vesting Tentative Tract Map 6345 proposing to subdivide approximately 36.75 acres of the subject property into a 199-lot conventional single-family residential development subject to compliance with the Conditions of Approval dated September 7, 2022. The subject properties are currently undeveloped parcels surrounded by single-family residences, a middle school, undeveloped land, and agriculture. **Entitlements:**

	The Project proposes an Annexation and Pre-zone of approximately 123.74 acres, of which T-6345 encompasses approximately 36.75 acres. The total annexation area will include parcels APNs: 481-020-01 (T-6345 parcel), 481-060-02S, 473-030-10 and 473-030-63 and the entirety of East California Avenue (alignment), which is currently railroad right-of-way, and South Willow Avenue within the annexation boundary, per the request of the Fresno County Local Agency Formation Commission ("LAFCO"). The proposed T-6345 would allow the applicant, D.R. Horton, to construct a single-family residential subdivision on approximately 36.75 acres with an approximate 2-acre neighborhood park site (Outlot D on T-6345). The proposed T-6345 intends to create 199 single-family residential lots and appurtenant infrastructure consistent with the General Plan designation of Medium Density Residential and proposed zoning designation of RS-5 (Residential Single-Family, Medium Density/Urban Growth Management), respectively. The Project also includes trail dedication to the City along the north property boundary for future trail connection (Outlot F on T-6345) to the existing Trails and Rails planned corridor. T-6345 proposes primary access from South Willow Avenue, which runs parallel to the western boundary of the Project site. Two stubbed access points are proposed to the east in order to facilitate connections to Vesting Tentative Tract Map No. 6379, which was recently approved by the City of Fresno Planning Commission on May 18, 2022. The Project is located within the Roosevelt Community Plan Area and is not within a Specific Plan Area. The Project site is relatively flat with minor variations in elevation of two feet. The average elevation of the Project site is approximately 306 feet above mean sea level. Once developed, the Project will drain stormwater into existing storm drain basin located south of the Project site. According to the Fresno Metropolitan Flood Control District ("FMFCD"), there are three inlet boundaries within the Project site and three planned inlets for the boundaries that feed into a retention basin. Drainage easements will straddle property lines of lots along the southern boundary of the project site in order to connect to FMFCD facilities. In addition, the approximate 2-acre park (Outlot D of T-6345) will be located in the northwestern corner of the project site and will connect to a 36 foot trail that will be overlayed on the FID easement along the norther portion of the project site (Outlot F of T-6345).

9. **Surrounding land uses and setting (from Annexation Boundary):**

	Planned Land Use	Existing Zoning	Existing Land Use
North	Medium Low Density Residential, Urban Neighborhood, & Open Space – Ponding Basin	**RS-4 (Single-Family Residential, Medium Low Density)** **RM-2** (Multi-Family Residential, Urban Neighborhood)	Single-Family & Multi-Family Residences, Ponding Basin
East	Medium Density Residential & Urban Neighborhood	**RS-5** (Single-Family Residential, Medium Density) **RM-2** (Multi-Family Residential, Urban Neighborhood)	Single-Family Residences and an undeveloped parcel approved for a 200 single-family residential subdivision
South	Medium Density Residential, Public & Institutional – Middle School, and Open Space – Ponding Basin	**RS-5** (Single-Family Residential, Medium Density) **PI** (Public & Institutional) **OS** (Open Space)	Middle School, Single-Family Residences, and a Ponding Basin
West	Medium Density Residential	**RS-5** (Single-Family Residential, Medium Density)	Single-Family Residences

10. **Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):** City of Fresno Planning and Development Department, City of Fresno Building & Safety Services Division; City of Fresno Department of Public Works; City of Fresno Department of Public Utilities; County of Fresno, Department of Community Health; County of Fresno, Department of Public Works and Planning; City of Fresno Fire Department; Fresno Metropolitan Flood Control District; Fresno Irrigation District; and, San Joaquin Valley Air Pollution Control District.

11. **Have California Native American tribes traditionally and culturally affiliated with the Project site requested consultation pursuant to Public Resources Code (PRC) Section 21080.3.1? If so, has consultation begun?** The State requires lead agencies to consider the potential effects of proposed Projects and consult with California Native American tribes during the local planning process for the purpose of protecting Traditional Tribal Cultural Resources through the California Environmental Quality Act (CEQA) Guidelines. Pursuant to PRC Section 21080.3.1, the lead agency

	shall begin consultation with the California Native American tribe that is traditionally and culturally affiliated with the geographical area of the proposed Project. Such significant cultural resources are either sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a tribe which is either on or eligible for inclusion in the California Historic Register or local historic register, or, the lead agency, at its discretion, and support by substantial evidence, choose to treat the resources as a Tribal Cultural Resources (PRC Section 21074(a)(1-2)). According to the most recent census data, California is home to 109 currently recognized Indian tribes. Tribes in California currently have nearly 100 separate reservations or Rancherias. Fresno County has a number of Rancherias such as Table Mountain Rancheria, Millerton Rancheria, Big Sandy Rancheria, Cold Springs Rancheria, and Squaw Valley Rancheria. These Rancherias are not located within the city limits. Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and Project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See PRC Section 21083.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per PRC Section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that PRC Section 21082.3(c) contains provisions specific to confidentiality. Currently, the Table Mountain Rancheria Tribe and the Dumna Wo Wah Tribe have requested to be notified pursuant to Assembly Bill 52 (AB 52). A certified letter was mailed to the above mentioned tribes on April 15, 2022. The 30-day comment period ended on May 16, 2022. Neither tribe requested consultation.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐	Aesthetics	☐	Agriculture and Forestry Resources
☐	Air Quality	☐	Biological Resources
☐	Cultural Resources	☐	Energy
☐	Geology/Soils	☐	Greenhouse Gas Emissions
☐	Hazards and 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: (To be completed by the Lead Agency)

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.
_X_	I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
__	I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT (EIR) is required.
__	I find that the proposed Project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An EIR is required, but it must analyze only the effects that remain to be addressed.
___	I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed

	adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

08/12/2022

Rob Holt, Planner III Date

EVALUATION OF ADDITIONAL ENVIRONMENTAL IMPACTS NOT ASSESSED INPROGRAM ENVIRONMENTAL IMPACT REPORT SCH NO. 2019050005 PREPARED FOR THE APPROVED FRESNO GENERAL PLAN (PEIR):

1. For purposes of this Initial Study, the following answers have the correspondingmeanings:

   a. “No Impact” means the specific impact category does not apply to the project, or that the record sufficiently demonstrates that project specific factors or general standards applicable to the project will result in no impact for the threshold under consideration.

   b. “Less than Significant Impact” means there is an impact related to the thresholdunder consideration, but that impact is less than significant;

   c. “Less than Significant with Mitigation Incorporation” means there is a potentially significant impact related to the threshold under consideration, however, with the mitigation incorporated into the project, the impact is less than significant. For purposes of this Initial Study “mitigation incorporated into the project” means mitigation originally described in the GP PEIR and applied to an individual project, as well as mitigation developed specifically for an individual project.

   d. “Potentially Significant Impact” means there is substantial evidence that an effect may be significant related to the threshold under consideration.

2. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supportedif the referenced information sources show that the impact simply does not apply to Projects like

the one involved (e.g., the Project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on Project-specific factorsas well as general standards (e.g., the Project will not expose sensitive receptors to pollutants, based on a Project-specific screening analysis).

3. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as Project-level, indirect as well as direct, and construction as well as operational impacts.

4. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant,less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant.If there are one or more "Potentially Significant Impact" entries when the determinationis made, an EIR is required.

5. "Negative Declaration: Less than Significant With Mitigation Incorporation" applies where the incorporation of mitigation measures has reduced an effect from "PotentiallySignificant Impact" to a "Less than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from, "Earlier Analyses," as describedin (6) below, may be cross-referenced).

6. Earlier analyses may be used where, pursuant to the tiering, program EIR, PEIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

    a. Earlier Analysis Used. Identify and state where they are available for review.

    b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in the PEIR or another earlierdocument pursuant to applicable legal standards, and state whether such effectswere addressed by mitigation measures based on the earlier analysis.

    c. Mitigation Measures. For effects that are "Less than significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific

conditions for the Project.

7. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

8. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

9. The explanation of each issue should identify:

   a. The significance criteria or threshold, if any, used to evaluate each question; and

   b. The mitigation measure identified, if any, to reduce the impact to less thansignificance.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
I. AESTHETICS – Except as provided in PRC Section 21099, would the Project:				
a) Have a substantial adverse effect on a scenic vista?				X
b) Substantially damage scenic resources, including, but not limited to, trees, rock out-croppings, and historic buildings within a state scenic highway?				X
c) In non-urbanized areas, substantially degrade the existing visual character or quality 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 which would adversely affect day or nighttime views in the area?		X		

DISCUSSION

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

The site is located within an area primarily consisting of large undeveloped parcels and single-family residences within the County of Fresno. Parcels to the south consist of single-family residences and a retention basin. Parcels to the north include agricultural crops and rural residences. Parcels to the east and west are undeveloped. The Project site is relatively flat with minor variations in elevation of two feet. The average elevation of the Project site is approximately 306 feet above mean sea level.

A scenic vista is a viewpoint that provides a distant view of highly valued natural or man-made landscape features for the benefit of the general public. Typical scenic vistas are locations where views of rivers, hillsides, and open space areas can be obtained as well as locations where valued urban landscape features can be viewed in the distance.

The City of Fresno General Plan Program Environmental Impact Report State Clearinghouse No. 2019050005 ("PEIR") acknowledges that the City has not identified or designated scenic vistas within the Project area. Although no scenic vista has been designated, it is acknowledged that scenic vistas within the City could provide distant views of natural landscape features such as the San Joaquin River along the northern boundary of the Planning Area and the foothills of the Sierra Nevada Mountain Range. The River bluffs provide distant views of the San Joaquin River as well as areas north of the River. However, the majority of these views are from private properties. There are limited views of the San Joaquin River from Weber Avenue, Milburn Avenue, McCampbell Drive, Valentine Avenue, Palm Avenue, State Route (SR) 41, Friant Road, and Woodward Park.

There are various locations throughout the eastern portion of the City that provide views of the Sierra Nevada foothills that are located northeast and east of the Planning Area. These distant views of the Sierra Nevada foothills are impeded many days during the year by the poor air quality in the Fresno region. Distant views of man-made landscape features include the Downtown Fresno buildings that provide a unique skyline. Given the site's distance from the San Joaquin River (approximately ten miles northwest of the site (as the crow flies)), the proposed Project will not interfere with public views of the San Joaquin River environs. Furthermore, as there are no designated public or scenic vistas on or adjacent to the Project site, there is no potential for adverse effect on a scenic vista.

The Project site is located within an area with a planned land use designation allowing for single-family residential development within the City of Fresno General Plan map, is outside of the San Joaquin River bluffs and not near the Downtown Fresno area. Properties further to the north, east, south and west have been developed with single-family residential neighborhoods. The subject Project site is currently undeveloped. The existing topography of the Project site is nearly flat. There will be *no impacts* to scenic vistas.

Mitigation Measures

No mitigation measures are required.

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

Scenic resources include landscapes and features that are visually or aesthetically pleasing and contribute positively to a distinct community or region. The scenic resources within the City include landscaped open spaces, such as parks and golf courses. Additional scenic resources within the City include areas along the San Joaquin River (River) due to the topographic variation in the relatively flat San Joaquin Valley. The River bluffs provide a unique geological feature in the San Joaquin Valley. Historic structures in Downtown Fresno buildings also represent scenic resources because they provide a unique skyline. The Project site is devoid of buildings, native trees or rock outcroppings. There are remnant nut trees from the previous agricultural use on the site, but they are not considered a scenic resource. The annexation parcel to the north is devoid of any scenic resource component but is still in nut production.

According to the California Department of Transportation Mapping of State Scenic Highways, there are no State Scenic Highways in Fresno County. Fresno County has three eligible State Scenic Highways, the closest is a portion of SR 168 that is approximately 6-miles northeast of the Project site and will not be impacted. The closest State Scenic Highway is SR 41 in Madera County and is approximately 30-miles north-east of the Project site.

The Project site is not within the vicinity of a State designated scenic highway and would have no impact or substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings. Therefore, the Project will have *no impact*.

Mitigation Measures

No mitigation measures are required.

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

The Project site is predominantly surrounded by existing or proposed residential development and is considered an urban area. Given the Project site's distance from the San Joaquin River (approximately 12 miles north of the site), the proposed Project will not interfere with public views of the San Joaquin River environment. The Project would create new single-family residential development similar in appearance to the existing residential development surrounding the site.

The PEIR recognizes and acknowledges that poor air quality reduces existing views within the City of Fresno's sphere of influence as a whole; and therefore, finds that a

less than significant impact will result to views of highly valued features such as the Sierra Nevada foothills from future development on and in the vicinity of the Project site.

The Project will not damage, nor will it degrade the visual character or quality of the Project site and its surroundings, given that the Project site is primarily vacant, in an area that is also primarily single-family residential and vacant; and, in an area generally planned for and developed with residential uses. As such, impacts to the visual character or quality of the site would be less than significant due to the development improving the existing character of the site and the surrounding properties being of a similar use. Therefore, Project impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required.

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

Future development of the site will create a new source of light or glare within the area. However, given that the Project site is within an area where development has already occurred with residential uses, which already affect day and nighttime views in the Project site to a certain degree, no significant impact will occur. The Project would incorporate the applicable mitigation measures pertaining to light and glare included in the PEIR (AES-4.1 and AES-4.2). Furthermore, through the entitlement process, staff will ensure that streetlights are located in areas that will minimize light sources to the neighboring properties in accordance with the mitigation measures of the PEIR pertaining to light and glare.

In conclusion, with PEIR mitigation measures incorporated in the Project Specific Mitigation Monitoring Checklist dated August 12, 2022, the Project will not result in any additional impacts related to aesthetics. The Project impacts are considered *less than significant with mitigation incorporation*.

Mitigation Measures

The proposed project shall implement and incorporate, as applicable, the aesthetic related mitigation measures as identified in the attached Project Specific Mitigation Monitoring Checklist dated August 12, 2022.

AES-4.1: Lighting for Street and Parking Areas. Lighting systems for street and parking areas shall include shields to direct light to the roadway surfaces and parking areas. Vertical shields on the light fixtures shall also be used to direct light away from adjacent light sensitive land uses such as residences.

AES-4.2: Lighting for Public Facilities. Lighting systems for public facilities such as active play areas shall provide adequate illumination for the activity; however, low intensity light fixtures and shields shall be used to minimize spillover light onto adjacent properties.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
II. AGRICULTURE AND FORESTRY RESOURCES – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the 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)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
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		

DISCUSSION

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?

Based upon the State of California Department of Conservation Farmland Mapping and Monitoring Program, the Project site (annexation boundary) includes properties designated as "Farmland of Local Importance," "Prime Farmland," and "Urban and Built-Up Land." Farmland of Local Importance is defined as farmable lands within Fresno County that do not meet the definitions of Prime, Statewide, or Unique. This includes land that is or has been used for irrigated pasture, dryland farming, confined livestock and dairy, poultry facilities, aquaculture and grazing land. Prime Farmland is defined as having the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date. Urban and Built-Up Land is defined as occupied by structures with a building density of at least one unit to 1.5 acres, or approximately six structures to a ten-acre parcel.

The Project site is undeveloped and is not currently utilized for agricultural purposes and is designated as Farmland of Local Importance and Urban and Built-Up Land. Development of the Project will not result in conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, and will have a less than significant impact.

The annexation portion to the north includes 42.3-acres of prime farmland and conversion of that land by that owner could be considered a significant impact.

The City has not yet adopted a Farmland Preservation Program as described in GP PEIR MM AG-1.1. Therefore, the final section of MM AG-1.1 applies to the annexation

parcel to the north, and will be required to mitigate on an individual basis as outlined below.

The northeast portion of the annexation will be designated and zoned for residential development that would have a non-agricultural use. However, because the DOC classifies the land as being Prime Farmland, the Developer will be required to provide in-kind value protection at a ratio of 1:1 for a total of 42.3-acres, by recording an agricultural conservation easement on agricultural land of equal size and classification to the land being converted to non-agricultural uses prior to obtaining a grading permit for the that Project site. The land selected for the agricultural conservation easement will have a tangible relationship to the land being converted from an agricultural use and shall be in or adjacent to Fresno County. The easement will be held by the City of Fresno, comply with the requirements of California Civil Code Section 815 et. seq., and will be in a form substantially similar to the model conservation easement prepared by the California Department of Conservation(https://www.conservation.ca.gov/dlrp/grant-programs/Documents/grant/SALCP%20Model%20ACE%20Template%20(2014-2015)%20Final%2012.4.2015.pdf).

There will be no loss pf Prime Farmland or impact to the parcels to the north until it is developed in the future. Mitigation AG 1.1 will be applicable to that property upon development.

Therefore, the Project will have *less than significant impact with mitigation incorporated*.

Mitigation Measures

The proposed Project shall implement and incorporate the agricultural resources related mitigation measures as identified in the attached Project Specific Mitigation Monitoring Checklist dated August 12,2022

MM AG-1.1: Prior to issuance of a grading or building permit, whichever occurs first, the Developer of APN 473-030-10/63 shall complete the following measures to mitigate the loss of agricultural land at a ratio of 1:1 for the net acreage before conversion. (The net acreage calculation shall exclude existing roads and areas already developed with structures, and a plot plan shall be submitted to substantiate the net acreage calculation, along with written evidence of compliance.).

Mitigation land shall meet the definition of Prime Farmland, Farmland of Statewide Importance, and/or Unique Farmland and be of similar agricultural quality or higher, as established by the California Department of Conservation. Completion of the selected measure or, with the City of Fresno Planning Director's approval, a combination of measures can occur on qualifying land within the San Joaquin Valley (San Joaquin, Stanislaus, Merced, Fresno, Madera, Kings, Tulare, or Kern County) or outside the San Joaquin Valley with written evidence that the same or equivalent crops can be produced on the mitigation land.

Developer shall provide in-kind value protection at a ratio of 1:1 for a total of 42.3 acres, by recording an agricultural conservation easement on agricultural land of equal size and classification to the land being converted to non-agricultural uses prior to obtaining a grading permit for the Project site. The land selected for the agricultural conservation easement will have a tangible relationship to the land being converted from an agricultural use and shall be in or adjacent to Fresno County. The easement will be held by the City of Fresno, comply with the requirements of California Civil Code Section 815 et. seq., and will be in a form substantially similar to the model conservation easement prepared by the California Department of Conservation(https://www.conservation.ca.gov/dlrp/grant-programs/Documents/grant/SALCP%20Model%20ACE%20Template%20(2014-2015)%20Final%2012.4.2015.pdf).

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

The Project site is zoned AL20 (Limited Ag) but is not subject to an existing Williamson Act Contract. However, the site is within the City's Sphere of Influence and is anticipated to be converted to a non- agricultural use similar to those properties in the vicinity. With approval of the proposed pre-zoning that would change the General Plan land use and zoning from the existing AL-20 to RS-5 (Residential Single-Family, Medium Density), the property will be consistent for residential development. Therefore, the proposed Project on the subject site will not affect existing agriculturally zoned or Williamson Act Contract parcels, and impacts would be *less than significant*.

Mitigation Measures

No mitigation measures are required

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

The Project site is not considered forest land as defined in Public Resources Code section 12220(g), timberland as defined by Public Resources Code section 4526, or timberland zoned Timberland Production as defined by Government Code section 51104(g). There are no forest lands identified on the Project site or within its vicinity; therefore, there would be no conflict with or impacts to zoning for forest land or timber land. Therefore, the proposed Project will not conflict with any forest land or Timberland Production or result in any loss of forest land. Therefore, the Project will have *no impact*.

Mitigation Measures

No mitigation measures are required.

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

The Project site is not considered forest land (as stated above in Impact II-c) and is located within the urban bounds of the City of Fresno and is surrounded by development. Therefore, the proposed Project will not result in the loss of any forest land or result in the conversion of forest land to non-forest uses. Therefore, the Project will have *no impact*.

Mitigation Measures

No mitigation measures are required.

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?

The Project includes the north parcel that is 42.3 acres of designated Prime Farmland. Therefore, MM AG-1.1 applies to the annexation parcel to the north and will be required to mitigate at a ratio of 1:1 for a total of 42.3-acres, by recording an agricultural conservation easement on agricultural land of equal size and classification.

The implementation of the Project would not result in other changes in the existing environment that would impact agricultural land outside of the Project site or Planning Area. The 42.3-acres of Prime Farmland are not a part of the proposed subdivision and will remain as Farmland until those property owners decide to develop. Impacts would be *less than significant with mitigation incorporated*.

Mitigation Measures

Implementation of MM AG-1.1

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
III. AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan (*e.g.*, by having potential emissions of regulated criterion pollutants which exceed the San Joaquin Valley Air Pollution Control Districts (SJVAPCD) adopted thresholds for these pollutants)?			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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?		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	

The analyses presented in this section are based on an *Air Quality and Greenhouse Gas Impact Assessment* prepared for the Project (VRPA, 2021a), attached as Appendix A.

Environmental Setting

The Project site is located in the City of Fresno and within the San Joaquin Valley Air Basin (SJVAB) which is regulated by the San Joaquin Valley Air Pollution Control District (SJVAPCD). This region has had chronic non-attainment of federal and state clean air standards for ozone/oxidants and particulate matter due to a combination of topography

and climate. The San Joaquin Valley (Valley) is hemmed in on three sides by mountain ranges, with prevailing winds carrying pollutants and pollutant precursors from urbanized areas to the north (and in turn contributing pollutants and precursors to downwind air basins). The Mediterranean climate of this region, with a high number of sunny days and little or no measurable precipitation for several months of the year, fosters photochemical reactions in the atmosphere, creating ozone and particulate matter. Regional factors affect the accumulation and dispersion of air pollutants within the SJVAB.

Air pollutant emissions overall are fairly constant throughout the year, yet the concentrations of pollutants in the air vary from day to day and even hour to hour. This variability is due to complex interactions of weather, climate, and topography. These factors affect the ability of the atmosphere to disperse pollutants. Conditions that move and mix the atmosphere help disperse pollutants, while conditions that cause the atmosphere to stagnate allow pollutants to concentrate. Local climatological effects, including topography, wind speed and direction, temperature, inversion layers, precipitation, and fog can exacerbate the air quality problem in the SJVAB.

The SJVAB is approximately 250 miles long and averages 35 miles wide and is the second largest air basin in the state. The SJVAB is defined by the Sierra Nevada in the east (8,000 to 14,000 feet in elevation), the Coastal Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 8,000 feet in elevation). The Valley is basically flat with a slight downward gradient to the northwest. The Valley opens to the sea at the Carquinez Straits where the San Joaquin- Sacramento Delta empties into San Francisco Bay. The Valley, thus, could be considered a “bowl” open only to the north.

During the summer, wind speed, and direction data indicate that summer wind usually originates at the north end of the Valley and flows in a south-southeasterly direction through the Valley, through Tehachapi pass, into the Southeast Desert Air Basin. In addition, the Altamont Pass also serves as a funnel for pollutant transport from the San Francisco Bay Area Air Basin into the region.

During the winter, wind speed and direction data indicate that wind occasionally originates from the south end of the Valley and flows in a north-northwesterly direction. Also during the winter months, the Valley generally experiences light, variable winds (less than 10 mph). Low wind speeds, combined with low inversion layers in the winter, create a climate conducive to high carbon monoxide (CO) and particulate matter (PM10 and PM2.5) concentrations. The SJVAB has an “Inland Mediterranean” climate averaging over 260 sunny days per year. The Valley floor is characterized by warm, dry summers and cooler winters. For the entire Valley, high daily temperature readings in summer average 95ºF. Temperatures below freezing are unusual. Average high temperatures in the winter are in the 50s, but highs in the 30s and 40s can occur on days with persistent fog and low cloudiness. The average daily low temperature is 45ºF.

The vertical dispersion of air pollutants in the Valley is limited by the presence of persistent temperature inversions. Solar energy heats up the Earth’s surface, which in turn radiates heat and warms the lower atmosphere. Therefore, as altitude increases, the air temperature usually decreases due to increasing distance from the source of heat. A

reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. Inversions can exist at the surface or at any height above the ground and tend to act as a lid on the Valley, holding in the pollutants that are generated here.

DISCUSSION

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

The SJVAPCD considered basin-wide cumulative impacts to air quality when developing its significance thresholds. The SJVAPCD's air quality significance thresholds represent the maximum emissions from a Project that are not expected to conflict with the SJVAPCD's air quality plans and is not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard. These are developed based on the ambient concentrations of the pollutant for each source. Because the Project would not exceed the air quality significance thresholds on the project-level and would not otherwise conflict with the SJVAPCD's air quality plans, the cumulative emissions would not be a significant contribution to a cumulative impact.

Consistency with Air Quality Plans (AQPs)
A measure for determining if the Project is consistent with the air quality plans is if the Project would not result in an increase in the frequency or severity of existing air quality violations, cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the air quality plans. Regional air quality impacts and attainment of standards are the result of the cumulative impacts of all emission sources within the air basin. Individual Projects are generally not large enough to contribute measurably to an existing violation of air quality standards.

To meet Federal Clean Air Act (CAA) requirements, the SJVAPCD has multiple air quality attainment plan (AQAP) documents, including:

- 2016 Ozone Plan
- 2007 PM_{10} Maintenance Plan and Request for Redesignation
- 2016 $PM_{2.5}$ Plan

As discussed below, emissions of ROG, NOX, PM10, and PM2.5 associated with the construction and operation of the Project would not exceed the District's significance thresholds. As shown in impact (b) below, the Project would not result in CO hotspots that would violate CO standards. Therefore, the Project would not contribute to air quality violations.

Compliance with Applicable Control Measures
The AQP contains a number of control measures, which are enforceable requirements through the adoption of rules and regulations. A description of rules and regulations that apply to this Project is provided below.

SJVAPCD Rule 9510 - Indirect Source Review (ISR) is a control measure in the 2006

PM10 Plan that requires NOX and PM10 emission reductions from development Projects in the San Joaquin Valley. The NOX emission reductions help reduce the secondary formation of PM10 in the atmosphere (primarily ammonium nitrate and ammonium sulfate) and also reduce the formation of ozone. Reductions in directly emitted PM10 reduce particles such as dust, soot, and aerosols. Rule 9510 is also a control measure in the 2016 Plan for the 2008 8-Hour Ozone Standard. Developers of Projects subject to Rule 9510 must reduce emissions occurring during construction and operational phases through on-site measures or pay off-site mitigation fees. The Project is required to comply with Rule 9510.

Regulation VIII - Fugitive PM10 Prohibitions is a control measure that is one main strategies from the 2006 PM10 for reducing the PM10 emissions that are part of fugitive dust. Projects over 10 acres are required to file a Dust Control Plan (DCP) containing dust control practices sufficient to comply with Regulation VIII. The Project is required to prepare a DCP to comply with Regulation VIII.

Other control measures that apply to the Project are Rule 4641 - Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operation that requires reductions in VOC emissions during paving and Rule 4601 - Architectural Coatings that limits the VOC content of all types of paints and coatings sold in the San Joaquin Valley. These measures apply at the point of sale of the asphalt and the coatings, so Project compliance is ensured.

The Project would comply with all applicable SJVAPCD rules and regulations and applicable control measures of the AQP. The Project complies with this criterion and would not conflict with or obstruct implementation of the applicable air quality attainment plan. Therefore, impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required

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?

Regional Emissions

Air pollutant emissions have both regional and localized effects. This analysis assesses the regional effects of the Project's criteria pollutant emissions in comparison to SJVAPCD thresholds of significance for short-term construction activities and long-term operation of the Project. Localized emissions from Project construction and operation are assessed under Impact c) below using concentration-based thresholds that determine if the Project would result in a localized exceedance of any ambient air quality standards or would make a cumulatively considerable contribution to an existing exceedance.

The SJVAPCD GAMAQI adopted in 2015 contains thresholds for CO, NOX, ROG, SOX, PM10, and PM2.5. Reduction of these pollutants during any future development construction activities as a result of the approved Project will be required.

Ozone is a secondary pollutant that can be formed miles from the source of emissions, through reactions of ROG and NOX emissions in the presence of sunlight. Therefore, ROG and NOX are termed ozone precursors. The Air Basin often exceeds the state and national ozone standards. Therefore, if the Project emits a substantial quantity of ozone precursors, the Project may contribute to an exceedance of the ozone standard. The Air Basin also exceeds air quality standards for PM10, and PM2.5; therefore, substantial Project emissions may contribute to an exceedance for these pollutants. The District's annual emission significance thresholds used for the Project define the substantial contribution for both operational and construction emissions as follows:

- 100 tons per year CO
- 10 tons per year NOX
- 10 tons per year ROG
- 27 tons per year SOX
- 15 tons per year PM10
- 15 tons per year PM2.5

The SJVAPCD Air Impact Assessment (AIA) applications for residential development projects that include 50 or more dwelling units. Therefore, the proposed 199-unit single-family residential development is subject to District Rule 9510 (Indirect Source Review) and an AIA application is required. Upon further development of the Project, the developer will be required to reduce any project-specific criteria pollutant emissions to have a less than significant impact.

Construction activity emissions are generated by the temporary use of equipment such as graders, bulldozers, trenchers, etc, and vehicles related to the development of the site. As shown in Table 3-1, the Project's emissions during temporary construction activities would not exceed established air district thresholds. Therefore, construction emissions would be less than significant.

Table 3-1
Project Construction Emissions

Emissions Source	Pollutant						
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	CO2e
	(tons/year)						
Construction Emissions	3.45	3.68	2.75	0.01	1.07	0.55	500.01
SJVAPCD Construction Emissions Thresholds	10	10	100	27	15	15	NA
Is Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Operation of the Project would also create additional criteria pollutants, particularly as a result of increased vehicular emissions, as well as landscape maintenance equipment and other components routinely used in residential developments. The long-term operational emissions associated with the proposed Project would be less than SJVAPCD significance threshold levels and would, therefore, not pose a significant impact to criteria air pollutants. These impacts would not exceed thresholds as shown in Table 3-2, below.

Table 3-2
Total Project Operational Emissions

Emissions Source	Pollutant						
	ROG	NOx	CO	SOx	PM_{10}	$PM_{2.5}$	CO2e
	(tons/year)						
Construction Emissions	2.80	2.07	10.94	0.02	2.07	0.59	2,685.6
SJVAPCD Construction Emissions Thresholds	10	10	100	27	15	15	NA
Is Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**	**No**

MM AIR-2.1 requires applicants for new development projects to incorporate mitigation measures, where applicable, into construction plans to reduce air pollutant emissions during construction activities, such as restricting idling of construction equipment, limiting grading operations to reduce disturbed areas, encouraging the removal of vegetation only when necessary. AIR-2.2 requires project applicants for new development projects to incorporate mitigation measures to reduce air pollutant emissions during operational activities, to the extent feasible. AIR-2.2 maximizing the use of solar energy on rooftops, the planting of trees in landscaping, the use of light-colored roofing, the use of electric lawn mowers, high efficiency appliances and the use of low volatile organic compound (VOC) cleaning products. By implementing the mitigation measures as identified in the GP PEIR, the Project impacts would be less than significant with mitigation incorporated. Therefore, by implementing the mitigation measures identified in the GP PEIR as applicable to the Project, Project impacts are considered to be *less than significant with mitigation incorporated*.

Mitigation Measures

The proposed Project shall implement and incorporate the air quality related mitigation measures as identified in the attached Project Specific Mitigation Monitoring Checklist dated August 12, 2022

AIR-2.1: Prior to future discretionary project approval, development project applicants shall prepare and submit to the Director of the City Planning and Development Department, or designee, a technical assessment evaluating potential project construction phase-related air quality impacts. The evaluation shall be prepared in conformance with SJVAPCD methodology for assessing construction impacts. If construction related air pollutants are determined to have the potential to exceed the

SJVAPCD adopted threshold of significance, the Planning and Development Department shall require that applicants for new development projects incorporate mitigation measures into construction plans to reduce air pollutant emissions during construction activities. The identified measures shall be included as part of the Project Conditions of Approval. Possible mitigation measures to reduce construction emissions include but are not limited to:

- Install temporary construction power supply meters on site and use these to provide power to electric power tools whenever feasible. If temporary electric power is available on site, forbid the use of portable gasoline- or diesel-fueled electric generators.
- Use of diesel oxidation catalysts and/or catalyzed diesel particulate traps on diesel equipment, as feasible.
- Maintain equipment according to manufacturers' specifications.
- Restrict idling of equipment and trucks to a maximum of 5 minutes (per California Air Resources Board [CARB] regulation).
- Phase grading operations to reduce disturbed areas and times of exposure.
- Avoid excavation and grading during wet weather.
- Limit on-site construction routes and stabilize construction entrance(s).
- Remove existing vegetation only when absolutely necessary.
- Sweep up spilled dry materials (e.g., cement, mortar, or dirt track-out) immediately. Never attempt to wash them away with water. Use only minimal water for dust control.
- Store stockpiled materials and wastes under a temporary roof or secured plastic sheeting or tarp.

MM AIR-2.2: Prior to future discretionary project approval, development project applicants shall prepare and submit to the Director of the City Planning and Development Department, or designee, a technical assessment evaluating potential project operation-related air quality impacts. The evaluation shall be prepared in conformance with SJVAPCD methodology in assessing air quality impacts. If operation-related air pollutants are determined to have the potential to exceed the SJVAPCD-adopted thresholds of significance, the Planning and Development Department shall require that applicants for new development projects incorporate mitigation measures to reduce air pollutant emissions during operational activities. The identified measures shall be included as part of the Project Conditions of Approval. Possible mitigation measures to reduce long-term emissions include but are not limited to:

- For site-specific development that requires refrigerated vehicles, the construction documents shall demonstrate an adequate number of electrical service connections at loading docks for plugging in the anticipated number of refrigerated trailers to reduce idling time and emissions.
- Applicants for manufacturing and light industrial uses shall consider energy storage (i.e., battery) and combined heat and power (CHP, also known as cogeneration) in appropriate applications to optimize renewable energy generation systems and avoid peak energy use.
- Site-specific developments with truck delivery and loading areas and truck parking spaces shall include signage as a reminder to limit idling of vehicles while parked for

loading/unloading in accordance with CARB Rule 2845 (13 California Code of Regulations [CCR] Chapter 10, Section 2485).

- Require that 240-volt electrical outlets or Level 3 chargers be installed in parking lots that would enable charging of neighborhood electric vehicles (NEVs) and/or battery powered vehicles.
- Maximize use of solar energy including solar panels; installing the maximum possible number of solar energy arrays on building roofs throughout the city to generate solar energy.
- Maximize the planting of trees in landscaping and parking lots.
- Use light-colored paving and roofing materials.
- Require use of electric or alternatively fueled street-sweepers with HEPA filters.
- Require use of electric lawn mowers and leaf blowers.
- Utilize only Energy Star heating, cooling, and lighting devices, and appliances.
- Use of water-based or low volatile organic compound (VOC) cleaning products.

c) Expose sensitive receptors to substantial pollutant concentrations?
See Impact (b), above

Sensitive Receptors
Those who are sensitive to air pollution include children, the elderly, and persons with pre-existing respiratory or cardiovascular illness. The District considers a sensitive receptor a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include hospitals, residences, convalescent facilities, and schools. The closest off-site sensitive receptors are existing residences located adjacent to the Project site to the north and west, and Elizabeth Terronez Middle School located approximately 100 feet southwest of the Project. As a residential land use development Project, proposed residences included as part of the Project would be considered sensitive receptors once occupied.

Off-site Sensitive Receptors
Impacts to receptors located outside the Project boundaries would occur primarily during Project construction. Construction emissions commencing with the year 2021 and continue until Project buildout. Construction activities are expected to occur over several years as the subdivision is gradually built out; however, most emissions are expected to occur during the initial site preparation and grading activities and to a lesser extent during ground up construction. For criteria pollutants, impacts to receptors located outside of the Project are based on emissions during the highest emissions during any construction year. Emissions generated from construction and operation of the Project are less than SJVAPCD screening criteria. Therefore, this impact would be less than significant.

On-site Sensitive Receptors
The Project is not a significant source of TAC emissions. Construction activities produce short-term emissions that would not contribute substantially to cancer risk, which is estimated on a 70-year exposure period.

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

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

Localized Pollutant Screening Analysis
Emissions occurring at or near the Project have the potential to create a localized impact, also referred to as an air pollutant hotspot. Localized emissions are considered significant if, when combined with background emissions, they would result in exceedance of any health-based air quality standard. The impact from localized pollutants is based on the impact to the nearest sensitive receptor.

The SJVAPCD's GAMAQI includes screening thresholds for identifying Projects that need detailed analysis for localized impacts. Projects with on-site emission increases from construction activities or operational activities that exceed the 100 pounds per day screening level of any criteria pollutant after compliance with Rule 9510 and implementation of all enforceable mitigation measures would require preparation of an ambient air quality analysis. The criteria pollutants of concern for localized impact in the SJVAB are PM10, PM2.5, NOX, and CO. There is no localized emission standard for ROG and most types of ROG are not toxic and have no health-based standard; however, ROG was included for informational purposes only.

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

Operation: PM10, PM2.5, CO, NO2
As shown in Table 3-2, localized emissions of PM10, PM2.5, CO, and NO2 would not exceed the SJVAPCD screening thresholds at full Project build-out. Residential development is an insignificant source of these pollutants, except for Projects that allow woodburning devices that emit PM10, PM2.5 in wood smoke. The Project will include only

natural gas-fueled fireplaces and inserts that are insignificant sources of PM2.5 and PM10. Therefore, the Project would not expose sensitive receptors to substantial criteria air pollutant concentrations during operation.

Carbon Monoxide Hot Spot Analysis
Localized high levels of CO are associated with traffic congestion and idling or slow-moving vehicles. The SJVAPCD provides screening criteria to determine when to quantify local CO concentrations based on impacts to the level of service (LOS) of intersections in the Project vicinity.

A sensitivity analysis using the CALINE4 CO Hotspot model was run for the General Plan PEIR to determine the volume of trips that would be required to exceed the most stringent CO standard. At triple the predicted peak for General Plan buildout of 36,000 peak-hour trips, the hourly concentration was 7.5 ppm and an 8-hour concentration of 6.0 ppm. Based on this analysis, it is extremely unlikely that a CO hotspot will occur in the Plan Area. CO emissions are predicted to continue to decline as old vehicles are retired and cleaner new motor vehicles take their place.

Therefore, no CO hotspot modeling is required for new Projects during General Plan Buildout unless intersection volumes exceed 36,000 peak-hour trips, which is not anticipated to occur with the Project as discussed under XVII. TRANSPORTATION.

Results of the Health Risk Assessment (HRA) prepared for the Project indicated that the maximum predicted cancer risk, chronic health hazard, and acute health hazard for residences and on-site/off-site workplaces are below the significance threshold of 10 in one million for cancer risks and 1.0 for non-cancer health risks. Therefore, the Projects health risk impacts are considered less than significant (VRPA, 2021a).

The Project would not exceed SJVAPCD localized emission daily screening levels for any criteria pollutant. The Project is not a significant source of TAC emissions during construction or operation. The Project is not in an area with suitable habitat for Valley fever spores and is not in area known to have naturally occurring asbestos. The Project site is not in an area known to have naturally occurring asbestos. Therefore, impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required

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

Odor impacts on residential areas and other sensitive receptors, such as hospitals, day-care centers, schools, etc. warrant the closest scrutiny, but consideration should also be

given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas. Two situations create a potential for odor impact. The first occurs when a new odor source is located near an existing sensitive receptor. The second occurs when a new sensitive receptor locates near an existing source of odor. According to the CBIA v. BAAQMD ruling (Alameda Superior Court Case No. RGI0548693), impacts of existing sources of odors on the Project are not subject to CEQA review (California Builiding Association v Bay Area Air Quality Mangement District, 2015). Therefore, the analysis to determine if the Project would locate new sensitive receptors near an existing source of odor is provided for information only. The SJVAPCD has determined the common land use types that are known to produce odors in the Air Basin.

Project as a Generator

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

During construction, the various diesel-powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and would not likely be noticeable for extended periods of time beyond the Project's site boundaries.

Project as a Receiver

With the *CBIA v. BAAQMD* ruling, analysis of odor impacts on receivers is not required for CEQA compliance. Therefore, the following analysis is provided for information only.

As a residential development, the Project has the potential to place sensitive receptors near existing odor sources. However, there are no major odor-generating sources within screening distance of the site. During construction, the various diesel-powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and would not likely be noticeable for extended periods of time beyond the Project's site boundaries. The potential for diesel odor impacts would therefore be less than significant.

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 discussed above along with a reasonable distance from the source within which, the degree of odors could possibly be significant. The Project will not generate odorus emissions given the residential nature of the Project. Therefore, impacts are considered to be *less than significant.*

Mitigation Measures

No mitigation measures are required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
IV. BIOLOGICAL RESOURCES – Would the Project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?				X
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			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

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
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

DISCUSSION

The analyses presented in this section are based on a *Biological Reconnaissance Evaluation* (QK, 2020a), prepared for the Project, which is attached as Appendix B.

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 Wildlife or the U.S. Fish and Wildlife Service?

A biological reconnaissance survey and database review were completed by qualified biologists to characterize the existing conditions onsite and determine the potential for special-status species and other sensitive biological resources to occur onsite and be impacted by the Project. No special-status wildlife species or their sign were observed on the Project site or within the biological survey area (BSA) 500-foot buffer. The survey noted that most of the Project site is highly disturbed and contains no habitat that would support most of the special-status wildlife species. There were 22 special-status wildlife species identified in the CNDDB, CNPS, and USFWS database queries that could potentially occur on the Project site. There were 30 special-status wildlife species documented within a 10-mile radius of the Project site. However, the survey indicated that there are no historical records on-site, though the site is located at the southeastern edge of 10-mile occurrence records for 9 special-status wildlife species.

Migratory Birds and Raptors

There were no nests of migratory birds or raptors on the Project site at the time of the survey. There was one walnut tree on-site that could potentially serve as nesting habitat, but most of the existing trees were either dead or degraded pistachio trees. Many of the trees were eliminated by the recent fire. More than two-dozen mourning doves, which are

a ground nesting species, were observed during the reconnaissance survey. No ground nests were found. A pair of red-tailed hawks were hunting on the southern side of the site, but no active nest was present. There is nesting habitat outside the Project site within the BSA, but that habitat is limited mostly to ornamental tree species. There are several large eucalyptus trees north of the site adjacent to an existing active orchard, but no nests were found in those trees or in any other tree observed within the BSA. Implementation of BIO-1.1, such as nesting bird surveys, raptor surveys, and establishing nest avoidance zones where necessary are recommended which, when implemented, will reduce Project impacts to biological resources to a less than significant level.

San Joaquin Kit Fox and American Badger

The San Joaquin kit fox is unlikely to occur on any portion of the Project site. The nearest record of occurrence for this species was from the 1980s and is more than 8.4 miles southeast of the Project near Sanger. The annual grassland habitat that exists on-site is limited and highly degraded and disturbed by surrounding urban development, trash dumping, repeated disking, a recent grassfire, multiple homeless camps, and nearby road traffic. One inactive mammal den entrance was found off the site but within the BSA within a dry basin. The entrance was unusually large and was accompanied by other oddly sized entrances within 30 feet of the entrance. Each void contained trash and other foreign materials. No diagnostic sign of any large mammal was found in or near the opening. While there are abundant prey items on-site, site conditions documented within the BSA make it unlikely that San Joaquin Kit fox would be present, even as transient foragers.

Likewise, the American badger, which has similar habitat requirements, is unlikely to occur on any portion of the Project site. Proposed Project activities would have no effect on these species.

The federally endangered and California-threatened San Joaquin kit fox once occurred throughout much of the San Joaquin Valley, but this species favored areas of alkali sink scrub and alkali grassland throughout the San Joaquin Valley and Tulare Basin, as well as areas further west. The low foothills of the Sierra Nevada at the eastern edge of the San Joaquin Valley are considered at the edge of their natural range. It is not uncommon to find San Joaquin kit fox in developed and cultivated areas; however, the subject site consists of low-quality habitat for this species.

Western Burrowing Owl

A California Species of Special Concern, the western burrowing owl is a small, terrestrial owl that inhabits relatively flat dry open prairies and grasslands where tree and shrub canopies provide minimal cover. This species is found in close association with California ground squirrels, using the abandoned burrows of these squirrels for shelter, roosting, and nesting. Burrowing owls are colonially nesting raptors, and colony size is indicative of habitat quality. It is not uncommon to find burrowing owls in developed and cultivated areas. Although a high abundance of California ground squirrels occupy the subject site, there are little to no abandoned burrows for the western burrowing owl to inhabit. Therefore, the subject site consists of low-quality habitat for this species.

Swainson's Hawk

The Swainson's hawk is unlikely to occur at the Project. The most recent record of occurrence in the region was from 2016 on the west side of SR 99, 3.5 miles southwest of the Project. While there is foraging habit on-site, there were no potential Swainson's hawk nests observed on the site, there were few agricultural trees of a size that would support nesting Swainson's hawks, and the disturbances and human activity in the area limit the potential for Swainson's hawks to use the site as a breeding area. Sixteen small mammal burrow complexes were mapped during the reconnaissance survey, but many more active burrows and burrow complexes likely exist on-site. Two red-tailed hawks were observed hunting on the southern half of the site and other raptors may use the site to forage.

The BRE concluded that three special status species, San Joaquin kit fox, American badger and western burrowing owl, could potentially be present at the Project site, but their potential for occurrence, even as transients, is very unlikely. Project activities would have no effect on these species. No potential nests of the Swainson's hawk were present on the Project site or within the BSA. The Project will result in the removal of on-site agricultural trees, but the loss of these trees will not represent a loss in nesting habitat for the Swainson's hawk. No special-status wildlife species or diagnostic signs of special-status wildlife species were observed on the Project site, and the degraded condition of the site would tend to preclude those species from occurring.

Therefore, the Project is anticipated to have no impact to special-status wildlife species. However, the Project would be subject to the applicable mitigation measures BIO-1.1, BIO-1.2, BIO-1.4, and BIO-2.1. The Project must comply with the MM BIO-1.1, which includes avoidance and minimization measures for special-status species, BIO 1.2 for the avoidance of direct or incidental take of any State or federally listed species, BIO 1.4,regarding construction during nesting season and related precautions, and BIO 2.1 which requires a pre-construction biological survey prior to construction to determine if the Project site supports any special-status species. These measures will reduce Project impacts to biological resources to a less than significant level. Therefore, impacts are considered to be *less than significant with mitigation incorporated*.

Mitigation Measures

The proposed Project shall implement and incorporate, as applicable, the biological resources related mitigation measures as identified in the attached PEIR Mitigation Monitoring and Reporting Program dated August 12, 2022.

MM BIO-1.1: Construction of a proposed project shall avoid, where possible, vegetation communities that provide suitable habitat for a special-status species known to occur within the Planning Area. If construction within potentially suitable habitat must occur, the presence/absence of any special-status plant or wildlife species must be determined prior to construction, to determine if the habitat supports any special-status species. If a special-status species are determined to occupy any portion of a project site, avoidance and minimization measures shall be incorporated into the construction phase of a project to avoid direct or incidental take of a listed species to the greatest extent feasible. Specific

mitigation measures for direct or incidental impacts to special-status species shall be determined on a case-by-case basis through agency consultation during the review process for discretionary projects, and shall be consistent with survey protocols and mitigations measures recommended by the agency at the time of consultation.

MM BIO-1.2: Direct or incidental take of any State or federally listed species shall be avoided to the greatest extent feasible. If construction of a proposed project will result in the direct or incidental take of a listed species, consultation with the resources agencies and/or additional permitting may be required. Agency consultation through the CDFW 2081 and USFWS Section 7 or Section 10 permitting processes shall take place prior to any action that may result in the direct or incidental take of a listed species. Specific mitigation measures for direct or incidental impacts to special-status species shall be determined on a case-by-case basis through agency consultation during the review process for discretionary projects, and shall be consistent with survey protocols and mitigations measures recommended by the agency at the time of consultation.

MM BIO-1.4: Proposed projects within the Planning Area should avoid, if possible, construction within the general nesting season of February through August for avian species protected under Fish and Game Code 3500 and the Migratory Bird Treaty Act (MBTA), if it is determined that suitable nesting habitat occurs on a project site. If construction cannot avoid the nesting season, a pre-construction clearance survey shall be conducted by a qualified biologist to determine if any nesting birds or nesting activity is observed on or within 500-feet of a project site. If an active nest is observed during the survey, a biological monitor shall be on site to ensure that no proposed project activities would impact the active nest. A suitable buffer shall be established around the active nest until the nestlings have fledged and the nest is no longer active. Project activities may continue in the vicinity of the nest only at the discretion of the biological monitor. Prior to commencement of grading activities and issuance of any building permits, the Director of the City of Fresno Planning and Development Department, or designee, shall verify that all proposed project grading and construction plans include specific documentation regarding the requirements of the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code Section 3503, that preconstruction surveys have been completed and the results reviewed by staff, and that the appropriate buffers (if needed) are noted on the plans and established in the field. Specific mitigation measures for direct or incidental impacts to avian species protected under Fish and Game Code 3500 and the Migratory Bird Treaty Act (MBTA) shall be determined on a case-by-case basis through agency consultation during the review process for discretionary projects, and shall be consistent with survey protocols and mitigations measures recommended by the agency at the time of consultation.

MM BIO-2.1: A pre-construction clearance survey, following current CDFW protocols, shall be conducted by a qualified biologist to determine if a proposed project will result in the removal or impact to any riparian habitat and/or a special-status natural community with potential to occur in the Planning Area, compensatory habitat-based mitigation shall be required to reduce project impacts. Compensatory mitigation must involve the preservation or restoration or the purchase of off-site mitigation credits for impacts to riparian habitat and/or a special-status natural community. Mitigation must be conducted

in-kind or within an approved mitigation bank in the region. The specific mitigation ratio for habitat-based mitigation shall be determined through consultation with the appropriate agency (i.e., CDFW or USFWS) on a case-by-case basis. The project applicant/developer for a proposed project shall develop and implement appropriate mitigation regarding impacts on their respective jurisdictions.

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 Wildlife or the U.S. Fish and Wildlife Service?

As described above, natural communities of special concern are those that are of limited distribution, distinguished by significant biological diversity, home to special status plant and animal species, of importance in maintaining water quality or sustaining flows, etc. Examples of natural communities of special concern in the San Joaquin Valley could include open, ruderal/non-native grassland habitat, which is infrequently disturbed, vernal pools and various types of riparian forest. No natural communities of special concern were identified on the subject site.

There are no riparian habitats or any other sensitive natural communities identified by CDFW or the USFWS located on the Project site. Therefore, the Project will have *no impact*.

Mitigation Measures

No mitigation measures are required

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?

The United States Army Corps of Engineers (USACE) has regulatory authority over the Clean Water Act (CWA), as provided for by the EPA. The USACE has established specific criteria for the determination of wetlands based upon the presence of wetland hydrology, hydric soils, and hydrophilic vegetation. There are no federally protected wetlands or vernal pools that occur within the Project

No State or federally protected wetlands or other water features are located on the subject site. The National Hydrography database (NHD) and National Wetlands Inventory (NWI) shows one stream feature, the Braley Canal, and one pond feature near the site. A freshwater pond, identified as PUBFx (USFWS 2020c), corresponds with a dry basin found within the BSA to the east of the site. A large, inundated retention pond occurs directly south of the Project and a dry basin occurs just east of the site. Both these features occur within the BSA. However, both features are manmade and had no

hydrologic connection with the Project site. The Project will not impact the Braley Canal during construction or operation. Therefore, impacts to wetlands or water features would be *less than significant*.

Mitigation Measures

No mitigation measures are required

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?

Wildlife movement corridors are areas where wildlife species regularly and predictably move during foraging, or during dispersal or migration. Movement corridors in California are typically associated with valleys, rivers, and creeks supporting riparian vegetation, and ridgelines. Such geographic and topographic features are absent from the Project site.

Therefore, the Project will not 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. Therefore, the Project will have *no impact*.

Mitigation Measures

No mitigation measures are required

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

The proposed Project is subject to provisions of the City's Municipal Code regarding trees on public property (Article 3 of Section 13 of the City of Fresno Municipal Code), and as proposed does not conflict with any of the existing ordinances. The trees currently on the site are remnant non-native nut trees from the previous agricultural operation and are not considered a biological resource. As a result, no impact would occur related to local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance In addition, the Project will comply with the policies and goals of the General Plan pertaining to protecting biological resources. Therefore, the proposed Project would have *less than significant impact.*

Mitigation Measures

No mitigation measures are required

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?

The Project site is not located within the boundaries of any approved or draft Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other adopted local, regional or state HCP. Therefore, development of the Project area will not result in any impacts to an adopted HCP or NCCP.

The Project site is located within an area covered by the PG&E San Joaquin Valley Operation and Maintenance (O&M) Habitat Conservation Plan (HCP). That HCP covers PG&E activities and does not apply to this Project. The subject site nor the immediate vicinity occur in any other habitat conservation plans or natural community conservation plans pertaining to natural resources within the region. Therefore, the Project will have *a less than significant impact*.

Mitigation Measures

No mitigation measures are required

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
V. CULTURAL RESOURCES – Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		X		
c) Disturb any human remains, including those interred outside of formal cemeteries?		X		

DISCUSSION

The analyses presented in this section are based on a *Cultural Resources Technical Memorandum* prepared for the Project (QK, 2020b), is included as Appendix C.

a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

A cultural resources records search was conducted by the Southern San Joaquin Valley Information Center, CSU Bakersfield for this Project.

The records search covered an area within one half mile of the Project site and included a review of the National Register of Historic Places (NRHP), California Points of Historical Interest, California Registry of Historic Resources (CRHR), California Historical Landmarks, California State Historic Resources Inventory, and a review of cultural resource reports on file. The records search indicated that subject property had never been surveyed for cultural resources. No cultural resources have been recorded on the property and it is not known if any exist there; however, one cultural resource was identified within a half mile of the proposed Project. The resource identified was a segment of the Southern Pacific Railroad line (P-10-003930) that abuts the Project property on its northern boundary. Although part of a historic railroad route, the track is in active use and is not considered a significant cultural resource.

Eight cultural resource studies have been conducted within a half mile of the property. These consisted of searches for potential housing developments, a USDA horticulture field station, and local schools dating from the early 1990s to as recent as 2018.

No other cultural surveys or resources have been recorded within a half mile of the Project. No cultural resources are known within the Project site. No Native American sacred sites or cultural landscapes had been identified within or immediately adjacent to the study area. A Sacred Lands File request was also submitted to the Native

American Heritage Commission. A response dated October 14, 2020 indicates negative results.

It should be noted however, that lack of surface evidence of historical resources does not preclude the subsurface existence of archaeological resources. Furthermore, previously unknown or undiscovered human remains could be disturbed during Project construction. However, during excavation activities, there is always the potential to discover archaeological or historical cultural resources. In the event cultural resources are found, construction will halt, and a qualified archaeologist or cultural resources specialist will be contacted and will make recommendations to the City. With implementation of the Project Specific Mitigation Measure CUL-1.1, CUL-1.2, and CUL 2, impacts are considered to be *less than significant with mitigation incorporated*.

Mitigation Measures

The proposed Project shall implement and incorporate the cultural resources related mitigation measures as identified in the attached Project Specific Mitigation Monitoring Checklist dated August 12, 2022.

CUL-1.1: If previously unknown resources are encountered before or during grading activities, construction shall stop in the immediate vicinity of the find, and a qualified historical resources specialist shall be consulted to determine whether the resource requires further study. The qualified historical resources specialist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to the excavation of the finds and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines and the City's Historic Preservation Ordinance. If the resources are determined to be unique historical resources as defined under Section 15064.5 of the CEQA Guidelines, measures shall be identified by the monitor and recommended to the Lead Agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds.

No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any historical artifacts recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study.

CUL-1.2: Prior to approval of any discretionary project that could result in an adverse change to a potential historic and/or cultural resource, the City shall require a site-specific evaluation of historic and/or cultural resources by a professional who meets the Secretary of Interior's Qualifications. The evaluation shall provide recommendations to mitigate potential impacts to historic and/or cultural resources and shall be approved by the Director of Planning and Development.

CUL-2: Subsequent to a preliminary City review of the project grading plans, if there is evidence that a project will include excavation or construction activities within previously undisturbed soils, a field survey and literature search for prehistoric archaeological resources shall be conducted. The following procedures shall be followed.

- If prehistoric resources are not found during either the field survey or literature search, excavation and/or construction activities can commence. In the event that buried prehistoric archaeological resources are discovered during excavation and/or construction activities, construction shall stop in the immediate vicinity of the find, and a qualified archaeologist shall be consulted to determine whether the resource requires further study. The qualified archaeologist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with CEQA Guidelines Section 15064.5. If the resources are determined to be unique prehistoric archaeological resources as defined under Section 15064.5 of the CEQA Guidelines, mitigation measures shall be identified by the monitor and recommended to the Lead Agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any prehistoric archaeological artifacts recovered as a result of mitigation shall be provided to a City approved institution or person who is capable of providing long-term preservation to allow future scientific study.

- If prehistoric resources are found during the field survey or literature review, the resources shall be inventoried using appropriate State record forms and submit the forms to the Southern San Joaquin Valley Information Center. The resources shall be evaluated for significance. If the resources are found to be significant, measures shall be identified by the qualified archaeologist. Similar to above, appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. In addition, appropriate mitigation for excavation and construction activities in the vicinity of the resources found during the field survey or literature review shall include an archaeological monitor. The monitoring period shall be determined by the qualified archaeologist. If additional prehistoric archaeological resources are found during excavation and/or construction activities, the procedure identified above for the discovery of unknown resources shall be followed.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

There are no known archaeological or paleontological resources that exist within the Project site. There is no evidence that cultural resources of any type (including historical, archaeological, paleontological, or unique geologic features) exist on the Project site. Nevertheless, there is some possibility that a buried site may exist in the area and be obscured by vegetation, fill, or other historic activities, leaving no surface evidence.

Therefore, with implementation of the Project Specific Mitigation Measure CUL-1.1, CUL-1.2, and CUL 2, impacts are considered to be *less than significant with mitigation incorporated*.

Mitigation Measures

Implementation of MM CUL-1.1 MM CUL 1-2 and CUL 2.

c) Disturb any human remains, including those interred outside of formal cemeteries?

Previously unknown or undiscovered human remains could be disturbed during Project construction. Based on the results of cultural records search findings and the lack of historical or archaeological resources previously identified within a 0.5-mile radius of the proposed Project, the potential to encounter subsurface resources is minimal. Although cultural resources aren't anticipated onsite, like most Projects in the state, the possibility exists that these resources could be found during construction; therefore, mitigation would be required to reduce this impact to a less than significant level. Therefore, due to the ground disturbing activities that will occur as a result of the Project, MM CUL- 3 will address archaeological resources and human remains will be employed to guarantee that should archaeological or human remains be encountered during Project excavations, then work shall stop immediately; and, that qualified professionals in the respective field are contacted and consulted in order to ensure that the activities of the proposed Project will not involve physical demolition, destruction, relocation, or alteration of historic and archaeological resources, or human remains.

In conclusion, with implementation of MM CUL-3 incorporated, the proposed Project will have a *less than significant impact with mitigation incorporated*.

Mitigation Measures

The proposed Project shall implement and incorporate the cultural resources related mitigation measures as identified in the attached Project Specific Mitigation Monitoring Checklist dated August 12, 2022.

CUL-3: In the event that human remains are unearthed during excavation and grading activities of any future development project, all activity shall cease immediately. Pursuant to Health and Safety Code (HSC) Section 7050.5, no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to PRC Section 5097.98(a). If the remains are determined to be of Native American descent, the coroner shall within 24 hours notify the Native American Heritage Commission (NAHC). The NAHC shall then contact the most likely descendent of the deceased Native American, who shall then serve as the consultant on how to proceed with the remains. Pursuant to PRC Section 5097.98(b), upon the discovery of Native American remains, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located is not damaged or disturbed by further development activity until the landowner has discussed and conferred with the most likely descendants regarding their recommendations, if applicable, taking into account the possibility of multiple human remains. The landowner shall discuss and confer with the descendants all reasonable options regarding the descendants' preferences for treatment.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
VI. ENERGY – Would the Project:				
a) Result in 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	

The following analysis is based on the Air Quality and Greenhouse Gases Analysis (VRPA, 2021a) prepared for the Project (Appendix A) and available energy resource consumption data.

DISCUSSION

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?

CEQA Guidelines requires consideration of the potentially significant energy implications of a project. CEQA requires mitigation measures to reduce "wasteful, inefficient and unnecessary" energy usage (Public Resources Code Section 21100, subdivision [b][3]). The means to achieve the goal of conserving energy include decreasing overall energy consumption, decreasing reliance on natural gas and oil, and increasing reliance on renewable energy sources. In particular, the proposed Project would be considered "wasteful, inefficient, and unnecessary" if it were to violate State and federal energy standards and/or result in significant adverse impacts related to Project energy requirements, energy inefficiencies, energy intensiveness of materials, cause significant impacts on local and regional energy supplies or generate requirements for additional capacity, fail to comply with existing energy standards, otherwise result in significant adverse impacts on energy resources, or conflict or create an inconsistency with applicable plan, policy, or regulation.

New buildings and landscapes are much more energy efficient and water efficient than the development that has been built over the past decades and will require much less energy. The 2020 Title 24 standards makes progress toward achieving net zero energy use through requirements for on-site renewable generation for most

projects. The Project would be required to comply with Title 24 standards and other applicable City development standards.

Analysis

Energy demand during the construction phase would result from the transportation of materials, construction equipment, and employee vehicle trips. Construction equipment includes rubber-tired dozers, tractors, loaders, backhoes, excavators, graders, scrapers, cranes, forklifts, generator sets, welders, pavers, paving equipment, rollers, and air compressors. The Project would comply with the SJVAPCD requirements regarding the use of fuel-efficient vehicles.

Energy saving strategies will be implemented where possible to further reduce the Project's energy consumption, during the construction phase. Strategies being implemented include those recommended by the California Air Resources Board (CARB) that may reduce both the Project's energy consumption, including diesel anti-idling measures, light-duty vehicle technology, usage of alternative fuels such as biodiesel blends and ethanol, and heavy-duty vehicle design measures to reduce energy consumption. Additionally, as outlined in the SJVAPCD's GAMAQI, the Project includes recommendations to reduce energy consumption by shutting down equipment when not in use for extended periods, limiting the usage of construction equipment to eight cumulative hours per day, usage of electric equipment for construction whenever possible in lieu of diesel or gasoline powered equipment, and encouragement of employees to carpool to retail establishments or to remain on-site during lunch breaks.

The proposed Project includes the construction of 199 single-family residential units and an approximate 2-acre park site on approximately 40-acres. The Project also includes designated outlots for City street dedication and trail dedication.

The amount of energy used at the Project site would directly correlate to the size of the proposed buildings, the energy consumption of associated appliances and technology, and outdoor lighting. Other major sources of proposed Project energy consumption include fuel used by vehicle trips generated during Project construction and operation, and fuel used by off-road construction vehicles during construction. The proposed Project will be consistent with the City's Greenhouse Gas Reduction Plan related to energy conservation and reduction measures, as shown in Table 6-1.

Table 6-1

City of Fresno Greenhouse Gas Reduction Plan

Objective RC-8 Reduce the consumption of non- renewable energy resources by requiring and encouraging conservation measures and the use of alternative energy sources**.**	**Consistent.** The Project will comply with Title 24 Energy Efficiency Standards and CalGreen Code requirements for solar ready roofs, electric vehicle charging, and water conservation. The 2019 Building Efficiency Standards are the current regulations and went into effect on January 1, 2020. One of the notable changes in the 2019 Title 24 Standards includes the solar photovoltaic systems

	requirement for new low-rise residential homes.
Policy RC-8-a Existing Standards and Programs. Continue existing beneficial energy conservation programs, including adhering to the California Energy Code in new construction and major renovations.	**Consistent.** The Project will comply with all applicable energy standards.
Policy RC-8-b Energy Reduction Targets. Strive to reduce per capita residential electricity use to 1,800 kWh per year and nonresidential electricity use to 2,700 kWh per year per capita by developing and implementing incentives, design and operation standards, promoting alternative energy sources, and cost-effective savings.	**Consistent.** The Project will comply with the Title 24 energy standards in effect at the time building permits are processed for approval.
Source: City of Fresno Greenhouse Gas Reduction Plan 2014.	

There are no unusual project characteristics or construction processes that would require the use of equipment that would be more energy intensive than is used for comparable activities. All construction equipment shall conform to current emissions standards and related fuel efficiencies. In particular, construction and operations of the Project would be subject to applicable CARB regulations (Airborne Toxic Control Measure), California Code of Regulations (Title 13, Motor Vehicles), and Title 24 standards that include a broad set of energy conservation requirements (e.g. Lighting Power Density requirements). In addition, the Project would follow Best Management Practices (BMPs) for water conservation, as warranted and appropriate. Enforcement of these regulations, requirements, and practices would thereby minimize or eliminate unnecessary or wasteful consumption of energy. In addition, the Project would be served by PG&E and would not require extensions of energy infrastructure or new energy supplies. For these reasons, the Project would have a less than significant impact

The proposed Project would use energy resources for the operation of Project buildings (electricity and natural gas), for on-road vehicle trips (e.g. gasoline and diesel fuel) generated by the proposed Project, and from off-road construction activities associated with the proposed Project (e.g. diesel fuel). Each of these activities would require the use of energy resources. The proposed Project would be responsible for conserving energy, to the extent feasible, and relies heavily on reducing per capita energy consumption to achieve this goal, including through State-wide and local measures. Therefore, impacts would be *less than significant*.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The proposed Project would be in compliance with all applicable federal, State, and local regulations regulating energy usage, as shown in Table 6-1. The Project will comply with Title 24 Energy Efficiency Standards and CalGreen Code requirements for solar ready roofs, electric vehicle charging, and water conservation. The Project also includes the installation of solar panels on each

home, to offset the use of electricity that would be generated by non-renewable energy sources such as coal-fired power plants.

PG&E is responsible for the mix of energy resources used to provide electricity for its customers, and it is in the process of implementing the State-wide Renewable Portfolio Standard (RPS) to increase the proportion of renewable energy (e.g. solar and wind) within its energy portfolio. PG&E is expected to achieve at least a 50% renewable energy by 2030 and 100% by 2045.

Other State-wide measures, including those intended to improve the energy efficiency of the State-wide passenger and heavy-duty truck vehicle fleet (e.g. the Pavley Bill and the Low Carbon Fuel Standard), would improve vehicle fuel economies, thereby conserving gasoline and diesel fuel. These energy savings would continue to accrue over time.

As a result, the proposed Project would not result in any significant adverse impacts related to Project energy requirements, energy use inefficiencies, and/or the energy intensiveness of materials by amount and fuel type for each stage of the Project including construction, operations, maintenance, and/or removal. PG&E, the electricity and natural gas provider to the site, maintains sufficient capacity to serve the proposed Project. The proposed Project would comply with all existing energy standards and would not result in significant adverse impacts on energy resources. For these reasons, the proposed Project would not be expected to cause an inefficient, wasteful, or unnecessary use of energy resources nor cause a significant impact on any of the threshold as described by Appendix F of the CEQA Guidelines. In conclusion, energy impacts would be considered *less than significant*.

Mitigation Measures

No mitigation measures are required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
VII. GEOLOGY AND SOILS – Would the Project:				
a) Directly or Indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:			X	
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			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 risks to life or property?			X	

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		

DISCUSSION

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

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

There are no known active earthquake faults within city limits and that there are no areas within the city limits identified within any Alquist-Priolo Special Studies Zones. GP PEIR indicates that projects within the Planning Area would be designed to withstand strong ground shaking because all built projects are required to comply with the CBC to minimize the potential effects of ground shaking and other seismic activity. To reduce ground-shaking impacts, the approved General Plan also includes Objective NS-2 and policies NS-2-a through NS-2-d, and the City of Fresno Municipal Code includes Section 11-101 The nearest active fault is located near Independence, CA, approximately 100 miles to the east along the Fresno County-Inyo County boundary. The principal potential earthquake hazard for Fresno is ground shaking, which could cause damage to buildings and infrastructure elements such as bridges and pipes. The distance between Fresno and major faults minimizes this potential hazard. However, the City of Fresno is classified by the State as being in a moderate seismic risk zone, Category “C” or “D,” depending on the soils underlying the specific location being categorized and that location’s proximity to the nearest known fault lines. No adverse environmental effects related to seismology or known fault lines are expected as a result of this Project.

Because no active faults occur within the Planning Area, impacts associated with fault rupture would be *less than significant.*

Mitigation Measures

No mitigation measures are required

ii. Strong seismic ground shaking?

According to the Fresno County Multi-Hazard Mitigation Plan, the Project site is located in an area of relatively low seismic activity. However, the GP PEIR indicates that projects within the Planning Area would be designed to withstand strong ground shaking because all built projects are required to comply with the California Building Code (CBC) to minimize the potential effects of ground shaking and other seismic activity. CBC covers many aspects of building design and construction as a guide to protect public health and safety. To reduce ground-shaking impacts, the approved General Plan also includes Objective NS-2 and policies NS-2-a through NS-2-d, and the City of Fresno Municipal Code includes Section 11-101.

With the implementation of the above-referenced objective and policies as well as adherence to the Municipal Code and other applicable regulations, development in accordance with the approved General Plan would reduce potential seismic ground shaking impacts to a less-than-significant level. Compliance with local and State building codes would ensure Project structures and personnel present during the construction would not be exposed to substantial adverse effects, including the risk of loss, injury, or death resulting from strong seismic ground shaking. Therefore, implementation of these building code requirements and local agency enforcement would reduce impacts from ground shaking to *less than significant* levels.

Mitigation Measures

No mitigation measures are required

iii. Seismic-related ground failure, including liquefaction?

No specific countywide assessment of liquefaction has been performed; however, the Fresno County Multi-Hazard Mitigation Plan identifies the risk of liquefaction within the county as low because the soil types are unsuitable for liquefaction. According to the Fresno County Multi-Hazard Mitigation Plan, the Project site is located in an area of relatively low seismic activity. The proposed Project does not include any activities or components which could feasibly cause strong seismic ground shaking, either directly or indirectly.

Mitigation Measures

No mitigation measures are required

iv. Landslides?

Landslides include rockfalls, deep slope failure, and shallow slope failure. Factors such as the geological conditions, drainage, slope, vegetation, and others directly affect the potential for landslides. One of the most common causes of landslides is construction activity that is associated with road building (i.e., cut and fill). The Project site is relatively flat; therefore, the potential for a landslide in the Project site is essentially non-existent. Because the Project is within an area with relatively flat

topography, the Project will not have any environmental impacts relating to landslides. Therefore, impacts would be *less than significant.*
The Project site is within an area of low seismic activity; however, the Project will be required to implement seismic protection consistent with the Fresno Municipal Code. Impacts would be less than significant.

Mitigation Measures

No mitigation measures are required

b) Result in substantial soil erosion or the loss of topsoil?

Minimal soil will be removed from the Project site during construction, as the site is relatively flat and has been previously impacted by grading from previous site use. Development of the Project site would require typical site preparation activities such as grading and trenching which may result in the potential for short term soil disturbance or erosion impacts. Construction would also involve the use of water that may cause further soil disturbance. Such impacts would be addressed through compliance with regulations set by the State Water Resources Control Board (SWRCB). Namely, the SWRCB requires sites larger than one (1) acre to comply with the General Permit for Discharges of Storm Water Associated with Construction Activity (i.e., General Permit Order No. 2012-0006-DWQ). The General Permit requires the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer (QSD). The SWPPP estimates the sediment risk associated with construction activities and includes best management practices (BMP) to control erosion.

Because Project impacts related to erosion would be temporary and limited to construction and required BMPs would prevent significant impacts related to erosion, the Project impacts will remain *less than significant* with applicable measures incorporated as required by the City of Fresno municipal code.

Mitigation Measures

No mitigation measures are required

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?

See discussion under VII. GEOLOGY AND SOILS (a)(i) through (a)(iv) and (b). The Project is required to comply with grading and drainage standards of the City of Fresno. Since there are no known faults within the immediate area, ground rupture from surface faulting should not be a potential problem. Seiche and landslides are not hazards in the area. Liquefaction potential (sudden loss of shear strength in a saturated, cohesionless soil) should be low since groundwater occurs below 60 feet. Lastly, deep subsidence problems may be low to moderate according to the conclusions of the Five County Seismic Safety Element. However, there are no known occurrences of structural or architectural damage due to deep subsidence in the Fresno area.

As previously discussed, the site soils are considered stable in that there is not a potential of on or offsite landslides, lateral spreading, subsidence or collapse. As discussed in VII. GEOLOGY AND SOILS (a)(iii), the Project site soils have a low overall potential for significant liquefaction to occur at the site. All structures would be subject to all applicable construction standards, including those relating to soil characteristics. In conclusion, All structures would be subject to all IBC and CBC earthquake construction standards, including those relating to soil characteristics. Development of the property requires compliance with grading and drainage standards of the City of Fresno. Therefore, there would *be less than significant impact.*

Mitigation Measures

No mitigation measures are required

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

See discussion under VII. GEOLOGY AND SOILS (a)(i) through (a)(iv),(b) and (c). Expansive soils contain large amounts of clay, which absorb water and cause the soil to increase in volume. There are no geologic hazards or unstable soil conditions known to exist on the site. The existing topography is relatively flat with no apparent unique or significant landforms such as vernal pools. Development of the property requires compliance with grading and drainage standards of the City of Fresno. A civil engineer or soils engineer registered in this state shall complete a Soils Investigation and Evaluation Report. The investigation will address the detail of the configuration, location, type of loading of the proposed structures and drainage plan. The report shall provide detailed recommendation for foundations, drainage, and other items. The preparation of the Soils Investigation and Evaluation Report is an existing standard and will be completed as a part of the Project.

The proposed Project would not result in any expansive soils environmental impacts therefore the Project would have a *less than significant impact*.

Mitigation Measures

No mitigation measures are required

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

The proposed Project does not include the development or use of septic tanks or alternative wastewater disposal systems as the Project would connect to the City's existing sewer system. Therefore, the Project will have *no impact*.

Mitigation Measures

No mitigation measures are required

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

There are no known paleontological resources that exist within the Project site. Nevertheless, previously unknown paleontological resources could be disturbed during future development construction. Therefore, due to the ground disturbing activities that will occur as a result of the Project, the measures within the Project Specific Mitigation and Monitoring Checklist dated August 12, 2022 addressing paleontological resources will be employed to guarantee that should animal fossil material be encountered during Project excavations, then work shall stop immediately; and, that qualified professionals in the respective field are contacted and consulted in order to ensure that the activities of the proposed Project will not involve physical demolition, destruction, relocation, or alteration of paleontological resources. Therefore, with implementation of Mitigation Measure GEO-6.1, Project impacts related to paleontological resources will be considered *less than significant with mitigation incorporated*.

Mitigation Measures

The proposed Project shall implement and incorporate, as applicable, the geologic resources related mitigation measures as identified in the attached Project Specific Mitigation Monitoring and Reporting Checklist dated August 12, 2022.

GEO-6.1: Subsequent to a preliminary City review of the project grading plans, if there is evidence that a project will include excavation or construction activities within previously undisturbed soils, a field survey and literature search for unique paleontological/geological resources shall be conducted. The following procedures shall be followed:

• If unique paleontological/geological resources are not found during either the field survey or literature search, excavation and/or construction activities can commence. In the event that unique paleontological/geological resources are discovered during excavation and/or construction activities, construction shall stop in the immediate vicinity of the find and a qualified paleontologist shall be consulted to determine whether the resource requires further study. The qualified paleontologist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to, excavation of the finds and evaluation of the finds. If the resources are determined to be significant, mitigation measures shall be identified by the monitor and recommended to the Lead Agency. Appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any paleontological/geological resources recovered as a result of mitigation shall be provided to a City-approved institution

or person who is capable of providing long-term preservation to allow future scientific study.

• If unique paleontological/geological resources are found during the field survey or literature review, the resources shall be inventoried and evaluated for significance. If the resources are found to be significant, mitigation measures shall be identified by the qualified paleontologist. Similar to above, appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. In addition, appropriate mitigation for excavation and construction activities in the vicinity of the resources found during the field survey or literature review shall include a paleontological monitor. The monitoring period shall be determined by the qualified paleontologist. If additional paleontological/geological resources are found during excavation and/or construction activities, the procedure identified above for the discovery of unknown resources shall be followed.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
VIII. GREENHOUSE GAS EMISSIONS – Would the Project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X	

DISCUSSION

The analyses presented in this section are based on the *Air Quality and Greenhouse Gas Impact Assessment* prepared for the Project (VRPA, 2021a), attached as Appendix A.

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

The City of Fresno adopted a Greenhouse Gas Reduction Plan in 2014 that includes procedures for certain qualified projects to demonstrate consistency with plan and use the streamlining provisions allowed under CEQA. In addition to the plan consistency analysis, a quantitative analysis was prepared showing that reductions from Business As Usual (BAU) emissions would exceed the 21.7 percent required by 2020 to show consistency with State reduction targets. The SJVAPCD's Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA provides guidance for preparing a BAU analysis (SJVAPCD 2009b). Under the SJVAPCD guidance, projects meeting one of the following would have a less than significant impact on climate change:

- Exempt from CEQA;
- Complies with an approved GHG emission reduction plan or GHG mitigation program;
- Project achieves 29 percent GHG reductions by using approved Best Performance Standards; and
- Project achieves AB 32 targeted 29 percent GHG reductions compared with "business as usual."

The 29 percent GHG reduction level is based on the target established by ARB's AB 32 Scoping Plan, approved in 2008. The GHG reduction level for the State to reach 1990 emission levels by 2020 was reduced to 21.7 percent from BAU in 2020 in the 2014 First Update to the Scoping Plan to account for slower than projected growth after

the 2008 recession. In addition, the State has reported that the 2016 greenhouse gas inventory was below the 2020 target for the first time (ARB 2018b). Furthermore, the 2017 Scoping Plan states that California is on track to achieve the 2020 target (VRPA, 2021a). First occupancy at the Project site is expected to occur in 2022, which is the year after the AB 32 target year. It is unknown when future development will occur as a result of the Project approval, but it is expected to take several years depending on market conditions. Until a new threshold or BPS are identified for projects constructed after 2020, significance is based on making continued progress toward the AB 32 2030 goal. For the proposed future development as a result of the Project approval, there will be a less than significant impact on climate change because the facts (set forth in this section) demonstrate that the Project will work to meet the AB 32 targeted 29% GHG reductions.

The ARB adopted the 2017 Scoping Plan Update on December 14, 2017. The plan provides the State's strategy to achieve the SB 32 2030 target of a 40 percent reduction in emissions compared to 1990 levels. The plan includes existing and new measures that when implemented are expected to achieve the SB 32 2030 target. The 2017 Scoping Plan achieves substantial reductions beyond 2020 through continued implementation of existing regulations. Other regulations will be adopted to implement recently enacted legislation including SB 350, which requires an increase in renewable energy from 33 percent to 50 percent and doubling the efficiency of existing buildings by 2030. The Legislature extended the Cap-and-Trade Program through 2030. Cap-and-Trade provides a mechanism to make up shortfalls in other strategies if they occur. In addition, the strategy relies on reductions achieved in implementing the ARB Short-Lived Climate Pollutant (SLCP) Reduction Strategy to reduce pollutants not previously controlled for climate change such as black carbon, CH4, and hydrofluorocarbons (VRPA, 2021a).

The SJVAPCD has not adopted a threshold for GHG impacts so they have used the South Coast Air Quality Management District's (SCAQMD) threshold of 10,000 MTCO2eq./year for GHG for construction emissions amortized over a 30-year project lifetime, plus annual operation emissions. Though the Project is under SJVAPCD jurisdiction, the SCAQMD GHG threshold provides some perspective on the GHG emissions generated by the Project. Table 8-1 below shows the yearly GHG emissions generated by the Project as determined by the CalEEMod model.

Table 8-1
Project Operational Greenhouse Gas Emissions

Summary Report	CO_2e
Project Operational Emissions Per Year(plus amortized construction emissions)	2702.29 MT/yr

Source: CalEEMod

Table 8-1 above shows the yearly GHG emissions generated by the Project as determined by the CalEEMod model, which is approximately 80 percent less than the threshold identified by the SCAQMD. The primary source of GHG sources would come from trucks and other vehicles within the Project area. The resulting permanent GHG increases related to Project operations would be within the GHG increases analyzed in the PEIR since the Project meets the applicable zoning requirements. There would be no increase in severity to the GHG

impacts, and implementation of the Project will not result in Project-specific or site-specific significant adverse impacts from GHG emissions. In conclusion, the proposed Project would not result in greenhouse gas emission environmental impacts beyond those analyzed in the GP PEIR. Therefore, impacts would be a *less than significant impact*.

Mitigation Measures

No mitigation measures are required

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

The City of Fresno adopted its Recirculated GHG Reduction Plan Update (2021) as part of the General Plan Update. The Project's consistency with applicable GHG policies from the Recirculated GHG Reduction Plan policies is assessed below.

The Project is also assessed for its consistency with ARB's adopted Scoping Plans. This would be achieved with an assessment of the Project's compliance with Scoping Plan measures contained in the 2008 Scoping Plan and the 2017 Scoping Plan Update.

City of Fresno Recirculated GHG Plan Update

The Recirculated GHG Plan Update includes procedures to use when assessing the impacts of Project's requiring a general plan amendment. The following requirements apply.

1. Review General Plan policies listed in the Recirculated GHG Reduction Plan Update to identify those that apply to the project and prepare a consistency analysis for compliance with the applicable policies.
2. Ensure project is consistent with the City's Development Code as it relates to complete streets and design standards for multi-family projects.
3. Prepare a GHG technical study to quantify project emissions and emission reductions through compliance with regulations and project design features.

In summary, the Project would be required to incorporate a number of features that would minimize GHG emissions as required by the City's existing plans and policies. These features are consistent with project-level strategies identified by the ARB's Scoping Plan and the City of Fresno Recirculated GHG Reduction Plan Update (2021).

Consistency with California's Post-2020 Targets

The State's executive branch adopted several Executive Orders related to GHG emissions. Executive Orders S-3-05 and B-30-15 are two examples. Executive Order S-3-05 sets goals to reduce emissions to 1990 levels by 2020 and 80 percent below 1990 levels by 2050. The goal of Executive Order S-3-05 to reduce GHG emissions to 1990 levels by 2020 was codified by AB 32. The Project, as analyzed above, is consistent with AB 32. Therefore, the Project does not conflict with this

component of Executive Order S-3-05. Executive Order B-30-15 establishes an interim goal to reduce GHG emissions to 40 percent below 1990 levels by 2030.

Consistency with SB 32
The 2017 Climate Change Scoping Plan Update (2017 Scoping Plan) includes the strategy that the State intends to pursue to achieve the 2030 targets of Executive Order S-3-05 and SB 32. The Project is required to comply with the SB 32 strategy and is not expected to conflict with this component of Executive Order S-3-05.

As discussed above, the proposed Project will not occur at a scale or scope with potential to contribute substantially or cumulatively to the generation of GHG emissions, either directly or indirectly, or conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. There would be a less than significant impact as the Project would adhere to standards as identified in the Fresno General Plan. Therefore, impacts are considered *less than significant*

Mitigation Measures

No mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
IX. HAZARDS AND HAZARDOUS MATERIAL – Would the Project:				
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 for people residing or working in the Project site?				X
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X	

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?			X	

DISCUSSION

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

Pursuant to the Fresno General Plan, hazardous materials are defined as those that no longer have practical use, such as substances that have been discarded, discharged, spilled, contaminated, or are being stored prior to proper disposal. Hazardous materials and hazardous wastes are classified according to four properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), and reactive (causes explosions or generates toxic gases). Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications and, to a limited extent, in residential areas.

Hazardous and non-hazardous wastes would likely be transported to and from the Project site during the future construction phase of the proposed Project. Construction would most likely involve the use of some standard hazardous materials, such as diesel fuel, hydraulic oil, grease, solvents, adhesives, paints, and other petroleum-based products, although these materials are commonly used during construction activities and would not be disposed of on the Project site. Workers would likely be trained to properly identify and handle all hazardous materials, following OSHA/CALOSHA regulations. Hazardous waste would be either recycled or disposed of at a permitted and licensed treatment and/or disposal facility. Any hazardous waste or debris that is generated during construction of future buildout as a result of the Project would be collected and transported away from the site and disposed of at an approved off-site landfill or other such facility. In addition, sanitary waste generated during construction would be managed through the use of portable toilets, which would be located at reasonably accessible on-site locations. Hazardous materials such as paint, bleach, water treatment chemicals, gasoline, oil, etc., may be used during construction. These materials would be required to be stored in appropriate storage locations and containers in the manner specified by the manufacturer and disposed of in accordance with local, federal, and State regulations. no significant hazard to the public or to the environment through the routine transport, use, or disposal of hazardous waste during construction or operation of the new residential development would occur.

The closest sensitive receptor (school facility) is located adjacent to the southwest of the Project site. However, the use of hazardous materials will be limited in quantities and duration, and if spilled, would be localized. The proposed Project

would not emit hazardous emissions or involve handling hazardous or acutely hazardous materials substances. The transport use and storage of hazardous materials would be required to comply with all applicable State and federal regulations, such as requirements that spills would be cleaned immediately, and all wastes and spills control materials would be properly disposed of at approved disposal facilities.

However, it is noted that residential construction generally uses fewer hazardous chemicals or use chemicals in relatively small quantities and concentrations as compared to commercial or industrial uses. In addition, once any future development is completed, the chemicals used would include minor quantities of pesticides/ rodenticides, fertilizers, paints, detergents, and other cleaners. Once constructed, the use of such materials such as paint, bleach, etc., are considered common for residential developments and would be unlikely for such materials to be stored or used in such quantities that would be considered a significant hazard. Therefore, Project impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required

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?

See discussion under IX. HAZARDS AND HAZARDOUS MATERIAL (a).

As noted in VII GEOLOGY AND SOILS(b), the Project would be required to prepare and implement a SWPPP under the NPDES permit for construction sites over one acre. The SWPPP identifies potential sources of pollution from the Project that may affect the quality of stormwater discharge and requires that BMPs be implemented to prevent contamination at the source. By implementing BMPs during construction activities, accidental spills of hazardous materials would be contained, and soil and groundwater contamination would be minimized or prevented. While there are no known existing hazardous material conditions on the site and the Project is not located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, portions of the Project site have been utilized for agricultural purposes, which may have utilized pesticides in association with agricultural operations and cultivation. However, dust control measures during construction activities would reduce potential pesticide exposure to workers. Once constructed, there would be minimal to no exposed soil that might create dust or expose residents to pesticide contamination.

Additionally, a review of Fresno County Environmental Health Services indicates there are no records for the site. The review of the State of California Regional Water Quality Control Board (RWQCB) Geotracker database available via the RWQCB Internet Website indicated that no LUST sites, land disposal sites, or military sites are listed for the subject site. Review of the State of California Department of Toxic Substances Control (DTSC) Envirostor database available via the DTSC's Internet Website indicated that no sites including State response sites,

voluntary cleanup sites, school cleanup sites, or military or school evaluation sites are listed for the subject site.

Review of State of California Department of Conservation, Geological Energy Management Division (CalGEM, formerly DOGGR) Online Mapping System (DOMS) indicated that no plugged and abandoned or producing oil wells are located on or adjacent to the subject site.

If during the construction phase of the Project there is a use of hazardous materials, the safe processing and storage of hazardous materials consistent with the California Building Code and the Uniform Fire Code will be required. To reduce potential impacts regarding transport, use, or disposal of hazardous materials in the City, the Policies NS-4-a through NS-4-I will be applied and followed.

The proposed Project is not anticipated to create a significant hazard to the public or the environment, as mentioned previously in subsection a) above, the residential Project would not routinely transport, use, dispose, or discharge hazardous materials into the environment. The Project will not result in any hazards and hazardous material impacts beyond those analyzed in analyzed in GP PEIR SCH No. 20190500005. Therefore, Project impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required

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

See discussion under IX. HAZARDS AND HAZARDOUS MATERIAL (a) and (b). The Project site is adjacent to the Elizabeth Terronez Middle School. Construction activities for the proposed Project could result in the temporary use of hazardous materials and or substances, such as lubricant and diesel fuel during construction. Exhaust from construction and related activities are expected to be minimal and not significant. All construction related activities as a result of the proposed Project would be subject to local, State, and federal laws related to emissions of hazardous materials and substances. All construction-related activities as a result of the proposed Project would be subject to local, State, and federal laws related to emissions of hazardous materials and substances. Therefore, impacts would be less than significant.

Mitigation Measures

No mitigation measures are required

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?

See discussion under IX. HAZARDS AND HAZARDOUS MATERIAL (b). There are no known existing hazardous material conditions on the property and the property is not included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and the Department of Toxic Substances Control. The Project itself will not generate or use hazardous materials in a manner outside health department requirements. Review of the State of California Department of Toxic Substances Control (DTSC) Envirostor database available via the DTSC's Internet Website indicated that no sites including State response sites, voluntary cleanup sites, school cleanup sites, or military or school evaluation sites are listed for the subject site or adjacent properties. Additionally, no Federal Superfund – National Priorities List (NPL) sites were determined to be located within a one-mile radius of the Project site.

To reduce potential impacts regarding transport, use, or disposal of hazardous materials in the City, the Policies NS-4-a through NS-4-I will be applied and followed.

It is not anticipated that there are no known underground storage tanks or pipelines located on the Project site that contain hazardous materials, however, any underground storage tanks or pipelines will be removed in accordance with removal standards of Fresno County Department of Public Health. The disturbance of such items during construction activities is unlikely. Therefore, because the Project is not located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Therefore, Project impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required

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

The Project is located over 10 miles east of the Fresno Chandler Executive Airport, and over 6 miles south of the Fresno Yosemite Airport. The Project is not within an Airport Land Use Compatibility Plan or within two miles of a public airport. Therefore, *no impact* would occur.

Mitigation Measures

No mitigation measures are required

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

The City's Police and Fire Departments are tasked with all local emergency response efforts. In addition, the City's full-time Emergency Preparedness Officer (EPO) is responsible for ensuring that Fresno's emergency response plans are up-to-date and implemented properly. The EPO also facilitates cooperation between City departments and other local, State and federal agencies that would be involved in emergency response operations. In addition, the Project site plan will be reviewed by the Fire Department per standard City procedure to ensure consistency with emergency response and evacuation needs.

All Project plans submitted to the City will be reviewed incompliance with federal, State and local regulations related to emergency access. The proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Currently, the Project incorporates an access drive that will be constructed to the west of the Project site to allow access from S. Willow Avenue and a stubbed access point will be constructed to the east of the Project site to facilitate connections to future subdivisions. Therefore, the proposed Project would have a less than significant impact on emergency evacuation.. Therefore, Project impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required

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

The General Plan Update identified areas within the City limits as largely being categorized as little or no threat or moderate fire hazard, which is attributed to urbanization. The General Plan further indicated that small areas along the San Joaquin River Bluff area in northern Fresno are prone to wildfires due to relatively steep terrain/vegetation, and these areas are classified as high fire hazard areas. However, the Project site is not located within this area and is proposed on relatively flat surface.

State Responsibility Areas (SRA) are designated areas where Cal Fire is the primary emergency response agency responsible for fire suppression and prevention. According to the 2021 Cal Fire State Responsibility Area Viewer Map, the Project area is not in a designated State Responsibility Area (SRA) or Fire Hazard Severity Zone (FHSZ). The Project area is entirely located in a Local Responsibility Area (LRA) and has been designated as Non-Wildland.

The land surrounding the Project site is primarily vacant land and is not considered to be wildlands. The proposed Project would not expose people or structures to significant risk of loss, injury or death involving wildland fires.. Therefore, Project impacts are considered to be *less than significant.*

Mitigation Measures

No mitigation measures are required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
X. HYDROLOGY AND WATER QUALITY – Would the Project:				
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	
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:			X	
i) Result in a 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 off-site:			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; or			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	

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?			X	

DISCUSSION

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Adverse groundwater conditions of limited supply and compromised quality have been well documented by planning, environmental impact report and technical studies over the past 20 years including the GP PEIR No. 20190500005 for the Fresno General Plan, the GP MEIR 10130 for the 2025 Fresno General Plan, Final EIR No.10100, Final EIR No.10117 and Final EIR No. SCH 95022029 (Fresno Metropolitan Water Resource Management Plan), et al. These conditions include water quality degradation due to contamination from 1,2-dibromo-3-chloropropane (DBCP), ethylene-dibromide (EDB), trichloroethylene (TCE), 1,2,3-trichloropropane (TCP), tetrachloroethylene (PCE), 1,1-dichloroethane (DCE), nitrate, and from naturally occurring arsenic, iron, manganese, and radon concentrations; low water well yields in some parts of the City; limited aquifer storage capacity from over-utilization; limited recharge activities; and, intensive urban or semi-urban development occurring up-gradient from the Fresno Metropolitan Area.

In order to be compliant with State regulations, the Project is required to comply with State regulations adopted to reduce groundwater degradation. Construction activities including grading could temporarily increase soil erosion rates during and shortly after Project construction. Construction-related erosion could result in the loss of soil and could adversely affect water quality in nearby surface waters. As noted in Section VII Geology and Soils, development as a result of the proposed Project will be required to prepare a site-specific SWPPP as required by the RWQCB. The SWPPP is required to be approved by the RWQCB prior to construction that identifies project-specific best management measures that are designed to control drainage and erosion.

In addition, prior to the commencement of construction activities, the Project proponent would be required to adhere to the requirements of the City Grading Code. This includes implementation of various measures designed to prevent erosion and control drainage onsite, thereby further preventing the potential sedimentation and subsequent degradation of stormwater. Therefore, Project impacts are considered to be *less than significant.*

Mitigation Measures

No mitigation measures are required

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

Fresno is one of the largest cities in the United States that still maintains a significant reliance on groundwater as part of its public water supply portfolio. Surface water treatment and distribution has been implemented in the northeastern part of the city since 2004 and in the southeastern part of the city in 2018, but the city is still subject to an EPA Sole Source Aquifer designation. While the aquifer underlying Fresno typically exceeds a depth of 300-feet and is capacious enough to provide adequate quantities of safe drinking water to the metropolitan area well into the twenty-first century, groundwater degradation, increasingly stringent water quality regulations, and an historic trend of high consumptive use of water on a per capita basis (currently 205 gallons per day per capita), have resulted in a general decline in aquifer levels, increased cost to provide potable water, and localized water supply limitations.

The City's groundwater aquifer has been documented by the State Department of Water Resources (Bulletin 118 - Interim Update 2016) to be critically over-drafted and has been designated a high-priority basin for corrective action through the Sustainable Groundwater Management Act (SGMA).

The City of Fresno is actively addressing these issues through citywide metering and updating water use targets and the water shortage contingency plan in the City of Fresno 2020 Urban Water Management Plan (UWMP) (City of Fresno, 2020). The City has adopted the Fresno Metropolitan Water Resource Management Plan. The purpose of these management plans is to provide safe, adequate, and dependable water supplies in order to adequately meet existing and future needs of the metropolitan area in an economical manner; protect groundwater quality from further degradation and overdraft; and provide a plan of reasonably implementable measures and facilities. City water wells, pump stations, recharge facilities, water treatment, and distribution systems have been expanded incrementally to mitigate increased water demands and respond to groundwater quality challenges.

In response to the need for a comprehensive long-range water supply and distribution strategy, the Fresno General Plan recognizes regional water resource planning efforts, such as the Kings Basin's Integrated Regional Water Management Plan, the Fresno Area Regional Groundwater Management Plan, the North Kings Groundwater Sustainability Agency, City of Fresno Metropolitan Water Resource Management Plan and cites the findings of the City 2020 UWMP. The purpose of these management plans is to provide safe, adequate, and dependable water supplies in order to adequately meet existing and future needs of the Kings Basin regions and the Fresno-Clovis metropolitan area in an economical manner; protect groundwater quality from further degradation and overdraft, and provide a plan of reasonably implementable measures and facilities.

The 2020 City of Fresno Urban Water Management Plan, Figures ES-3 through ES-5 (incorporated by reference), illustrates the City of Fresno's goals to achieve a 'water balance' between supply and demand while decreasing reliance upon and use of groundwater. To achieve these goals the city is implementing strategies including:

- Intentional groundwater recharge through reclamation at the City's groundwater recharge facility at Leaky Acres (located northwest of Fresno-Yosemite international Airport), refurbish existing streams and canals to increase percolation, and recharge at Fresno Metropolitan Flood Control District's (FMFCD) storm water basins;
- Increase use of existing surface water entitlements from the Kings River, United States Bureau of Reclamation and Fresno Irrigation District for treatment at the Northeast Surface Water Treatment Facility (NESWTF) and construct a new Southeast Surface Water Treatment Facility (SESWTF); and
- Recycle wastewater at the Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF) for treatment and re-use for irrigation, and to percolation ponds for groundwater recharge. Further actions include the General Plan, Policy RC-6-d to prepare, adopt and implement a City of Fresno Recycled Water Master Plan.

The use of groundwater will continue to be an important part of the City's supply but will not be relied upon as heavily as has historically been the case. The 2020 UWMP shows that groundwater pumped by the City has decreased from approximately 148,006 AF/year in 2008 to approximately 55,000 AF/year in 2020. The projected total estimated groundwater yield for 2045 is approximately 159,820 AF/year, inclusive of intentional recharge. In order to meet future demand projections, the City is planning to rely on expanding their delivery and treatment of surface water supplies and groundwater recharge activities. .

Project construction would add additional impervious surfaces to the Project site; however, various areas of the Project site would remain largely pervious, which would allow infiltration to underlying groundwater. For example, the Project includes ample landscaping areas that would remain pervious. The areas would continue to contribute to groundwater recharge following the construction of the Project. Furthermore, the Project is not anticipated to significantly affect groundwater quality because sufficient stormwater infrastructure would be constructed as part of the Project to detain and filter stormwater runoff and prevent long-term water quality degradation. Therefore, Project construction and operation would not substantially deplete or interfere with groundwater supply or quality.

The Urban Water Management Plan states that in 2020, the City's water use averaged 198 GPCD based on 121,993 AF of water production and a service area population of 550,217. The City is far below its 2020 daily per capita water use target of 247 GPCD due to the extensive conservation efforts implemented by the City in the past decade (City of Fresno, 2020).

The proposed Project consists of 199 dwelling units, and the average household size in Fresno is 3.07 (U.S. Census Bureau, 2019), the Project will house approximately 611 people. The proposed Project would result in estimated water demand of 120,978 gallons per day (611 people x 198 gallons/day = 120,978 gallons/day – 135.53-acre-foot per year).

The Project will not conflict with the implementation of a water quality control plan or sustainable groundwater management or impede sustainable groundwater management plans.

Implementation of the City of Fresno General Plan policies will ensure that the City has a reliable, long-range source of water through the implementation of measures, standards, incentives, and capital investments to promote water conservation and supply.

The proposed Project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted). Therefore, impacts are *less than significant.*

Mitigation Measures

No mitigation measures are required

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?

The rate and amount of surface runoff is determined by multiple factors, including the following: topography, the amount and intensity of precipitation, the amount of evaporation that occurs in the watershed and the amount of precipitation and water that infiltrates to the groundwater. The proposed Project would alter the existing drainage pattern of the site, which would have the potential to result in erosion, siltation, or flooding on or offsite, and a temporary retention basin will located on the Project site. The disturbance of soils onsite during construction could cause erosion, resulting in temporary construction impacts. In addition, the placement of permanent structures onsite could affect drainage in the long-term. Impacts from construction and operation are discussed below.

The Project site is generally flat. The Project site does not have a stream or river and is not near another body of water. The Project would not result in substantial erosion or siltation on or offsite or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or offsite.

As discussed in VII. GEOLOGY AND SOILS (b), above, potential impacts on water quality arising from erosion and sedimentation are expected to be localized and temporary during construction. Construction-related erosion and sedimentation impacts as a result of soil disturbance would be less than significant after implementation of an SWPPP and BMPs required by NPDES.

No drainages or other water bodies are present on the Project site, and therefore, the proposed Project would not change the course of any such drainages.

The Project has been designed in a way that does not require a stormwater retention basin, and stormwater would drain into the existing City stormwater system. The Project will be constructed to meet City standards related to stormwater and would not degrade surface or groundwater quality, and *impacts would be less than significant.*

Once constructed, the Project would develop areas of impervious surfaces that would reduce the rate of percolation at the site or concentrate, but areas of open space will allow for the percolation of stormwater to recharge the aquifer or the water would be directed into the City's existing stormwater sewer system. The Project would comply with applicable City development standards and codes. Therefore, the Project would have a less than significant impact on drainage patterns or cause substantial erosion or siltation on or off the site.. The impact would be *less than significant*.

Mitigation Measures

No mitigation measures are required

ii. Substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?

See also response (c(i)), above. No drainages or other water bodies are present on the Project site, and therefore, the development of the site would not change the course of any such drainages that may potentially result in on or offsite flooding. Water would be used during the temporary construction phase of the proposed Project (i.e., for dust suppression). However, any water used for dust control would be mechanically and precisely applied and would generally infiltrate or evaporate prior to running off.

The BMPs associated with the SWPPP would prevent flooding onsite and offsite. While the project would permanently increase the impervious surface area, the Project would maintain the overall on-site drainage patterns and continue to direct surface water to catch basins that flow into the existing storm drains. Prior to the issuance of building permits, the applicant would be required to provide a stormwater improvement plan to the City to ensure that the stormwater system would be capable of handling a 25-year storm and that the drainage facilities conform to City requirements. Additionally, the applicant would be required to pay for all necessary improvement costs if the City determines that the City's storm drain system or storm drain pumping capacity requires expansion or modification as a result of the Project.

Therefore, the Project would not substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, or

substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or offsite and impacts are *less than significant*.

Mitigation Measures

No mitigation measures are required

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?

See responses (c(i)-c(ii)), above. The Project will comply with all applicable State and City codes and regulations. The storm drainage plan will be supported by engineering calculations to ensure that the Project does not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.

As discussed above, the proposed Project would result in a minimal increase in impervious surfaces and therefore would not substantially increase runoff from the site. However, compliance with existing regulatory requirements, including compliance with City standards during construction and operation, would reduce or eliminate the potential for project operations to cause substantial additional polluted runoff or runoff in excess of existing or planned stormwater drainage systems. Therefore, the Project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff and impacts will *be less than significant*.

Mitigation Measures

No mitigation measures are required

iv. Impede or redirect flood flows?

Please see responses (c(i)-c(iii)), above. The rate and amount of surface runoff are determined by multiple factors, including the following: topography, the amount and intensity of precipitation, the amount of evaporation that occurs in the watershed, and the amount of precipitation and water that infiltrates the groundwater.

The proposed Project is not located within the 100-year flood hazard area as mapped by the Federal Emergency Management Agency (FEMA). The Project is not located within a FEMA 100-year floodplain. According to the FEMA Flood Insurance Rate Map (FIRM), the subject site is located in the 0.2 percent annual chance flood hazard designation (500 year flood zone); however, it does not necessitate floodplain management action. As discussed above, the existing drainage pattern of the site and area would be affected by project development.

However, the Project will connect to the existing stormwater sewer system, and therefore potential impacts resulting from the impeding or redirection of flood flows would be *less than significant*.

Mitigation Measures

No mitigation measures are required

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?

Please see responses (c(i)-c(iv)), above

The Project site is not located near the ocean or a steep topographic feature (i.e., mountain, hill, bluff, etc.). Additionally, there is no body of water within the vicinity of the Project site. The proposed Project's inland location makes the risk of tsunami highly unlikely. The probability of a seiche occurring in the City of Fresno is considered negligible. Furthermore, given the geologic context at the proposed Project site and the absence of pollutants, if such an event were to occur, the likelihood of it exposing Project structures or people to a significant risk is considered low.

As noted previously, the Project is in the 0.2 percent annual chance flood hazard designation. The closest dams are the Friant Dam, approximately 19 miles north, and the Pine Flat dam, approximately 23 miles northeast of the Project. In the case of dam failure, flood waters would not reach the City for hours. The extremely low probability of dam failure, large volume of flood water available for dilution of potential pollutants, and the relatively long warning period to prepare, indicate that inundation due to dam failure would not have a significant impact on the Project.

Therefore, the Project would not be subject to inundation by seiche, tsunami, or mudflow, and impacts are considered to be *less than significant*.

Mitigation Measure(s)

No mitigation is required .

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

See response b. above. As noted, the proposed Project is anticipated to use approximately 16 million gallons of water annually. The Project will obtain water by connecting to City utility services.

Implementation of the Fresno General Plan policies, the Kings Basin Integrated Regional Water Management Plan, City of Fresno Urban Water Management Plan, Fresno-Area Regional Groundwater Management Plan, and City of Fresno Metropolitan Water Resource Management Plan and the applicable policies of the GP PEIR, will address the issues of providing an adequate, reliable, and

sustainable water supply for the Project's urban domestic and public safety consumptive purposes. City of Fresno, Water Division has reviewed the Project for compliance with water quality and groundwater management. Further, the Fresno General Plan policies and initiatives ensure water conservation. The GP PEIR also evaluated the need for additional water conveyance infrastructure (e.g., new water wells) and the increase in additional water demand with the approval of proposed development in the City.

As noted above, the proposed project would be required to adhere to NPDES drainage control requirements during construction and operation as well as to FMFCD drainage control requirements. As a result, the proposed project would not include any other waste discharges that could conflict with the Basin Plan. Therefore, the proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan and impacts would be *less than significant*.

Mitigation Measures

No mitigation measures are required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
XI. LAND USE AND PLANNING – Would the Project:				
a) Physically divide an established 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

DISCUSSION

a) Physically divide an established community?

The Project is located within an area primarily consisting of several large vacant/ residential parcels located outside of the City of Fresno City Limits as a County Island. Areas to the south of the Project site are large residential parcels, and areas to the east and west are vacant while the subject parcel is undeveloped. The City's General Plan designates the annexation area as Medium Density Residential and Medium High Density Residential. More specifically, the Project site for the proposed subdivision is planned for Medium Density Residential land uses. The proposed single-family residential development is allowed within this land use designation, and the Project does not exceed the maximum density, therefore the Project is not dividing an established community. The Project is not being built in a pre-existing community area, would not create any physical barrier between an established community. Therefore there are no impacts.

Mitigation Measure(s)

No mitigation is required.

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?

The Project proposes to construct a 199-unit single-family residential development with approval of the associated Annexation, Pre-zone, and Tentative Tract Map. The 38.72 acre Project site will be annexed into the City to the Medium Density Residential and Medium High Density Residential land use designations. This annexation boundary was determined by Fresno LAFCO. Approval of the pre-zoning and General Plan amendment would ensure that the zoning designation is

consistent with the land use designation for the Project site. Upon approval of the requested entitlements, the proposed Project would be developed in compliance with the General Plan and be consistent with Medium Density and Medium High Density residential standards. The discretionary approvals required for the Project will include reviews and comments from responsible agencies, and from several City departments to ensure compliance with all applicable, plans, policies, regulations, standards, and conditions of approval. With approval of the discretionary actions, the Project will be consistent with the City's General Plan and Zoning Ordinance and will comply with local and State building codes and requirements. Therefore there would be no impacts.

Mitigation Measure(s)

No mitigation is required

Mitigation Measures

No mitigation measures are required

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
XII. MINERAL RESOURCES – Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				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

DISCUSSION

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?

The California Department of Conservation, Geological Survey classifies lands into Aggregate and Mineral Resource Zones (MRZs) based on guidelines adopted by the California State Mining and Geology Board, as mandated by the Surface Mining and Reclamation Act of 1974. These MRZs identify whether known or inferred significant mineral resources are present in areas. The subject site is not located in an area designated for mineral resource preservation or recovery

According to the California Department of Conservation - Geologic Energy Management Division (CalGEM) website, there are no active, inactive, or capped oil wells located within the Project site, and it is not within a DOGGR-recognized oilfield. Additionally, the Fresno General Plan has not designated the Project site to be located in an area designated for mineral resource preservation or recovery. The Project will not 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. Therefore, there would be *no impact*.

Mitigation Measures

No mitigation measures are required

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?

The subject site is not designated by the General Plan, or other land use plan as a locally important mineral resource recovery site. Consequently, it will not result in the loss of availability of a locally important mineral resource. This is a less than significant impact. Therefore, the Project would result in *no impact*

Mitigation Measures

No mitigation measures are required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
XIII. NOISE – Would the Project result in:				
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 site to excessive noise levels?				X

DISCUSSION

The analyses presented in this section are based on a *Environmental Noise & Vibration Assessment* prepared for the Project (Bollard Acoustical Consultants, Inc, 2021) attached as Appendix D.

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 in other applicable local, state, or federal standards?

The 2014 City of Fresno General Plan Noise Element provides noise level criteria for land use compatibility for both transportation and non-transportation noise sources. The General Plan sets noise compatibility standards for transportation noise sources in terms of the Day-Night Average Level (L_{dn}). The L_{dn} represents the time-weighted energy average noise level for a 24-hour day, with a 10-dB penalty added to noise levels occurring during the nighttime hours (10:00 p.m.-7:00 a.m.). The L_{dn} represents cumulative exposure to noise over an extended period of time and are therefore calculated based upon annual average conditions.

Implementing Policy NS-1-h of the Noise Element requires that interior noise levels attributable to exterior transportation noise sources not exceed 45 dB L_{dn}. The intent

of the interior noise level standard is to provide an acceptable noise environment for indoor communication and sleep.

Residential construction methods will comply with current building code requirements and 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 Ldn interior standard by the proposed Project.

The Project site is located on the eastside of South Willow Avenue and the existing San Joaquin Valley Railroad (SJVR) track runs along the northern border of the project. The Project proposes the construction of 199 single-family residential lots and a neighborhood park. Existing land uses in the immediate project vicinity include residential and agricultural to the north, residential to the south, agricultural to the west, and undeveloped land to the east.

Construction Noise

Project construction would result in short-term noise impacts on the nearby sensitive receptors. Maximum construction noise would be short duration, generally intermittent depending on the construction phase, and variable depending on receiver distance from the active construction zone. The duration of noise impacts generally would be from one day to several days depending on the phase of construction. Short-term noise impacts would occur during grading and site preparation activities. Construction-related short-term noise levels would be higher than existing ambient noise levels currently in the project area but would no longer occur once construction of the proposed project is completed. During the construction phase of the Project, noise generating activities will be present, however, it will be temporary in nature and any machinery used as a part of the construction of the Project will be muffled. Construction activities would be temporary in nature and are anticipated to occur during normal daytime working hours. Impacts are anticipated to *less than significant*.

Traffic Noise Exposure

The FHWA Model was used with future traffic data to predict future S. Willow Avenue traffic noise levels at the proposed residential uses of the development. The predicted future S. Willow Avenue traffic noise levels at the proposed development are summarized in Table 13-1.

Table 13-1

Predicted Future Exterior S. Willow Avenue

Traffic Noise Levels at the Project Site

Location	Receiver Description	Distance(ft)[1]	Offset (dB)[2]	Future Exterior DNL (dB)
Park	Neighborhood park	220		55
Residences (Lots 1-4, 189-199)	Backyards	60	+2	64
	First-floor building facades	70		63
	Upper-floor building facades	70		65

[1] Distances scaled from center of park and other said locations to roadway centerline using the provided site plans.
[2] An offset of +2 dB was applied at upper-floors for reduced ground absorption of sound at elevated locations.
Source: Bollard Acoustical Consultants, Inc. (2021)

The Fresno General Plan does not currently have adopted noise level criteria for park uses affected by transportation noise sources. However, the Fresno Municipal Code establishes a land use compatibility noise level limit of 65 dB DNL or less as satisfactory for new proposed park uses. As indicated in Table 13-1, the predicted future S. Willow Avenue traffic noise level of 55 dB DNL at the proposed park would satisfy the Municipal Code land use compatibility noise level limit of 65 dB DNL for park uses.

The Project site plans indicate that 6-foot-tall block walls (traffic noise barriers) are proposed to be constructed along residential lots adjacent to S. Willow Avenue. The results presented in Table 13-2 below contain predicted future S. Willow Avenue traffic noise levels at the nearest residential ground level locations (i.e., backyards and first-floor building facades) with noise attenuation that would be provided by the proposed 6-foot-tall walls. Because elevated upper-floor building facades of the residences constructed adjacent to S. Willow Avenue would not receive shielding from the proposed 6-foot-tall walls, attenuated noise levels for those locations were not included in Table 13-2.

Table 13-2

Predicted Future Exterior Willow Avenue

Traffic Noise Levels with Proposed 6 foot Noise Barriers

Location	Receiver Description	Future Exterior DNL w/Barriers (dB)[1]
Residences	Backyards	58
(Lots 1-4, 189-199)	First-floor building facades	57

[1] Predicted noise levels include consideration of shielding provided by proposed 6-foot-tall noise barriers at thelocations illustrated on Figure 2. A complete listing of inputs and elevation assumptions used for the barrier insertion loss evaluation are provided as Appendix H.
Source: Bollard Acoustical Consultants, Inc. (2021)

As indicated in Table 13-2, future exterior S. Willow Avenue traffic noise levels at the backyards proposed nearest to the roadway are predicted to satisfy the Fresno General Plan and Municipal Code 65 dB DNL exterior noise level standard applicable to residential uses. The predicted exterior compliance above includes consideration of the shielding that would be provided by the construction of 6-foot-tall noise barriers (block wall) along S. Willow Avenue, as proposed.

Because future traffic noise level exposure is predicted to satisfy applicable Fresno General Plan and Municipal Code exterior noise level criteria at the proposed development, this impact is identified as being less than significant.

Interior Traffic Noise Exposure

After construction of the proposed 6-foot-tall traffic noise barriers (block walls) at the locations shown on Figure 2 of the *Environmental Noise & Vibration Assessment*, future S. Willow Avenue traffic noise level exposure is predicted to be approximately 57 dB DNL at the nearest first-floor residential building facades. Due to reduced ground absorption of sound at elevated positions, and lack of shielding provided by the proposed walls, noise levels at the upper-floor building facades of those residences are predicted to approach 65 dB DNL. The Fresno General Plan and Municipal Code establish an interior noise level standard of 45 dB Leq within residential interior areas for transportation noise sources. In addition, Policy NS-1-h of the General Plan requires compliance with a State Building Code requirement of 45 dB DNL within the interior areas of new residential uses. To satisfy the applicable General Plan and Municipal Code interior noise level limits of 45 dB DNL/Leq, minimum noise reductions of 12 and 20 dB would be needed for compliance within the first- and upper-floor interior areas (respectively) of residences constructed nearest to S. Willow Avenue.

Standard building construction (stucco siding, STC-27 windows, door weather-stripping, exterior wall insulation, composition plywood roof), typically results in an exterior to interior noise reduction of approximately 25 dB with windows closed and approximately 15 dB with windows open. This level of noise reduction would be adequate to reduce future S. Willow Avenue traffic noise levels within all levels of residences in this development to 45 dB DNL/Leq or less, which result in satisfaction of the applicable General Plan and Municipal Code interior noise level criteria cited above. As a result, consideration of additional building facade construction improvements for future traffic noise would not be warranted for the residential buildings of the development provided that mechanical ventilation (air conditioning) is included to allow occupants to close doors and windows as desired for additional acoustical isolation. Based on the analysis provided above, this is impact is identified as being less than significant.

Exterior Railroad Noise Exposure

As mentioned previously, BAC ambient noise measurement site N-1 was specifically selected to be representative of the existing ambient noise level environment associated with SJVR operations at the project site. According to the data from the 72-hour ambient noise monitoring effort, railroad activity adjacent to the project site consisted of approximately two daily railroad passersby (evenly distributed between daytime and nighttime hours). The noise generation for individual train passbys varies depending on train length, speed, warning horn usage, track condition and number of locomotives. From the results of the long-term railroad noise survey conducted at site N-1, it was determined that the existing railroad noise exposure adjacent to the project site is approximately 61 dB DNL at a distance of 50 feet from the center of the track. The measured noise levels at site N-1 included noise generated from locomotives, rail cars, warning horns, and bells from a nearby at-grade crossing at S. Willow Avenue.

The degree by which rail activity will increase on the SJVR track adjacent the project site is difficult to predict. Ultimately, daily rail activity is limited by the capacity of the track. As such, it is unlikely that rail activity adjacent to the project site would increase by more than 50% along this track in the future. A 50% increase in activity corresponds to a 2 dB increase in noise exposure.

Conservatively assuming a 2 dB increase over existing levels, future railroad noise levels were projected at the proposed development. The results of those projections are summarized in Table 13-3.

Table 13-3

Predicted Future Exterior SJVR Railroad Noise Levels at the Project Site

Location	Receiver Description	(ft)[1]	(dB)[2]	DNL (dB)[3]
Park	Neighborhood park	160		55
Residence (Lot 103)	Backyard	150	-5	51
	First-floor building facade	145		56
	Upper-floor building facades	145	+2	58
Residences (Lots 104-115)	Backyards	210	-7	47
	First-floor building facades	160		55
	Upper-floor building facades	160	+2	57
Residence (Lot 74)	Backyard	80	+2	60
	First-floor building facade	75		60
	Upper-floor building facades	75		62

[1] Distances scaled from center of park and other said locations to center of track using the provided site plans.
[2] An offset of +2 dB was applied at upper-floors for reduced ground absorption of sound at elevated locations. Negative offsets applied to account for reduced view of track and/or intervening proposed building shielding.
[3] Predicted future railroad noise levels based on a reference noise level of 63 dB DNL at 50 feet, which includes a +2 dB increase relative to measured ambient conditions to account for a 50% increase in future operations.
Source: Bollard Acoustical Consultants, Inc. (2021)

The data in Table 13-3 above contains predicted future railroad noise levels at the proposed development. However, the project site plans indicate that an 8-foot-tall block wall (railroad noise barrier) is proposed to be constructed along northern end of the project area adjacent to the SJVR track. The following results presented in Table 13-4 contain predicted future railroad noise levels at the nearest residential ground level locations (i.e., backyards and first-floor building facades) with consideration of the noise attenuation that would be provided by the proposed 8-foot-tall wall, which is calculated to provide approximately 5 to 7 dB of railroad noise attenuation at those locations. Because elevated upper-floor building facades of the residences constructed adjacent to the SJVR track would not receive shielding from the proposed 8-foot-tall wall, attenuated noise levels for those locations were not included in Table 13-4.

Table 13-4

Predicted Future Exterior SJVR Railroad Noise Levels with Proposed 8' Noise Barrier[1]

Location	Receiver Description	Future Exterior DNL w/Barrier (dB)[2]
Park	Neighborhood park	51
Residence (Lot 103)	Backyard	46
	First-floor building facade	46
Residences (Lots 104-115)	Backyards	42
	First-floor building facades	50
Residence	Backyard	54

(Lot 74)	First-floor building facade	53

[1] Location of proposed railroad noise barrier is illustrated on Figure 2.
[2] Predicted noise levels include consideration of shielding provided by proposed 8-foot-tall noise barrier at the location illustrated on Figure 2, which is calculated to provide approximately 5-7 dB of attenuation at the receivers above (dependent upon on distance to barrier).
Source: Bollard Acoustical Consultants, Inc. (2021)

As noted previously, the Fresno Municipal Code establishes a land use compatibility noise level limit of 65 dB DNL or less as satisfactory for new proposed park uses. As indicated in Table 13-4, the predicted future railroad noise level of 51 dB DNL at the proposed park would satisfy the Municipal Code land use compatibility noise level limit of 65 dB DNL for park uses. The predicted compliance at the park includes consideration of attenuation that would be provided by the construction of an 8-foot-tall noise barrier adjacent to the SJVR track, as proposed.

The Table 13-4 data indicate that future exterior railroad noise level exposure at the backyards proposed nearest to the track is predicted to satisfy the Fresno General Plan and Municipal Code 65 dB DNL exterior noise level standard applicable to residential uses. The predicted exterior compliance at the nearest backyards includes consideration of attenuation that would be provided by the construction of an 8-foot-tall noise barrier (block wall) adjacent to the SJVR track, as proposed.

Because future railroad noise level exposure is predicted to satisfy applicable Fresno General Plan and Municipal Code exterior noise level criteria at the proposed development, this impact is identified as being less than significant.

Conclusion

The Project will be required to comply with all noise policies and development standards identified within the Fresno General Plan and the noise ordinance of the Fresno Municipal Code, Chapter 10 Article 1 – Noise Regulations. Through compliance with the policies and development standards, and with implementation of the mitigation measures as proposed on the TTM to reduce noise impacts related to the railroad and park sites, the interior and exterior noise levels would comply with the City's noise standards and impacts will be less than significant. Furthermore, the Project may produce an elevated ambient noise level during construction, however, those impacts are temporary, and no operational noise will be generated that exceeds the adopted noise levels identified for neighboring land uses. Therefore, Project impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required

b) Generation of excessive groundborne vibration or groundborne noise levels?

According to the Federal Transit Administration Noise and Vibration Impact Assessment Guidelines (FTA-VA-90-06), ground-borne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual

for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads.

The City of Fresno does not currently have adopted standards for groundborne vibration. As a result, vibration impact criteria established by the U.S. Department of Transportation's Federal Transit Administration (FTA) criteria were applied to the assessment of railroad operations at the project site. The FTA vibration impact criteria are based on maximum overall levels for a single event, such as train passersby.

On-Site Railroad Operations Vibration Levels

As indicated in Table 11 of the *Environmental Noise & Vibration Assessment*, the assessment measured railroad passersby vibration levels at site V-1 ranged from 80 VdB to 81 VdB at a distance of 50 feet from the center of the SJVR track. The Table 11 data also indicate that a maximum of two railroad events per day were identified over the 72-hour monitoring period. According to the FTA groundborne vibration impact assessment criteria provided in Table 1, a numeric standard of 80 VdB for "Infrequent Events" (defined as fewer than 30 vibration events of the same kind per day) is applied to residences and buildings where people normally sleep.

Based on the highest measured train passby vibration level at the 50-foot distance (81 VdB), vibration exposure from railroad operations is projected to be approximately 72 VdB at the building facade of the residence proposed nearest to the SJVR track, located approximately 75 feet away on Lot 74. The projected train passersby vibration level of 72 VdB would satisfy the applicable FTA groundborne vibration impact assessment criterion of 80 VdB.

Based on the measured railroad operations vibration levels at the project site and the analysis provided above, this impact is identified as being less than significant.

Project Construction Vibration Levels

During Project construction, heavy equipment would be used for grading, excavation, paving, and building construction, which would generate localized vibration in the immediate vicinity of the construction. The nearest existing sensitive structures (residences) are located approximately 50 feet from construction activities which could occur within the project site.

Table 13-5 includes the range of vibration levels for equipment commonly used in general construction projects at a distance of 25 feet. The Table 13-5 data also include predicted equipment vibration levels at the nearest existing residences to the project site located approximately 50 feet away.

Table 13-5

Reference and Projected Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV at 25 Feet[1]	Projected PPV at 50 Feet
Hoe ram	0.089	0.032
Large bulldozer	0.089	0.032
Caisson drilling	0.089	0.032
Loaded trucks	0.076	0.027
Jackhammer	0.035	0.012
Small bulldozer	0.003	0.001

Source: 2018 FTA Transit Noise and Vibration Impact Assessment Manual (Table 7-4) and BAC calculations

As shown in Table 13-5, vibration levels generated from project construction activities at the nearest residences located approximately 50 feet away are predicted to be well below the Caltrans thresholds for damage to residential structures of 0.5 in/sec PPV. In addition, the projected equipment vibration levels in Table 13-5 are within the range of the "barely/slightly perceptible" human response threshold as defined by Caltrans. Therefore, on-site construction within the project area is not expected to result in excessive groundborne vibration levels at nearby existing residential uses.

Construction activity would be exempt from City of Fresno noise regulations, as long as such activity is conducted pursuant to an applicable construction permit and occurs between 7:00 a.m. and 10:00 p.m., excluding Sunday. The Project would also comply with Project Specific Mitigation Measure NOI-2 that prohibits the use of heavy construction equipment within 25 feet of existing structures during construction. With implementation of Mitigation Measure NOI-2, short-term construction impacts associated with the exposure of persons to or the generation of noise levels in excess of standards established in the general plan or noise ordinance or applicable standards of other agencies would be less than significant. The Project would not generate excessive vibratory or noise impacts. Therefore, the Project will have a *less than significant impact with mitigation incorporated*.

Mitigation Measures

The proposed project shall implement and incorporate the noise-related mitigation measures as identified in the attached Project Specific Mitigation Monitoring Checklist dated August 12, 2022.

NOI-2: Construction Vibration. The use of heavy construction equipment within 25 feet of existing structures shall be prohibited.

c) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project site to excessive noise levels?

The closest airport is the Fresno Yosemite International Airport, located approximately 6 miles south of the Project site. The proposed Project is outside noise level contours identified in the Fresno Airport Land Use Compatibility Plan (Fresno Council of Governments, 2018).

Therefore, the proposed Project would not expose people residing or working in the Project site to excessive noise levels associated with such airport facilities and the Project will have *no impact*.

Mitigation Measures

No mitigation measures are required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
XIV. POPULATION AND HOUSING – Would the Project:				
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

DISCUSSION

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)?

Population forecasts for the City of Fresno indicate growth for the City to include 1,373,700 persons by the year 2040, according to the City of Fresno General Plan. The average persons per household is 3.07 according to the City of Fresno Housing Element. The 2020 City of Fresno population was 542,107.

The Project build-out will result in an additional 199 single-family residences, and a corresponding population increase of 611 residents. The Project population growth represents a 0.001 percent increase in the 2020 population, and a 0.00044 percent increase in the 2040 population. The Project related population increase is de-minimis and will be absorbed over a minimum two-year time frame upon full build-out of the Project. The installation of new infrastructure would be limited to the internal single-family residences and related park site improvements. The sizing of the infrastructure would be specific to the number of units proposed within the Project site. Implementation of the proposed Project would not induce unplanned population growth in an area, either directly or indirectly. Therefore, impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required

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

The Project site is undeveloped and surrounded by a combination of vacant lots, agriculture, and residential property. As proposed, the Project will not displace existing housing or people either directly or indirectly. Therefore, there are no impacts.

Mitigation Measures

No mitigation measures are required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
XV. PUBLIC SERVICES – Would the Project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?			X	
Police protection?			X	
Schools?			X	
Parks?				X
Other public facilities?			X	

DISCUSSION

a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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:

i. Fire protection?

Fire protection services within City limits are provided by the City of Fresno Fire Department. The Project site is located approximately 1-mile southwest of Fire Station 15.

The Project is required to pay development impact fees that will provide for future fire-related facilities as the City's population increases. Recognizing that there would be an increased demand for fire and emergency medical response, the General Plan includes several policies to support the activities of the Fresno Fire Department. The policies and objectives of the General Plan will ensure that the proposed Project does not significantly affect fire protection.

The construction of the Project may result in a minor increase in demand for fire protection services but would not require new or altered facilities. The General Plan includes several policies to support the activities of the Fresno Fire Department, such as PU-3-d, which requires the Fire Department to review of development applications, and PU-3-e, which enforces amendments to construction and fire codes, to systematically reduce the level of risk to life and property from fire, commensurate with the City's fire suppression capabilities.

The policies and objectives of the General Plan will ensure that the proposed Project does not significantly affect fire protection. The Project would not affect the Department's response time to incidents as described in General Plan Policy PF-H 8. Therefore, impacts would be *less than significant*.

As such, impacts to fire protection services will be *less than significant.*

ii. Police protection?

Police protection services within the City limits are provided by the City of Fresno Police Department. The Project site resides within the Southeast Police District, Sector 3G, and is located approximately 1-mile southwest of the Southeast Police Station.

The Project may result in significant environmental impacts related to acceptable service ratios, response times, or other performance objectives specific to police protection services. However, to reduce impacts to public protection services, the Project developer is required to pay appropriate impact fees related to police protection and is responsible for constructing any infrastructure needed to serve the Project. Therefore, the Project does not significantly affect police protection.

Therefore, with implementation of standard local requirements for development projects related to police protection services, Project impacts are considered less than significant. Therefore, with implementation of standard local requirements for development projects related to police protection services, Project impacts are considered *less than significant*.

iii. Schools?

The surrounding schools include Sunnyside High School, approximately 1 mile northeast, Winchell Elementary School, approximately 1.8 miles northwest, Edison High School approximately 4 miles west of the Project, Jefferson Elementary School approximately 3.25 miles northwest, and Fulton High School approximately 4.5 miles northwest of the Project.

The proposed residential uses result in the generation of students, which would impact the District's student classroom capacity. Census Data shows the average household hold has approximately 3 persons per household, which would approximately yield 1 student per household, portion of whom may attend public K-12 schools. Any future development occurring as a result of the proposed project may have an effect on the Fresno Unified School District's student housing capacity. The District, through local funding, is in a position to mitigate its shortage of classrooms to accommodate planned population growth

for the foreseeable future. However, the District recognizes that the legislature, as a matter of law, has deemed under Government Code Section 65996 that all school facilities impacts are mitigated as a consequence of SB 50 Level 1, 2, and 3 developer fee legislative provisions. The project developer will pay appropriate impact fees at time of building permits. The proposed Project does not result in the construction of new school facilities.

School fees are collected for all new residential and commercial buildings. Fees are typically higher for residential uses, as these uses are associated with increased population growth, leading to increased student population at existing schools. The Project review and approval process will ensure that all school related fees are paid by the applicant. These requirements will ensure that the proposed Project does not significantly affect school facilities. Therefore, with implementation of standard local requirements for development projects related to school fees, impacts are considered *less than significant*.

iv. Parks?

Impacts on parks and recreational facilities are determined by analyzing the projected increase in demand for these facilities as a result of future residential development and corresponding population increase projected under the proposed Project. According the 2025 City of Fresno General Plan, the City's standard called for at least 3.0 acres of parkland to be provided per 1,000 residents. Park and recreation fees (Quimby) are collected for all new residential developments. The Project review and approval process will ensure that all park related fees are paid by the developer.

However, the Project proposes Outlot A, which will be dedicated park acreage to the City of Fresno to satisfy park requirements of the City of Fresno Municipal Code. Therefore, as the Project proposes a community park, the proposed Project does not significantly affect park and recreation facilities. Therefore, there is *no impact* as the Project will increase available park facilities and amenities in the area.

v. Other public facilities?

The Project build-out will result in an additional 199 single-family residences, and a corresponding population increase of 611 residents. The Project population growth represents a 0.00044 percent increase in the 2040 population. Impacts on other public facilities such as courts, libraries, and hospitals would be minimal.

The Project review and approval process will ensure that all development related impact fees are paid by the applicant. Therefore, Project impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
XVI. RECREATION - Would the Project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?			X	

DISCUSSION

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Full build-out of the Fresno General Plan would result in a potential population increase of approximately 425,000 additional residents within the City and result in an increase in the demand for parks and recreational facilities. Based on the proposed standard of 3 acres of public parkland per 1,000 residents, the build-out of the General Plan would require 4,850-acres of parkland and associated recreational amenities to serve all of the residents.

As discussed in Section XV (iv) PUBLIC SERVICES above, impacts on parks and recreational facilities are determined by analyzing the Projected increase in demand for these facilities. The Project build-out will result in a population increase of 611 residents. The Project population growth represents a 0.00044 percent increase in the 2040 population. Further, the Project proposes an approximate 2-acre parkland dedicated to the City for use by community members.

Therefore, there would be *no impacts* of the Project related to parks and recreational facilities.

Mitigation Measures

No mitigation measures are required

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

As stated above, Project proposes to develop an approximate 2-acre park for dedication to the City. Future construction of the park facilities and any associated infrastructure (such as bathrooms) will be conducted by the City of Fresno. Therefore, through standard City building process for the future park, City staff will ensure that the proposed Project does not significantly affect park and recreation facilities. Therefore, impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
XVII. TRANSPORTATION – Would the Project:				
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 § 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	

DISCUSSION

The analyses presented in this section are based on a *Local Transportation Analysis* prepared for the Project (VRPA, 2021b), which is attached as Appendix E.

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

Within proximity to the Project, there are several transportation facilities, including transit, roadway, bicycle, and pedestrian facilities.

Bicycle Facilities

The 2017 City of Fresno Active Transportation Plan (ATP) refers to the Caltrans Highway Design Manual for classification of bicycle facilities as follows:

- Class I Bikeway (Bike Path): Off-street facilities that provide exclusive use for non-motorized travel, including bicyclists and pedestrians.
- Class II Bikeway (Bike Lane): On-street facilities that use striping, stencils, and signage to denote preferential or exclusive use by bicyclists.
- Class III Bikeway (Bike Route): On-street pavement markings or signage that connect the bicycle roadway network along corridors that do not provide enough space for dedicated lanes on low-speed and low-volume streets.

Class IV Bikeway (Separated Bikeways): Physically separated bicycle facilities that are distinct from the sidewalk and designed for exclusive use by bicyclists. The ATP also identifies a Class I bike path along the San Joaquin Valley Railroad system, which the site will be responsible for contributing to development of the trail system. It is noted that Outlot F has been identified on the map for dedication to the City of Fresno to develop the bike/trail system. Project development would be in accordance with alternative transportation policies included in the City of Fresno General Plan, the Fresno County Regional Transportation Plan, and any other adopted policies, plans or programs supporting alternative transportation.

Pedestrian Facilities

Pedestrian connectivity is not well established in the general vicinity of the site. Sidewalks typically exist only within, and along the frontage of, adjacent residential developments. The Project would be required to construct sidewalks along its frontage. Upon submittal of development permits with the City for the Project, all applicable requirements for updating sidewalks and other related infrastructure will be required from the City of Fresno 2017 Active Transportation Plan.

Transit

Fresno Area Express (FAX) is the transit operator in the City of Fresno. The closest is FAX Route 41, is located at the intersection S Chestnut and E Church Avenues. The Project is not expected to have a significant impact, disrupt or impede existing transit facilities.

The Project will not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, bicycle and pedestrian facilities.

Roadways

Access to and from the Project site will be from two (2) access points along the Project's frontage on South Willow Avenue, located along the west Project boundary. Additional access for the Project is proposed on the east Project boundary to connect with existing future local streets upon development of the residential land use designation. No further access points or frontage of other streets are proposed for this Project, as the north side of the Project is adjacent to the Braly Canal and an existing railroad. To the south of the Project site are existing single-family residences and a retention basin.

The City threshold is a LOS standard of D or better for all roadways. Results of the analysis show that the intersection of Church Avenue at Willow Avenue does not currently meet the minimum level of service criteria during the AM Peak Hour (VRPA, 2021b) The intersection of Butler Avenue / Willow Avenue, Church Avenue / Willow Avenue, and Jensen Avenue / Willow Avenue is expected to exceed the LOS threshold during peak periods as a result of the cumulative Year 2042 Plus Project scenario. To improve the LOS at these intersections, Mitigation Measure MM TRA-1 requiring payment of Fair Share fee to pay for future improvements to the intersection. Payment of fees would reduce impacts to less than significant.

Pro-Rate Fair Share of Future Transportation Improvements

The Project's fair share percentage impact to study intersections projected to fall below their LOS threshold and which are not covered by an existing impact fee program is provided in Table 17-1. Table 17-1 shows the future improvements necessary to maintain an acceptable LOS. However, fair share contributions should only be made for those facilities, or portion thereof, currently not funded by the

responsible agencies roadway impact fee program(s) or grant funded projects, as appropriate. For those improvements not presently covered by local and regional roadway impact fee programs or grant funding, it is recommended that the Project contribute its equitable fair share. Payment of the Project's equitable fair share in addition to the local and regional impact fee programs would reduce the Project's traffic impacts related to LOS to less than significant levels.

Table 17-1
Fair Share Impact Fees

INTERSECTION	PEAK HOUR	EXISTING	PROJECT TRIPS	CUMULATIVE YEAR 2042 PLUS PROJECT	FAIR SHARE PERCENTAGE
Butler Avenue / Willow Avenue	AM	1,065	90	1,988	9.8%
	PM	870	122	1,722	14.3%
Church Avenue / Willow Avenue	AM	1,133	54	2,063	5.8%
	PM	900	74	1,730	8.9%
Jensen Avenue / Willow Avenue	AM	1,527	31	2,901	2.3%
	PM	1,451	43	2,853	3.1%

The proposed Project will not require any changes to existing transportation systems and will have no impact on any plans, ordinances, or policies related to the effectiveness or performance of the circulation system. The Project will comply with all applicable City development standards. Impacts would be l*ess than significant with mitigation incorporated*.

Mitigation Measures

The proposed project shall implement and incorporate the transportation related mitigation measures as identified in the attached Project Specific Mitigation Monitoring Checklist dated August 12, 2022.

MM TRA-1: Prior to the issuance of building permits, the developer shall pay its pro rata share for signalization and roadway improvements such as the construction of additional turn lanes and through lanes of the following intersections:

- Church Avenue / Willow Avenue
- Butler Avenue / Willow Avenue
- Jensen Avenue / Willow Avenue

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

Vehicle Miles Traveled:

Senate Bill (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 project adds excessive car travel onto our roads, the project may cause a significant transportation impact.

The State CEQA Guidelines were amended to implement SB 743, by adding Section 15064.3. Among its provisions, Section 15064.3 confirms that, except with respect to transportation projects, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, LOS measures of impacts on traffic facilities are no longer a relevant CEQA criteria for transportation impacts.

CEQA Guidelines Section 15064.3(b)(4) states that "[a] lead agency has discretion to evaluate a project's vehicle miles traveled, 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 vehicle miles traveled and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate used to estimate vehicle miles traveled and any revision to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section."

On June 25, 2020, the City of Fresno adopted CEQA Guidelines for Vehicle Miles Traveled Thresholds pursuant to Senate Bill 743 to be effective of July 1, 2020. The thresholds described therein are referred to herein as the City of Fresno VMT Thresholds. The City of Fresno VMT Thresholds document was prepared and adopted consistent with the requirements of CEQA Guidelines Sections 15064.3 and 15064.7. The December 2018 Technical Advisory on Evaluating Transportation Impacts in CEQA (Technical Advisory) published by the Governor's Office of Planning and Research (OPR), was utilized as a reference and guidance document in the preparation of the Fresno VMT Thresholds.

The Project is located at 2121 South Willow Avenue, on the east side of Willow Avenue approximately halfway between Kings Canyon Road and Jensen Avenue. Based on Figure 6 of the City of Fresno's CEQA Guidelines for Vehicle Miles Traveled, this is a low VMT area (VRPA, 2021b).

As noted in The City of Fresno VMT Guidelines, the Fresno Council of Governments (COG) provides an analytical service to review a proposed project's potential VMT impacts through the use of models and VMT calculators. Based on the scope of the project, the Fresno COG recommends that projects that propose 500 residential units or less can be analyzed using the Fresno COG VMT Calculation tool. In fact, Section 4.2.3.1 of the Fresno COG *Implementation Regional Guidelines*, projects may be calculated using the Fresno COG VMT Calculation Tool for residential projects.

Therefore, an analysis was completed using the most recent version of the VMT calculator tool (v1.38) for the proposed Project. The analysis resulted in a project-specific Per Capita VMT of 10.3, which is less than the adopted threshold of 14 VMT per capita. This is also a 13% reduction of the 16.1 regional VMT threshold (the results of the VMT Calculator is included in Appendix E). Because the Project will result in the generation of VMT less than the threshold that has been adopted by the City of Fresno, no VMT mitigation is needed, the Project will result in a *less*

than significant VMT impact and is consistent with CEQA Guidelines Section 15064.3(b).

Mitigation Measures

No mitigation measures are required

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

The Project will be designed to current standards and safety regulations. All intersections will be constructed as to comply with the City and Caltrans regulations, and design and safety standards of Chapter 33 of the California Building Codes (CBC) and the guidelines of Title 24 in order to create safe and accessible roadways.

Vehicles exiting the subdivision will be provided with a clear view of the roadway without obstructions. Landscaping associated with the entry driveways could impede such views, if improperly installed. Specific circulation patterns and roadway designs will incorporate all applicable safety measures to ensure that hazardous design features or inadequate emergency access to the site or other areas surrounding the project area would not occur. Therefore, with the incorporated design features and all applicable rules and regulations, the Project will have a less than significant impact. The Project would not increase hazards due to a geometric design feature or incompatible use. There would be a *less than significant impact*.

Mitigation Measures

No mitigation measures are required

d) Result in inadequate emergency access?

There will be two main entry points to the Project from S Willow Avenue and future proposed additional entry points to approved residential development east of the Project site. The Project will be required to construct all necessary street frontage improvements to City Standards. In addition, the proposed Project will be required to dedicate and construct improvements along all major street frontages and on any future proposed interior local streets within respective phases in accordance with City of Fresno standards, specifications and requirements.

The Project is not located near an airport; therefore, it will not change air traffic levels. The proposed streets will not create hazards or conflict with emergency access. Therefore, the Project would result in a *less than significant* impact associated with emergency access.

Mitigation Measures

No mitigation measures are required

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
XVII. TRIBAL CULTURAL RESOURCES – Would the Project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:		X		
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC section 5020.1(k), or,		X		
ii) A resource determined by the lead agency, in its discretion and supported by substantial evi-dence, to be significant pursuant to criteria set forth in subdivision (c) of PRC section 5024.1. In applying the criteria set forth in subdivision (c) of PRC section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		X		

DISCUSSION

a) Would the Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

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

The State requires lead agencies to consider the potential effects of proposed Projects and consult with California Native American tribes during the local

planning process for the purpose of protecting Traditional Tribal Cultural Resources through the CEQA Guidelines. Pursuant to PRC Section 21080.3.1, the lead agency shall begin consultation with the California Native American tribe that is traditionally and culturally affiliated with the geographical area of the proposed Project. Such significant cultural resources are either sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a tribe which is either on or eligible for inclusion in the California Historic Register or local historic register, or, the lead agency, at its discretion, and support by substantial evidence, choose to treat the resources as a Tribal Cultural Resources (PRC Section 21074(a)(1-2)).

Pursuant to AB 52, the Table Mountain Rancheria of California and Dumna Wo Wah Tribal Government were invited to consult under AB 52. The City of Fresno mailed notices of the proposed Project to each of these tribes on April 15, 2022 , which included the required 30-day time period required by AB 52which ended on May 16, 2022. Neither tribe decided to request consultation for the project during the required comment period.

As noted in V. CULTURAL RESOURCES (a)-(c), a cultural resources records search was conducted by the Southern San Joaquin Valley Information Center, California State University Bakersfield. The records search covered an area within one-half mile of the Project site and included a review of the National Register of Historic Places (NRHP), California Points of Historical Interest, California Registry of Historic Resources (CRHR), California Historical Landmarks, California State Historic Resources Inventory, and a review of cultural resource reports on file.

The records search indicated that the subject property had never been surveyed for cultural resources. No cultural resources have been recorded on the property and it is not known if any exist there Eight cultural resource studies have been conducted within a half mile of the project. No cultural resources have been recorded on the subject property and it is not known if any exist on it.

One cultural resource has been identified within a half mile of the proposed project. This is a segment of the Southern Pacific Railroad line (P-10-003930) that abuts the project property on its northern boundary. Although part of a historic railroad route, the track is in active use and is not a significant cultural resource. In addition, the proposed Project would not impact the railroad line. The Project will not impact these historical resources, as construction will be restricted to the boundaries of the site.

A Sacred Lands File request was also submitted to the Native American Heritage Commission. A response dated October 14, 2020 indicates negative results.

It should be noted however, that lack of surface evidence of tribal cultural resources. Furthermore, previously unknown or undiscovered human remains could be disturbed during Project construction. However, during excavation activities, there is always the potential to discover archaeological or historical cultural resources. In the event cultural resources are found, construction will halt, and a qualified archaeologist or cultural resources specialist will be contacted and will make recommendations to the City.

The Project site is currently undeveloped and was historically in agricultural production. If any artifacts are inadvertently discovered during ground-disturbing activities, existing federal, State, and local laws and regulations as well as the mitigation measures of the Project Specific Mitigation Monitoring Checklist dated August 12, 2022 will require construction activities to cease until such artifacts are properly examined and determined not to be of significance by a qualified cultural resources professional.

In conclusion, with Project Specific Mitigation Measures incorporated, the Project will not result in any cultural resource impacts, and implementation of Mitigation Measures CUL-1.1, CUL 1.2 and CUL-3 will result in a *less than significant impact with mitigation incorporated*.

Mitigation Measures

Implementation of MM CUL-1.1, CUL 1.2 and CUL-3

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

The State requires lead agencies to consider the potential effects of proposed projects and consult with California Native American tribes during the local planning process for the purpose of protecting Traditional Tribal Cultural Resources through the CEQA Guidelines. Pursuant to PRC Section 21080.3.1, the lead agency shall begin consultation with the California Native American tribe that is traditionally and culturally affiliated with the geographical area of the proposed Project. Such significant cultural resources are either sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a tribe which is either on or eligible for inclusion in the California Historic Register or local historic register or, the lead agency, at its discretion, and support by substantial evidence, choose to treat the resources as a Tribal Cultural Resources (PRC Section 21074(a)(1-2)).

Additional information may also be available from the California Native American Heritage Commission's Sacred Lands File per PRC Section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that PRC Section 21082.3(c) contains provisions specific to confidentiality.

Overall, because all tribes to which invitations for consultation were extended declined AB 52 consultation and because existing cultural resources protection laws exist that would require construction activities to cease if artifacts are discovered. The Project site is currently undeveloped and was historically in agricultural production. If any artifacts are inadvertently discovered during ground-disturbing activities, existing federal, State, and local laws and regulations as well as the mitigation measures of the GP PEIR, will require

construction activities to cease until such artifacts are properly examined and determined not to be of significance by a qualified cultural resource professional.

In conclusion, with GP PEIR mitigation measures incorporated, the Project will not result in any cultural resource impacts beyond those analyzed in the GP PEIR, and implementation of GP PEIR Mitigation Measures CUL-1.1, CUL 1.2, CUL-2 and CUL-3 will result in a less than significant impact with mitigation incorporated.

Mitigation Measures

Implementation of MM CUL-1.1, CUL 1.2 and CUL-3

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS – Would the Project:				
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 effect?			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, which serves or may serve the Project that it has adequate capacity to serve the Project's Projected demand in addition to the provider's existing commitments?			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 and reduction statutes and regulations related to solid waste?			X	

DISCUSSION

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?

The proposed Project will require construction of new infrastructure to connect to the existing utility infrastructure. This will include water, wastewater, and storm water drainage connections. Additionally, the Project will include connections for electric power, natural gas, and telecommunications facilities. The installation of this infrastructure will not require any major upsizing or other offsite construction activities that would cause a significant impact. The new infrastructure would be connected to existing infrastructure that is adjacent to the Project site.

Impacts to storm drainage facilities have been previously discussed in X. HYDROLOGY AND WATER QUALITY (b, c (i)-C(iii) and e). In compliance with NPDES General Construction Permit requirements, the proposed Project would design and submit a site-specific SWPPP to minimize the discharge of wastewater during construction and a Water Quality Management Plan that includes BMPs for runoff control as required. Therefore, the proposed Project would not require new stormwater drainage facilities to manage stormwater runoff during construction or operation, and impacts would be less than significant.

The proposed Project would be subject to the payment of any applicable connection charges and/or fees and extension of services in a manner that is compliant with the Department of Public Utilities standards, specifications, and policies.

Sanitary sewer and water service under City of Fresno jurisdiction, delivery is also subject to payment of applicable connection charges and/or fees; compliance with the Department of Public Utilities standards, specifications, and policies; the rules and regulations of the California Public Utilities Commission and California Health Services; and, implementation of the Citywide program for the completion of incremental expansions to facilities for planned water supply, treatment, and storage. Therefore, the impacts of the Project are less than significant.

Mitigation Measures

No mitigation measures are required.

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

As discussed under the Section VII HYDROLOGY AND WATER QUALITY (b, c(i)-c(iii) and e, the proposed Project is anticipated to use approximately 133.74 acre-feet of water annually. The Project will obtain water by connecting to City utility services. The City Department of Public Works issued comments on the Project dated April 29, 2022 regarding among other things, water service and water supply requirements. These requirements included the use of water meters, the installation of water mains, fire hydrants, and the payment of applicable Water Capacity fees.

The GP PEIR recognizes regional water resource planning efforts, such as, the Kings Basin's Integrated Regional Water Management Plan, the Fresno- Area Regional Groundwater Management Plan, and the City of Fresno Metropolitan Water Resource Management Plan, and cites the findings of the City of Fresno 2020 UWMP. As was

previously discussed, the Project would result in a less-than-significant impact related to water supply and there are sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years.

The applicant will be required to comply with all requirements of the City of Fresno Department of Public Utilities to reduce the Project's water impacts to less than significant. Impacts of the Project are *less than significant*.

Mitigation Measures

No mitigation measures are required.

c) Result in a determination by the wastewater treatment provider, which serves or may serve the Project that it has adequate capacity to serve the Project's Projected demand in addition to the provider's existing commitments?

The City of Fresno acts as the Regional Sewer Agency and is responsible for operating the Fresno/Clovis Regional Wastewater Reclamation Facility (RWRF) and the North Fresno Wastewater Treatment Facility (NFWTF). The Regional Facility provides wastewater treatment for a service area that includes most of the Cities of Fresno and Clovis, and some unincorporated areas of Fresno County. The Regional Facility received and treated approximately 72,302 acre-feet (AF) of wastewater during 2011, representing an annual average daily flow of approximately 64.5 million gallons per day (MGD). The quantity of wastewater received and treated by the Regional Facility has been declining since 2006, when it peaked at a total of approximately 80,801 AF, representing an annual average daily flow of approximately 72.1 MGD.

The permitted wastewater treatment capacity of the Regional Facility is currently 80-MGD as an annual monthly average flow, and 88-MGD as a maximum monthly average flow. The City is currently evaluating upgrades and modifications to the existing Regional Facility that may result in a capacity rating increase of 15-MGD. The City of Clovis owns 9.3-MGD of wastewater treatment capacity at the Regional Facility, and the City of Fresno owns the remaining capacity.

The NFWTF was constructed in late 2006 to provide wastewater treatment service for residential and commercial development in the surrounding area of north Fresno. The permitted capacity of the NFWRF is 0.71-MGD, as an average monthly flow, and 1.07-MGD, as a maximum daily flow. The City's master plan for the NFWRF calls for ultimate expansion to an average monthly flow capacity of 1.07-MGD upon full development of the NFWRF service area.

The City of Fresno Department of Public Utilities has determined that adequate sanitary sewer and water services would be available to serve the proposed Project subject to the payment of any applicable connection charges and/or fees and extension of services in a manner that is compliant with the Department of Public Utilities standards, specifications, and policies. The proposed Project will not result in an inadequate capacity to serve the Project's anticipated wastewater demand in addition to the provider's existing commitments. Impacts are *less than significant*

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Mitigation Measures

No mitigation measures are required.

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?

The City of Fresno Department of Public Utilities, Solid Waste Division has reviewed the Project for compliance with any federal, State, and local management and reduction statutes and regulations related to solid waste. According to the City's General Plan PEIR, garbage disposed of in the City of Fresno is taken to Cedar Avenue Recycling and Transfer Station. Once trash has been off-loaded at the transfer station, it is sorted, and non-recyclable solid waste is loaded onto large trucks and taken to the American Avenue Landfill located approximately six miles southwest of Kerman. American Avenue Landfill is owned and operated by Fresno County and began operations in 1992 for both public and commercial solid waste haulers. The American Avenue Landfill is a sanitary landfill, meaning that it is a disposal site for non-hazardous solid waste spread in layers, compacted to the smallest practical volume, and covered by material applied at the end of each operating day.

The American Avenue Landfill (i.e. American Avenue Disposal Site 10-AA-0009) has a maximum permitted capacity of 32,700,000 cubic yards and a remaining capacity of 29,358,535 cubic yards, with an estimated closure date of August 31, 2031. The maximum permitted throughput is 2,200 tons per day. Other landfills within the County of Fresno include the Clovis Landfill with a maximum remaining permitted capacity of 7,740,000 cubic yards, a maximum permitted throughput of 2,000 tons per day, and an estimated closure date of 2047. There is also the Coalinga Landfill with a maximum remaining capacity of 1,930,062 cubic yards, a maximum permitted throughput of 200 tons per day, and an estimated closure date of 2029. As noted above, the estimated closure date of the American Avenue Landfill is 2031. Additional capacity also exists at the Clovis Landfill and Coalinga Landfill. The 200 tons per year would not result in exceedance of the local capacity infrastructure.

It is anticipated the Project would generate minimal amounts of waste during construction. Any hazardous waste generated during construction would be disposed of at an approved location and construction activities are not expected to exceed the capacity of these landfills.

Once operational, typical household refuse would be generated by residences. Using the CalRecycle Estimated Solid Waste Generation Rates Website for Residential Sector Generation Rate of 12.23 lbs/household/day, the proposed 199 units would generate 2,435 pounds of waste per day (or 444 tons per year). The Project will comply with any statutes and regulations related to solid waste. Therefore, the proposed Project would not result in any waste related environmental impacts. Therefore, the Project will have a *less than significant impact*.

Mitigation Measures

No mitigation measures are required.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Project construction and operational activities that generate solid waste are handled, transported, and disposed of in accordance with applicable federal, State, and local regulations pertaining to municipal waste. The 1989 California Integrated Waste Management Act requires jurisdictions to attain specific waste diversion goals (AB 939, 2019). In addition, the California Solid Waste Reuse and Recycling Access Act of 1991, as amended, requires expanded or new development Projects to incorporate storage areas for recycling bins into the proposed Project design. Reuse and recycling of construction debris would reduce operating expenses and save valuable landfill space. With development in accordance with the City's General Plan, solid waste will continue to be handled, transported, and disposed of according to all applicable federal, State, and local regulation pertaining to municipal waste disposal. The City has a number of provisions that require or promote recycling and waste reduction, including the Construction and Demolition Recycling Ordinance that requires contractors to recycle construction and demolition debris.

In 2005, the Fresno City Council adopted the City of Fresno Solid Waste and Recycling Facilities Ordinance (Ord. No. 2003-100) in order to comply with AB 939, which requires the implementation of integrated waste management plans and mandates that local jurisdictions divert at least 50 percent of all solid waste. The recycling of construction and demolition materials is required for any City-issued building, relocation, or demolition permit that generates at least eight cubic yards of material by volume.

The Project would generate solid waste during construction and operation of the new single-family residences. Common construction waste may include metals, masonry, plastic pipe, rocks, dirt, cardboard, or green waste related to land development. AB 939 and Ordinance No. 2003-100 require the City of Fresno to attain specific waste diversion goals. The wasted disposal facilities listed above have available capacity to accept construction waste from potential new facilities.

The Project is required to comply with all local, state, and federal regulations related to solid waste and would not result in any utility related environmental impacts. Therefore, impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
XX. WILDFIRE – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?			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

DISCUSSION

Setting

There are no State Responsibility Areas (SRAs) within the vicinity of the Project site. The Project site is not categorized as a "Very High" Fire Hazard Severity Zone (FHSZ) by CalFire. Although this CEQA topic only applies to areas within an SRA or Very High FHSZ, out of an abundance of caution, these checklist questions are analyzed below.

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

The City of Fresno's Police and Fire Departments are tasked with all local emergency response efforts. In addition, the City's full-time Emergency

Preparedness Officer (EPO) is responsible for ensuring that Fresno's emergency response plans are up-to-date and implemented properly. The EPO also facilitates cooperation between City departments and other local, State and federal agencies that would be involved in emergency response operations.

The proposed Project is for the construction 199 single-family residences, related development improvements, and an approximate 2-acre park. These types of uses are similar in nature to the other uses within the Project area. It is not anticipated that new or different impairments would occur that may physically interfere with an adopted emergency response plan or emergency evacuation plan. All Project plans submitted to the City will be reviewed incompliance with Federal, State and local regulations related to emergency access. The Project is required to comply with all local, State, and federal regulations related to emergency preparedness, and would not result in environmental impacts. Therefore, Project impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required.

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?

See IX. HAZARDS AND HAZARDOUS MATERIAL (g). Although the City of Fresno is proximate to high and very high fire hazard designated areas, the City is largely categorized as little or no threat or moderate fire hazard, which is largely attributed to urban development. Some small areas along the San Joaquin River Bluff area in northern Fresno are prone to wildfires due to relatively steep terrain/vegetation, and these areas are classified as high fire hazard areas. The Project area is located in a Local Responsibility Area (LRA) and has been designated as Non-Wildland by CalFire.

The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents) and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point. The Project site is located in an area that is predominately urban, which is not considered at a significant risk of wildlife. The Project would not pose a wildfire risk during construction or operations. Therefore, Project impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required

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?

See discussion under XX. WILDFIRE (a) above. The Project includes development of infrastructure (water, sewer, and storm drainage) required to support the proposed residential uses and park site. The Project site is surrounded by agriculture, vacant lots, and single-family residences. However, the site is not located within an area designated as a high wildfire risk. Additionally, all new single-family residences would be required to comply with federal, State, and local health and safety regulations, development standards, building codes, and other laws and regulations that govern fire protection and suppression.

All Project related construction will meet or exceed all Federal, State and local regulations and codes related to fire protection and suppression. Additionally, the Project would not require the installation or maintenance of associated infrastructure and will not exacerbate fire risk that may result in impacts to the environment. Therefore, there are no impacts. Therefore, Project impacts are considered to be *less than significant*.

Mitigation Measures

No mitigation measures are required

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?

The Project site and surrounding area is relatively flat and with little to no topography and not near a mountain, hill, bluff, etc. Additionally, there is no body of water within the vicinity of the Project site. The Project is not located within a FEMA 100-year floodplain.

Therefore, the Project will not expose people or structures to risks of causing downstream flooding, landslides, runoff, slope instability, or drainage changes. The Project would not pose a risk of downslope or downstream flooding or landslides during construction or operations and there are *no impacts*.

Mitigation Measures

No mitigation measures are required

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ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less than significant with Mitigation Incorporated	Less than significant Impact	No Impact
XIX. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
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 which will cause substantial adverse effects on human beings, either directly or indirectly?		X		

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 an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?

The size of the Project is a size that is not a detriment to the existing environment with the Project area. The Project will not reduce habitat, biological resource populations, or local historical components. As discussed in Section IV. Biological Resources and Section V, Cultural Resources, with the incorporation of Mitigation Measures BIO-1.1, BIO-1.2, BIO-1.4, BIO-2.1, CUL-1.1, CUL-1.2, CUL-2, CUL-3, the Project does not have the potential to degrade the quality of the environment or reduce the habitat of wildlife species and will not threaten plant communities or endanger any floral or faunal species. Furthermore, the Project has no potential to eliminate important examples of major periods in history. With implementation of applicable City of Fresno General Plan PEIR mitigation measures, impacts are considered to be *less than significant with mitigation incorporated.*

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.)

The Project is considered to be proposed at a size and scope that would not result in impacts that are cumulatively considerable when viewed in connection with existing or future development as described in this initial study document.

Implementation of recommended mitigation measures AES-4.1, AES-4.2, AG-1.1, AIR-2.1 AIR-2.2, BIO-1.1, BIO-1.2, BIO-1.4, BIO-2.1, CUL-1.1, CUL-1.2, CUL-2, CUL-3, GEO-6.1, and NOI-2 would ensure that the impacts of the project would be below established thresholds of significance and that these impacts would not combine with the impacts of other cumulative projects to result in a cumulatively considerable impact on the environment as a result of project development and this impact would be less than significant with mitigation incorporated.

For the topics of Energy, Hazards and Hazardous Materials, Hydrology and Water Quality Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Recreation, Transportation, Utilities and Service Systems, and Wildlife, the Project would have no impacts or less-than-significant impacts, and therefore, the project would not substantially contribute to any potential cumulative impacts for these topics..

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

The Project is consistent with applicable environmental policies and mitigation measures as outlined in the General Plan PEIR that are required in several impact areas to reduce any potentially significant impacts to less than significant. Additionally, due to the existing residential development surrounding the project site and in the general area, the General Plan anticipates that future development will increase the density within adjacent areas. Development is planned to occur in the immediate area projected by the City's General Plan and analyzed in the General Plan PEIR.

Therefore, the Project is not anticipated to cause substantial adverse effects on human beings directly. With implementation of applicable City of Fresno General Plan PEIR mitigation measures AES-4.1, AES-4.2, AG-1.1, AIR-2.1 AIR-2.2, BIO-1.1, BIO-1.2, BIO-

1.4, BIO-2.1, CUL-1.1, CUL-1.2, CUL-2, CUL-3, GEO-6.1, , and NOI-2, impacts are considered to be *less than significant with mitigation incorporated.*

Project Specific Mitigation Monitoring Checklist for EA No. T-6345/P22-00411/P22-00442

August 12, 2022

This Project Requirement checklist was prepared pursuant to California EnvironmentalQuality Act (CEQA) Guidelines Section 15183 to uniformly apply development standards and policies for the Project Specific Mitigation Monitoring Checklist to ensure that any site-specific impacts or construction-related impacts are reduced to a less-than-significant level. Letter designations to the right of each Project Specific Mitigation Measure listed in this Exhibit note how the project requirement relates to the environmental assessment of the above- listed project, according to the key found at right and at the bottoms of the following pages:

A - Incorporated into Project

B - Project Requirement Complete **C** - Project Requirement in Progress**D** - Responsible Agency Contacted **E** - Part of City-wide Program

F - Not Applicable

The timing of implementing each Project requirements is identified in in the checklist, as well as identifies the entity responsible forverifying that the Project requirement applied to a Project are performed. Project applicants are responsible for providing evidencethat project requirements are implemented. As lead agency, the City of Fresno is responsible for verifying that the Project requirements are performed/completed.

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Aesthetics:								
AES-1. Lighting systems for street and parking areas shall include shields to direct light to the roadway surfaces and parking areas. Vertical shields on the light fixtures shall also beused to direct light away from adjacent light sensitive land uses such as residences. **Verification comments:**	Prior to issuance of building permits	Public Works Department (PW) and Development & Resource Management Dept. (DARM)	X				X	

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Aesthetics *(continued)*:								
AES-2: Lighting systems for public facilities such as active play areas shall provide adequate illumination for the activity; however, low intensity light fixtures and shields shall be used to minimize spillover light onto adjacent properties. **Verification comments:**	Prior to issuance of building permits	DARM	X				X	

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Aesthetics *(continued)*:

Air Quality:

AIR-1: Projects that include five or more heavy-duty truck deliveries per day with sensitive receptors located within 300 feet of the truck loading area shall provide a screening analysis to determine if the project has the potential to exceedcriteria pollutant concentration-based standards and thresholds for NO2 and PM2.5. If projects exceed screening criteria, refined dispersion modeling and health risk assessment shall be accomplished and if needed, mitigation measures to reduce impacts shall be included in the project toreduce the impacts to the extent feasible. Mitigationmeasures include but are not limited to: • Locate loading docks and truck access routes as far from sensitive receptors as reasonably possible considering site design limitations to comply with other City design standards. • Post signs requiring drivers to limit idling to 5 minutes or less. **Verification comments:**	Prior to issuanceof building permits	DARM	X					

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Air Quality *(continued)*:								
AIR-2: Projects that result in an increased cancer risk of 10 in a million or exceed criteria pollutant ambient air quality standards shall implement site-specific measures that reduce toxic air contaminant (TAC) exposure to reduce excess cancer risk to less than 10 in a million. Possible control measures include but are not limited to: • Locate loading docks and truck access routes as far from sensitive receptors as reasonably possible considering site design limitations to comply with other City design standards. • Post signs requiring drivers to limit idling to 5 minutes or less • Construct block walls to reduce the flow of emissions toward sensitive receptors • Install a vegetative barrier downwind from the TAC source that can absorb a portion of the diesel PM emissions • For projects proposing to locate a new building containing sensitive receptors near existing sources of TAC emissions, install HEPA filters in HVAC systems to reduce TAC emission levels exceeding risk thresholds. • Install heating and cooling services at truck stops to eliminate the need for idling during overnight stops to run onboard systems. *(continued on next page)*	Prior to issuanceof building permits	DARM	X					

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Air Quality *(continued)***:**

AIR-2 *(continued from previous page)* • For large distribution centers where the owner controls the vehicle fleet, provide facilities to support alternative fueled trucks powered by fuels such as natural gas or bio-diesel • Utilize electric powered material handling equipment where feasible for the weight and volume of material to be moved. **Verification comments:**	*[see previous page]*	*[see previous page]*						
AIR-3: Require developers proposing projects on ARB's list of projects in its Air Quality and Land Use Handbook (Handbook) warranting special consideration to prepare a cumulative health risk assessment when sensitive receptors are located within the distance screening criteria of the facility as listed in the ARB Handbook. **Verification comments:**	Prior to issuanceof building permits	DARM	X					

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Agriculture and Forestry Resources								
AG-1: MM AG-1.1: Prior to issuance of a grading or building permit, whichever occurs first, the Developer of APN 473-030-10/63 shall complete the following measures to mitigate the loss of agricultural land at a ratio of 1:1 for the net acreage before conversion. (The net acreage calculation shall exclude existing roads and areas already developed with structures, and a plot plan shall be submitted to substantiate the net acreage calculation, along with written evidence of compliance.). Mitigation land shall meet the definition of Prime Farmland, Farmland of Statewide Importance, and/or Unique Farmland and be of similar agricultural quality or higher, as established by the California Department of Conservation. Completion of the selected measure or, with the City of Fresno Planning Director's approval, a combination of measures can occur on qualifying land within the San Joaquin Valley (San Joaquin, Stanislaus, Merced, Fresno, Madera, Kings, Tulare, or Kern County) or outside the San Joaquin Valley with written evidence that the same or equivalent crops can be produced on the mitigation land. Developer shall provide in-kind value protection at a ratio of 1:1 for a total of 42.3 acres, by recording an agricultural conservation easement on agricultural land of equal size and classification to the land being converted to non-agricultural uses prior to obtaining a grading permit for the Project site. The land selected	Prior to issuanceof building permits	DARM	X			X		

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for the agricultural conservation easement will have a tangible relationship to the land being converted from an agricultural use and shall be in or adjacent to Fresno County. The easement will be held by the City of Fresno, comply with the requirements of California Civil Code Section 815 et. seq., and will be in a form substantially similar to the model conservation easement prepared by the California Department of Conservation(https://www.conservation.ca.gov/dlrp/grant-programs/Documents/grant/SALCP%20Model%20ACE%20Template%20(2014-2015)%20Final%2012.4.2015.pdf).			

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Biological Resources:								
BIO-1: Construction of a proposed project should avoid, where possible, vegetation communities that provide suitable habitat for a special-status species known to occur within the Planning Area. If construction within potentially suitable habitat must occur, the presence/absence of any special- status plant or wildlife species must be determined prior to construction, to determine if the habitat supports any special- status species. If special-status species are determined to occupy any portion of a project site, avoidance and minimization measures shall be incorporated into the construction phase of a project to avoid direct or incidental take of a listed species to the greatest extent feasible. **Verification comments:**	Prior to issuanceof building permits	DARM	X			X	X	
BIO-2: Direct or incidental take of any state or federally listed species should be avoided to the greatest extent feasible. If construction of a proposed project will result in the direct or incidental take of a listed species, consultation with the resources agencies and/or additional permitting may be required. Agency consultation through the California Department of Fish and Wildlife (CDFW) 2081 and U.S. Fish and Wildlife Service (USFWS) Section 7 or Section 10 permitting processes must take place prior to any action that *(continued on next page)*	Prior to issuanceof building permits	DARM	X			X	X	

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Biological Resources *(continued)*:

BIO-2 *(continued from previous page)* may result in the direct or incidental take of a listed species. Specific mitigation measures for direct or incidental impacts to a listed species will be determined on a case-by-case basis through agency consultation. **Verification comments:**	*[see previous page]*	*[see previous page]*						
BIO-3: Development within the Planning Area should avoid, where possible, special-status natural communities and vegetation communities that provide suitable habitat for special-status species. If a proposed project will result in the loss of a special-status natural community or suitable habitat for special-status species, compensatory habitat-based mitigation is required under CEQA and the California Endangered Species Act (CESA). Mitigation will consist of preserving on-site habitat, restoring similar habitat or purchasing off-site credits from an approved mitigation bank. Compensatory mitigation will be determined through consultation with the City and/or resource agencies. An appropriate mitigation strategy and ratio will be agreed upon by the developer and lead agency to reduce project impacts to special-status natural communities to a less than significant *(continued on next page)*	Prior to issuanceof building permits	DARM						X

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Biological Resources *(continued)*:

BIO-3 *(continued from previous page)*: level. Agreed-upon mitigation ratios will depend on the quality of the habitat and presence/absence of a special-status species. The specific mitigation for project level impacts will be determined on a case-by-case basis. **Verification comments:**	*[see previous page]*	*[see previous page]*						
BIO-4: Proposed projects within the Planning Area should avoid, if possible, construction within the general nesting season of February through August for avian species protected under Fish and Game Code 3500 and the Migratory Bird Treaty Act (MBTA), if it is determined that suitable nesting habitat occurs on a project site. If construction cannot avoid the nesting season, a pre-construction clearance survey must be conducted to determine if any nesting birds or nestingactivity is observed on or within 500-feet of a project site. If anactive nest is observed during the survey, a biological monitor must be on site to ensure that no proposed project activities would impact the active nest. A suitable buffer will be established around the active nest until the nestlings have fledged and the nest is no longer active. Project activities *(continued on next page)*	Prior to issuanceof building permits and during construction activities	DARM	X			X	X	

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Biological Resources *(continued)*:

BIO-4 *(continued from previous page)*: may continue in the vicinity of the nest only at the discretion of the biological monitor. **Verification comments:**	*[see previous page]*	*[see previous page]*							
BIO-5: If a proposed project will result in the removal or impact to any riparian habitat and/or a special-status natural community with potential to occur in the Planning Area, compensatory habitat-based mitigation shall be required to reduce project impacts. Compensatory mitigation must involve the preservation or restoration or the purchase of off- site mitigation credits for impacts to riparian habitat and/or a special-status natural community. Mitigation must be conducted in-kind or within an approved mitigation bank in the region. The specific mitigation ratio for habitat-basedmitigation will be determined through consultation with the appropriate agency (*i.e*., CDFW or USFWS) on a case-by- case basis. **Verification comments:**	Prior to issuanceof building permits	DARM						**X**

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Biological Resources *(continued)*:

BIO-6: Project impacts that occur to riparian habitat may also result in significant impacts to streambeds or waterways protected under Section 1600 of Fish and Wildlife Code and Section 404 of the CWA. CDFW and/or USACE consultation, determination of mitigation strategy, and regulatory permitting to reduce impacts, as required for projects that remove riparian habitat and/or alter a streambed or waterway, shall be implemented. **Verification comments:**	Prior to issuanceof building permits	DARM							X
BIO-7: Project-related impacts to riparian habitat or a special-status natural community may result in direct or incidental impacts to special-status species associated with riparian or wetland habitats. Project impacts to special-status species associated with riparian habitat shall be mitigated through agency consultation, development of a mitigation strategy, and/or issuing incidental take permits for the specific special-status species, as determined by the CDFW and/or USFWS. **Verification comments:**	Prior to issuanceof building permits	DARM							X

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Biological Resources *(continued)***:**

BIO-8: If a proposed project will result in the significant alteration or fill of a federally protected wetland, a formal wetland delineation conducted according to U.S. Army Corps of Engineers (USACE) accepted methodology is required for each project to determine the extent of wetlands on a project site. The delineation shall be used to determine if federal permitting and mitigation strategy are required to reduce project impacts. Acquisition of permits from USACE for the fill of wetlands and USACE approval of a wetland mitigation plan would ensure a "no net loss" of wetland habitat within the Planning Area. Appropriate wetland mitigation/creation shall be implemented in a ratio according to the size of the impacted wetland. **Verification comments:**	Prior to development project approval	DARM						X
BIO-9: In addition to regulatory agency permitting, Best Management Practices (BMPs) identified from a list provided by the USACE shall be incorporated into the design and construction phase of the project to ensure that no pollutants or siltation drain into a federally protected wetland. Project design features such as fencing, appropriate drainage and *(continued on next page)*	Prior to issuance of building permits;but for long-term operational BMPs, prior to issuance of occupancy	DARM							X

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Biological Resources *(continued)*:

BIO-9 *(continued from previous page)*: incorporating detention basins shall assist in ensuring project-related impacts to wetland habitat are minimized to the greatest extent feasible. **Verification comments:**	*[see previous page]*	*[see previous page]*						

Cultural Resources:

CUL-1: If previously unknown resources are encountered before or during grading activities, construction shall stop in the immediate vicinity of the find and a qualified historical resources specialist shall be consulted to determine whether the resource requires further study. The qualified historical resources specialist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to excavationof the finds and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines and the City's Historic Preservation Ordinance. If the resources are determined to be unique historical resources as defined under Section 15064.5 of the CEQA Guidelines, measures shall be identified by the monitor and *(continued on next page)*	Prior to commencement of, and during, construction activities	DARM	X					

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Cultural Resources *(continued)*:

CUL-1 *(continued from previous page)* recommended to the Lead Agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these. Any historical artifacts recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of providing long-germ preservation to allow future scientific study. **Verification comments:**	*[see previous page]*	*[see previous page]*						
CUL-2: Subsequent to a preliminary City review of the project grading plans, if there is evidence that a project will include excavation or construction activities within previously undisturbed soils, a field survey and literature search for prehistoric archaeological resources shall be conducted. The following procedures shall be followed. If prehistoric resources are not found during either the field survey or literature search, excavation and/or construction activities can commence. In the event that buried prehistoric *(continued on next page)*	Prior to commencement of, and during, construction activities	DARM	**X**					

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Cultural Resources *(continued)*:

CUL-2 *(continued from previous page)* archaeological resources are discovered during excavation and/or construction activities, construction shall stop in the immediate vicinity of the find and a qualified archaeologistshall be consulted to determine whether the resource requiresfurther study. The qualified archaeologist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with CEQA Guidelines Section 15064.5. If the resources are determined to be unique prehistoric archaeological resources as defined under Section 15064.5 of the CEQA Guidelines, mitigation measures shall be identified by the monitor and recommended to the Lead Agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any prehistoric archaeological artifacts recovered as a result of mitigation shall be provided *(continued on next page)*	*[see previous page]*	*[see previous page]*	

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Cultural Resources *(continued)*:

CUL-2 *(further continued from previous two pages)* to a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study. If prehistoric resources are found during the field survey or literature review, the resources shall be inventoried using appropriate State record forms and submit the forms to the Southern San Joaquin Valley Information Center. The resources shall be evaluated for significance. If the resources are found to be significant, measures shall be identified by the qualified archaeologist. Similar to above, appropriate mitigation measures for significant resources could includeavoidance or capping, incorporation of the site in green space,parks, or open space, or data recovery excavations of the finds. In addition, appropriate mitigation for excavation and construction activities in the vicinity of the resources found during the field survey or literature review shall include an archaeological monitor. The monitoring period shall be determined by the qualified archaeologist. If additional prehistoric archaeological resources are found during *(continued on next page)*	*[see Page 14]*	*[see Page 14]*	

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Cultural Resources *(continued)*:

CUL-2 *(further continued from previous three pages)* excavation and/or construction activities, the procedure identified above for the discovery of unknown resources shall be followed. **Verification comments:**	*[see Page 14]*	*[see Page 14]*						
CUL-3: Subsequent to a preliminary City review of the project grading plans, if there is evidence that a project will include excavation or construction activities within previously undisturbed soils, a field survey and literature search for unique paleontological/geological resources shall beconducted. The following procedures shall be followed: If unique paleontological/geological resources are not found during either the field survey or literature search, excavation and/or construction activities can commence. In the event that unique paleontological/geological resources are discovered during excavation and/or construction activities, construction shall stop in the immediate vicinity of the find anda qualified paleontologist shall be consulted to determine whether the resource requires further study. The qualified paleontologist shall make recommendations to the City on the measures that shall be implemented to protect the discovered *(continued on next page)*	Prior to commencement of, and during, construction activities	DARM	X					

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Cultural Resources *(continued)*:

CUL-3 *(continued from previous page)* resources, including but not limited to, excavation of the finds and evaluation of the finds. If the resources are determined to be significant, mitigation measures shall be identified by the monitor and recommended to the Lead Agency. Appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any paleontological/geological resources recovered as a result of mitigation shall be providedto a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study. If unique paleontological/geological resources are foundduring the field survey or literature review, the resources shall be inventoried and evaluated for significance. If the resourcesare found to be significant, mitigation measures shall be identified by the qualified paleontologist. Similar to above, appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the sitein green space, parks, or open space, or data recovery excavations of the finds. In addition, appropriate mitigation for excavation and construction activities in the vicinity of the *(continued on next page)*	*[see previous page]*	*[see previous page]*	

Cultural Resources *(continued)*:**A** - Incorporated into Project

B - Project Requirement Complete

C - Project Requirement in Progress

D - Responsible Agency Contacted

E - Part of City-Wide Program

F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
CUL-3 *(further continued from previous two pages)* resources found during the field survey or literature review shall include a paleontological monitor. The monitoring periodshall be determined by the qualified paleontologist. If additional paleontological/geological resources are found during excavation and/or construction activities, the procedure identified above for the discovery of unknown resources shall be followed. **Verification comments:**	*[see Page 17]*	*[see Page 17]*						
CUL-4: In the event that human remains are unearthed during excavation and grading activities of any future development project, all activity shall cease immediately. Pursuant to Health and Safety Code (HSC) Section 7050.5, no further disturbance shall occur until the County Coronerhas made the necessary findings as to origin and disposition pursuant to PRC Section 5097.98(a). If the remains are determined to be of Native American descent, the coroner shall within 24 hours notify the Native American Heritage Commission (NAHC). The NAHC shall then contact the most *(continued on next page)*	Prior to commencement of, and during, construction activities	DARM	X			X		

Cultural Resources *(continued)*:**A** - Incorporated into Project
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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
CUL-4 *(continued from previous page)* likely descendent of the deceased Native American, who shall then serve as the consultant on how to proceed with the remains. Pursuant to PRC Section 5097.98(b), upon the discovery of Native American remains, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located is not damaged or disturbed by further development activity until the landowner has discussed and conferred with the most likely descendants regarding th recommendations, if applicable, taking into account the possibility of multiple human remains. The landowner shall discuss and confer with the descendants all reasonable options regarding the descendants' preferences for treatment. **Verification comments:**	*[see previous page]*	*[see previous page]*						

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Hazards and Hazardous Materials								
HAZ-1: Re-designate the existing vacant land proposed for low density residential located northwest of the intersection of East Garland Avenue and North Dearing Avenue and located within Fresno Yosemite International Airport Zone 1-RPZ,to Open Space. **Verification comments:**	Prior to development approvals	DARM						X
HAZ-2: Limit the proposed low density residential (1 to 3 dwelling units per acre) located northwest of the airport and located within Fresno Yosemite International Airport Zone 3-Inner Turning Area, to 2 dwelling units per acre orless. **Verification comments:**	Prior to development approvals	DARM						X
HAZ-3: Re-designate the current area within Fresno Yosemite International Airport Zone 5-Sideline located northeast of the airport to Public Facilities-Airport or Open Space. **Verification comments:**	Prior to development approvals	DARM						X

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Hazards and Hazardous Materials *(continued)*:

HAZ-4: Re-designate the current vacant lots at the northeast corner of Kearney Boulevard and South Thorne Avenue to Public Facilities-Airport or Open Space. **Verification comments:**	Prior to development approvals	DARM						X
HAZ-5: Prohibit residential uses within Safety Zone 1 northwest of the Hawes Avenue and South Thorne Avenue intersection. **Verification comments:**	Prior to development approvals	DARM						X
HAZ-6: Establish an alternative Emergency Operations Center in the event the current Emergency Operations Center is under redevelopment or blocked. **Verification comments:**	Prior to redevelopment of the current Emergency Operations Center	Fresno Fire Department and Mayor/ City Manager's Office						X

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Hydrology and Water Quality								
HYD-1: The City shall develop and implement water conservation measures to reduce the per capita water use to 215 gallons per capita per day. **Verification comments:**	Prior to water demand exceeding water supply	Department of Public Utilities (DPU)	X				X	
HYD-2: The City shall continue to be an active participant in the Kings Water Authority and the implementation of the Kings Basin IRWMP. **Verification comments:**	Ongoing	DPU	X				X	
HYD-5.1: The City and partnering agencies shall implement the following measures to reduce the impacts on the capacity of existing or planned storm drainage Master Plan collection systems to less than significant. • Implement the existing Storm Drainage Master Plan(SDMP) for collection systems in drainage areas where theamount of imperviousness is unaffected by the change in land uses. *(continued on next page)*	Prior to exceedance of capacity of existing stormwater drainage facilities	Fresno Metropolitan Flood Control District (FMFCD), DARM, and PW	X			X	X	

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Hydrology and Water Quality *(continued)***:**

HYD-5.1 *(continued from previous page)* • Update the SDMP in those drainage areas where the amount of imperviousness increased due to the change in land uses to determine the changes in the collection systems that would need to occur to provide adequate capacity for the stormwater runoff from the increased imperviousness. • Implement the updated SDMP to provide stormwater collection systems that have sufficient capacity to convey the peak runoff rates from the areas of increased imperviousness. Require developments that increase site imperviousness to install, operate, and maintain FMFCD approved on-site detention systems to reduce the peak runoff rates resulting from the increased imperviousness to the peak runoff rates that will not exceed the capacity of the existing stormwater collection systems. **Verification comments:**	*[see previous page]*	*[see previous page]*	

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E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Hydrology and Water Quality *(continued)*:								
HYD-5.2: The City and partnering agencies shall implement the following measures to reduce the impacts on the capacity of existing or planned storm drainage Master Plan retention basins to less than significant: Consult the SDMP to analyze the impacts to existing and planned retention basins to determine remedial measures required to reduce the impact on retention basin capacity to less than significant. Remedial measures would include: • Increase the size of the retention basin through the purchase of more land or deepening the basin or a combination for planned retention basins. • Increase the size of the emergency relief pump capacity required to pump excess runoff volume out of the basin and into adjacent canal that convey the stormwater to a disposal facility for existing retention basins. • Require developments that increase runoff volume to install, operate, and maintain, Low Impact Development (LID) measures to reduce runoff volume to the runoff volume that will not exceed the capacity of the existing retention basins. **Verification comments:**	Prior to exceedance of capacity of existing retention basin facilities	FMFCD, DARM, and PW	X			X	X	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Hydrology and Water Quality *(continued)*:								
HYD-5.3: The City and partnering agencies shall implement the following measures to reduce the impacts on the capacity of existing or planned storm drainage Master Plan urban detention (stormwater quality) basins to less than significant. Consult the SDMP to determine the impacts to the urban detention basin weir overflow rates and determine remedial measures required to reduce the impact on the detention basin capacity to less than significant. Remedial measures would include: • Modify overflow weir to maintain the suspended solids removal rates adopted by the FMFCD Board of Directors. • Increase the size of the urban detention basin to increase residence time by purchasing more land. The existing detention basins are already at the adopted design depth. • Require developments that increase runoff volume to install, operate, and maintain, Low Impact Development (LID) measures to reduce peak runoff rates and runoffvolume to the runoff rates and volumes that will not exceedthe weir overflow rates of the existing urban detention basins. **Verification comments:**	Prior to exceedance of capacity of existing urban detention basin (stormwater quality) facilities	FMFCD, DARM, and PW	X			X	X	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Hydrology and Water Quality *(continued)*:								
HYD-5.4: The City shall implement the following measures to reduce the impacts on the capacity of existing or planned storm drainage Master Plan pump disposal systems to less than significant. • Consult the SDMP to determine the extent and degree to which the capacity of the existing pump system will be exceeded. • Require new developments to install, operate, and maintain FMFCD design standard on-site detention facilities to reduce peak stormwater runoff rates to existing planned peak runoff rates. • Provide additional pump system capacity to maximum allowed by existing permitting to increase the capacity to match or exceed the peak runoff rates determined by the SDMP. **Verification comments:**	Prior to exceedance of capacity of existing pump disposal systems	FMFCD, DARM, and PW	X			X	X	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Hydrology and Water Quality *(continued)***:**

• **HYD-5.5:** The City shall work with FMFCD to develop and adopt an update to the SDMP for the Southeast Development Area that would be adequately designed to collect, convey and dispose of runoff at the rates and volumes which would be generated by the planned land uses in that area. **Verification comments:**	Prior to development approvals in the Southeast Development Area	FMFCD, DARM, and PW						X

Public Services:

PS-1: As future fire facilities are planned, the fire department shall evaluate if specific environmental effects would occur. Typical impacts from fire facilities include noise, traffic, and lighting. Typical mitigation to reduce these impacts includes: • *Noise:* Barriers and setbacks on the fire department sites. • *Traffic:* Traffic devices for circulation and a "keep clear zone" during emergency responses. • *Lighting:* Provision of hoods and deflectors on lighting fixtures on the fire department sites. **Verification comments:**	During the planning process for future fire department facilities	DARM	X				X	

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B - Project Requirement Complete
C - Project Requirement in Progress
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E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Public Services *(continued)***:**

PS-2: As future police facilities are planned, the police department shall evaluate if specific environmental effects would occur. Typical impacts from police facilities include noise, traffic, and lighting. Typical mitigation to reduce potential impacts from police department facilities includes: • *Noise:* Barriers and setbacks on the police department sites. • *Traffic:* Traffic devices for circulation. • *Lighting:* Provision of hoods and deflectors on lighting fixtures on the police department sites. **Verification comments:**	During the planning process for future Police Department facilities	DARM	X				X	
PS-3: As future public and private school facilities are planned, school districts shall evaluate if specific environmental effects would occur with regard to public schools, and DARM shall evaluate other school facilities. Typical impacts from school facilities include noise, traffic, andlighting. Typical mitigation to reduce potential impacts from school facilities includes: *(continued on next page)*	During the planning process for future school facilities	DARM, local school districts, and the Division of the State Architect	X			X	X	

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B - Project Requirement Complete
C - Project Requirement in Progress
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E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Public Services *(continued)***:**

PS-3 *(continued from previous page)* • *Noise*: Barriers and setbacks placed on school sites. • *Traffic*: Traffic devices for circulation. • *Lighting*: Provision of hoods and deflectors on lighting fixtures for stadium lights. **Verification comments:**	*[see previous page]*	*[see previous page]*						
PS-4: As future parks and recreational facilities are planned, the City shall evaluate if specific environmental effects would occur. Typical impacts from school facilities include noise, traffic, and lighting. Typical mitigation to reduce potential impacts from park and recreational facilities includes: • *Noise*: Barriers and setbacks placed on school sites. • *Traffic*: Traffic devices for circulation. • *Lighting*: Provision of hoods and deflectors on lighting fixtures for outdoor play area/field lights. **Verification comments:**	During the planning process for future park and recreation facilities	DARM	X				X	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
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E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Public Services *(continued)***:**

PS-5: As future detention, court, library, and hospital facilities are planned, the appropriate agencies shall evaluate if specific environmental effects would occur. Typical impacts from court, library, and hospital facilities include noise, traffic, and lighting. Typical mitigation to reduce potential impacts includes: • *Noise:* Barriers and setbacks placed on school sites. • *Traffic:* Traffic devices for circulation. • *Lighting:* Provision of hoods and deflectors on outdoor lighting fixtures. **Verification comments:**	During the planning process for future detention, court, library, and hospital facilities	DARM, to the extent that agencies constructing these facilities are subject to City of Fresno regulation						X

Utilities and Service Systems

USS-1: The City shall develop and implement a wastewater master plan update. **Verification comments:**	Prior to wastewater conveyance and treatment demand exceeding capacity	DPU	X				X	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems *(continued)***:**

USS-2: Prior to exceeding existing wastewater treatment capacity, the City shall evaluate the wastewater system and shall not approve additional development that contributes wastewater to the wastewater treatment facility that could exceed capacity until additional capacity is provided. By approximately the year 2025, the City shall construct the following improvements: • Construct an approximately 70 MGD expansion of the Regional Wastewater Treatment and Reclamation Facility and obtain revised waste discharge permits as the generation of wastewater is increased. • Construct an approximately 0.49 MGD expansion of the North Facility and obtain revised waste discharge permits as the generation of wastewater is increased. **Verification comments:**	Prior to exceeding existing wastewater treatment capacity	DPU	X				X	
USS-3: Prior to exceeding existing wastewater treatment capacity, the City shall evaluate the wastewater system and shall not approve additional development that contributes wastewater to the wastewater treatment facility that could exceed capacity until additional capacity is provided. After *(continued on next page)*	Prior to exceeding existing wastewater treatment capacity	DPU	X				X	

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C - Project Requirement in Progress
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E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems *(continued)***:**

USS-3 *(continued from previous page)* approximately the year 2025, the City shall construct the following improvements: • Construct an approximately 24 MGD wastewater treatment facility within the Southeast Development Area and obtain revised waste discharge requirements as the generation of wastewater is increased. • Construct an approximately 9.6 MGD expansion of the Regional Wastewater Treatment and Reclamation Facility and obtain revised waste discharge permits as the generation of wastewater is increased. **Verification comments:**	*[see previous page]*	*[see previous page]*							
USS-4: A Traffic Control/Traffic Management Plan to address traffic impacts during construction of water and sewer facilities shall be prepared and implemented, subject to approval by the City (and Fresno County, when work is being done in unincorporated area roadways). The plan shall identify access and parking restrictions, pavement markings and signage, and hours of construction and for deliveries. It shall include haul routes, the notification plan, and coordination withemergency service providers and schools. **Verification comments:**	Prior to construction of water and sewer facilities	PW for work in the City; PW and Fresno County Public Works and Planning when unincorporated area roadways are involved	X				X	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
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E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems *(continued)***:**

USS-5: Prior to exceeding capacity within the existing wastewater collection system facilities, the City shall evaluate the wastewater collection system and shall not approve additional development that would generate additional wastewater and exceed the capacity of a facility until additional capacity is provided. By approximately the year 2025, the following capacity improvements shall be provided. • Orange Avenue Trunk Sewer: This facility shall be improved between Dakota and Jensen Avenues. Approximately 37,240 feet of new sewer main shall be installed and approximately 5,760 feet of existing sewer main shall be rehabilitated. The size of the new sewer main shall range from 27 inches to 42 inches in diameter. The associated project designations in the 2006 Wastewater Master Plan are RS03A, RL02, C01-REP, C02-REP, C03-REP, C04-REP, C05-REP, C06-REL and C07-REP. • Marks Avenue Trunk Sewer: This facility shall be improved between Clinton Avenue and Kearney Boulevard. Approximately 12,150 feet of new sewer main shall be installed. The size of the new sewer main shall range from 33 inches to 60 inches in diameter. The associated project designations in the 2006 Wastewater Master Plan are CM1-REP and CM2-REP. *(continued on next page)*	Prior to exceeding capacity within the existing wastewater collection system facilities	DPU	X				X	

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B - Project Requirement Complete
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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems *(continued)***:**

USS-5 *(continued from previous page)* • North Avenue Trunk Sewer: This facility shall be improved between Polk and Fruit Avenues and also between Orange and Maple Avenues. Approximately 25,700 feet of new sewer main shall be installed. The size of the new sewer main shall range from 48 inches to 66 inches in diameter. The associated project designations in the 2006Wastewater Master Plan are CN1-REL1 and CN3-REL1. • Ashlan Avenue Trunk Sewer: This facility shall be improved between Hughes and West Avenues and also between Fruit and Blackstone Avenues. Approximately 9,260 feet ofnew sewer main shall be installed. The size of the new sewer main shall range from 24 inches to 36 inches indiameter. The associated project designations in the 2006 Wastewater Master Plan are CA1-REL and CA2-REP. **Verification comments:**	*[see previous page]*	*[see previous page]*	

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PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems *(continued)*:

USS-6: Prior to exceeding capacity within the existing 28 pipeline segments shown in Figures 1 and 2 in Appendix J-1, the City shall evaluate the wastewater collection system and shall not approve additional development that would generate additional wastewater and exceed the capacity of one of the 28 pipeline segments until additional capacity is provided. **Verification comments:**	Prior to exceeding capacity within the existing 28 pipeline segments shown in Figures 1 and 2 in Appendix J-1 of the MEIR	DPU	X				X	
USS-7: Prior to exceeding existing water supply capacity, the City shall evaluate the water supply system and shall not approve additional development that demand additional water until additional capacity is provided. By approximately the year 2025, the following capacity improvements shall be provided. • Construct an approximately 80 million gallon per day (MGD) surface water treatment facility near the intersection of Armstrong and Olive Avenues, in accordance with Chapter 9 and Figure 9-1 of the City of Fresno MetropolitanWater Resources Management Plan Update (2014 Metro Plan Update) Phase 2 Report, dated January 2012. *(continued on next page)*	Prior to exceeding existing water supply capacity	DPU	X				X	

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B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems *(continued)***:**

USS-7 *(continued from previous page)* • Construct an approximately 30 MGD expansion of the existing northeast surface water treatment facility for a total capacity of 60 MGD, in accordance with Chapter 9 and Figure 9-1 of the 2014 Metro Plan Update. • Construct an approximately 20 MGD surface water treatment facility in the southwest portion of the City, in accordance with Chapter 9 and Figure 9-1 of the 2014 Metro Plan Update. **Verification comments:**	*[see previous page]*	*[see previous page]*						
USS-8: Prior to exceeding capacity within the existing water conveyance facilities, the City shall evaluate the water conveyance system and shall not approve additional development that would demand additional water and exceed the capacity of a facility until additional capacity is provided. The following capacity improvements shall be provided by approximately 2025. • Construct 65 new groundwater wells, in accordance with Chapter 9 and Figure 9-1 of the 2014 Metro Plan Update. *(continued on next page)*	Prior to exceeding capacity within the existing water conveyance facilities	DPU	X				X	

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B - Project Requirement Complete
C - Project Requirement in Progress
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E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems *(continued)***:**

USS-8 *(continued from previous page)* • Construct a 2.0 million gallon potable water reservoir (Reservoir T2) near the intersection of Clovis and California Avenues, in accordance with Chapter 9 and Figure 9-1 of the 2014 Metro Plan Update. • Construct a 3.0 million gallon potable water reservoir (Reservoir T3) near the intersection of Temperance and Dakota Avenues, in accordance with Chapter 9 and Figure 9-1 of the 2014 Metro Plan Update. • Construct a 3.0 million gallon potable water reservoir (Reservoir T4) in the Downtown Planning Area, in accordance with Chapter 9 and Figure 9-1 of the 2014 Metro Plan Update. • Construct a 4.0 million gallon potable water reservoir (Reservoir T5) near the intersection of Ashlan and Chestnut Avenues, in accordance with Chapter 9 and Figure 9-1 of the 2014 Metro Plan Update. • Construct a 4.0 million gallon potable water reservoir (Reservoir T6) near the intersection of Ashlan Avenue and Highway 99, in accordance with Chapter 9 and Figure 9-1 of the 2014 Metro Plan Update. *(continued on next page)*	*[see previous page]*	*[see previous page]*	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
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E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems *(continued)***:**

USS-8 *(continued from previous two pages)* • Construct 50.3 miles of regional water transmission mains ranging in size from 24-inch to 48-inch diameter, in accordance with Chapter 9 and Figure 9-1 of the 2014 Metro Plan Update. • Construct 95.9 miles of 16-inch diameter transmissiongrid mains, in accordance with Chapter 9 and Figure 9-1 of the 2014 Metro Plan Update. **Verification comments:**	*[see Page 37]*	*[see Page 37]*						
USS-9: Prior to exceeding capacity within the existing water conveyance facilities, the City shall evaluate the water conveyance system and shall not approve additional development that would demand additional water and exceed the capacity of a facility until additional capacity is provided. The following capacity improvements shall be provided after approximately the year 2025 and additional water conveyance facilities shall be provided prior to exceedance of capacity within the water conveyance facilities to accommodate full buildout of the General Plan Update. *(continued on next page)*	Prior to exceeding capacity within the existing water conveyance facilities	DPU	X				X	

A - Incorporated into Project
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D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems *(continued)***:**

USS-9 *(continued from previous page)* • Construct a 4.0 million gallon potable water reservoir (SEDA Reservoir 1) within the northern part of the Southeast Development Area. • Construct a 4.0 million gallon potable water reservoir (SEDA Reservoir 2) within the southern part of the Southeast Development Area. Additional water conveyance facilities shall be provided prior to exceedance of capacity within the water conveyance facilities to accommodate full buildout of the General Plan Update. **Verification comments:**	*[see previous page]*	*[see previous page]*						
USS-10: In order to maintain Fresno Irrigation District canal operability, FMFCD shall maintain operational intermittent flows during the dry season, within defined channel capacity and downstream capture capabilities, for recharge. **Verification comments:**	During the dry season	Fresno Irrigation District (FID)						X

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Utilities and Service Systems - ***Biological Resources:***								
USS-11: When FMFCD proposes to provide drainage service outside of urbanized areas: (a) FMFCD shall conduct preliminary investigations on undeveloped lands outside of highly urbanized areas. These investigations shall examine wetland hydrology, vegetation and soil types. These preliminary investigations shall be the basis for making a determination on whether or not more in-depth wetland studies shall be necessary. If the proposed project site does not exhibit wetland hydrology, support aprevalence of wetland vegetation and wetland soil types then no further action is required. (b) Where proposed activities could have an impact on areas verified by the Corps as jurisdictional wetlands or waters of the U.S. (urban and rural streams, seasonal wetlands, and vernal pools), FMFCD shall obtain the necessary Clean Water Act, Section 404 permits for activities where fill material shall be placed in a wetland, obstruct the flow or circulation of waters of the United States, impair or reduce the reach of such waters. As part of FMFCD's Memorandum of Understanding with CDFG, Section 404 and 401 permits would be obtained from the U.S. Army Corps of Engineers and from the *(continued on next page)*	Prior to development approvals outside of highly urbanized areas	California Regional Water Quality Control Board (RWQCB), and USACE						X

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems - *Biological Resources* *(continued)**:***

USS-11 *(continued from previous page)* Regional Water Quality Control Board for any activity involving filling of jurisdictional waters). At a minimum, to meet "no net loss policy," the permits shall require replacement of wetland habitat at a 1:1 ratio. (c) Where proposed activities could have an impact on areas verified by the Corps as jurisdictional wetlands or waters of the U.S. (urban and rural streams, seasonal wetlands, and vernal pools), FMFCD shall submit and implement a wetland mitigation plan based on the wetland acreage verified by the U.S. Army Corps of Engineers. The wetland mitigation plan shall be prepared by a qualified biologist or wetland scientist experienced in wetland creation, and shall include the following or equally effective elements: i. Specific location, size, and existing hydrology and soils within the wetland creation area. ii. Wetland mitigation techniques, seed source, planting specifications, and required buffer setbacks. In addition, the mitigation plan shall ensure adequate water supply is provided to the created wetlands in order to maintain the proper *(continued on next page)*	*[see previous page]*	*[see previous page]*	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems - *Biological Resources* *(continued)**:***

USS-11 *(continued from previous two pages)* hydrologic regimes required by the different types of wetlands created. Provisions to ensure the wetland water supply is maintained in perpetuity shall be included in the plan. iii. A monitoring program for restored, enhanced, created, and preserved wetlands on the project site. A monitoring program is required to meet three objectives; 1) establish a wetland creation success criteria to be met; 2) to specify monitoring methodology; 3) to identify as far as is possible, specific remedial actions that will be required inorder to achieve the success criteria; and 4) todocument the degree of success achieved in establishing wetland vegetation. (d) A monitoring plan shall be developed and implemented by a qualified biologist to monitor results of any on-site wetland restoration and creation for five years. The monitoring plan shall include specific success criteria, frequency and timing of monitoring, and assessment of whether or not maintenance activities are being carried out and how these shall be adjusted if necessary. *(continued on next page)*	*[see Page 41]*	*[see Page 41]*	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
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E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems - *Biological Resources* *(continued)**:***

USS-11 *(continued from previous three pages)* If monitoring reveals that success criteria are not being met, remedial habitat creation or restoration should be designed and implemented by a qualified biologist and subject to five years of monitoring as described above. Or (e) In lieu of developing a mitigation plan that outlines the avoidance, purchase, or creation of wetlands, FMCD could purchase mitigation credits through a Corps approved Mitigation Bank. **Verification comments:**	*[see Page 41]*	*[see Page 41]*						
USS-12: When FMFCD proposes to provide drainage service outside in areas that support seasonal wetlands or vernalpools: (a) During facility design and prior to initiation of ground disturbing activities in areas that support seasonal wetlands or vernal pools, FMFCD shall conduct a preliminary rare plant assessment. The assessment will determine the likelihood on whether or not the project site could support rare plants. If it is determined that the project site would not support rare plants, then no further *(continued on next page)*	During facility design and prior to initiation of ground disturbing activities in areas that support seasonal wetlands or vernal pools	California Department of Fish & Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS)						X

A - Incorporated into Project
B - Project Requirement Complete
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F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems - *Biological Resources* *(continued)**:***

USS-12 *(continued from previous page)* action is required. However, if the project site has the potential to support rare plants; then a rare plant survey shall be conducted. Rare plant surveys shall be conducted by qualified biologists in accordance with the most current CDFG/USFWS guidelines or protocols and shall be conducted at the time of year when the plants in question are identifiable. (b) Based on the results of the survey, prior to design approval, FMFCD shall coordinate with CDFG and/or implement a Section 7 consultation with USFWS, shall determine whether the project facility would result in a significant impact to any special status plant species. Evaluation of project impacts shall consider the following: • The status of the species in question (*e.g.*, officially listed by the State or Federal Endangered Species Acts). • The relative density and distribution of the on-site occurrence versus typical occurrences of the species in question. *(continued on next page)*	*[see previous page]*	*[see previous page]*	

A - Incorporated into Project
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E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems - *Biological Resources* *(continued)*:

USS-12 *(continued from previous two pages)* • The habitat quality of the on-site occurrence relative to historic, current or potential distribution of the population. (c) Prior to design approval, and in consultation with the CDFG and/or the USFWS, FMFCD shall prepare and implement a mitigation plan, in accordance with any applicable State and/or federal statutes or laws, thatreduces impacts to a less than significant level. **Verification comments:**	*[see Page 44]*	*[see Page 44]*						
USS-13: When FMFCD proposes to provide drainage service outside in areas that support seasonal wetlands or vernalpools: (a) During facility design and prior to initiation of ground disturbing activities in areas that support seasonal wetlands or vernal pools, FMFCD shall conduct a preliminary survey to determine the presence of listed vernal pool crustaceans. *(continued on next page)*	During facility design and prior to initiation of ground disturbing activities in areas that support seasonal wetlands or vernal pools	CDFW and USFWS						X

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Utilities and Service Systems - *Biological Resources* *(continued)***:**								
USS-13 *(continued from previous page)* (b) If potential habitat (vernal pools, seasonally inundated areas) or fairy shrimp exist within areas proposed to be disturbed, FMFCD shall complete the first and second phase of fairy shrimp presence or absence surveys. If an absence finding is determined and accepted by the USFWS, then no further mitigation shall be required for fairy shrimp. (c) If fairy shrimp are found to be present within vernal pools or other areas of inundation to be impacted by the implementation of storm drainage facilities, FMFCD shall mitigate impacts on fairy shrimp habitat in accordance with the USFWS requirements of the Programmatic Biological Opinion. This shall include on-site or off-site creation and/or preservation of fairy shrimp habitat at ratios ranging from 3:1 to 5:1 depending on the habitat impacted and the choice of on-site or off-site mitigation. Or mitigation shall be the purchase of mitigation credit through an accredited mitigation bank. **Verification comments:**	*[see previous page]*	*[see previous page]*						

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
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F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems - *Biological Resources* *(continued)*:

USS-14: When FMFCD proposes to construct drainage facilities in an area where elderberry bushes may occur: (a) During facility design and prior to initiation of construction activities, FMFCD shall conduct a project- specific survey for all potential Valley Elderberry Longhorn Beetle (VELB) habitats (elderberry shrubs),including a stem count and an assessment of historic or current VELB habitat. (b) FMFCD shall avoid and protect all potential identified VELB habitat where feasible. (c) Where avoidance is infeasible, develop and implement a VELB mitigation plan in accordance with the most current USFWS mitigation guidelines for unavoidable take of VELB habitat pursuant to either Section 7 or Section 10(a) of the Federal Endangered Species Act. The mitigation plan shall include, but might not be limitedto, relocation of elderberry shrubs, planting of elderberry shrubs, and monitoring of relocated and planted elderberry shrubs. **Verification comments:**	During facility design and prior to initiation of construction activities	CDFW and USFWS						X

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems - *Biological Resources* *(continued)***:**

USS-15: Prior to ground disturbing activities during nesting season (March through July) for a project that supports bird nesting habitat, FMFCD shall conduct a survey of trees. If nests are found during the survey, a qualified biologist shall assess the nesting activity on the project site. If active nests are located, no construction activities shall be allowed within 250 feet of the nest until the young have fledged. If construction activities are planned during the no n-breeding period (August through February), a nest survey is not necessary. **Verification comments:**	Prior to ground disturbing activities during nesting season (March through July) for a project that supports bird nesting habitat	CDFW and USFWS						X
USS-16: When FMFCD proposes to construct drainage facilities in an area that supports bird nesting habitat: (a) FMFCD shall conduct a pre-construction breeding- season survey (approximately February 1 through August31) of proposed project sites in suitable habitat (levee and canal berms, open grasslands with suitable burrows) during the same calendar year that construction is planned to begin. If phased construction procedures are planned for the proposed project, the results of the abovesurvey shall be valid only for the season when it is conducted. *(continued on next page)*	Prior to ground disturbing activities during nesting season (March through July) for a project that supports bird nesting habitat	CDFW and USFWS						X

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems - *Biological Resources* *(continued)***:**

USS-16 *(continued from previous page)* (b) During the construction stage, FMFCD shall avoid all burrowing owl nest sites potentially disturbed by project construction during the breeding season while the nest is occupied with adults and/or young. The occupied nest site shall be monitored by a qualified biologist to determine when the nest is no longer used. Avoidance shall include the establishment of a 160-foot diameter non-disturbance buffer zone around the nest site. Disturbance of any nest sites shall only occur outside of the breeding season and when the nests are unoccupied based on monitoring by a qualified biologist. The buffer zone shall be delineated by highly visible temporary construction fencing. Based on approval by CDFG, pre-construction and pre-breeding season exclusion measures may be implemented to preclude burrowing owl occupation of the project site prior to project-related disturbance. Burrowing owls can be passively excluded from potential nest sites in the construction area, either by closing the burrows or placing one-way doors in the burrows according to current CDFG protocol. Burrows shall be examined not more than 30 days before construction to ensure that no owls have recolonized the area of construction. *(continued on next page)*	*[see previous page]*	*[see previous page]*	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems - *Biological Resources* *(continued)***:**

USS-16 *(continued from previous two pages)* For each burrow destroyed, a new burrow shall be created (by installing artificial burrows at a ratio of 2:1 on protected lands nearby. **Verification comments:**	*[see Page 49]*	*[see Page 49]*						
USS-17: When FMFCD proposes to construct drainage facilities in the San Joaquin River corridor: (a) FMFCD shall not conduct instream activities in the San Joaquin River between October 15 and April 15. If this is not feasible, FMFCD shall consult with the National Marine Fisheries Service and CDFW on the appropriate measures to be implemented in order to protect listed salmonids in the San Joaquin River. (b) Riparian vegetation shading the main channel that is removed or damaged shall be replaced at a ratio and quantity sufficient to maintain the existing shading of the channel. The location of replacement trees on or within *(continued on next page)*	During instream activities conducted between October 15 and April 15	National Marine Fisheries Service (NMFS), CDFW, and Central Valley Flood Protection Board (CVFPB)						X

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems / *Biological Resources* *(continued)***:**

USS-17 *(continued from previous page)* FMFCD berms, detention ponds or river channels shall be approved by FMFCD and the Central Valley Flood Protection Board. **Verification comments:**	*[see previous page]*	*[see previous page]*						

Utilities and Service Systems – *Recreation / Trails*:

USS-18: When FMFCD updates its District Service Plan: Prior to final design approval of all elements of the District Services Plan, FMFCD shall consult with Fresno County, City of Fresno, and City of Clovis to determine if any element would temporarily disrupt or permanently displace adopted existing or planned trails and associated recreational facilities as a result of the proposed District Services Plan. If the proposed project would not temporarily disrupt or permanently displace adopted existing or planned trails, no further mitigation is necessary. If the proposed project would have an effect on the trails and associated facilities, FMFCD shall implement the following: *(continued on next page)*	Prior to final design approval of all elements of the District Services Plan	DARM, PW, City of Clovis, and County of Fresno						X

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F

Utilities and Service Systems – *Recreation / Trails* *(continued)*:

USS-18 *(continued from previous page)* (a) If short-term disruption of adopted existing or planned trails and associated recreational facilities occur, FMFCD shall consult and coordinate with Fresno County, City of Fresno, and City of Clovis to temporarily re-route the trails and associated facilities. (b) If permanent displacement of the adopted existing or planned trails and associated recreational facilities occur, the appropriate design modifications to prevent permanent displacement shall be implemented in the final project design or FMFCD shall replace these facilities. **Verification comments:**	*[see previous page]*	*[see previous page]*						

Utilities and Service Systems – *Air Quality*:

USS-19: When District drainage facilities are constructed, FMFCD shall: (a) Minimize idling time of construction equipment vehicles to no more than ten minutes, or require that engines be shut off when not in use. *(continued on next page)*	During storm water drainage facility construction activities	Fresno Metropolitan Flood Control District and SJVAPCD						X

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Utilities and Service Systems – *Air Quality* *(continued)*:								
USS-19 *(continued from previous page)* (b) Construction shall be curtailed as much as possible when the Air Quality Index (AQI) is above 150. AQI forecasts can be found on the SJVAPCD web site. (c) Off-road trucks should be equipped with on-road engines if possible. (d) Construction equipment should have engines that meet the current off-road engine emission standard (as certified by CARB), or be re-powered with an engine that meets this standard. **Verification comments:**	*[see previous page]*	*[see previous page]*						
Utilities and Service Systems – *Adequacy of Storm Water Drainage Facilities*:								
USS-20: Prior to exceeding capacity within the existing storm water drainage facilities, the City shall coordinate with FMFCD to evaluate the storm water drainage system and shall not approve additional development that would convey additional storm water to a facility that would experience an exceedance of capacity until the necessary additional capacity is provided. **Verification comments:**	Prior to exceeding capacity within the existing storm water drainage facilities	FMFCD, PW, and DARM	X			X	X	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

PROJECT REQUIREMENT	WHEN IMPLEMENTED	COMPLIANCE VERIFIED BY	A	B	C	D	E	F
Utilities and Service Systems – *Adequacy of Water Supply Capacity*:								
USS-21: Prior to exceeding existing water supply capacity, the City shall evaluate the water supply system and shall not approve additional development that demand additional water until additional capacity is provided. By approximately the year 2025, the City shall construct an approximately 25,000 AF/year tertiary recycled water expansion to the Fresno- Clovis Regional Wastewater Reclamation Facility in accordance with the 2013 Recycled Water Master Plan and the 2014 City of Fresno Metropolitan Water Resources Management Plan update. Implementation of Mitigation Measure USS-5 is also required prior to approximately the year 2025. **Verification comments:**	Prior to exceeding existing water supply capacity	DPU and DARM	X			X	X	
Utilities and Service Systems – *Adequacy of Landfill Capacity*:								
USS-22: Prior to exceeding landfill capacity, the City shall evaluate additional landfill locations and shall not approve additional development that could contribute solid waste to a landfill that is at capacity until additional capacity is provided. **Verification comments:**	Prior to exceeding landfill capacity	DPU and DARM	X				X	

A - Incorporated into Project
B - Project Requirement Complete
C - Project Requirement in Progress
D - Responsible Agency Contacted
E - Part of City-Wide Program
F - Not Applicable

Autumn Ridge Residential Development

Local Transportation Analysis - Appendix
July 7, 2022

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

APPENDIX A

General Plan and Development Code Update

It should be noted that this traditional methodology used to analyze the roadway system does not consider the potential impact on walking, bicycling, and transit. Pedestrians, bicyclists, and transit riders are all users of the roadway system but may not be fully recognized in the traffic operations analysis and the calculation of LOS. The LOS thresholds in Table 5.14-2 are based on driver's comfort and convenience. Identifying the need for roadway improvements based on the resulting roadway LOS can have unintended impacts to other modes such as increasing the walking time for pedestrians. In evaluating the roadway system, a lower vehicle LOS may be desired when balanced against other community values related to resource protection, social equity, economic development, and consideration of pedestrians, bicyclists, and transit users.

Table 5.14-2: Roadway Functional Class and Peak Hour Level-of-Service Thresholds

Functional Class	Median	Lanes	Peak Hour Level of Service Capacity Threshold				
			A	B	C	D	E
Freeway	N/A[1]	4	2,720	4,460	6,630	7,720	8,630
		3+Aux[2]	2,360	3,860	5,640	6,730	7,530
		3	2,000	3,270	4,660	5,740	6,430
		2+Aux	1,650	2,700	3,850	4,760	5,340
		2	1,300	2,130	3,050	3,790	4,260
State Expressway	Divided	6	2,410	3,960	5,730	7,450	8,450
		4	1,610	2,650	3,810	4,960	5,630
		2	810	1,340	1,890	2,470	2,810
City Expressway	Raised Median	6			1,860	6,170	6,520
		5			1,520	5,110	5,430
		4			1,180	4,050	4,340
		2			520	1,910	2,160
Super Arterial	Raised Median	6				4,910	6,240
		5				4,040	5,195
		4				3,170	4,150
Arterial	Raised Median	8			2,120	7,070	7,490
		6			1,560	5,270	5,610
		5			1,280	4,370	4,670
		4			1,000	3,470	3,730
		3			720	2,555	2,795
		2			440	1,640	1,860
	TWLTL[3]	4			940	3,290	3,550
		2			420	1,550	1,760

Functional Class	Median	Lanes	Peak Hour Level of Service Capacity Threshold				
			A	B	C	D	E
	Undivided	4			770	2,740	2,980
		2			340	1,270	1,480
Collector	TWLTL	4			940	3,290	3,550
		2			420	1,550	1,760
	Undivided	4			770	2,740	2,980
		2			340	1,270	1,480
One-Way	Undivided	3		1,960	2,240	2,430	2,610
		2		1,250	1,490	1,620	1,740
		1		550	740	800	870
Rural State Highway	Undivided	2	310	570	1,020	1,730	2,470
Rural Arterial	Divided	4			1,950	3,580	3,780
	Undivided	2			570	1,230	1,310
Rural Collector/Local	Undivided	2			700	930	1,000

Notes:
[1] N/A - Not applicable for operational class
[2] Aux - Auxiliary Lane
[3] TWLTL – Two-way Left-turn Lane
- LOS is not achievable because of type of facility.
Source: Fehr & Peers 2012.

Exhibit 5.14-2 shows existing AM peak hour traffic volumes (two-way total) and LOS (See Appendix H-3 for detail) and Exhibit 5.14-3 shows existing PM peak hour traffic volumes (two-way total) and LOS (See Appendix H-4 for detail). Exhibit 5.14-4 illustrates the planned roadway number of lanes.

Most roadways operate at LOS D or better during the AM and PM peak hours, except for the following, which operate at LOS E and F:

City of Fresno

- Willow Avenue – Copper to Behymer Avenue (LOS E during the PM peak hour)
- Willow Avenue – Behymer Avenue to Shepherd Avenue (LOS F during the PM peak hour)
- Golden State Boulevard – Shaw Avenue to Swift Avenue (LOS F during the PM peak hour)
- Golden State Boulevard – Motel Drive to Ashlan Avenue (LOS E during the PM peak hour)
- Nees Avenue – Jordan Avenue to Paula Avenue (LOS E during the PM peak hour)
- Cornelia Avenue – Ashlan Avenue to Griffith Way (LOS E during the PM peak hour)
- Marks Avenue – Dakota Avenue to Weber Avenue (LOS E during the PM peak hour)
- Clinton Avenue – Valentine Avenue to Marks Avenue (LOS F during the PM peak hour)

APPENDIX B

Traffic Count Data Worksheets

National Data & Surveying Services Intersection Turning Movement Count

Location: S Willow Ave & E Butler Ave
City: Fresno
Control: Signalized

Project ID: 21-090096-001
Date: 10/5/2021

Data - Totals

NS/EW Streets:	S Willow Ave				S Willow Ave				E Butler Ave				E Butler Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	9	0	12	0	0	0	0	0	0	13	6	0	8	30	0	0	78
7:15 AM	8	0	26	0	0	0	0	0	0	37	14	0	32	63	0	0	180
7:30 AM	29	0	45	0	0	0	0	0	0	69	31	0	57	102	0	0	333
7:45 AM	35	0	62	0	0	0	0	0	0	73	36	0	56	100	0	0	362
8:00 AM	17	0	12	0	0	0	0	0	0	41	13	0	31	76	0	0	190
8:15 AM	19	0	10	0	0	0	0	0	0	28	8	0	7	36	0	0	108
8:30 AM	19	0	7	0	0	0	0	0	0	18	8	0	16	47	0	0	115
8:45 AM	28	0	11	0	0	0	0	0	0	25	6	0	6	49	0	0	125
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	164	0	185	0	0	0	0	0	0	304	122	0	213	503	0	0	1491
APPROACH %'s :	46.99%	0.00%	53.01%	0.00%					0.00%	71.36%	28.64%	0.00%	29.75%	70.25%	0.00%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	89	0	145	0	0	0	0	0	0	220	94	0	176	341	0	0	1065
PEAK HR FACTOR :	0.636	0.000	0.585	0.000	0.000	0.000	0.000	0.000	0.000	0.753	0.653	0.000	0.772	0.836	0.000	0.000	0.735
	0.603								0.720				0.813				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	27	0	24	0	0	0	0	0	0	52	19	0	17	47	0	0	186
4:15 PM	20	0	21	0	0	0	0	0	0	63	8	0	24	50	0	0	186
4:30 PM	27	0	28	0	0	0	0	0	0	43	15	0	20	57	0	0	190
4:45 PM	22	0	25	0	0	0	0	0	0	52	14	0	29	68	0	0	210
5:00 PM	25	0	25	0	0	0	0	0	0	73	21	0	31	65	0	0	240
5:15 PM	23	0	23	0	0	0	0	0	0	68	23	0	24	68	0	0	229
5:30 PM	18	0	27	0	0	0	0	0	0	66	13	0	18	49	0	0	191
5:45 PM	15	0	15	0	0	0	0	0	0	55	19	0	19	46	0	0	169
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	177	0	188	0	0	0	0	0	0	472	132	0	182	450	0	0	1601
APPROACH %'s :	48.49%	0.00%	51.51%	0.00%					0.00%	78.15%	21.85%	0.00%	28.80%	71.20%	0.00%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	88	0	100	0	0	0	0	0	0	259	71	0	102	250	0	0	870
PEAK HR FACTOR :	0.880	0.000	0.926	0.000	0.000	0.000	0.000	0.000	0.000	0.887	0.772	0.000	0.823	0.919	0.000	0.000	0.906
	0.940								0.878				0.907				

National Data & Surveying Services Intersection Turning Movement Count

Location: S Willow Ave & E Church Ave
City: Fresno
Control: 4-Way Stop

Project ID: 21-090096-002
Date: 10/5/2021

Data - Totals

NS/EW Streets:	S Willow Ave				S Willow Ave				E Church Ave				E Church Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	1	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	2	9	6	0	4	8	2	0	2	31	4	0	7	43	7	0	125
7:15 AM	7	19	6	0	9	14	16	0	13	37	8	1	11	55	8	0	204
7:30 AM	8	29	11	0	35	16	23	0	26	47	7	0	10	62	24	0	298
7:45 AM	11	30	23	0	49	18	42	0	26	56	13	0	13	62	54	0	397
8:00 AM	5	14	24	0	20	13	12	0	5	62	5	0	15	54	6	0	235
8:15 AM	2	13	14	0	6	10	5	0	9	42	5	0	28	40	10	0	184
8:30 AM	0	15	7	0	3	6	5	0	1	27	7	0	5	31	8	0	115
8:45 AM	0	15	6	0	1	6	2	0	2	20	3	0	6	27	6	0	94
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	35	144	97	0	127	91	107	0	84	322	52	1	95	374	123	0	1652
APPROACH %'s :	12.68%	52.17%	35.14%	0.00%	39.08%	28.00%	32.92%	0.00%	18.30%	70.15%	11.33%	0.22%	16.05%	63.18%	20.78%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	31	92	64	0	113	61	93	0	70	202	33	1	49	233	92	0	1134
PEAK HR FACTOR :	0.705	0.767	0.667	0.000	0.577	0.847	0.554	0.000	0.673	0.815	0.635	0.250	0.817	0.940	0.426	0.000	0.714
			0.730				0.612				0.805				0.725		

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	1	0	0	1	1	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	9	18	10	0	4	14	15	0	12	56	3	0	10	54	6	0	211
4:15 PM	7	23	9	0	1	15	9	0	7	61	2	0	13	50	5	0	202
4:30 PM	2	32	18	0	5	12	7	0	4	71	7	0	7	40	8	0	213
4:45 PM	10	19	9	0	5	18	9	0	6	76	7	0	16	60	8	0	243
5:00 PM	6	24	9	0	10	15	18	0	14	45	6	0	9	41	9	0	206
5:15 PM	6	16	4	0	8	23	13	0	8	71	9	0	10	52	14	0	234
5:30 PM	7	28	8	0	10	16	11	0	9	62	4	0	12	60	8	0	235
5:45 PM	9	13	18	0	8	11	18	0	8	58	1	0	8	71	8	0	231
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	56	173	85	0	51	124	100	0	68	500	39	0	85	428	66	0	1775
APPROACH %'s :	17.83%	55.10%	27.07%	0.00%	18.55%	45.09%	36.36%	0.00%	11.20%	82.37%	6.43%	0.00%	14.68%	73.92%	11.40%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	29	87	30	0	33	72	51	0	37	254	26	0	47	213	39	0	918
PEAK HR FACTOR :	0.725	0.777	0.833	0.000	0.825	0.783	0.708	0.000	0.661	0.836	0.722	0.000	0.734	0.888	0.696	0.000	0.944
			0.849				0.886				0.890				0.890		

National Data & Surveying Services Intersection Turning Movement Count

Location: S Willow Ave & E Jensen Ave
City: Fresno
Control: Signalized

Project ID: 21-090096-003
Date: 10/5/2021

Data - Totals

NS/EW Streets:	S Willow Ave				S Willow Ave				E Jensen Ave				E Jensen Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	1	1	1	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	1	1	4	0	2	6	19	0	2	53	8	0	5	187	2	0	290
7:15 AM	3	1	1	0	4	8	23	0	8	67	4	0	7	186	10	1	323
7:30 AM	7	5	6	0	12	6	35	0	14	103	5	2	8	260	10	0	473
7:45 AM	7	4	0	0	7	12	23	0	18	82	14	0	11	255	8	0	441
8:00 AM	4	1	4	0	11	2	17	0	8	70	4	1	13	138	13	0	286
8:15 AM	4	2	3	0	4	3	12	0	7	65	10	0	12	136	5	0	263
8:30 AM	6	6	3	0	3	1	11	0	4	54	6	1	8	106	5	1	215
8:45 AM	4	5	4	0	1	3	16	0	6	57	7	0	6	87	3	0	199
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	36	25	25	0	44	41	156	0	67	551	58	4	70	1355	56	2	2490
APPROACH %'s :	41.86%	29.07%	29.07%	0.00%	18.26%	17.01%	64.73%	0.00%	9.85%	81.03%	8.53%	0.59%	4.72%	91.37%	3.78%	0.13%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	18	11	11	0	25	32	100	0	42	305	31	2	31	888	30	1	1527
PEAK HR FACTOR :	0.643	0.550	0.458	0.000	0.521	0.667	0.714	0.000	0.583	0.740	0.554	0.250	0.705	0.854	0.750	0.250	0.807
			0.556				0.741				0.766				0.854		

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	1	0	0	1	1	1	0	1	2	0	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	9	12	6	0	7	6	10	0	14	150	6	2	3	99	6	0	330
4:15 PM	9	11	7	0	7	4	15	0	13	188	11	6	0	97	9	1	378
4:30 PM	11	19	8	0	7	2	4	0	26	172	6	6	4	107	5	0	377
4:45 PM	9	10	12	0	7	5	8	0	12	124	2	5	3	119	10	0	326
5:00 PM	20	20	14	0	1	3	12	0	21	191	6	4	5	67	6	0	370
5:15 PM	10	8	11	0	5	3	12	0	10	162	6	2	0	90	8	0	327
5:30 PM	11	6	4	0	9	4	12	0	26	145	4	2	3	92	7	0	325
5:45 PM	6	12	9	0	4	1	11	0	18	109	3	2	2	113	5	0	295
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	85	98	71	0	47	28	84	0	140	1241	44	29	20	784	56	1	2728
APPROACH %'s :	33.46%	38.58%	27.95%	0.00%	29.56%	17.61%	52.83%	0.00%	9.63%	85.35%	3.03%	1.99%	2.32%	91.06%	6.50%	0.12%	
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	49	60	41	0	22	14	39	0	72	675	25	21	12	390	30	1	1451
PEAK HR FACTOR :	0.613	0.750	0.732	0.000	0.786	0.700	0.650	0.000	0.692	0.884	0.568	0.875	0.600	0.819	0.750	0.250	0.960
			0.694				0.721				0.893				0.820		

APPENDIX C

Synchro 10(HCM 6th Edition) Worksheets

EXISTING CONDITIONS

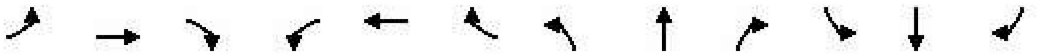
HCM 6th Signalized Intersection Summary
1: Willow Avenue & Butler Avenue

11/07/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	220	94	176	341	89	145
Future Volume (veh/h)	220	94	176	341	89	145
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	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	297	127	238	461	120	196
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	368	157	300	1052	146	239
Arrive On Green	0.30	0.30	0.17	0.57	0.24	0.24
Sat Flow, veh/h	1233	527	1767	1856	621	1015
Grp Volume(v), veh/h	0	424	238	461	317	0
Grp Sat Flow(s),veh/h/ln	0	1761	1767	1856	1642	0
Q Serve(g_s), s	0.0	12.2	7.1	7.8	10.0	0.0
Cycle Q Clear(g_c), s	0.0	12.2	7.1	7.8	10.0	0.0
Prop In Lane		0.30	1.00		0.38	0.62
Lane Grp Cap(c), veh/h	0	526	300	1052	386	0
V/C Ratio(X)	0.00	0.81	0.79	0.44	0.82	0.00
Avail Cap(c_a), veh/h	0	922	634	1821	770	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	17.7	21.7	6.8	19.8	0.0
Incr Delay (d2), s/veh	0.0	3.0	4.7	0.3	4.4	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	4.5	2.9	2.1	3.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	20.7	26.5	7.1	24.2	0.0
LnGrp LOS	A	C	C	A	C	A
Approach Vol, veh/h	424			699	317	
Approach Delay, s/veh	20.7			13.7	24.2	
Approach LOS	C			B	C	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		18.2	14.7	21.7		36.4
Change Period (Y+Rc), s		5.4	5.4	5.4		5.4
Max Green Setting (Gmax), s		25.6	19.6	28.6		53.6
Max Q Clear Time (g_c+I1), s		12.0	9.1	14.2		9.8
Green Ext Time (p_c), s		0.8	0.5	2.1		3.0

Intersection Summary	
HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	305	31	32	888	30	18	11	11	25	32	100
Future Volume (veh/h)	44	305	31	32	888	30	18	11	11	25	32	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	54	377	38	40	1096	37	22	14	14	31	40	123
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	82	1221	122	71	1291	44	48	255	255	61	549	465
Arrive On Green	0.05	0.38	0.38	0.04	0.37	0.37	0.03	0.30	0.30	0.03	0.30	0.30
Sat Flow, veh/h	1767	3236	324	1767	3480	117	1767	851	851	1767	1856	1572
Grp Volume(v), veh/h	54	204	211	40	555	578	22	0	28	31	40	123
Grp Sat Flow(s),veh/h/ln	1767	1763	1797	1767	1763	1834	1767	0	1702	1767	1856	1572
Q Serve(g_s), s	3.0	8.2	8.3	2.2	29.0	29.0	1.2	0.0	1.2	1.7	1.6	4.5
Cycle Q Clear(g_c), s	3.0	8.2	8.3	2.2	29.0	29.0	1.2	0.0	1.2	1.7	1.6	4.5
Prop In Lane	1.00		0.18	1.00		0.06	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	82	665	678	71	654	681	48	0	510	61	549	465
V/C Ratio(X)	0.66	0.31	0.31	0.56	0.85	0.85	0.45	0.00	0.05	0.51	0.07	0.26
Avail Cap(c_a), veh/h	169	910	928	129	869	905	111	0	510	116	549	465
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.1	22.0	22.0	47.3	29.0	29.0	48.1	0.0	25.0	47.6	25.4	15.2
Incr Delay (d2), s/veh	8.6	0.3	0.3	6.8	6.1	5.9	6.5	0.0	0.2	6.4	0.3	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.1	3.2	1.1	12.1	12.5	0.6	0.0	0.5	0.9	0.7	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.6	22.3	22.3	54.1	35.1	34.9	54.6	0.0	25.2	54.0	25.7	16.6
LnGrp LOS	E	C	C	D	D	C	D	A	C	D	C	B
Approach Vol, veh/h		469			1173			50			194	
Approach Delay, s/veh		26.1			35.7			38.1			24.4	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	36.6	10.5	44.4	9.3	36.2	11.2	43.7
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	* 6.5	6.5	6.5
Max Green Setting (Gmax), s	6.6	29.4	7.3	51.8	6.3	* 30	9.6	49.5
Max Q Clear Time (g_c+I1), s	3.7	3.2	4.2	10.3	3.2	6.5	5.0	31.0
Green Ext Time (p_c), s	0.0	0.1	0.0	2.1	0.0	0.5	0.0	6.2

Intersection Summary	
HCM 6th Ctrl Delay	32.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	424	238	461	316
v/c Ratio	0.77	0.64	0.42	0.70
Control Delay	32.1	35.8	9.2	27.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	32.1	35.8	9.2	27.2
Queue Length 50th (ft)	147	89	87	85
Queue Length 95th (ft)	233	159	147	142
Internal Link Dist (ft)	1512		2571	3098
Turn Bay Length (ft)		100		
Base Capacity (vph)	808	539	1472	720
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	0.52	0.44	0.31	0.44

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	54	415	40	1133	22	28	31	40	123
v/c Ratio	0.38	0.28	0.33	0.84	0.20	0.05	0.27	0.06	0.19
Control Delay	58.4	19.9	59.6	35.5	57.6	22.3	59.0	31.5	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	19.9	59.6	35.5	57.6	22.3	59.0	31.5	0.7
Queue Length 50th (ft)	38	104	28	389	16	8	22	18	0
Queue Length 95th (ft)	74	124	61	410	40	29	51	48	0
Internal Link Dist (ft)		2543		2787		592		1750	
Turn Bay Length (ft)	250		125		150		150		
Base Capacity (vph)	175	1868	133	1798	114	531	120	620	659
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	0.31	0.22	0.30	0.63	0.19	0.05	0.26	0.06	0.19

Intersection Summary

Intersection	
Intersection Delay, s/veh	43.8
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	70	202	33	49	233	92	31	92	64	113	61	93
Future Vol, veh/h	70	202	33	49	233	92	31	92	64	113	61	93
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	99	285	46	69	328	130	44	130	90	159	86	131
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	57.3	53.7	31.1	23.6
HCM LOS	F	F	D	C

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	17%	26%	0%	17%	0%	65%	0%
Vol Thru, %	49%	74%	0%	83%	0%	35%	0%
Vol Right, %	34%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	187	272	33	282	92	174	93
LT Vol	31	70	0	49	0	113	0
Through Vol	92	202	0	233	0	61	0
RT Vol	64	0	33	0	92	0	93
Lane Flow Rate	263	383	46	397	130	245	131
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.69	0.948	0.104	0.968	0.286	0.648	0.307
Departure Headway (Hd)	9.426	8.912	8.047	8.778	7.957	9.52	8.451
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	385	410	447	413	452	380	426
Service Time	7.484	6.641	5.776	6.509	5.688	7.255	6.186
HCM Lane V/C Ratio	0.683	0.934	0.103	0.961	0.288	0.645	0.308
HCM Control Delay	31.1	62.8	11.7	66.7	13.9	28.2	14.9
HCM Lane LOS	D	F	B	F	B	D	B
HCM 95th-tile Q	5	10.7	0.3	11.4	1.2	4.4	1.3

HCM 6th Signalized Intersection Summary
1: Willow Avenue & Butler Avenue

11/07/2021

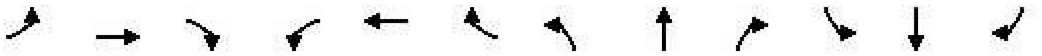
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	259	71	102	250	88	100
Future Volume (veh/h)	259	71	102	250	88	100
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	285	78	112	275	97	110
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	399	109	189	979	156	176
Arrive On Green	0.28	0.28	0.11	0.53	0.20	0.20
Sat Flow, veh/h	1403	384	1767	1856	774	877
Grp Volume(v), veh/h	0	363	112	275	208	0
Grp Sat Flow(s),veh/h/ln	0	1786	1767	1856	1659	0
Q Serve(g_s), s	0.0	7.3	2.4	3.3	4.6	0.0
Cycle Q Clear(g_c), s	0.0	7.3	2.4	3.3	4.6	0.0
Prop In Lane		0.21	1.00		0.47	0.53
Lane Grp Cap(c), veh/h	0	509	189	979	334	0
V/C Ratio(X)	0.00	0.71	0.59	0.28	0.62	0.00
Avail Cap(c_a), veh/h	0	1464	648	2453	1109	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	12.8	16.9	5.2	14.5	0.0
Incr Delay (d2), s/veh	0.0	1.9	2.9	0.2	1.9	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	2.4	0.9	0.6	1.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	14.7	19.9	5.4	16.4	0.0
LnGrp LOS	A	B	B	A	B	A
Approach Vol, veh/h	363			387	208	
Approach Delay, s/veh	14.7			9.6	16.4	
Approach LOS	B			A	B	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		13.4	9.7	16.7		26.4
Change Period (Y+Rc), s		5.4	5.4	5.4		5.4
Max Green Setting (Gmax), s		26.6	14.6	32.6		52.6
Max Q Clear Time (g_c+I1), s		6.6	4.4	9.3		5.3
Green Ext Time (p_c), s		0.6	0.2	2.1		1.6

Intersection Summary	
HCM 6th Ctrl Delay	13.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	675	25	13	390	30	49	60	41	22	14	39
Future Volume (veh/h)	93	675	25	13	390	30	49	60	41	22	14	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	97	703	26	14	406	31	51	62	43	23	15	41
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	200	893	33	35	546	42	87	411	285	52	686	582
Arrive On Green	0.11	0.26	0.26	0.02	0.16	0.16	0.05	0.40	0.40	0.03	0.37	0.37
Sat Flow, veh/h	1767	3467	128	1767	3320	253	1767	1020	708	1767	1856	1572
Grp Volume(v), veh/h	97	357	372	14	215	222	51	0	105	23	15	41
Grp Sat Flow(s),veh/h/ln	1767	1763	1832	1767	1763	1810	1767	0	1728	1767	1856	1572
Q Serve(g_s), s	4.4	16.2	16.2	0.7	9.9	10.0	2.4	0.0	3.3	1.1	0.4	0.8
Cycle Q Clear(g_c), s	4.4	16.2	16.2	0.7	9.9	10.0	2.4	0.0	3.3	1.1	0.4	0.8
Prop In Lane	1.00		0.07	1.00		0.14	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	200	454	472	35	290	298	87	0	696	52	686	582
V/C Ratio(X)	0.49	0.79	0.79	0.40	0.74	0.75	0.59	0.00	0.15	0.44	0.02	0.07
Avail Cap(c_a), veh/h	381	895	930	175	689	707	258	0	696	177	686	582
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.7	29.6	29.6	41.5	34.1	34.1	39.9	0.0	16.3	40.9	17.2	5.9
Incr Delay (d2), s/veh	1.8	3.1	3.0	7.2	3.7	3.7	6.1	0.0	0.5	5.7	0.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	6.5	6.8	0.3	4.2	4.3	1.1	0.0	1.2	0.5	0.2	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.5	32.7	32.6	48.7	37.8	37.8	46.0	0.0	16.8	46.6	17.2	6.1
LnGrp LOS	D	C	C	D	D	D	D	A	B	D	B	A
Approach Vol, veh/h		826			451			156			79	
Approach Delay, s/veh		33.2			38.2			26.3			20.0	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.9	41.0	8.2	28.6	10.7	38.2	16.2	20.6
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	* 6.5	6.5	6.5
Max Green Setting (Gmax), s	8.6	34.5	8.5	43.5	12.5	* 31	18.5	33.5
Max Q Clear Time (g_c+I1), s	3.1	5.3	2.7	18.2	4.4	2.8	6.4	12.0
Green Ext Time (p_c), s	0.0	0.5	0.0	3.9	0.0	0.1	0.1	2.1

Intersection Summary	
HCM 6th Ctrl Delay	33.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	363	112	275	207
v/c Ratio	0.62	0.35	0.28	0.48
Control Delay	21.4	26.1	6.9	18.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.4	26.1	6.9	18.7
Queue Length 50th (ft)	88	30	34	38
Queue Length 95th (ft)	217	93	93	114
Internal Link Dist (ft)	1512		2571	3098
Turn Bay Length (ft)		100		
Base Capacity (vph)	1207	547	1691	979
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	0.30	0.20	0.16	0.21

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	97	729	14	437	51	106	23	15	41
v/c Ratio	0.43	0.61	0.10	0.61	0.31	0.14	0.16	0.02	0.06
Control Delay	45.3	27.4	47.2	37.8	47.4	17.1	47.3	25.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	27.4	47.2	37.8	47.4	17.1	47.3	25.6	0.2
Queue Length 50th (ft)	53	171	8	122	28	23	13	6	0
Queue Length 95th (ft)	112	301	31	201	73	83	43	24	0
Internal Link Dist (ft)		2543		2787		592		1750	
Turn Bay Length (ft)	250		125		150		150		
Base Capacity (vph)	386	1794	176	1376	258	759	178	730	741
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	0.25	0.41	0.08	0.32	0.20	0.14	0.13	0.02	0.06

Intersection Summary

Intersection	
Intersection Delay, s/veh	12.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	47	213	39	47	213	39	29	87	30	33	72	51
Future Vol, veh/h	47	213	39	47	213	39	29	87	30	33	72	51
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	50	227	41	50	227	41	31	93	32	35	77	54
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	13.6	13.6	12.4	10.8
HCM LOS	B	B	B	B

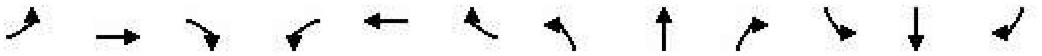
Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	20%	18%	0%	18%	0%	31%	0%
Vol Thru, %	60%	82%	0%	82%	0%	69%	0%
Vol Right, %	21%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	260	39	260	39	105	51
LT Vol	29	47	0	47	0	33	0
Through Vol	87	213	0	213	0	72	0
RT Vol	30	0	39	0	39	0	51
Lane Flow Rate	155	277	41	277	41	112	54
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.286	0.474	0.062	0.474	0.062	0.212	0.09
Departure Headway (Hd)	6.629	6.169	5.367	6.169	5.367	6.841	5.969
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	541	584	665	584	665	523	597
Service Time	4.696	3.925	3.122	3.925	3.122	4.608	3.736
HCM Lane V/C Ratio	0.287	0.474	0.062	0.474	0.062	0.214	0.09
HCM Control Delay	12.4	14.4	8.5	14.4	8.5	11.5	9.3
HCM Lane LOS	B	B	A	B	A	B	A
HCM 95th-tile Q	1.2	2.5	0.2	2.5	0.2	0.8	0.3

EXISTING PLUS PROJECT CONDITIONS

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	220	108	184	341	132	169
Future Volume (veh/h)	220	108	184	341	132	169
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	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	297	146	249	461	178	228
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	351	173	303	1028	202	259
Arrive On Green	0.30	0.30	0.17	0.55	0.28	0.28
Sat Flow, veh/h	1174	577	1767	1856	723	926
Grp Volume(v), veh/h	0	443	249	461	407	0
Grp Sat Flow(s),veh/h/ln	0	1752	1767	1856	1653	0
Q Serve(g_s), s	0.0	15.4	8.8	9.6	15.3	0.0
Cycle Q Clear(g_c), s	0.0	15.4	8.8	9.6	15.3	0.0
Prop In Lane		0.33	1.00		0.44	0.56
Lane Grp Cap(c), veh/h	0	524	303	1028	463	0
V/C Ratio(X)	0.00	0.85	0.82	0.45	0.88	0.00
Avail Cap(c_a), veh/h	0	771	533	1531	651	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	21.4	25.9	8.6	22.3	0.0
Incr Delay (d2), s/veh	0.0	5.8	5.5	0.3	9.9	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	6.4	3.8	3.0	6.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	27.2	31.4	8.9	32.2	0.0
LnGrp LOS	A	C	C	A	C	A
Approach Vol, veh/h	443			710	407	
Approach Delay, s/veh	27.2			16.8	32.2	
Approach LOS	C			B	C	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		23.6	16.6	24.8		41.4
Change Period (Y+Rc), s		5.4	5.4	5.4		5.4
Max Green Setting (Gmax), s		25.6	19.6	28.6		53.6
Max Q Clear Time (g_c+I1), s		17.3	10.8	17.4		11.6
Green Ext Time (p_c), s		0.9	0.5	2.0		3.0

Intersection Summary	
HCM 6th Ctrl Delay	23.8
HCM 6th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	305	31	32	888	31	18	11	11	27	33	120
Future Volume (veh/h)	51	305	31	32	888	31	18	11	11	27	33	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	63	377	38	40	1096	38	22	14	14	33	41	148
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	87	1230	123	71	1289	45	48	253	253	63	547	463
Arrive On Green	0.05	0.38	0.38	0.04	0.37	0.37	0.03	0.30	0.30	0.04	0.29	0.29
Sat Flow, veh/h	1767	3236	324	1767	3476	121	1767	851	851	1767	1856	1572
Grp Volume(v), veh/h	63	204	211	40	556	578	22	0	28	33	41	148
Grp Sat Flow(s),veh/h/ln	1767	1763	1797	1767	1763	1834	1767	0	1702	1767	1856	1572
Q Serve(g_s), s	3.5	8.2	8.3	2.2	29.2	29.2	1.2	0.0	1.2	1.8	1.6	5.5
Cycle Q Clear(g_c), s	3.5	8.2	8.3	2.2	29.2	29.2	1.2	0.0	1.2	1.8	1.6	5.5
Prop In Lane	1.00		0.18	1.00		0.07	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	87	670	683	71	654	680	48	0	505	63	547	463
V/C Ratio(X)	0.72	0.31	0.31	0.56	0.85	0.85	0.45	0.00	0.06	0.52	0.08	0.32
Avail Cap(c_a), veh/h	168	906	923	128	865	900	110	0	505	116	547	463
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.3	21.9	21.9	47.5	29.1	29.1	48.3	0.0	25.3	47.8	25.7	15.5
Incr Delay (d2), s/veh	10.7	0.3	0.3	6.9	6.3	6.1	6.5	0.0	0.2	6.5	0.3	1.8
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	1.7	3.1	3.2	1.1	12.2	12.6	0.6	0.0	0.5	0.9	0.7	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.0	22.2	22.2	54.4	35.4	35.2	54.8	0.0	25.5	54.2	25.9	17.3
LnGrp LOS	E	C	C	D	D	D	D	A	C	D	C	B
Approach Vol, veh/h		478			1174			50			222	
Approach Delay, s/veh		26.9			35.9			38.4			24.4	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	36.4	10.5	44.8	9.3	36.2	11.5	43.9
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	* 6.5	6.5	6.5
Max Green Setting (Gmax), s	6.6	29.4	7.3	51.8	6.3	* 30	9.6	49.5
Max Q Clear Time (g_c+I1), s	3.8	3.2	4.2	10.3	3.2	7.5	5.5	31.2
Green Ext Time (p_c), s	0.0	0.1	0.0	2.1	0.0	0.6	0.0	6.2

Intersection Summary	
HCM 6th Ctrl Delay	32.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	443	249	461	406
v/c Ratio	0.81	0.69	0.43	0.81
Control Delay	36.9	41.0	10.7	36.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	36.9	41.0	10.7	36.4
Queue Length 50th (ft)	189	116	117	155
Queue Length 95th (ft)	244	166	147	210
Internal Link Dist (ft)	1512		2571	3098
Turn Bay Length (ft)		100		
Base Capacity (vph)	721	479	1354	643
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	0.61	0.52	0.34	0.63

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	63	415	40	1134	22	28	33	41	148
v/c Ratio	0.43	0.28	0.33	0.84	0.20	0.05	0.29	0.07	0.23
Control Delay	60.2	19.9	59.8	35.6	57.7	22.4	59.6	31.6	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.2	19.9	59.8	35.6	57.7	22.4	59.6	31.6	2.5
Queue Length 50th (ft)	45	104	29	393	16	8	24	19	0
Queue Length 95th (ft)	84	124	61	411	40	29	54	49	6
Internal Link Dist (ft)		2543		2787		592		1750	
Turn Bay Length (ft)	250		125		150		150		
Base Capacity (vph)	174	1862	132	1791	114	530	119	617	657
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	0.36	0.22	0.30	0.63	0.19	0.05	0.28	0.07	0.23

Intersection Summary

Intersection	
Intersection Delay, s/veh	51.1
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	74	202	33	49	233	93	31	100	64	116	85	106
Future Vol, veh/h	74	202	33	49	233	93	31	100	64	116	85	106
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	104	285	46	69	328	131	44	141	90	163	120	149
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	66.2	64.3	35.9	29.5
HCM LOS	F	F	E	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	16%	27%	0%	17%	0%	58%	0%
Vol Thru, %	51%	73%	0%	83%	0%	42%	0%
Vol Right, %	33%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	195	276	33	282	93	201	106
LT Vol	31	74	0	49	0	116	0
Through Vol	100	202	0	233	0	85	0
RT Vol	64	0	33	0	93	0	106
Lane Flow Rate	275	389	46	397	131	283	149
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.736	0.984	0.106	1.017	0.305	0.75	0.353
Departure Headway (Hd)	9.872	9.309	8.435	9.219	8.395	9.746	8.712
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	368	393	428	397	434	374	415
Service Time	7.872	7.009	6.135	6.863	6.039	7.446	6.412
HCM Lane V/C Ratio	0.747	0.99	0.107	1	0.302	0.757	0.359
HCM Control Delay	35.9	72.7	12.1	80.6	14.7	36.5	16.1
HCM Lane LOS	E	F	B	F	B	E	C
HCM 95th-tile Q	5.7	11.6	0.4	12.7	1.3	5.9	1.6

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	36	288	7	12	278
Future Vol, veh/h	20	36	288	7	12	278
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	22	39	313	8	13	302

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	645	317	0	0	321	0
Stage 1	317	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	435	721	-	-	1233	-
Stage 1	736	-	-	-	-	-
Stage 2	728	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	429	721	-	-	1233	-
Mov Cap-2 Maneuver	429	-	-	-	-	-
Stage 1	736	-	-	-	-	-
Stage 2	719	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	580	1233	-
HCM Lane V/C Ratio	-	-	0.105	0.011	-
HCM Control Delay (s)	-	-	11.9	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	34	261	7	11	287
Future Vol, veh/h	21	34	261	7	11	287
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	23	37	284	8	12	312

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	624	288	0	0	292	0
Stage 1	288	-	-	-	-	-
Stage 2	336	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	448	749	-	-	1264	-
Stage 1	759	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	443	749	-	-	1264	-
Mov Cap-2 Maneuver	443	-	-	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	714	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.8	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	593	1264	-
HCM Lane V/C Ratio	-	-	0.101	0.009	-
HCM Control Delay (s)	-	-	11.8	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

HCM 6th Signalized Intersection Summary
1: Willow Avenue & Butler Avenue

11/07/2021

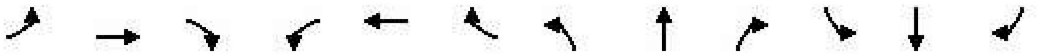
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	259	120	130	250	117	116
Future Volume (veh/h)	259	120	130	250	117	116
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	285	132	143	275	129	127
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	377	175	199	1019	172	170
Arrive On Green	0.31	0.31	0.11	0.55	0.21	0.21
Sat Flow, veh/h	1200	556	1767	1856	836	823
Grp Volume(v), veh/h	0	417	143	275	257	0
Grp Sat Flow(s),veh/h/ln	0	1756	1767	1856	1666	0
Q Serve(g_s), s	0.0	9.4	3.4	3.5	6.4	0.0
Cycle Q Clear(g_c), s	0.0	9.4	3.4	3.5	6.4	0.0
Prop In Lane		0.32	1.00		0.50	0.49
Lane Grp Cap(c), veh/h	0	552	199	1019	343	0
V/C Ratio(X)	0.00	0.76	0.72	0.27	0.75	0.00
Avail Cap(c_a), veh/h	0	1297	585	2212	1004	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	13.6	18.9	5.3	16.4	0.0
Incr Delay (d2), s/veh	0.0	2.1	4.8	0.1	3.3	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	0.0	3.1	1.4	0.7	2.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	15.8	23.7	5.4	19.7	0.0
LnGrp LOS	A	B	C	A	B	A
Approach Vol, veh/h	417			418	257	
Approach Delay, s/veh	15.8			11.7	19.7	
Approach LOS	B			B	B	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		14.5	10.4	19.3		29.6
Change Period (Y+Rc), s		5.4	5.4	5.4		5.4
Max Green Setting (Gmax), s		26.6	14.6	32.6		52.6
Max Q Clear Time (g_c+I1), s		8.4	5.4	11.4		5.5
Green Ext Time (p_c), s		0.7	0.2	2.4		1.6

Intersection Summary	
HCM 6th Ctrl Delay	15.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	675	25	13	390	33	49	61	41	23	15	52
Future Volume (veh/h)	116	675	25	13	390	33	49	61	41	23	15	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	121	703	26	14	406	34	51	64	43	24	16	54
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	198	893	33	35	545	45	87	416	280	54	687	583
Arrive On Green	0.11	0.26	0.26	0.02	0.17	0.17	0.05	0.40	0.40	0.03	0.37	0.37
Sat Flow, veh/h	1767	3467	128	1767	3294	275	1767	1035	695	1767	1856	1572
Grp Volume(v), veh/h	121	357	372	14	216	224	51	0	107	24	16	54
Grp Sat Flow(s),veh/h/ln	1767	1763	1832	1767	1763	1806	1767	0	1730	1767	1856	1572
Q Serve(g_s), s	5.6	16.2	16.2	0.7	10.0	10.1	2.4	0.0	3.4	1.1	0.5	1.1
Cycle Q Clear(g_c), s	5.6	16.2	16.2	0.7	10.0	10.1	2.4	0.0	3.4	1.1	0.5	1.1
Prop In Lane	1.00		0.07	1.00		0.15	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	198	454	472	35	292	299	87	0	696	54	687	583
V/C Ratio(X)	0.61	0.79	0.79	0.40	0.74	0.75	0.59	0.00	0.15	0.45	0.02	0.09
Avail Cap(c_a), veh/h	381	893	929	175	688	705	257	0	696	177	687	583
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	29.7	29.7	41.6	34.1	34.1	39.9	0.0	16.4	40.9	17.2	6.0
Incr Delay (d2), s/veh	3.0	3.1	3.0	7.2	3.7	3.7	6.1	0.0	0.5	5.7	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	2.4	6.5	6.8	0.3	4.2	4.4	1.1	0.0	1.3	0.6	0.2	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.4	32.7	32.6	48.7	37.8	37.8	46.1	0.0	16.8	46.6	17.2	6.3
LnGrp LOS	D	C	C	D	D	D	D	A	B	D	B	A
Approach Vol, veh/h		850			454			158			94	
Approach Delay, s/veh		33.6			38.2			26.3			18.4	
Approach LOS		C			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	41.0	8.2	28.6	10.7	38.3	16.1	20.7
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	* 6.5	6.5	6.5
Max Green Setting (Gmax), s	8.6	34.5	8.5	43.5	12.5	* 31	18.5	33.5
Max Q Clear Time (g_c+I1), s	3.1	5.4	2.7	18.2	4.4	3.1	7.6	12.1
Green Ext Time (p_c), s	0.0	0.5	0.0	3.9	0.0	0.2	0.2	2.1

Intersection Summary	
HCM 6th Ctrl Delay	33.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	417	143	275	256
v/c Ratio	0.68	0.44	0.27	0.58
Control Delay	23.5	31.0	7.3	23.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.5	31.0	7.3	23.7
Queue Length 50th (ft)	117	45	40	62
Queue Length 95th (ft)	261	128	98	166
Internal Link Dist (ft)	1512		2571	3098
Turn Bay Length (ft)		100		
Base Capacity (vph)	1094	499	1579	898
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	0.38	0.29	0.17	0.29

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	121	729	14	440	51	107	24	16	54
v/c Ratio	0.53	0.58	0.11	0.68	0.32	0.14	0.18	0.02	0.08
Control Delay	48.2	27.1	47.9	41.7	48.9	17.2	48.5	25.9	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	27.1	47.9	41.7	48.9	17.2	48.5	25.9	0.2
Queue Length 50th (ft)	68	171	8	125	29	25	14	6	0
Queue Length 95th (ft)	136	301	31	201	73	85	44	25	0
Internal Link Dist (ft)		2543		2787		592		1750	
Turn Bay Length (ft)	250		125		150		150		
Base Capacity (vph)	359	1668	163	1279	240	743	165	655	685
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	0.34	0.44	0.09	0.34	0.21	0.14	0.15	0.02	0.08

Intersection Summary

Intersection	
Intersection Delay, s/veh	14.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	213	39	47	213	43	29	115	30	35	88	60
Future Vol, veh/h	62	213	39	47	213	43	29	115	30	35	88	60
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	66	227	41	50	227	46	31	122	32	37	94	64
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	15.3	14.6	13.7	11.4
HCM LOS	C	B	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	17%	23%	0%	18%	0%	28%	0%
Vol Thru, %	66%	77%	0%	82%	0%	72%	0%
Vol Right, %	17%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	174	275	39	260	43	123	60
LT Vol	29	62	0	47	0	35	0
Through Vol	115	213	0	213	0	88	0
RT Vol	30	0	39	0	43	0	60
Lane Flow Rate	185	293	41	277	46	131	64
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.352	0.525	0.065	0.496	0.072	0.256	0.109
Departure Headway (Hd)	6.845	6.463	5.635	6.461	5.657	7.033	6.175
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	522	556	631	553	628	508	575
Service Time	4.937	4.24	3.412	4.241	3.436	4.826	3.967
HCM Lane V/C Ratio	0.354	0.527	0.065	0.501	0.073	0.258	0.111
HCM Control Delay	13.7	16.2	8.8	15.5	8.9	12.3	9.7
HCM Lane LOS	B	C	A	C	A	B	A
HCM 95th-tile Q	1.6	3	0.2	2.7	0.2	1	0.4

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	24	196	22	40	195
Future Vol, veh/h	13	24	196	22	40	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	14	26	213	24	43	212

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	523	225	0	0	237	0
Stage 1	225	-	-	-	-	-
Stage 2	298	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	513	812	-	-	1324	-
Stage 1	810	-	-	-	-	-
Stage 2	751	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	494	812	-	-	1324	-
Mov Cap-2 Maneuver	494	-	-	-	-	-
Stage 1	810	-	-	-	-	-
Stage 2	723	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	1.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	662	1324	-
HCM Lane V/C Ratio	-	-	0.061	0.033	-
HCM Control Delay (s)	-	-	10.8	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	23	195	24	39	169
Future Vol, veh/h	14	23	195	24	39	169
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	15	25	212	26	42	184

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	493	225	0	0	238	0
Stage 1	225	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	534	812	-	-	1323	-
Stage 1	810	-	-	-	-	-
Stage 2	775	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	515	812	-	-	1323	-
Mov Cap-2 Maneuver	515	-	-	-	-	-
Stage 1	810	-	-	-	-	-
Stage 2	748	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	1.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	667	1323	-
HCM Lane V/C Ratio	-	-	0.06	0.032	-
HCM Control Delay (s)	-	-	10.7	7.8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

NEAR-TERM CONDITIONS

HCM 6th Signalized Intersection Summary
1: Willow Avenue & Butler Avenue

11/07/2021

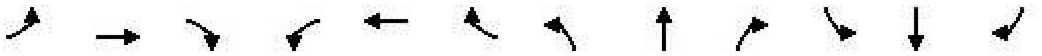
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	245	131	192	387	162	176
Future Volume (veh/h)	245	131	192	387	162	176
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	331	177	259	523	219	238
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	365	195	301	1040	240	261
Arrive On Green	0.32	0.32	0.17	0.56	0.30	0.30
Sat Flow, veh/h	1138	608	1767	1856	794	863
Grp Volume(v), veh/h	0	508	259	523	458	0
Grp Sat Flow(s),veh/h/ln	0	1746	1767	1856	1661	0
Q Serve(g_s), s	0.0	21.9	11.2	13.5	20.9	0.0
Cycle Q Clear(g_c), s	0.0	21.9	11.2	13.5	20.9	0.0
Prop In Lane		0.35	1.00		0.48	0.52
Lane Grp Cap(c), veh/h	0	561	301	1040	501	0
V/C Ratio(X)	0.00	0.91	0.86	0.50	0.91	0.00
Avail Cap(c_a), veh/h	0	637	374	1197	605	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	25.5	31.6	10.6	26.4	0.0
Incr Delay (d2), s/veh	0.0	15.5	15.3	0.4	16.4	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	10.6	5.7	4.6	9.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	41.0	46.9	10.9	42.8	0.0
LnGrp LOS	A	D	D	B	D	A
Approach Vol, veh/h	508			782	458	
Approach Delay, s/veh	41.0			22.9	42.8	
Approach LOS	D			C	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		29.1	18.8	30.6		49.4
Change Period (Y+Rc), s		5.4	5.4	5.4		5.4
Max Green Setting (Gmax), s		28.6	16.6	28.6		50.6
Max Q Clear Time (g_c+I1), s		22.9	13.2	23.9		15.5
Green Ext Time (p_c), s		0.8	0.2	1.3		3.4

Intersection Summary	
HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	420	32	33	1039	52	18	12	11	39	34	141
Future Volume (veh/h)	70	420	32	33	1039	52	18	12	11	39	34	141
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	86	519	40	41	1283	64	22	15	14	48	42	174
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	109	1456	112	68	1422	71	47	227	212	74	506	428
Arrive On Green	0.06	0.44	0.44	0.04	0.42	0.42	0.03	0.26	0.26	0.04	0.27	0.27
Sat Flow, veh/h	1767	3317	255	1767	3417	170	1767	883	824	1767	1856	1572
Grp Volume(v), veh/h	86	275	284	41	661	686	22	0	29	48	42	174
Grp Sat Flow(s),veh/h/ln	1767	1763	1810	1767	1763	1825	1767	0	1707	1767	1856	1572
Q Serve(g_s), s	5.4	11.6	11.6	2.5	39.1	39.2	1.4	0.0	1.4	3.0	1.9	7.8
Cycle Q Clear(g_c), s	5.4	11.6	11.6	2.5	39.1	39.2	1.4	0.0	1.4	3.0	1.9	7.8
Prop In Lane	1.00		0.14	1.00		0.09	1.00		0.48	1.00		1.00
Lane Grp Cap(c), veh/h	109	774	794	68	733	759	47	0	439	74	506	428
V/C Ratio(X)	0.79	0.36	0.36	0.60	0.90	0.90	0.47	0.00	0.07	0.65	0.08	0.41
Avail Cap(c_a), veh/h	151	836	859	114	800	828	97	0	439	100	506	428
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	20.8	20.8	52.7	30.4	30.5	53.5	0.0	31.3	52.6	30.2	19.6
Incr Delay (d2), s/veh	17.3	0.3	0.3	8.1	12.7	12.6	7.1	0.0	0.3	9.4	0.3	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	4.4	4.6	1.2	17.5	18.1	0.7	0.0	0.6	1.5	0.9	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	21.1	21.1	60.9	43.1	43.0	60.6	0.0	31.6	62.0	30.5	22.4
LnGrp LOS	E	C	C	E	D	D	E	A	C	E	C	C
Approach Vol, veh/h		645			1388			51			264	
Approach Delay, s/veh		27.5			43.6			44.1			30.9	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	35.2	10.8	55.4	9.5	35.8	13.4	52.9
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	5.4	6.5	6.5
Max Green Setting (Gmax), s	6.3	28.7	7.2	52.9	6.1	28.9	9.5	50.6
Max Q Clear Time (g_c+I1), s	5.0	3.4	4.5	13.6	3.4	9.8	7.4	41.2
Green Ext Time (p_c), s	0.0	0.1	0.0	3.0	0.0	0.7	0.0	5.2

Intersection Summary	
HCM 6th Ctrl Delay	37.7
HCM 6th LOS	D

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	508	259	523	457
v/c Ratio	0.88	0.79	0.50	0.85
Control Delay	44.8	52.3	13.1	40.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	44.8	52.3	13.1	40.4
Queue Length 50th (ft)	249	139	161	204
Queue Length 95th (ft)	288	180	188	237
Internal Link Dist (ft)	1512		2571	3098
Turn Bay Length (ft)		100		
Base Capacity (vph)	652	366	1176	644
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	0.78	0.71	0.44	0.71

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	86	559	41	1347	22	29	48	42	174
v/c Ratio	0.61	0.36	0.37	0.90	0.22	0.06	0.48	0.08	0.29
Control Delay	72.3	21.7	64.4	39.8	60.5	22.9	71.9	35.1	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.3	21.7	64.4	39.8	60.5	22.9	71.9	35.1	3.8
Queue Length 50th (ft)	66	146	31	507	17	9	37	25	0
Queue Length 95th (ft)	109	167	62	515	40	30	70	50	17
Internal Link Dist (ft)		2543		2787		592		1750	
Turn Bay Length (ft)	250		125		150		150		
Base Capacity (vph)	153	1696	116	1626	98	463	101	534	602
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	0.56	0.33	0.35	0.83	0.22	0.06	0.48	0.08	0.29

Intersection Summary

Intersection	
Intersection Delay, s/veh	82
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	76	213	35	57	254	95	36	138	73	119	116	109
Future Vol, veh/h	76	213	35	57	254	95	36	138	73	119	116	109
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	107	300	49	80	358	134	51	194	103	168	163	154
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	97.2	105.1	71.9	47.6
HCM LOS	F	F	F	E

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	15%	26%	0%	18%	0%	51%	0%
Vol Thru, %	56%	74%	0%	82%	0%	49%	0%
Vol Right, %	30%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	247	289	35	311	95	235	109
LT Vol	36	76	0	57	0	119	0
Through Vol	138	213	0	254	0	116	0
RT Vol	73	0	35	0	95	0	109
Lane Flow Rate	348	407	49	438	134	331	154
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.954	1.092	0.121	1.167	0.327	0.907	0.38
Departure Headway (Hd)	10.688	10.217	9.338	10.076	9.24	10.586	9.581
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	341	358	386	364	392	344	378
Service Time	8.688	7.917	7.038	7.776	6.94	8.286	7.281
HCM Lane V/C Ratio	1.021	1.137	0.127	1.203	0.342	0.962	0.407
HCM Control Delay	71.9	107.4	13.3	132.2	16.4	61.3	18
HCM Lane LOS	F	F	B	F	C	F	C
HCM 95th-tile Q	10.1	14.2	0.4	16.8	1.4	9	1.7

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	36	330	7	12	314
Future Vol, veh/h	20	36	330	7	12	314
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	22	39	359	8	13	341

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	730	363	0	0	367	0
Stage 1	363	-	-	-	-	-
Stage 2	367	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	388	680	-	-	1186	-
Stage 1	702	-	-	-	-	-
Stage 2	699	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	383	680	-	-	1186	-
Mov Cap-2 Maneuver	383	-	-	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	689	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	533	1186	-
HCM Lane V/C Ratio	-	-	0.114	0.011	-
HCM Control Delay (s)	-	-	12.6	8.1	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	34	303	7	11	323
Future Vol, veh/h	21	34	303	7	11	323
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	23	37	329	8	12	351

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	708	333	0	0	337	0
Stage 1	333	-	-	-	-	-
Stage 2	375	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	400	706	-	-	1217	-
Stage 1	724	-	-	-	-	-
Stage 2	693	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	395	706	-	-	1217	-
Mov Cap-2 Maneuver	395	-	-	-	-	-
Stage 1	724	-	-	-	-	-
Stage 2	685	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.4	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	543	1217	-
HCM Lane V/C Ratio	-	-	0.11	0.01	-
HCM Control Delay (s)	-	-	12.4	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

HCM 6th Signalized Intersection Summary
1: Willow Avenue & Butler Avenue

11/07/2021

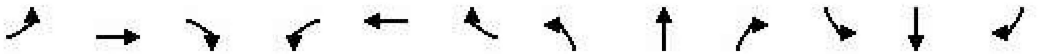
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	317	147	135	291	140	122
Future Volume (veh/h)	317	147	135	291	140	122
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	348	162	148	320	154	134
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	431	201	193	1064	193	168
Arrive On Green	0.36	0.36	0.11	0.57	0.22	0.22
Sat Flow, veh/h	1198	558	1767	1856	891	775
Grp Volume(v), veh/h	0	510	148	320	289	0
Grp Sat Flow(s),veh/h/ln	0	1755	1767	1856	1672	0
Q Serve(g_s), s	0.0	13.5	4.2	4.6	8.4	0.0
Cycle Q Clear(g_c), s	0.0	13.5	4.2	4.6	8.4	0.0
Prop In Lane		0.32	1.00		0.53	0.46
Lane Grp Cap(c), veh/h	0	632	193	1064	363	0
V/C Ratio(X)	0.00	0.81	0.77	0.30	0.80	0.00
Avail Cap(c_a), veh/h	0	1177	466	1927	829	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	14.9	22.4	5.7	19.1	0.0
Incr Delay (d2), s/veh	0.0	2.5	6.3	0.2	4.0	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	4.6	1.9	1.1	3.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	17.4	28.6	5.8	23.1	0.0
LnGrp LOS	A	B	C	A	C	A
Approach Vol, veh/h	510			468	289	
Approach Delay, s/veh	17.4			13.0	23.1	
Approach LOS	B			B	C	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		16.6	11.0	24.0		35.0
Change Period (Y+Rc), s		5.4	5.4	5.4		5.4
Max Green Setting (Gmax), s		25.6	13.6	34.6		53.6
Max Q Clear Time (g_c+I1), s		10.4	6.2	15.5		6.6
Green Ext Time (p_c), s		0.8	0.2	3.0		1.9

Intersection Summary	
HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	143	859	26	13	515	51	50	63	42	48	15	78
Future Volume (veh/h)	143	859	26	13	515	51	50	63	42	48	15	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	149	895	27	14	536	53	52	66	44	50	16	81
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	220	1088	33	35	669	66	84	372	248	82	642	544
Arrive On Green	0.12	0.31	0.31	0.02	0.21	0.21	0.05	0.36	0.36	0.05	0.35	0.35
Sat Flow, veh/h	1767	3494	105	1767	3241	320	1767	1039	692	1767	1856	1572
Grp Volume(v), veh/h	149	452	470	14	291	298	52	0	110	50	16	81
Grp Sat Flow(s),veh/h/ln	1767	1763	1837	1767	1763	1798	1767	0	1731	1767	1856	1572
Q Serve(g_s), s	7.6	22.4	22.4	0.7	14.8	14.9	2.7	0.0	4.1	2.6	0.5	2.0
Cycle Q Clear(g_c), s	7.6	22.4	22.4	0.7	14.8	14.9	2.7	0.0	4.1	2.6	0.5	2.0
Prop In Lane	1.00		0.06	1.00		0.18	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	220	549	572	35	364	371	84	0	620	82	642	544
V/C Ratio(X)	0.68	0.82	0.82	0.41	0.80	0.80	0.62	0.00	0.18	0.61	0.02	0.15
Avail Cap(c_a), veh/h	384	851	887	122	589	601	197	0	620	180	642	544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	30.0	30.0	45.7	35.5	35.6	44.1	0.0	20.7	44.1	20.3	7.6
Incr Delay (d2), s/veh	3.6	3.8	3.7	7.5	4.1	4.1	7.3	0.0	0.6	7.1	0.1	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	3.3	9.1	9.5	0.4	6.2	6.4	1.3	0.0	1.6	1.3	0.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.1	33.9	33.7	53.1	39.6	39.7	51.4	0.0	21.3	51.2	20.4	8.2
LnGrp LOS	D	C	C	D	D	D	D	A	C	D	C	A
Approach Vol, veh/h		1071			603			162			147	
Approach Delay, s/veh		35.1			40.0			31.0			24.2	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.8	40.3	8.3	35.8	11.0	39.1	18.2	26.0
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	* 6.5	6.5	6.5
Max Green Setting (Gmax), s	9.6	33.5	6.5	45.5	10.5	* 33	20.5	31.5
Max Q Clear Time (g_c+I1), s	4.6	6.1	2.7	24.4	4.7	4.0	9.6	16.9
Green Ext Time (p_c), s	0.0	0.5	0.0	5.0	0.0	0.3	0.2	2.6

Intersection Summary	
HCM 6th Ctrl Delay	35.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	510	148	320	288
v/c Ratio	0.76	0.49	0.31	0.63
Control Delay	27.2	36.4	8.2	27.7
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.2	36.4	8.2	27.7
Queue Length 50th (ft)	172	56	55	88
Queue Length 95th (ft)	352	141	127	197
Internal Link Dist (ft)	1512		2571	3098
Turn Bay Length (ft)		100		
Base Capacity (vph)	1052	417	1482	781
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	0.48	0.35	0.22	0.37

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	149	922	14	589	52	110	50	16	81
v/c Ratio	0.61	0.69	0.13	0.76	0.36	0.18	0.36	0.03	0.12
Control Delay	54.1	30.6	54.4	44.5	56.1	23.1	56.7	29.7	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.1	30.6	54.4	44.5	56.1	23.1	56.7	29.7	0.4
Queue Length 50th (ft)	94	247	9	191	33	38	32	7	0
Queue Length 95th (ft)	175	388	33	274	80	96	79	27	0
Internal Link Dist (ft)		2543		2787		592		1750	
Turn Bay Length (ft)	250		125		150		150		
Base Capacity (vph)	361	1600	114	1102	185	603	169	622	660
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	0.41	0.58	0.12	0.53	0.28	0.18	0.30	0.03	0.12

Intersection Summary

Intersection	
Intersection Delay, s/veh	18.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	244	44	60	232	44	32	152	44	36	129	61
Future Vol, veh/h	63	244	44	60	232	44	32	152	44	36	129	61
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	67	260	47	64	247	47	34	162	47	38	137	65
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	21.1	19.9	18.2	14
HCM LOS	C	C	C	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	14%	21%	0%	21%	0%	22%	0%
Vol Thru, %	67%	79%	0%	79%	0%	78%	0%
Vol Right, %	19%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	228	307	44	292	44	165	61
LT Vol	32	63	0	60	0	36	0
Through Vol	152	244	0	232	0	129	0
RT Vol	44	0	44	0	44	0	61
Lane Flow Rate	243	327	47	311	47	176	65
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.508	0.654	0.083	0.625	0.084	0.377	0.125
Departure Headway (Hd)	7.544	7.212	6.388	7.247	6.423	7.741	6.91
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	475	500	558	497	556	463	517
Service Time	5.616	4.978	4.154	5.013	4.188	5.515	4.683
HCM Lane V/C Ratio	0.512	0.654	0.084	0.626	0.085	0.38	0.126
HCM Control Delay	18.2	22.7	9.7	21.4	9.8	15.2	10.7
HCM Lane LOS	C	C	A	C	A	C	B
HCM 95th-tile Q	2.8	4.7	0.3	4.2	0.3	1.7	0.4

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	24	235	22	40	238
Future Vol, veh/h	13	24	235	22	40	238
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	14	26	255	24	43	259

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	612	267	0	0	279	0
Stage 1	267	-	-	-	-	-
Stage 2	345	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	455	769	-	-	1278	-
Stage 1	775	-	-	-	-	-
Stage 2	715	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	437	769	-	-	1278	-
Mov Cap-2 Maneuver	437	-	-	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	687	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	607	1278	-
HCM Lane V/C Ratio	-	-	0.066	0.034	-
HCM Control Delay (s)	-	-	11.4	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	23	234	24	39	212
Future Vol, veh/h	14	23	234	24	39	212
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	15	25	254	26	42	230

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	581	267	0	0	280	0
Stage 1	267	-	-	-	-	-
Stage 2	314	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	474	769	-	-	1277	-
Stage 1	775	-	-	-	-	-
Stage 2	738	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	456	769	-	-	1277	-
Mov Cap-2 Maneuver	456	-	-	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	710	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	1.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	610	1277	-
HCM Lane V/C Ratio	-	-	0.066	0.033	-
HCM Control Delay (s)	-	-	11.3	7.9	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

CUMULATIVE YEAR 2042 CONDITIONS

HCM 6th Signalized Intersection Summary
1: Willow Avenue & Butler Avenue

11/07/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	389	178	299	610	176	247
Future Volume (veh/h)	389	178	299	610	176	247
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	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	423	193	325	663	191	268
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	442	202	352	1137	201	282
Arrive On Green	0.37	0.37	0.20	0.61	0.29	0.29
Sat Flow, veh/h	1206	550	1767	1856	684	960
Grp Volume(v), veh/h	0	616	325	663	460	0
Grp Sat Flow(s),veh/h/ln	0	1756	1767	1856	1648	0
Q Serve(g_s), s	0.0	39.5	20.8	24.9	31.6	0.0
Cycle Q Clear(g_c), s	0.0	39.5	20.8	24.9	31.6	0.0
Prop In Lane		0.31	1.00		0.42	0.58
Lane Grp Cap(c), veh/h	0	644	352	1137	484	0
V/C Ratio(X)	0.00	0.96	0.92	0.58	0.95	0.00
Avail Cap(c_a), veh/h	0	663	376	1182	508	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	35.7	45.4	13.5	40.0	0.0
Incr Delay (d2), s/veh	0.0	24.4	27.0	0.7	27.2	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	20.5	11.5	9.6	16.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	60.1	72.3	14.2	67.1	0.0
LnGrp LOS	A	E	E	B	E	A
Approach Vol, veh/h	616			988	460	
Approach Delay, s/veh	60.1			33.3	67.1	
Approach LOS	E			C	E	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		39.4	28.4	47.8		76.2
Change Period (Y+Rc), s		5.4	5.4	5.4		5.4
Max Green Setting (Gmax), s		35.6	24.6	43.6		73.6
Max Q Clear Time (g_c+I1), s		33.6	22.8	41.5		26.9
Green Ext Time (p_c), s		0.4	0.2	0.8		4.9

Intersection Summary	
HCM 6th Ctrl Delay	48.8
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	619	52	54	1620	71	30	18	18	53	54	187
Future Volume (veh/h)	92	619	52	54	1620	71	30	18	18	53	54	187
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	100	673	57	59	1761	77	33	20	20	58	59	203
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	96	1487	126	76	1517	66	59	215	215	76	487	412
Arrive On Green	0.05	0.45	0.45	0.04	0.44	0.44	0.03	0.25	0.25	0.04	0.26	0.26
Sat Flow, veh/h	1767	3290	278	1767	3442	150	1767	851	851	1767	1856	1572
Grp Volume(v), veh/h	100	360	370	59	897	941	33	0	40	58	59	203
Grp Sat Flow(s),veh/h/ln	1767	1763	1805	1767	1763	1829	1767	0	1702	1767	1856	1572
Q Serve(g_s), s	6.5	16.8	16.8	3.9	52.5	52.5	2.2	0.0	2.1	3.9	2.9	10.3
Cycle Q Clear(g_c), s	6.5	16.8	16.8	3.9	52.5	52.5	2.2	0.0	2.1	3.9	2.9	10.3
Prop In Lane	1.00		0.15	1.00		0.08	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	96	797	816	76	777	806	59	0	430	76	487	412
V/C Ratio(X)	1.04	0.45	0.45	0.77	1.15	1.17	0.56	0.00	0.09	0.76	0.12	0.49
Avail Cap(c_a), veh/h	96	797	816	142	777	806	96	0	430	89	487	412
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.3	22.5	22.5	56.4	33.3	33.3	56.7	0.0	34.1	56.4	33.5	23.3
Incr Delay (d2), s/veh	102.0	0.4	0.4	15.1	83.8	88.7	8.0	0.0	0.4	27.6	0.5	4.2
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	5.5	6.5	6.7	2.0	38.2	40.8	1.1	0.0	0.9	2.3	1.4	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	158.3	22.9	22.9	71.5	117.1	122.0	64.7	0.0	34.5	84.0	34.0	27.4
LnGrp LOS	F	C	C	E	F	F	E	A	C	F	C	C
Approach Vol, veh/h		830			1897			73			320	
Approach Delay, s/veh		39.2			118.1			48.1			38.9	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	36.6	11.6	60.4	10.5	36.6	13.0	59.0
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	5.4	6.5	6.5
Max Green Setting (Gmax), s	6.0	30.1	9.6	49.4	6.5	29.6	6.5	52.5
Max Q Clear Time (g_c+I1), s	5.9	4.1	5.9	18.8	4.2	12.3	8.5	54.5
Green Ext Time (p_c), s	0.0	0.1	0.0	4.0	0.0	0.8	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	87.4
HCM 6th LOS	F

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	616	325	663	459
v/c Ratio	0.93	0.89	0.58	0.90
Control Delay	56.9	71.8	15.5	56.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	56.9	71.8	15.5	56.8
Queue Length 50th (ft)	445	248	291	297
Queue Length 95th (ft)	#682	#417	402	#480
Internal Link Dist (ft)	1512		2571	3098
Turn Bay Length (ft)		100		
Base Capacity (vph)	709	389	1227	576
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	0.87	0.84	0.54	0.80

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	100	730	59	1838	33	40	58	59	203
v/c Ratio	1.04	0.46	0.47	1.18	0.35	0.09	0.65	0.12	0.35
Control Delay	158.3	24.9	65.6	118.7	65.3	21.4	88.4	34.9	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	158.3	24.9	65.6	118.7	65.3	21.4	88.4	34.9	6.2
Queue Length 50th (ft)	~85	214	44	~914	25	12	45	36	0
Queue Length 95th (ft)	#199	273	89	#1056	60	41	#113	72	55
Internal Link Dist (ft)		2543		2787		592		1750	
Turn Bay Length (ft)	250		125		150		150		
Base Capacity (vph)	96	1573	143	1559	96	451	89	510	584
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	1.04	0.46	0.41	1.18	0.34	0.09	0.65	0.12	0.35

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	148.3
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	118	345	56	89	406	155	56	191	114	190	131	156
Future Vol, veh/h	118	345	56	89	406	155	56	191	114	190	131	156
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	128	375	61	97	441	168	61	208	124	207	142	170
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	193.8	195.7	112.8	61.2
HCM LOS	F	F	F	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	16%	25%	0%	18%	0%	59%	0%
Vol Thru, %	53%	75%	0%	82%	0%	41%	0%
Vol Right, %	32%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	361	463	56	495	155	321	156
LT Vol	56	118	0	89	0	190	0
Through Vol	191	345	0	406	0	131	0
RT Vol	114	0	56	0	155	0	156
Lane Flow Rate	392	503	61	538	168	349	170
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	1.086	1.374	0.152	1.459	0.42	0.974	0.427
Departure Headway (Hd)	11.877	10.952	10.071	10.99	10.149	11.77	10.71
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	310	337	359	334	357	311	339
Service Time	9.877	8.652	7.771	8.69	7.849	9.47	8.41
HCM Lane V/C Ratio	1.265	1.493	0.17	1.611	0.471	1.122	0.501
HCM Control Delay	112.8	215.5	14.6	250.7	20	80.7	21.2
HCM Lane LOS	F	F	B	F	C	F	C
HCM 95th-tile Q	12.9	22.8	0.5	25.8	2	10.1	2.1

HCM 6th Signalized Intersection Summary
1: Willow Avenue & Butler Avenue

11/07/2021

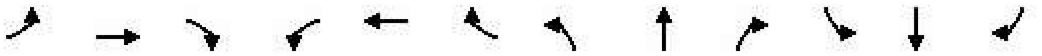
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	487	144	174	455	169	171
Future Volume (veh/h)	487	144	174	455	169	171
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	529	157	189	495	184	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	577	171	228	1144	204	207
Arrive On Green	0.42	0.42	0.13	0.62	0.25	0.25
Sat Flow, veh/h	1374	408	1767	1856	825	834
Grp Volume(v), veh/h	0	686	189	495	371	0
Grp Sat Flow(s),veh/h/ln	0	1782	1767	1856	1664	0
Q Serve(g_s), s	0.0	28.9	8.3	11.1	17.1	0.0
Cycle Q Clear(g_c), s	0.0	28.9	8.3	11.1	17.1	0.0
Prop In Lane		0.23	1.00		0.50	0.50
Lane Grp Cap(c), veh/h	0	748	228	1144	412	0
V/C Ratio(X)	0.00	0.92	0.83	0.43	0.90	0.00
Avail Cap(c_a), veh/h	0	844	280	1299	494	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	21.8	33.7	8.0	28.9	0.0
Incr Delay (d2), s/veh	0.0	13.8	15.7	0.3	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	0.0	13.4	4.3	3.5	8.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	35.6	49.4	8.2	46.2	0.0
LnGrp LOS	A	D	D	A	D	A
Approach Vol, veh/h	686			684	371	
Approach Delay, s/veh	35.6			19.6	46.2	
Approach LOS	D			B	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		25.1	15.6	38.7		54.4
Change Period (Y+Rc), s		5.4	5.4	5.4		5.4
Max Green Setting (Gmax), s		23.6	12.6	37.6		55.6
Max Q Clear Time (g_c+I1), s		19.1	10.3	30.9		13.1
Green Ext Time (p_c), s		0.5	0.1	2.5		3.2

Intersection Summary	
HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	1301	42	22	770	68	82	101	69	61	24	91
Future Volume (veh/h)	181	1301	42	22	770	68	82	101	69	61	24	91
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	197	1414	46	24	837	74	89	110	75	66	26	99
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	310	1535	50	50	960	85	181	271	185	84	388	329
Arrive On Green	0.18	0.44	0.44	0.03	0.29	0.29	0.10	0.26	0.26	0.05	0.21	0.21
Sat Flow, veh/h	1767	3485	113	1767	3277	290	1767	1028	701	1767	1856	1572
Grp Volume(v), veh/h	197	714	746	24	450	461	89	0	185	66	26	99
Grp Sat Flow(s),veh/h/ln	1767	1763	1835	1767	1763	1803	1767	0	1729	1767	1856	1572
Q Serve(g_s), s	11.7	43.2	43.4	1.5	27.5	27.5	5.4	0.0	10.0	4.2	1.3	6.0
Cycle Q Clear(g_c), s	11.7	43.2	43.4	1.5	27.5	27.5	5.4	0.0	10.0	4.2	1.3	6.0
Prop In Lane	1.00		0.06	1.00		0.16	1.00		0.41	1.00		1.00
Lane Grp Cap(c), veh/h	310	777	809	50	516	528	181	0	456	84	388	329
V/C Ratio(X)	0.63	0.92	0.92	0.48	0.87	0.87	0.49	0.00	0.41	0.78	0.07	0.30
Avail Cap(c_a), veh/h	310	817	850	95	627	641	200	0	456	103	388	329
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.3	29.8	29.9	54.3	38.0	38.0	48.1	0.0	34.4	53.4	35.9	37.8
Incr Delay (d2), s/veh	4.2	15.1	14.9	7.1	11.1	10.9	2.1	0.0	2.7	26.3	0.3	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	19.6	20.4	0.7	12.6	12.9	2.4	0.0	4.3	2.4	0.6	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.5	44.9	44.8	61.4	49.2	48.9	50.1	0.0	37.0	79.7	36.3	40.2
LnGrp LOS	D	D	D	E	D	D	D	A	D	E	D	D
Approach Vol, veh/h		1657			935			274			191	
Approach Delay, s/veh		45.2			49.4			41.3			53.3	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	36.4	9.7	56.4	18.1	29.1	26.4	39.7
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	5.4	6.5	6.5
Max Green Setting (Gmax), s	6.6	29.9	6.1	52.5	12.8	23.7	18.3	40.3
Max Q Clear Time (g_c+I1), s	6.2	12.0	3.5	45.4	7.4	8.0	13.7	29.5
Green Ext Time (p_c), s	0.0	0.8	0.0	4.5	0.1	0.3	0.2	3.7

Intersection Summary	
HCM 6th Ctrl Delay	46.6
HCM 6th LOS	D

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	686	189	495	370
v/c Ratio	0.91	0.75	0.43	0.83
Control Delay	41.9	55.7	9.8	42.8
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	41.9	55.7	9.8	42.8
Queue Length 50th (ft)	341	104	130	166
Queue Length 95th (ft)	#573	#211	200	#301
Internal Link Dist (ft)	1512		2571	3098
Turn Bay Length (ft)		100		
Base Capacity (vph)	842	273	1270	529
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	0.81	0.69	0.39	0.70

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	197	1460	24	911	89	185	66	26	99
v/c Ratio	0.75	0.91	0.24	0.84	0.49	0.37	0.63	0.06	0.19
Control Delay	65.5	38.8	60.9	43.3	59.5	33.0	80.8	39.5	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.5	38.8	60.9	43.3	59.5	33.0	80.8	39.5	0.8
Queue Length 50th (ft)	144	563	18	340	66	102	51	17	0
Queue Length 95th (ft)	#254	#730	47	411	121	172	#124	42	0
Internal Link Dist (ft)		2543		2787		592		1750	
Turn Bay Length (ft)	250		125		150		150		
Base Capacity (vph)	302	1700	98	1292	206	497	106	435	529
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	0.65	0.86	0.24	0.71	0.43	0.37	0.62	0.06	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Intersection	
Intersection Delay, s/veh	101.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	79	384	70	91	372	66	51	181	63	55	160	86
Future Vol, veh/h	79	384	70	91	372	66	51	181	63	55	160	86
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	86	417	76	99	404	72	55	197	68	60	174	93
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	137.5	139.1	49.2	25.1
HCM LOS	F	F	E	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	17%	17%	0%	20%	0%	26%	0%
Vol Thru, %	61%	83%	0%	80%	0%	74%	0%
Vol Right, %	21%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	295	463	70	463	66	215	86
LT Vol	51	79	0	91	0	55	0
Through Vol	181	384	0	372	0	160	0
RT Vol	63	0	70	0	66	0	86
Lane Flow Rate	321	503	76	503	72	234	93
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.834	1.239	0.171	1.241	0.161	0.618	0.226
Departure Headway (Hd)	10.509	9.463	8.638	9.472	8.633	10.578	9.704
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	346	388	418	388	418	344	372
Service Time	8.509	7.163	6.338	7.172	6.333	8.278	7.404
HCM Lane V/C Ratio	0.928	1.296	0.182	1.296	0.172	0.68	0.25
HCM Control Delay	49.2	156.3	13.1	157.1	13	29	15.2
HCM Lane LOS	E	F	B	F	B	D	C
HCM 95th-tile Q	7.4	20.1	0.6	20.2	0.6	3.9	0.9

HCM 6th Signalized Intersection Summary
1: Willow Avenue & Butler Avenue

11/07/2021

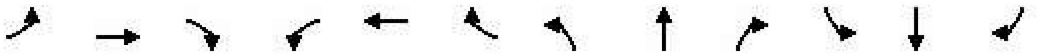
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	389	192	307	610	220	271
Future Volume (veh/h)	389	192	307	610	220	271
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	423	209	334	663	239	295
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	415	205	358	1118	227	281
Arrive On Green	0.35	0.35	0.20	0.60	0.31	0.31
Sat Flow, veh/h	1172	579	1767	1856	739	912
Grp Volume(v), veh/h	0	632	334	663	535	0
Grp Sat Flow(s),veh/h/ln	0	1751	1767	1856	1654	0
Q Serve(g_s), s	0.0	42.4	22.2	26.5	36.8	0.0
Cycle Q Clear(g_c), s	0.0	42.4	22.2	26.5	36.8	0.0
Prop In Lane		0.33	1.00		0.45	0.55
Lane Grp Cap(c), veh/h	0	620	358	1118	509	0
V/C Ratio(X)	0.00	1.02	0.93	0.59	1.05	0.00
Avail Cap(c_a), veh/h	0	620	363	1123	509	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	38.6	46.9	14.7	41.4	0.0
Incr Delay (d2), s/veh	0.0	40.9	30.2	0.8	54.2	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	24.5	12.5	10.4	22.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	79.5	77.1	15.6	95.6	0.0
LnGrp LOS	A	F	E	B	F	A
Approach Vol, veh/h	632			997	535	
Approach Delay, s/veh	79.5			36.2	95.6	
Approach LOS	E			D	F	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		42.2	29.7	47.8		77.5
Change Period (Y+Rc), s		5.4	5.4	5.4		5.4
Max Green Setting (Gmax), s		36.8	24.6	42.4		72.4
Max Q Clear Time (g_c+I1), s		38.8	24.2	44.4		28.5
Green Ext Time (p_c), s		0.0	0.0	0.0		4.9

Intersection Summary	
HCM 6th Ctrl Delay	63.5
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	619	52	54	1620	72	30	19	18	55	55	207
Future Volume (veh/h)	99	619	52	54	1620	72	30	19	18	55	55	207
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	108	673	57	59	1761	78	33	21	20	60	60	225
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	96	1486	126	76	1515	67	59	221	210	77	487	413
Arrive On Green	0.05	0.45	0.45	0.04	0.44	0.44	0.03	0.25	0.25	0.04	0.26	0.26
Sat Flow, veh/h	1767	3290	278	1767	3440	151	1767	874	832	1767	1856	1572
Grp Volume(v), veh/h	108	360	370	59	897	942	33	0	41	60	60	225
Grp Sat Flow(s),veh/h/ln	1767	1763	1805	1767	1763	1828	1767	0	1706	1767	1856	1572
Q Serve(g_s), s	6.5	16.8	16.8	3.9	52.5	52.5	2.2	0.0	2.2	4.0	2.9	11.6
Cycle Q Clear(g_c), s	6.5	16.8	16.8	3.9	52.5	52.5	2.2	0.0	2.2	4.0	2.9	11.6
Prop In Lane	1.00		0.15	1.00		0.08	1.00		0.49	1.00		1.00
Lane Grp Cap(c), veh/h	96	796	816	76	776	805	59	0	431	77	487	413
V/C Ratio(X)	1.12	0.45	0.45	0.77	1.16	1.17	0.56	0.00	0.10	0.78	0.12	0.54
Avail Cap(c_a), veh/h	96	796	816	142	776	805	96	0	431	89	487	413
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.3	22.5	22.5	56.4	33.3	33.3	56.7	0.0	34.1	56.4	33.5	23.6
Incr Delay (d2), s/veh	127.9	0.4	0.4	15.1	84.3	89.3	8.0	0.0	0.4	31.1	0.5	5.1
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	6.2	6.5	6.7	2.0	38.3	40.9	1.1	0.0	0.9	2.4	1.4	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	184.2	22.9	22.9	71.5	117.7	122.7	64.7	0.0	34.6	87.5	34.0	28.7
LnGrp LOS	F	C	C	E	F	F	E	A	C	F	C	C
Approach Vol, veh/h		838			1898			74			345	
Approach Delay, s/veh		43.7			118.7			48.0			39.9	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	36.6	11.6	60.4	10.5	36.7	13.0	59.0
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	5.4	6.5	6.5
Max Green Setting (Gmax), s	6.0	30.1	9.6	49.4	6.5	29.6	6.5	52.5
Max Q Clear Time (g_c+I1), s	6.0	4.2	5.9	18.8	4.2	13.6	8.5	54.5
Green Ext Time (p_c), s	0.0	0.1	0.0	4.0	0.0	0.9	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	88.5
HCM 6th LOS	F

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	632	334	663	534
v/c Ratio	0.99	0.94	0.60	0.97
Control Delay	70.1	82.6	17.5	70.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	70.1	82.6	17.5	70.2
Queue Length 50th (ft)	471	256	299	376
Queue Length 95th (ft)	#724	#434	414	#607
Internal Link Dist (ft)	1512		2571	3098
Turn Bay Length (ft)		100		
Base Capacity (vph)	640	361	1119	551
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	0.99	0.93	0.59	0.97

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	108	730	59	1839	33	41	60	60	225
v/c Ratio	1.12	0.46	0.47	1.18	0.35	0.09	0.67	0.12	0.39
Control Delay	180.3	24.9	65.6	119.0	65.3	21.8	90.9	34.9	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	180.3	24.9	65.6	119.0	65.3	21.8	90.9	34.9	8.3
Queue Length 50th (ft)	~98	214	44	~915	25	12	47	36	10
Queue Length 95th (ft)	#217	273	89	#1056	60	42	#118	73	74
Internal Link Dist (ft)		2543		2787		592		1750	
Turn Bay Length (ft)	250		125		150		150		
Base Capacity (vph)	96	1573	143	1559	96	452	89	510	584
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	1.13	0.46	0.41	1.18	0.34	0.09	0.67	0.12	0.39

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	156.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	122	345	56	89	406	156	56	199	114	193	156	170
Future Vol, veh/h	122	345	56	89	406	156	56	199	114	193	156	170
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	133	375	61	97	441	170	61	216	124	210	170	185
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	203.7	200.3	125.5	77.1
HCM LOS	F	F	F	F

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	15%	26%	0%	18%	0%	55%	0%
Vol Thru, %	54%	74%	0%	82%	0%	45%	0%
Vol Right, %	31%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	369	467	56	495	156	349	170
LT Vol	56	122	0	89	0	193	0
Through Vol	199	345	0	406	0	156	0
RT Vol	114	0	56	0	156	0	170
Lane Flow Rate	401	508	61	538	170	379	185
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	1.122	1.399	0.154	1.472	0.427	1.057	0.465
Departure Headway (Hd)	12.115	11.154	10.268	11.232	10.388	11.895	10.854
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	305	330	351	328	349	307	334
Service Time	10.115	8.854	7.968	8.932	8.088	9.595	8.554
HCM Lane V/C Ratio	1.315	1.539	0.174	1.64	0.487	1.235	0.554
HCM Control Delay	125.5	226.4	14.8	256.9	20.6	103.7	22.6
HCM Lane LOS	F	F	B	F	C	F	C
HCM 95th-tile Q	13.7	23.3	0.5	25.8	2.1	12.1	2.4

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	20	36	497	7	12	488
Future Vol, veh/h	20	36	497	7	12	488
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	22	39	540	8	13	530

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1100	544	0	0	548	0
Stage 1	544	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	234	537	-	-	1016	-
Stage 1	580	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	230	537	-	-	1016	-
Mov Cap-2 Maneuver	230	-	-	-	-	-
Stage 1	580	-	-	-	-	-
Stage 2	562	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	364	1016	-
HCM Lane V/C Ratio	-	-	0.167	0.013	-
HCM Control Delay (s)	-	-	16.9	8.6	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	21	34	470	7	11	497
Future Vol, veh/h	21	34	470	7	11	497
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	23	37	511	8	12	540

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1079	515	0	0	519	0
Stage 1	515	-	-	-	-	-
Stage 2	564	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	241	558	-	-	1042	-
Stage 1	598	-	-	-	-	-
Stage 2	567	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	237	558	-	-	1042	-
Mov Cap-2 Maneuver	237	-	-	-	-	-
Stage 1	598	-	-	-	-	-
Stage 2	558	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.7	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	368	1042	-
HCM Lane V/C Ratio	-	-	0.162	0.011	-
HCM Control Delay (s)	-	-	16.7	8.5	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	0.6	0	-

HCM 6th Signalized Intersection Summary
1: Willow Avenue & Butler Avenue

11/07/2021

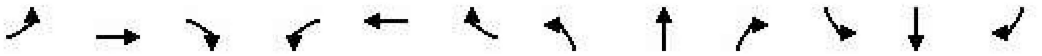
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	487	193	202	455	198	187
Future Volume (veh/h)	487	193	202	455	198	187
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	529	210	220	495	215	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	529	210	254	1154	221	208
Arrive On Green	0.42	0.42	0.14	0.62	0.26	0.26
Sat Flow, veh/h	1264	502	1767	1856	856	808
Grp Volume(v), veh/h	0	739	220	495	419	0
Grp Sat Flow(s),veh/h/ln	0	1765	1767	1856	1667	0
Q Serve(g_s), s	0.0	37.6	10.9	12.4	22.4	0.0
Cycle Q Clear(g_c), s	0.0	37.6	10.9	12.4	22.4	0.0
Prop In Lane		0.28	1.00		0.51	0.48
Lane Grp Cap(c), veh/h	0	738	254	1154	430	0
V/C Ratio(X)	0.00	1.00	0.87	0.43	0.97	0.00
Avail Cap(c_a), veh/h	0	738	256	1156	430	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	26.1	37.7	8.8	33.0	0.0
Incr Delay (d2), s/veh	0.0	33.3	25.5	0.3	36.4	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	21.0	6.3	4.2	12.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	59.5	63.1	9.0	69.5	0.0
LnGrp LOS	A	F	E	A	E	A
Approach Vol, veh/h	739			715	419	
Approach Delay, s/veh	59.5			25.7	69.5	
Approach LOS	E			C	E	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		28.6	18.3	43.0		61.3
Change Period (Y+Rc), s		5.4	5.4	5.4		5.4
Max Green Setting (Gmax), s		23.2	13.0	37.6		56.0
Max Q Clear Time (g_c+I1), s		24.4	12.9	39.6		14.4
Green Ext Time (p_c), s		0.0	0.0	0.0		3.2

Intersection Summary	
HCM 6th Ctrl Delay	48.8
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	1301	42	22	770	71	82	102	69	62	24	104
Future Volume (veh/h)	204	1301	42	22	770	71	82	102	69	62	24	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	222	1414	46	24	837	77	89	111	75	67	26	113
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	313	1535	50	50	951	87	182	272	184	86	388	329
Arrive On Green	0.18	0.44	0.44	0.03	0.29	0.29	0.10	0.26	0.26	0.05	0.21	0.21
Sat Flow, veh/h	1767	3485	113	1767	3264	300	1767	1032	698	1767	1856	1572
Grp Volume(v), veh/h	222	714	746	24	452	462	89	0	186	67	26	113
Grp Sat Flow(s),veh/h/ln	1767	1763	1835	1767	1763	1801	1767	0	1730	1767	1856	1572
Q Serve(g_s), s	13.4	43.3	43.5	1.5	27.7	27.7	5.4	0.0	10.1	4.3	1.3	6.9
Cycle Q Clear(g_c), s	13.4	43.3	43.5	1.5	27.7	27.7	5.4	0.0	10.1	4.3	1.3	6.9
Prop In Lane	1.00		0.06	1.00		0.17	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	313	776	808	50	514	525	182	0	456	86	388	329
V/C Ratio(X)	0.71	0.92	0.92	0.48	0.88	0.88	0.49	0.00	0.41	0.78	0.07	0.34
Avail Cap(c_a), veh/h	313	816	849	95	601	615	199	0	456	103	388	329
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.9	29.9	29.9	54.3	38.3	38.3	48.0	0.0	34.5	53.4	36.0	38.2
Incr Delay (d2), s/veh	7.3	15.1	15.0	7.1	12.7	12.5	2.0	0.0	2.7	26.9	0.3	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	19.6	20.5	0.7	12.9	13.2	2.4	0.0	4.3	2.5	0.6	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.2	45.0	44.9	61.5	51.0	50.8	50.1	0.0	37.2	80.2	36.3	41.1
LnGrp LOS	D	D	D	E	D	D	D	A	D	F	D	D
Approach Vol, veh/h		1682			938			275			206	
Approach Delay, s/veh		45.8			51.2			41.3			53.2	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	36.4	9.7	56.5	18.2	29.1	26.6	39.6
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	5.4	6.5	6.5
Max Green Setting (Gmax), s	6.6	29.9	6.1	52.5	12.8	23.7	19.9	38.7
Max Q Clear Time (g_c+I1), s	6.3	12.1	3.5	45.5	7.4	8.9	15.4	29.7
Green Ext Time (p_c), s	0.0	0.8	0.0	4.5	0.1	0.3	0.2	3.3

Intersection Summary	
HCM 6th Ctrl Delay	47.5
HCM 6th LOS	D

Lane Group	EBT	WBL	WBT	NBL
Lane Group Flow (vph)	739	220	495	418
v/c Ratio	0.97	0.87	0.43	0.91
Control Delay	51.9	70.2	10.0	55.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	51.9	70.2	10.0	55.0
Queue Length 50th (ft)	391	124	132	204
Queue Length 95th (ft)	#642	#252	197	#376
Internal Link Dist (ft)	1512		2571	3098
Turn Bay Length (ft)		100		
Base Capacity (vph)	773	259	1173	479
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	0.96	0.85	0.42	0.87

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	222	1460	24	914	89	186	67	26	113
v/c Ratio	0.80	0.90	0.25	0.86	0.50	0.38	0.64	0.06	0.21
Control Delay	67.5	38.1	61.0	45.6	59.9	33.2	82.0	39.5	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.5	38.1	61.0	45.6	59.9	33.2	82.0	39.5	0.9
Queue Length 50th (ft)	164	563	18	342	66	103	52	17	0
Queue Length 95th (ft)	#282	#730	47	421	121	173	#127	42	0
Internal Link Dist (ft)		2543		2787		592		1750	
Turn Bay Length (ft)	250		125		150		150		
Base Capacity (vph)	321	1702	97	1229	204	494	105	431	527
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	0.69	0.86	0.25	0.74	0.44	0.38	0.64	0.06	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	120.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	94	384	70	91	372	69	51	209	63	58	176	95
Future Vol, veh/h	94	384	70	91	372	69	51	209	63	58	176	95
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	102	417	76	99	404	75	55	227	68	63	191	103
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	170.9	156.2	67.6	29.4
HCM LOS	F	F	F	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	16%	20%	0%	20%	0%	25%	0%
Vol Thru, %	65%	80%	0%	80%	0%	75%	0%
Vol Right, %	20%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	323	478	70	463	69	234	95
LT Vol	51	94	0	91	0	58	0
Through Vol	209	384	0	372	0	176	0
RT Vol	63	0	70	0	69	0	95
Lane Flow Rate	351	520	76	503	75	254	103
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.929	1.33	0.178	1.288	0.175	0.686	0.255
Departure Headway (Hd)	10.983	9.927	9.084	9.992	9.149	11.029	10.156
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	334	369	397	367	395	331	356
Service Time	8.983	7.627	6.784	7.692	6.849	8.729	7.856
HCM Lane V/C Ratio	1.051	1.409	0.191	1.371	0.19	0.767	0.289
HCM Control Delay	67.6	193.9	13.7	177.4	13.8	34.7	16.3
HCM Lane LOS	F	F	B	F	B	D	C
HCM 95th-tile Q	9.3	22.9	0.6	21.2	0.6	4.8	1

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	24	349	22	40	340
Future Vol, veh/h	13	24	349	22	40	340
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	14	26	379	24	43	370

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	847	391	0	0	403	0
Stage 1	391	-	-	-	-	-
Stage 2	456	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	331	655	-	-	1150	-
Stage 1	681	-	-	-	-	-
Stage 2	636	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	315	655	-	-	1150	-
Mov Cap-2 Maneuver	315	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	606	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	475	1150	-
HCM Lane V/C Ratio	-	-	0.085	0.038	-
HCM Control Delay (s)	-	-	13.3	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	23	348	24	39	314
Future Vol, veh/h	14	23	348	24	39	314
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
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, %	3	3	3	3	3	3
Mvmt Flow	15	25	378	26	42	341

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	816	391	0	0	404	0
Stage 1	391	-	-	-	-	-
Stage 2	425	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227	-
Pot Cap-1 Maneuver	345	655	-	-	1149	-
Stage 1	681	-	-	-	-	-
Stage 2	657	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	329	655	-	-	1149	-
Mov Cap-2 Maneuver	329	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	627	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.3	0	0.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	476	1149	-
HCM Lane V/C Ratio	-	-	0.084	0.037	-
HCM Control Delay (s)	-	-	13.3	8.3	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

MITIGATION

Intersection	
Intersection Delay, s/veh	22.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	74	202	33	49	233	93	31	100	64	116	85	106
Future Vol, veh/h	74	202	33	49	233	93	31	100	64	116	85	106
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	104	285	46	69	328	131	44	141	90	163	120	149
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	24.3	27.9	15.7	16.7
HCM LOS	C	D	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	31	100	64	74	202	33	49	233	93	116	85
LT Vol	31	0	0	74	0	0	49	0	0	116	0
Through Vol	0	100	0	0	202	0	0	233	0	0	85
RT Vol	0	0	64	0	0	33	0	0	93	0	0
Lane Flow Rate	44	141	90	104	285	46	69	328	131	163	120
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.119	0.365	0.216	0.269	0.696	0.105	0.175	0.785	0.288	0.427	0.296
Departure Headway (Hd)	9.838	9.338	8.638	9.308	8.808	8.108	9.11	8.61	7.91	9.403	8.903
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	365	386	416	387	410	442	394	420	455	384	403
Service Time	7.593	7.093	6.393	7.058	6.558	5.858	6.857	6.357	5.657	7.151	6.651
HCM Lane V/C Ratio	0.121	0.365	0.216	0.269	0.695	0.104	0.175	0.781	0.288	0.424	0.298
HCM Control Delay	13.9	17.4	13.8	15.5	29.5	11.8	13.8	36.5	13.8	19	15.4
HCM Lane LOS	B	C	B	C	D	B	B	E	B	C	C
HCM 95th-tile Q	0.4	1.6	0.8	1.1	5.2	0.3	0.6	6.8	1.2	2.1	1.2

Intersection	
Intersection Delay, s/veh	12.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	213	39	47	213	43	29	115	30	35	88	60
Future Vol, veh/h	62	213	39	47	213	43	29	115	30	35	88	60
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	66	227	41	50	227	46	31	122	32	37	94	64
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	12.8	12.9	11.4	10.8
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	115	30	62	213	39	47	213	43	35	88
LT Vol	29	0	0	62	0	0	47	0	0	35	0
Through Vol	0	115	0	0	213	0	0	213	0	0	88
RT Vol	0	0	30	0	0	39	0	0	43	0	0
Lane Flow Rate	31	122	32	66	227	41	50	227	46	37	94
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.064	0.239	0.056	0.13	0.414	0.068	0.099	0.416	0.075	0.078	0.182
Departure Headway (Hd)	7.519	7.019	6.319	7.085	6.585	5.885	7.111	6.611	5.911	7.509	7.009
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	474	509	563	504	544	605	502	542	602	475	509
Service Time	5.3	4.8	4.1	4.857	4.357	3.657	4.881	4.381	3.681	5.288	4.788
HCM Lane V/C Ratio	0.065	0.24	0.057	0.131	0.417	0.068	0.1	0.419	0.076	0.078	0.185
HCM Control Delay	10.8	12	9.5	10.9	14	9.1	10.7	14.1	9.2	10.9	11.4
HCM Lane LOS	B	B	A	B	B	A	B	B	A	B	B
HCM 95th-tile Q	0.2	0.9	0.2	0.4	2	0.2	0.3	2	0.2	0.3	0.7

Intersection	
Intersection Delay, s/veh	30.9
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	76	213	35	57	254	95	36	138	73	119	116	109
Future Vol, veh/h	76	213	35	57	254	95	36	138	73	119	116	109
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	107	300	49	80	358	134	51	194	103	168	163	154
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	33.5	44.7	20.4	19.8
HCM LOS	D	E	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	36	138	73	76	213	35	57	254	95	119	116
LT Vol	36	0	0	76	0	0	57	0	0	119	0
Through Vol	0	138	0	0	213	0	0	254	0	0	116
RT Vol	0	0	73	0	0	35	0	0	95	0	0
Lane Flow Rate	51	194	103	107	300	49	80	358	134	168	163
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.149	0.543	0.267	0.302	0.806	0.123	0.221	0.934	0.323	0.474	0.439
Departure Headway (Hd)	10.549	10.049	9.349	10.169	9.669	8.969	9.895	9.395	8.695	10.174	9.674
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	339	358	382	352	375	398	362	386	412	354	371
Service Time	8.339	7.839	7.139	7.956	7.456	6.756	7.676	7.176	6.476	7.958	7.458
HCM Lane V/C Ratio	0.15	0.542	0.27	0.304	0.8	0.123	0.221	0.927	0.325	0.475	0.439
HCM Control Delay	15.2	24.3	15.5	17.3	42.6	13	15.5	62.2	15.6	21.9	19.9
HCM Lane LOS	C	C	C	C	E	B	C	F	C	C	C
HCM 95th-tile Q	0.5	3.1	1.1	1.2	7	0.4	0.8	10.1	1.4	2.4	2.2

Intersection	
Intersection Delay, s/veh	14.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	244	44	60	232	44	32	152	44	36	129	61
Future Vol, veh/h	63	244	44	60	232	44	32	152	44	36	129	61
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	67	260	47	64	247	47	34	162	47	38	137	65
Number of Lanes	1	1	1	1	1	1	1	1	1	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	15.5	15.1	13.1	12.4
HCM LOS	C	C	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	32	152	44	63	244	44	60	232	44	36	129
LT Vol	32	0	0	63	0	0	60	0	0	36	0
Through Vol	0	152	0	0	244	0	0	232	0	0	129
RT Vol	0	0	44	0	0	44	0	0	44	0	0
Lane Flow Rate	34	162	47	67	260	47	64	247	47	38	137
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.077	0.341	0.09	0.144	0.52	0.085	0.137	0.497	0.085	0.086	0.29
Departure Headway (Hd)	8.098	7.598	6.898	7.709	7.209	6.509	7.743	7.243	6.543	8.113	7.613
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	443	474	519	466	501	550	463	499	547	442	472
Service Time	5.844	5.344	4.644	5.449	4.949	4.249	5.487	4.987	4.287	5.859	5.359
HCM Lane V/C Ratio	0.077	0.342	0.091	0.144	0.519	0.085	0.138	0.495	0.086	0.086	0.29
HCM Control Delay	11.5	14.2	10.3	11.7	17.5	9.9	11.7	17	9.9	11.6	13.5
HCM Lane LOS	B	B	B	B	C	A	B	C	A	B	B
HCM 95th-tile Q	0.2	1.5	0.3	0.5	3	0.3	0.5	2.7	0.3	0.3	1.2

HCM 6th Signalized Intersection Summary
1: Willow Avenue & Butler Avenue

11/07/2021

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	389	192	307	610	220	271
Future Volume (veh/h)	389	192	307	610	220	271
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	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	423	209	334	663	239	295
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	473	401	372	982	254	313
Arrive On Green	0.26	0.26	0.21	0.53	0.34	0.34
Sat Flow, veh/h	1856	1572	1767	1856	739	912
Grp Volume(v), veh/h	423	209	334	663	535	0
Grp Sat Flow(s),veh/h/ln	1856	1572	1767	1856	1654	0
Q Serve(g_s), s	18.6	9.7	15.6	22.1	26.6	0.0
Cycle Q Clear(g_c), s	18.6	9.7	15.6	22.1	26.6	0.0
Prop In Lane		1.00	1.00		0.45	0.55
Lane Grp Cap(c), veh/h	473	401	372	982	568	0
V/C Ratio(X)	0.89	0.52	0.90	0.68	0.94	0.00
Avail Cap(c_a), veh/h	518	439	410	1066	599	0
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	0.00
Uniform Delay (d), s/veh	30.4	27.1	32.5	14.6	27.0	0.0
Incr Delay (d2), s/veh	16.8	1.0	20.9	1.5	23.0	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	10.0	3.5	8.4	8.4	13.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	47.2	28.1	53.5	16.1	49.9	0.0
LnGrp LOS	D	C	D	B	D	A
Approach Vol, veh/h	632			997	535	
Approach Delay, s/veh	40.9			28.6	49.9	
Approach LOS	D			C	D	

Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		34.4	23.2	27.0		50.2
Change Period (Y+Rc), s		5.4	5.4	5.4		5.4
Max Green Setting (Gmax), s		30.6	19.6	23.6		48.6
Max Q Clear Time (g_c+I1), s		28.6	17.6	20.6		24.1
Green Ext Time (p_c), s		0.5	0.2	1.0		4.4

Intersection Summary	
HCM 6th Ctrl Delay	37.5
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	487	193	202	455	198	187
Future Volume (veh/h)	487	193	202	455	198	187
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	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	529	210	220	495	215	203
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	635	538	264	1054	238	225
Arrive On Green	0.34	0.34	0.15	0.57	0.28	0.28
Sat Flow, veh/h	1856	1572	1767	1856	856	808
Grp Volume(v), veh/h	529	210	220	495	419	0
Grp Sat Flow(s),veh/h/ln	1856	1572	1767	1856	1667	0
Q Serve(g_s), s	18.5	7.2	8.5	11.1	17.1	0.0
Cycle Q Clear(g_c), s	18.5	7.2	8.5	11.1	17.1	0.0
Prop In Lane		1.00	1.00		0.51	0.48
Lane Grp Cap(c), veh/h	635	538	264	1054	465	0
V/C Ratio(X)	0.83	0.39	0.83	0.47	0.90	0.00
Avail Cap(c_a), veh/h	989	838	326	1473	548	0
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	0.00
Uniform Delay (d), s/veh	21.3	17.6	29.2	9.0	24.5	0.0
Incr Delay (d2), s/veh	3.6	0.5	14.1	0.3	16.3	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	7.7	2.4	4.4	3.5	8.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.0	18.1	43.3	9.3	40.8	0.0
LnGrp LOS	C	B	D	A	D	A
Approach Vol, veh/h	739			715	419	
Approach Delay, s/veh	23.0			19.7	40.8	
Approach LOS	C			B	D	

Timer - Assigned Phs	2	3	4	8
Phs Duration (G+Y+Rc), s	25.1	15.9	29.5	45.5
Change Period (Y+Rc), s	5.4	5.4	5.4	5.4
Max Green Setting (Gmax), s	23.2	13.0	37.6	56.0
Max Q Clear Time (g_c+I1), s	19.1	10.5	20.5	13.1
Green Ext Time (p_c), s	0.6	0.1	3.6	3.2

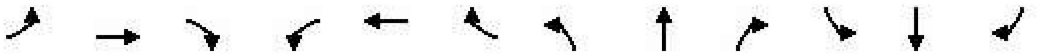
Intersection Summary	
HCM 6th Ctrl Delay	25.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary
2: Willow Avenue & Church Avenue

11/07/2021



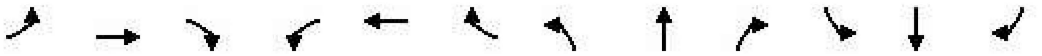
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	122	345	56	89	406	156	56	199	114	193	156	170
Future Volume (veh/h)	122	345	56	89	406	156	56	199	114	193	156	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.95	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	133	375	61	97	441	170	61	216	124	210	170	185
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	171	597	492	125	548	442	94	303	257	261	479	405
Arrive On Green	0.10	0.32	0.32	0.07	0.30	0.30	0.05	0.16	0.16	0.15	0.26	0.26
Sat Flow, veh/h	1767	1856	1531	1767	1856	1498	1767	1856	1572	1767	1856	1566
Grp Volume(v), veh/h	133	375	61	97	441	170	61	216	124	210	170	185
Grp Sat Flow(s),veh/h/ln	1767	1856	1531	1767	1856	1498	1767	1856	1572	1767	1856	1566
Q Serve(g_s), s	4.5	10.4	1.7	3.3	13.3	5.5	2.1	6.7	3.2	7.0	4.5	4.0
Cycle Q Clear(g_c), s	4.5	10.4	1.7	3.3	13.3	5.5	2.1	6.7	3.2	7.0	4.5	4.0
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	171	597	492	125	548	442	94	303	257	261	479	405
V/C Ratio(X)	0.78	0.63	0.12	0.78	0.80	0.38	0.65	0.71	0.48	0.80	0.35	0.46
Avail Cap(c_a), veh/h	306	927	765	224	841	679	256	596	505	422	771	651
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	26.8	17.5	14.5	27.7	19.8	17.0	28.2	24.0	12.6	25.0	18.4	8.5
Incr Delay (d2), s/veh	7.4	1.1	0.1	10.0	3.3	0.5	7.4	3.1	1.4	5.7	0.4	0.8
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	2.1	4.0	0.5	1.6	5.4	1.7	1.0	2.8	1.5	3.0	1.8	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.2	18.6	14.7	37.7	23.1	17.5	35.6	27.1	14.0	30.7	18.8	9.3
LnGrp LOS	C	B	B	D	C	B	D	C	B	C	B	A
Approach Vol, veh/h		569			708			401			565	
Approach Delay, s/veh		21.8			23.7			24.3			20.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.5	14.4	8.8	24.0	7.7	20.2	10.4	22.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	19.5	7.7	30.3	8.8	25.2	10.5	27.5
Max Q Clear Time (g_c+I1), s	9.0	8.7	5.3	12.4	4.1	6.5	6.5	15.3
Green Ext Time (p_c), s	0.3	1.1	0.0	2.1	0.0	1.4	0.1	2.5

Intersection Summary	
HCM 6th Ctrl Delay	22.5
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
2: Willow Avenue & Church Avenue

11/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	384	70	91	372	69	51	209	63	58	176	95
Future Volume (veh/h)	94	384	70	91	372	69	51	209	63	58	176	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	102	417	76	99	404	75	55	227	68	63	191	103
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	138	556	472	136	554	470	96	334	283	105	343	291
Arrive On Green	0.08	0.30	0.30	0.08	0.30	0.30	0.05	0.18	0.18	0.06	0.19	0.19
Sat Flow, veh/h	1767	1856	1572	1767	1856	1572	1767	1856	1572	1767	1856	1572
Grp Volume(v), veh/h	102	417	76	99	404	75	55	227	68	63	191	103
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1767	1856	1572	1767	1856	1572	1767	1856	1572
Q Serve(g_s), s	2.7	9.5	1.1	2.6	9.2	1.6	1.4	5.4	1.2	1.6	4.4	2.7
Cycle Q Clear(g_c), s	2.7	9.5	1.1	2.6	9.2	1.6	1.4	5.4	1.2	1.6	4.4	2.7
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	138	556	472	136	554	470	96	334	283	105	343	291
V/C Ratio(X)	0.74	0.75	0.16	0.73	0.73	0.16	0.57	0.68	0.24	0.60	0.56	0.35
Avail Cap(c_a), veh/h	444	1257	1065	403	1213	1028	267	814	690	335	885	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	21.2	14.8	5.1	21.2	14.8	12.1	21.7	18.0	7.5	21.5	17.4	16.7
Incr Delay (d2), s/veh	7.4	2.1	0.2	7.1	1.9	0.2	5.2	2.4	0.4	5.3	1.4	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	1.2	3.4	0.5	1.2	3.3	0.5	0.6	2.1	0.5	0.7	1.7	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.6	16.9	5.2	28.3	16.6	12.3	26.9	20.4	7.9	26.8	18.8	17.4
LnGrp LOS	C	B	A	C	B	B	C	C	A	C	B	B
Approach Vol, veh/h		595			578			350			357	
Approach Delay, s/veh		17.4			18.1			19.0			19.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	12.9	8.1	18.6	7.1	13.2	8.2	18.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.9	20.6	10.7	31.8	7.1	22.4	11.8	30.7
Max Q Clear Time (g_c+I1), s	3.6	7.4	4.6	11.5	3.4	6.4	4.7	11.2
Green Ext Time (p_c), s	0.0	1.1	0.1	2.6	0.0	1.1	0.1	2.4

Intersection Summary	
HCM 6th Ctrl Delay	18.4
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
3: Willow Avenue & Jensen Avenue

11/07/2021

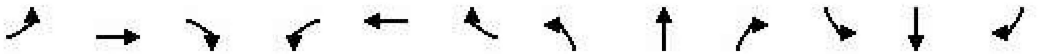
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	619	52	54	1620	72	30	19	18	55	55	207
Future Volume (veh/h)	99	619	52	54	1620	72	30	19	18	55	55	207
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	108	673	57	59	1761	78	33	21	20	60	60	225
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	134	1419	120	79	1992	88	61	226	215	80	499	423
Arrive On Green	0.08	0.43	0.43	0.04	0.40	0.40	0.03	0.26	0.26	0.05	0.27	0.27
Sat Flow, veh/h	1767	3290	278	1767	4973	220	1767	874	832	1767	1856	1572
Grp Volume(v), veh/h	108	360	370	59	1195	644	33	0	41	60	60	225
Grp Sat Flow(s),veh/h/ln	1767	1763	1805	1767	1689	1816	1767	0	1706	1767	1856	1572
Q Serve(g_s), s	6.8	16.5	16.5	3.7	37.1	37.2	2.1	0.0	2.1	3.8	2.8	10.4
Cycle Q Clear(g_c), s	6.8	16.5	16.5	3.7	37.1	37.2	2.1	0.0	2.1	3.8	2.8	10.4
Prop In Lane	1.00		0.15	1.00		0.12	1.00		0.49	1.00		1.00
Lane Grp Cap(c), veh/h	134	761	779	79	1353	727	61	0	441	80	499	423
V/C Ratio(X)	0.81	0.47	0.47	0.75	0.88	0.88	0.55	0.00	0.09	0.75	0.12	0.53
Avail Cap(c_a), veh/h	177	766	784	152	1420	763	102	0	441	111	499	423
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	23.0	23.0	53.3	31.4	31.4	53.7	0.0	31.8	53.3	31.2	19.9
Incr Delay (d2), s/veh	18.2	0.5	0.5	13.0	6.7	11.7	7.4	0.0	0.4	16.8	0.5	4.7
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	3.6	6.4	6.5	1.9	15.0	17.1	1.0	0.0	0.9	2.0	1.3	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.7	23.4	23.4	66.3	38.2	43.1	61.1	0.0	32.3	70.2	31.7	24.7
LnGrp LOS	E	C	C	E	D	D	E	A	C	E	C	C
Approach Vol, veh/h		838			1898			74			345	
Approach Delay, s/veh		29.4			40.7			45.1			33.8	
Approach LOS		C			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	35.7	11.6	55.3	10.4	35.8	15.0	51.8
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	5.4	6.5	6.5
Max Green Setting (Gmax), s	7.1	29.2	9.7	49.1	6.5	29.8	11.3	47.5
Max Q Clear Time (g_c+I1), s	5.8	4.1	5.7	18.5	4.1	12.4	8.8	39.2
Green Ext Time (p_c), s	0.0	0.1	0.0	4.0	0.0	0.9	0.0	6.1

Intersection Summary	
HCM 6th Ctrl Delay	37.1
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary
3: Willow Avenue & Jensen Avenue

11/07/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	1301	42	22	770	71	82	102	69	62	24	104
Future Volume (veh/h)	204	1301	42	22	770	71	82	102	69	62	24	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	222	1414	46	24	837	77	89	111	75	67	26	113
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	254	1535	50	50	1533	140	182	272	184	86	388	329
Arrive On Green	0.14	0.44	0.44	0.03	0.32	0.32	0.10	0.26	0.26	0.05	0.21	0.21
Sat Flow, veh/h	1767	3485	113	1767	4722	433	1767	1032	698	1767	1856	1572
Grp Volume(v), veh/h	222	714	746	24	598	316	89	0	186	67	26	113
Grp Sat Flow(s),veh/h/ln	1767	1763	1835	1767	1689	1778	1767	0	1730	1767	1856	1572
Q Serve(g_s), s	14.0	43.3	43.5	1.5	16.5	16.6	5.4	0.0	10.1	4.3	1.3	4.8
Cycle Q Clear(g_c), s	14.0	43.3	43.5	1.5	16.5	16.6	5.4	0.0	10.1	4.3	1.3	4.8
Prop In Lane	1.00		0.06	1.00		0.24	1.00		0.40	1.00		1.00
Lane Grp Cap(c), veh/h	254	776	808	50	1096	577	182	0	456	86	388	329
V/C Ratio(X)	0.87	0.92	0.92	0.48	0.55	0.55	0.49	0.00	0.41	0.78	0.07	0.34
Avail Cap(c_a), veh/h	391	816	849	95	1096	577	199	0	456	103	388	329
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.5	29.9	29.9	54.3	31.4	31.5	48.0	0.0	34.5	53.4	36.0	18.0
Incr Delay (d2), s/veh	12.8	15.1	15.0	7.1	0.6	1.1	2.0	0.0	2.7	26.9	0.3	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	19.6	20.5	0.7	6.4	6.8	2.4	0.0	4.3	2.5	0.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.4	45.0	44.9	61.5	32.0	32.6	50.1	0.0	37.2	80.2	36.3	20.8
LnGrp LOS	E	D	D	E	C	C	D	A	D	F	D	C
Approach Vol, veh/h		1682			938			275			206	
Approach Delay, s/veh		47.0			32.9			41.3			42.1	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	36.4	9.7	56.5	18.2	29.1	22.8	43.3
Change Period (Y+Rc), s	5.4	6.5	6.5	6.5	6.5	5.4	6.5	6.5
Max Green Setting (Gmax), s	6.6	29.9	6.1	52.5	12.8	23.7	25.1	33.5
Max Q Clear Time (g_c+I1), s	6.3	12.1	3.5	45.5	7.4	6.8	16.0	18.6
Green Ext Time (p_c), s	0.0	0.8	0.0	4.5	0.1	0.4	0.4	4.5

Intersection Summary	
HCM 6th Ctrl Delay	41.9
HCM 6th LOS	D

APPENDIX D

Collision Data Worksheets

SWITRS Query & Map

Result Summary

Date 01/01/2016 - 12/31/2020
County Fresno
City Fresno

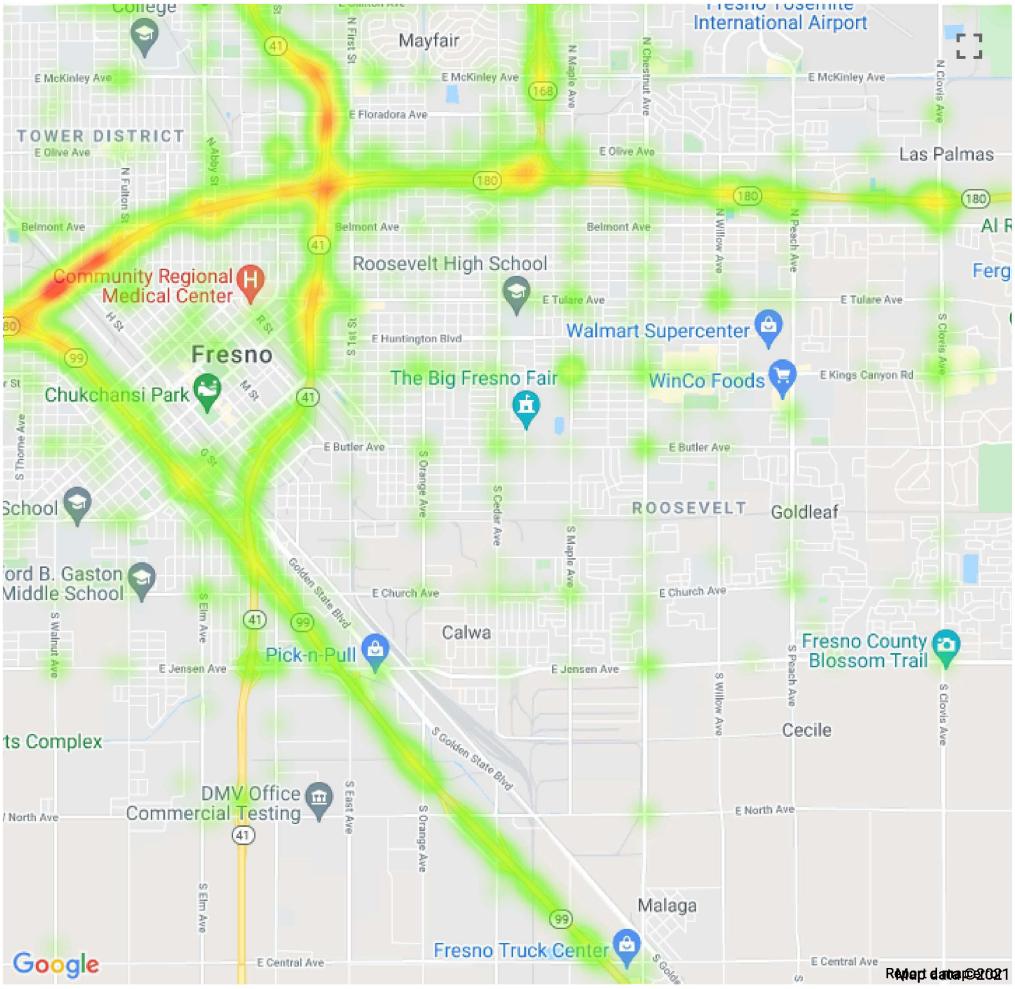
Change Filters | Download Raw Data

Total Crashes	3,910	**Total Victims**	242 Killed & 5,395 Injured	**State Highway**	2,650 (67.8%)
Ped Crashes	249 (6.4%)	**Bike Crashes**	92 (2.4%)	**Motorcycle Crashes**	189 (4.8%)

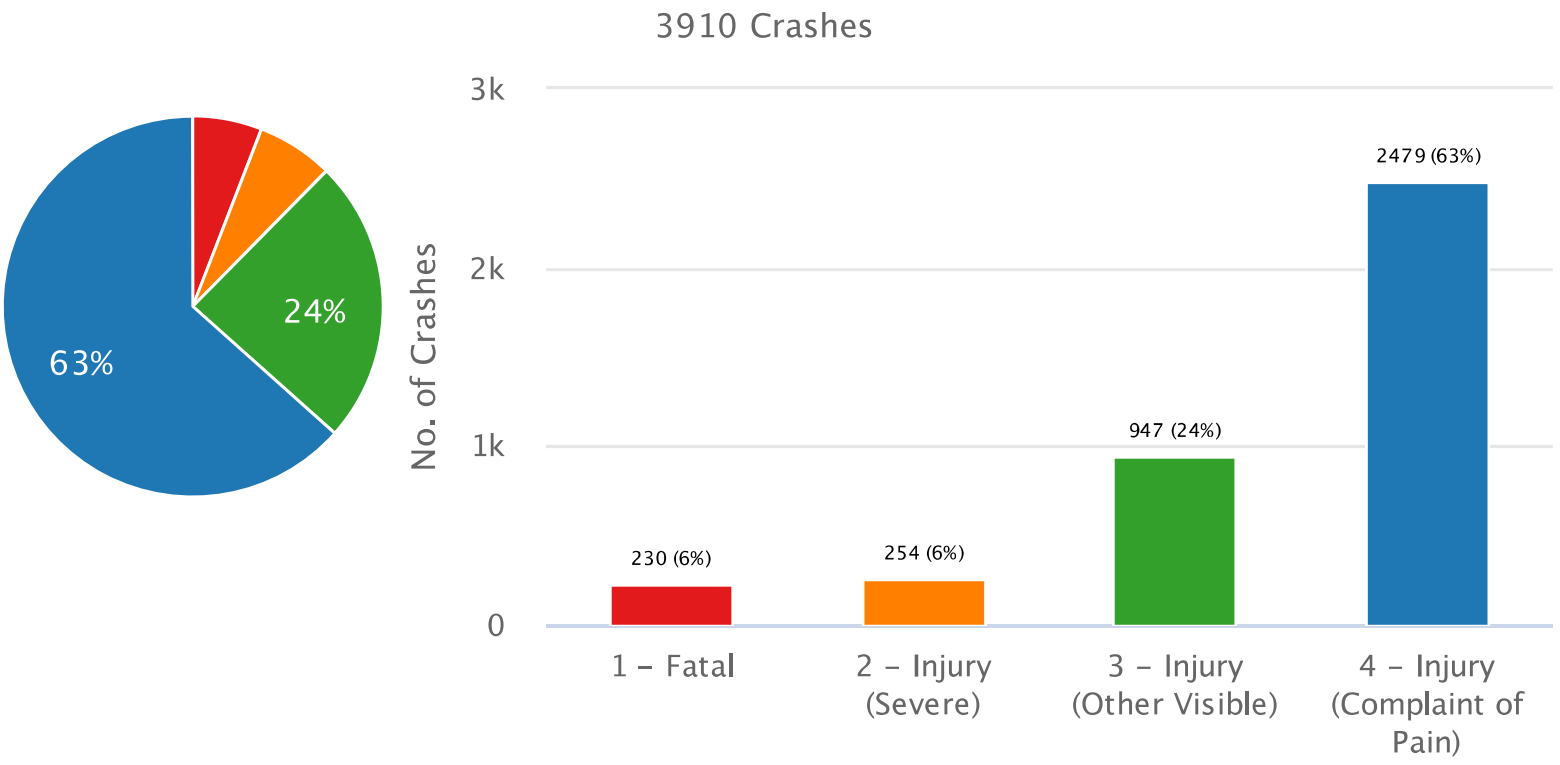
Map

Results Map: 3,806 of 3,910 (97.3%) Crashes Mapped.

Cluster | Heatmap | Traffic | Bicycling | List Unmapped Crashes



Number of Crashes by Crash Severity



Crash Severity

- 1 – Fatal
- 2 – Injury (Severe)
- 3 – Injury (Other Visible)
- 4 – Injury (Complaint of Pain)

BerkeleySafeTREC

Crash Details for: Case ID 7182524

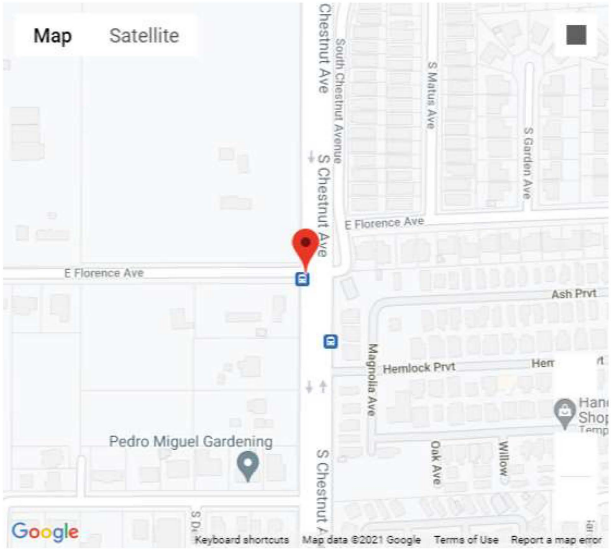
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	02/01/2016 17:39
Location (Intersection)	Chestnut Av & Florence Av
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Geocoded Location	36.71778, -119.73662

Type of Crash	H - Other
Motor Vehicle Involved With	G - Bicycle
Crash Severity	3 - Injury (Other Visible)
PCF Violation Category	11 - Pedestrian Violation
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	Yes
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	4 - Bicyclist	L - Bicycle	Yes	West	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	North	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	4 - Bicyclist	M - Male	9	6 - Suspected Minor Injury

BerkeleySafeTREC

Crash Details for: Case ID 8014686

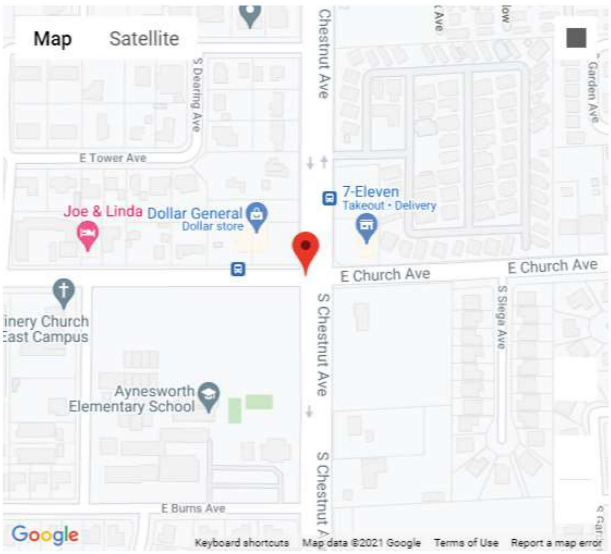
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	02/12/2016 23:43
Location (Intersection)	South Chestnut Av & East Church Av
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Geocoded Location	36.71418, -119.7366399

Type of Crash	G - Vehicle/Pedestrian
Motor Vehicle Involved With	B - Pedestrian
Crash Severity	2 - Injury (Severe)
PCF Violation Category	- - Not Stated
Weather	A - Clear
Alcohol Involved	Yes

Pedestrian Accident	Yes	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 3

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	South	B - Proceeding Straight
2	2 - Pedestrian	N - Pedestrian	No	West	R - Other
3	2 - Pedestrian	N - Pedestrian	No	West	R - Other

Victims: 2

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	3 - Pedestrian	M - Male	37	5 - Suspected Serious Injury
3	3 - Pedestrian	M - Male	13	7 - Possible Injury

BerkeleySafeTREC

Crash Details for: Case ID 8404643

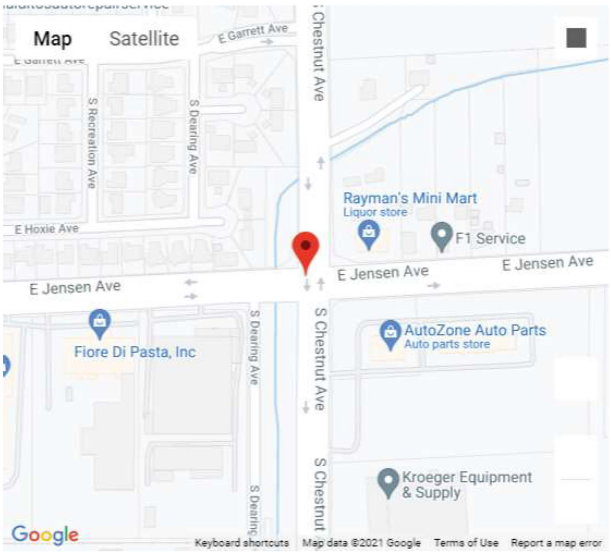
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	11/05/2017 01:19
Location (Intersection)	Jensen Av & Chestnut Av
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Geocoded Location	36.70703, -119.7365299

Type of Crash	D - Broadside
Motor Vehicle Involved With	C - Other Motor Vehicle
Crash Severity	1 - Fatal
PCF Violation Category	01 - Driving or Bicycling Under the Influence of Alcohol or Drug
Weather	A - Clear
Alcohol Involved	Yes

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	West	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	E - Making Left Turn

Victims: 4

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	1 - Driver	M - Male	30	1 - Killed
1	2 - Passenger	M - Male	31	1 - Killed
2	1 - Driver	F - Female	44	5 - Suspected Serious Injury

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	2 - Passenger	F - Female	20	6 - Suspected Minor Injury

BerkeleySafeTREC

Crash Details for: Case ID 8404672

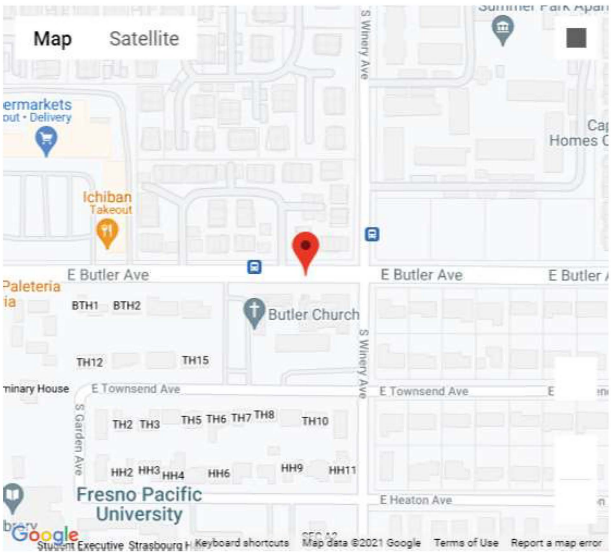
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	09/27/2017 18:17
Location (Intersection)	Butler Av & Winery Av
Dist. & Dir. from Intersection	177.00 ft West
State Highway	No
Geocoded Location	36.72865, -119.7325336

Type of Crash	G - Vehicle/Pedestrian
Motor Vehicle Involved With	B - Pedestrian
Crash Severity	1 - Fatal
PCF Violation Category	03 - Unsafe Speed
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	Yes	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	West	B - Proceeding Straight
2	2 - Pedestrian	N - Pedestrian	No	North	- - Not Stated

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	3 - Pedestrian	F - Female	41	1 - Killed

BerkeleySafeTREC

Crash Details for: Case ID 8404673

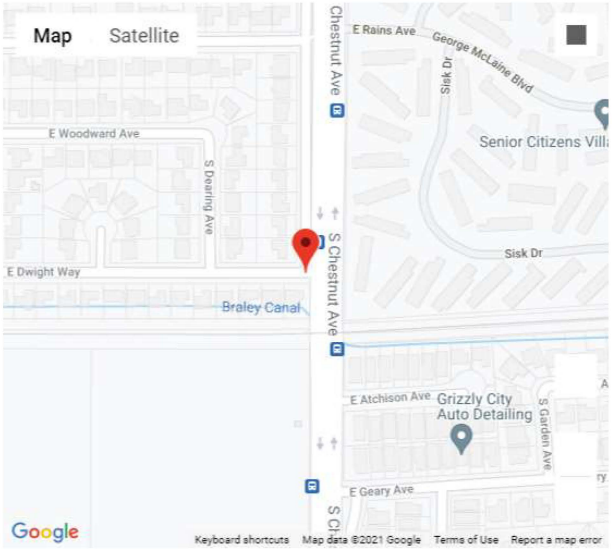
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	08/22/2017 06:08
Location (Intersection)	Chestnut Av & Dwight Wy
Dist. & Dir. from Intersection	140.00 ft South
State Highway	No
Geocoded Location	36.72185, -119.73671

Type of Crash	G - Vehicle/Pedestrian
Motor Vehicle Involved With	B - Pedestrian
Crash Severity	1 - Fatal
PCF Violation Category	11 - Pedestrian Violation
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	Yes	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	2 - Pedestrian	N - Pedestrian	Yes	South	- - Not Stated
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	North	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	3 - Pedestrian	M - Male	62	1 - Killed

BerkeleySafeTREC

Crash Details for: Case ID 8465835

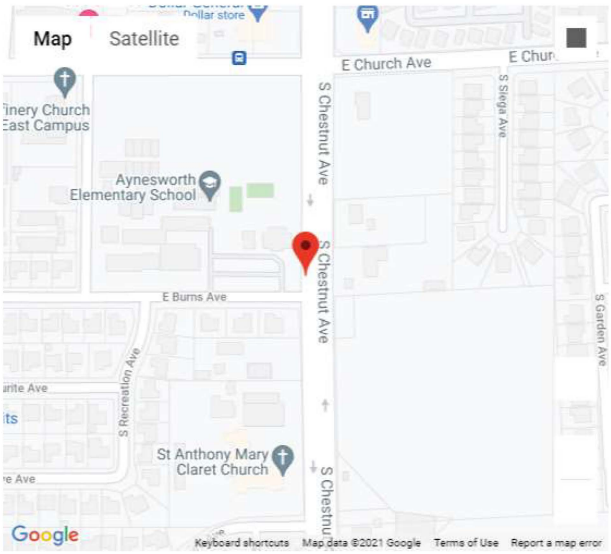
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	02/17/2019 18:50
Location (Intersection)	Chestnut Av & Burns Av
Dist. & Dir. from Intersection	66.00 ft North
State Highway	No
Geocoded Location	36.712513, -119.7366562

Type of Crash	C - Rear End
Motor Vehicle Involved With	C - Other Motor Vehicle
Crash Severity	1 - Fatal
PCF Violation Category	01 - Driving or Bicycling Under the Influence of Alcohol or Drug
Weather	B - Cloudy
Alcohol Involved	Yes

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 3

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	North	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	North	A - Stopped
3	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	North	B - Proceeding Straight

Victims: 8

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	1 - Driver	M - Male	31	6 - Suspected Minor Injury

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	1 - Driver	M - Male	59	6 - Suspected Minor Injury
2	2 - Passenger	F - Female	29	6 - Suspected Minor Injury
2	2 - Passenger	M - Male	3	6 - Suspected Minor Injury
2	2 - Passenger	M - Male	19	1 - Killed
2	2 - Passenger	M - Male	5	6 - Suspected Minor Injury
3	2 - Passenger	F - Female	44	0 - No Injury
3	2 - Passenger	M - Male	10	0 - No Injury

BerkeleySafeTREC

Crash Details for: Case ID 8465884

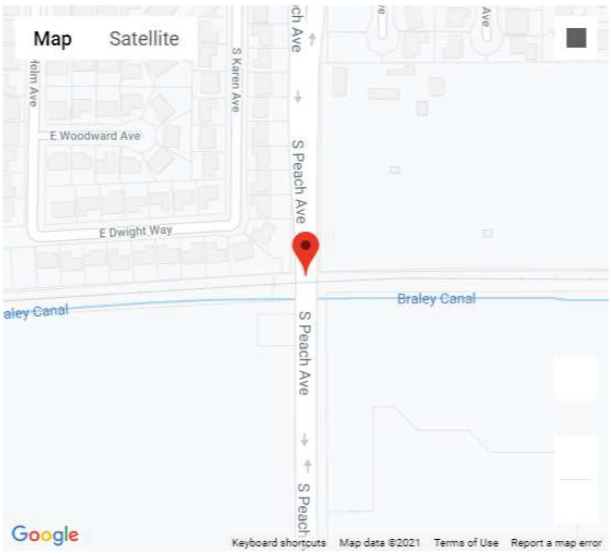
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	04/21/2019 02:21
Location (Intersection)	Peach Av & San Joaquin Crossing Gate
Dist. & Dir. from Intersection	5.00 ft West
State Highway	No
Geocoded Location	36.7223053, -119.7185364

Type of Crash	E - Hit Object
Motor Vehicle Involved With	I - Fixed Object
Crash Severity	1 - Fatal
PCF Violation Category	01 - Driving or Bicycling Under the Influence of Alcohol or Drug
Weather	A - Clear
Alcohol Involved	Yes

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 1

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	South	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	1 - Driver	M - Male	21	1 - Killed

BerkeleySafeTREC

Crash Details for: Case ID 81132447

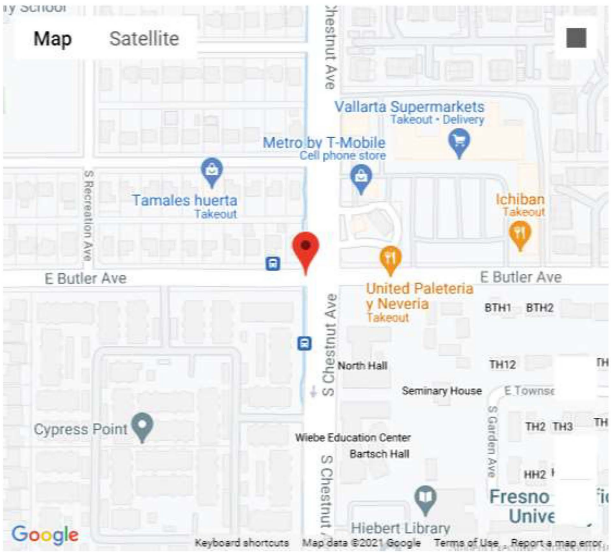
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	11/28/2019 11:07
Location (Intersection)	E Butler Ave & S. Chestnut Avenue
Dist. & Dir. from Intersection	18.00 ft West
State Highway	No
Geocoded Location	36.7286682, -119.7366028

Type of Crash	C - Rear End
Motor Vehicle Involved With	C - Other Motor Vehicle
Crash Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	- - Not Stated
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	A - Stopped

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	2 - Passenger	F - Female	69	7 - Possible Injury

BerkeleySafeTREC

Crash Details for: Case ID 81191568

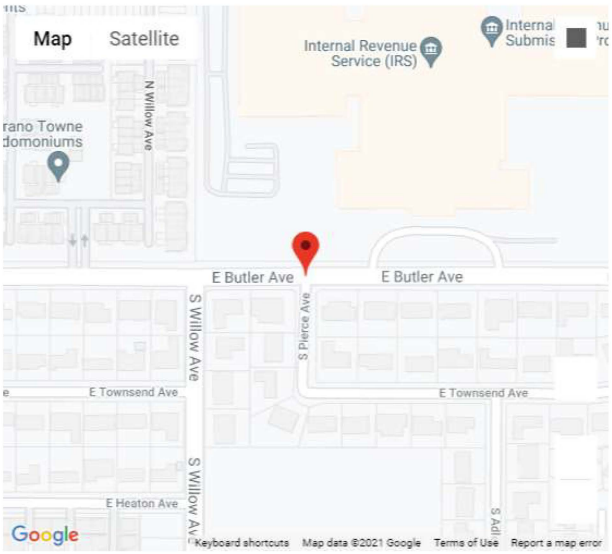
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	01/09/2020 05:10
Location (Intersection)	5045 E Butler Av & Pierce Ave
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Geocoded Location	36.7286606, -119.7263489

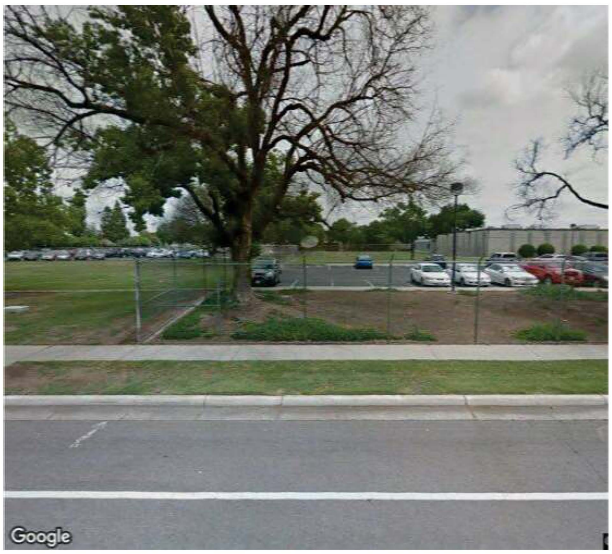
Type of Crash	G - Vehicle/Pedestrian
Motor Vehicle Involved With	B - Pedestrian
Crash Severity	3 - Injury (Other Visible)
PCF Violation Category	00 - Unknown
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	Yes	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View



Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	West	E - Making Left Turn
2	2 - Pedestrian	N - Pedestrian	No	North	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	3 - Pedestrian	F - Female	66	6 - Suspected Minor Injury

BerkeleySafeTREC

Crash Details for: Case ID 81212049

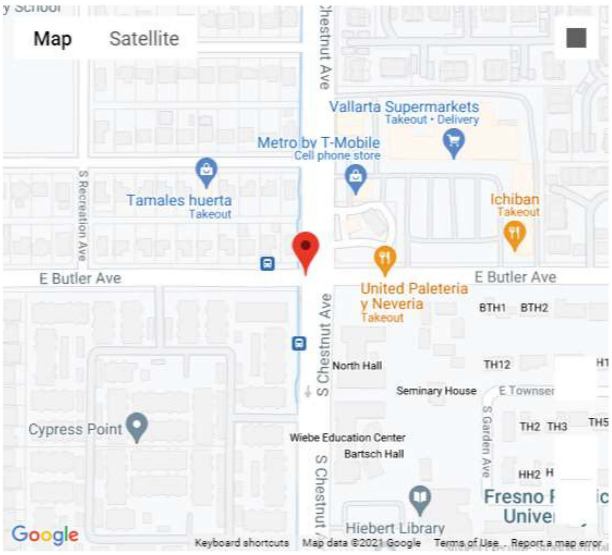
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	03/17/2020 09:23
Location (Intersection)	Chestnut Ave & Butler Ave
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Geocoded Location	36.7286682, -119.7365417

Type of Crash	D - Broadside
Motor Vehicle Involved With	C - Other Motor Vehicle
Crash Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	09 - Automobile Right of Way
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	North	E - Making Left Turn
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	South	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	1 - Driver	F - Female	59	7 - Possible Injury

BerkeleySafeTREC

Crash Details for: Case ID 81222778

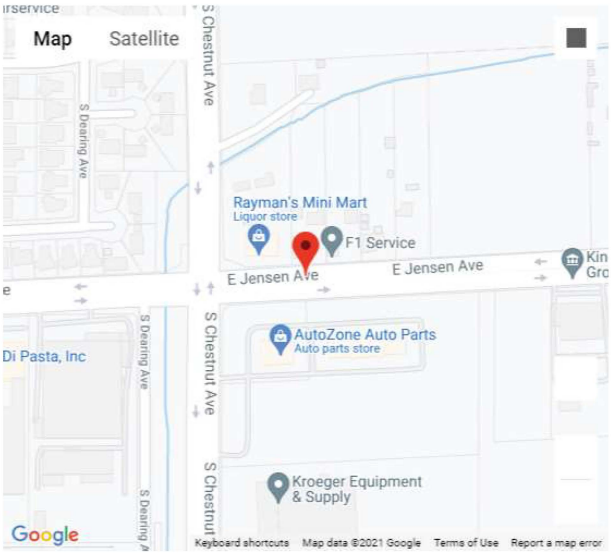
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	04/05/2020 14:25
Location (Intersection)	Jensen Ave & Chestnut Ave
Dist. & Dir. from Intersection	320.00 ft East
State Highway	No
Geocoded Location	36.7070694, -119.7354431

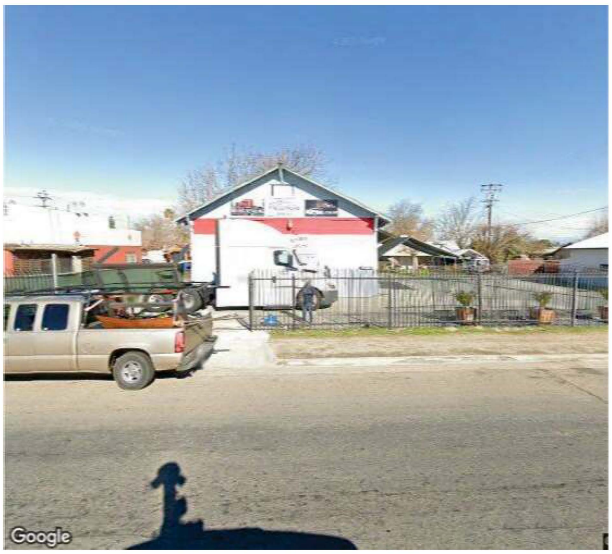
Type of Crash	C - Rear End
Motor Vehicle Involved With	C - Other Motor Vehicle
Crash Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	03 - Unsafe Speed
Weather	C - Raining
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View



Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	D - Pickup or Panel Truck	Yes	East	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	B - Proceeding Straight

Victims: 2

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	2 - Passenger	F - Female	4	7 - Possible Injury
2	2 - Passenger	F - Female	5	7 - Possible Injury

BerkeleySafeTREC

Crash Details for: Case ID 81228699

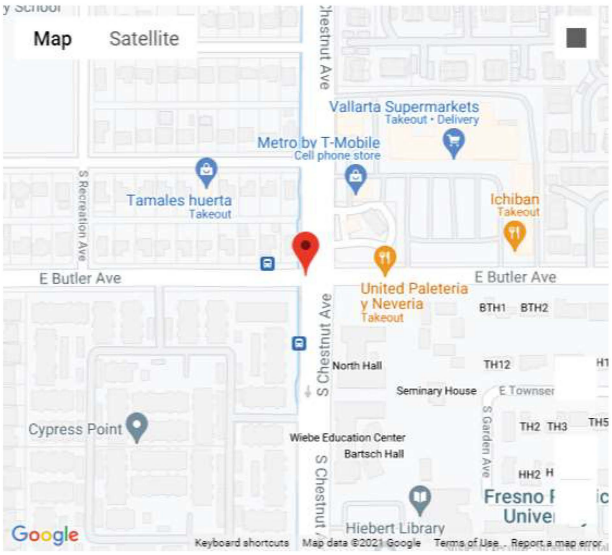
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	04/16/2020 16:46
Location (Intersection)	Chestnut Ave & Butler Ave
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Geocoded Location	36.7286682, -119.7365417

Type of Crash	D - Broadside
Motor Vehicle Involved With	C - Other Motor Vehicle
Crash Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	17 - Other Hazardous Violation
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	South	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	- - Not Stated	No	West	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	1 - Driver	F - Female	58	7 - Possible Injury

BerkeleySafeTREC

Crash Details for: Case ID 81241866

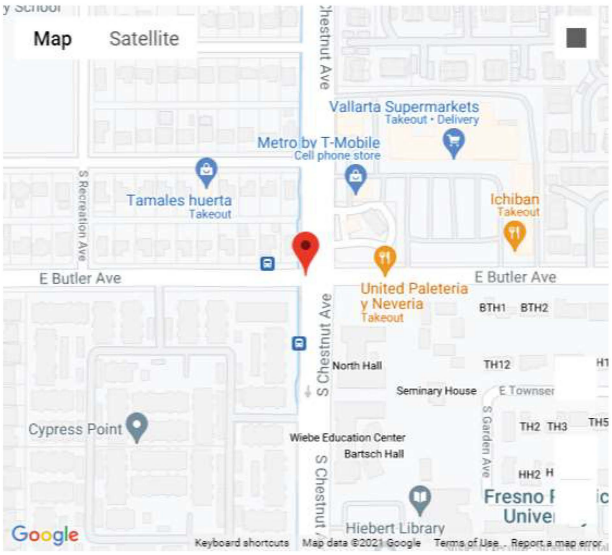
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	05/24/2020 20:52
Location (Intersection)	E Butler Ave & S Chestnut Ave
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Geocoded Location	36.7286682, -119.7365417

Type of Crash	G - Vehicle/Pedestrian
Motor Vehicle Involved With	B - Pedestrian
Crash Severity	3 - Injury (Other Visible)
PCF Violation Category	11 - Pedestrian Violation
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	Yes	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	2 - Pedestrian	N - Pedestrian	Yes	North	- - Not Stated
2	1 - Driver (including Hit and Run)	D - Pickup or Panel Truck	No	East	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	3 - Pedestrian	M - Male	35	6 - Suspected Minor Injury

BerkeleySafeTREC

Crash Details for: Case ID 81259416

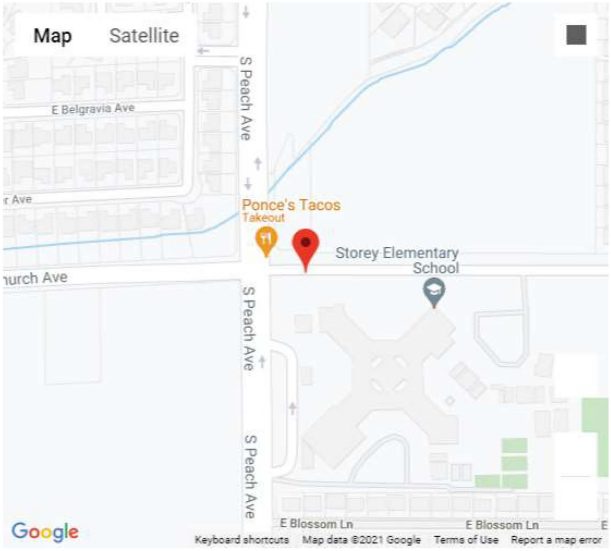
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	06/23/2020 14:38
Location (Intersection)	Church Ave & Peach Ave
Dist. & Dir. from Intersection	167.00 ft East
State Highway	No
Geocoded Location	36.7148895, -119.7179642

Type of Crash	B - Sideswipe
Motor Vehicle Involved With	C - Other Motor Vehicle
Crash Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	08 - Improper Turning
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	East	F - Making U-Turn
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	1 - Driver	F - Female	71	7 - Possible Injury

BerkeleySafeTREC

Crash Details for: Case ID 81270019

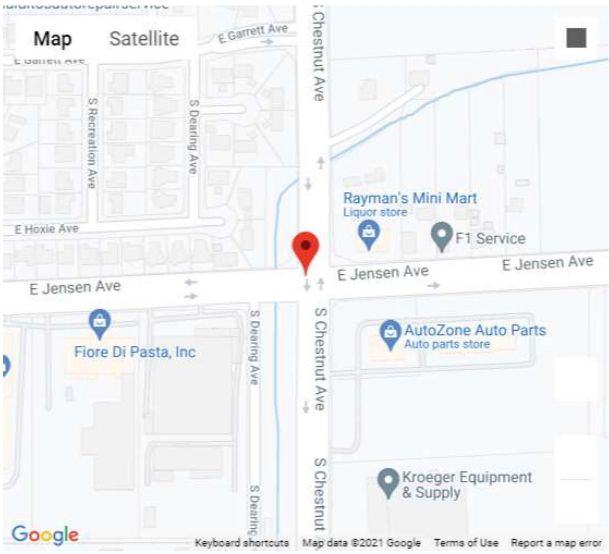
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	07/13/2020 09:25
Location (Intersection)	Jensen Ave & Chestnut Ave
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Geocoded Location	36.7070313, -119.7365265

Type of Crash	A - Head-On
Motor Vehicle Involved With	C - Other Motor Vehicle
Crash Severity	3 - Injury (Other Visible)
PCF Violation Category	12 - Traffic Signals and Signs
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 4

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	East	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	South	B - Proceeding Straight
3	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	A - Stopped
4	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	A - Stopped

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
4	1 - Driver	M - Male	56	6 - Suspected Minor Injury

BerkeleySafeTREC

Crash Details for: Case ID 81296551

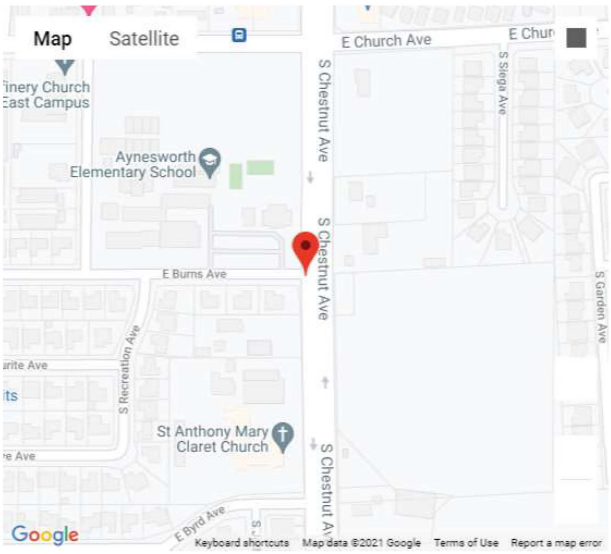
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	08/28/2020 13:32
Location (Intersection)	Chestnut Ave & Burns Ave
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Geocoded Location	36.7123299, -119.7366562

Type of Crash	D - Broadside
Motor Vehicle Involved With	C - Other Motor Vehicle
Crash Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	09 - Automobile Right of Way
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	East	E - Making Left Turn
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	South	B - Proceeding Straight

Victims: 2

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	1 - Driver	F - Female	27	7 - Possible Injury
2	1 - Driver	F - Female	34	7 - Possible Injury

BerkeleySafeTREC

Crash Details for: Case ID 81302624

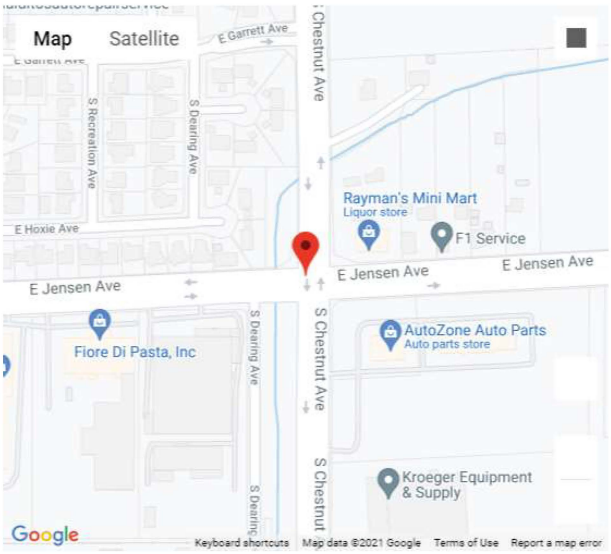
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	09/05/2020 22:42
Location (Intersection)	Jensen Ave & Chestnut Ave
Dist. & Dir. from Intersection	At Intersection
State Highway	No
Geocoded Location	36.7070313, -119.7365265

Type of Crash	D - Broadside
Motor Vehicle Involved With	C - Other Motor Vehicle
Crash Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	22 - Other Improper Driving
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	J - Emergency Vehicle	Yes	West	B - Proceeding Straight
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	South	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	2 - Passenger	M - Male	24	7 - Possible Injury

BerkeleySafeTREC

Crash Details for: Case ID 81347370

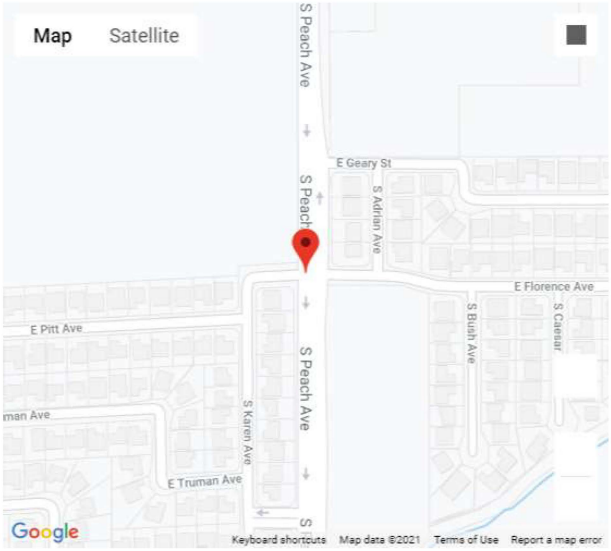
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	10/25/2020 17:57
Location (Intersection)	Peach Ave & Florence Ave
Dist. & Dir. from Intersection	At Intersection
State Highway Info	N/A
Geocoded Location	36.7185402, -119.7185593

Type of Crash	E - Hit Object
Motor Vehicle Involved With	I - Fixed Object
Crash Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	08 - Improper Turning
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 1

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	D - Pickup or Panel Truck	Yes	South	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	2 - Passenger	M - Male	19	7 - Possible Injury

BerkeleySafeTREC

Crash Details for: Case ID 81352022

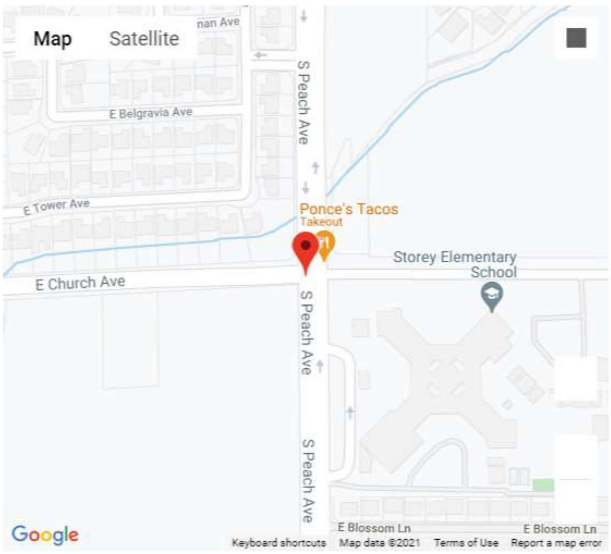
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	08/16/2020 12:05
Location (Intersection)	Peach Ave & Church Ave
Dist. & Dir. from Intersection	At Intersection
State Highway Info	N/A
Geocoded Location	36.714901, -119.7185287

Type of Crash	D - Broadside
Motor Vehicle Involved With	I - Fixed Object
Crash Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	08 - Improper Turning
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	B - Passenger Car with Trailer	Yes	North	D - Making Right Turn
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	North	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
2	1 - Driver	F - Female	22	7 - Possible Injury

BerkeleySafeTREC

Crash Details for: Case ID 81383835

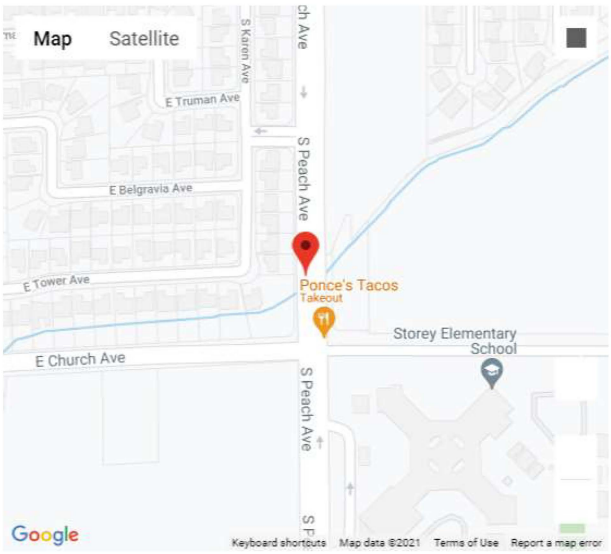
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	12/29/2020 11:23
Location (Intersection)	Peach Ave & Church Ave
Dist. & Dir. from Intersection	221.00 ft North
State Highway	No
Geocoded Location	36.7155075, -119.7185364

Type of Crash	F - Overturned
Motor Vehicle Involved With	J - Other Object
Crash Severity	4 - Injury (Complaint of Pain)
PCF Violation Category	03 - Unsafe Speed
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 1

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	Yes	North	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	1 - Driver	M - Male	31	7 - Possible Injury

BerkeleySafeTREC

Crash Details for: Case ID 90665176

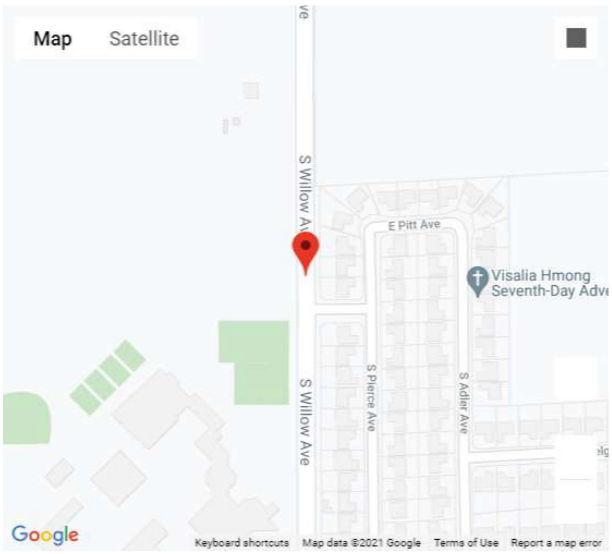
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	02/09/2018 14:42
Location (Intersection)	Willow Ave & Truman Ave
Dist. & Dir. from Intersection	105.00 ft North
State Highway	No
Geocoded Location	36.7174683, -119.7274704

Type of Crash	D - Broadside
Motor Vehicle Involved With	G - Bicycle
Crash Severity	3 - Injury (Other Visible)
PCF Violation Category	08 - Improper Turning
Weather	A - Clear
Alcohol Involved	No

Pedestrian Accident	No	**Bicycle Accident**	Yes
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	4 - Bicyclist	L - Bicycle	Yes	West	M - Other Unsafe Turning
2	1 - Driver (including Hit and Run)	H - Schoolbus	No	North	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	4 - Bicyclist	M - Male	63	6 - Suspected Minor Injury

BerkeleySafeTREC

Crash Details for: Case ID 90791900

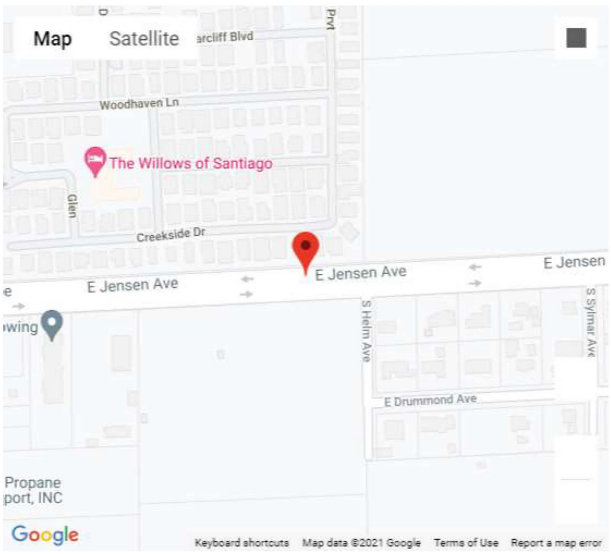
Crash Information

County	Fresno
City	Fresno
Date & Time (M/D/Y)	08/08/2018 21:25
Location (Intersection)	Jensen Avenue E/b & South Helm Avenue
Dist. & Dir. from Intersection	164.00 ft West
State Highway	No
Geocoded Location	36.7075844, -119.7234802

Type of Crash	G - Vehicle/Pedestrian
Motor Vehicle Involved With	B - Pedestrian
Crash Severity	2 - Injury (Severe)
PCF Violation Category	11 - Pedestrian Violation
Weather	A - Clear
Alcohol Involved	Yes

Pedestrian Accident	Yes	**Bicycle Accident**	No
Motorcycle Accident	No	**Truck Accident**	No

Map View



Street View

Parties: 2

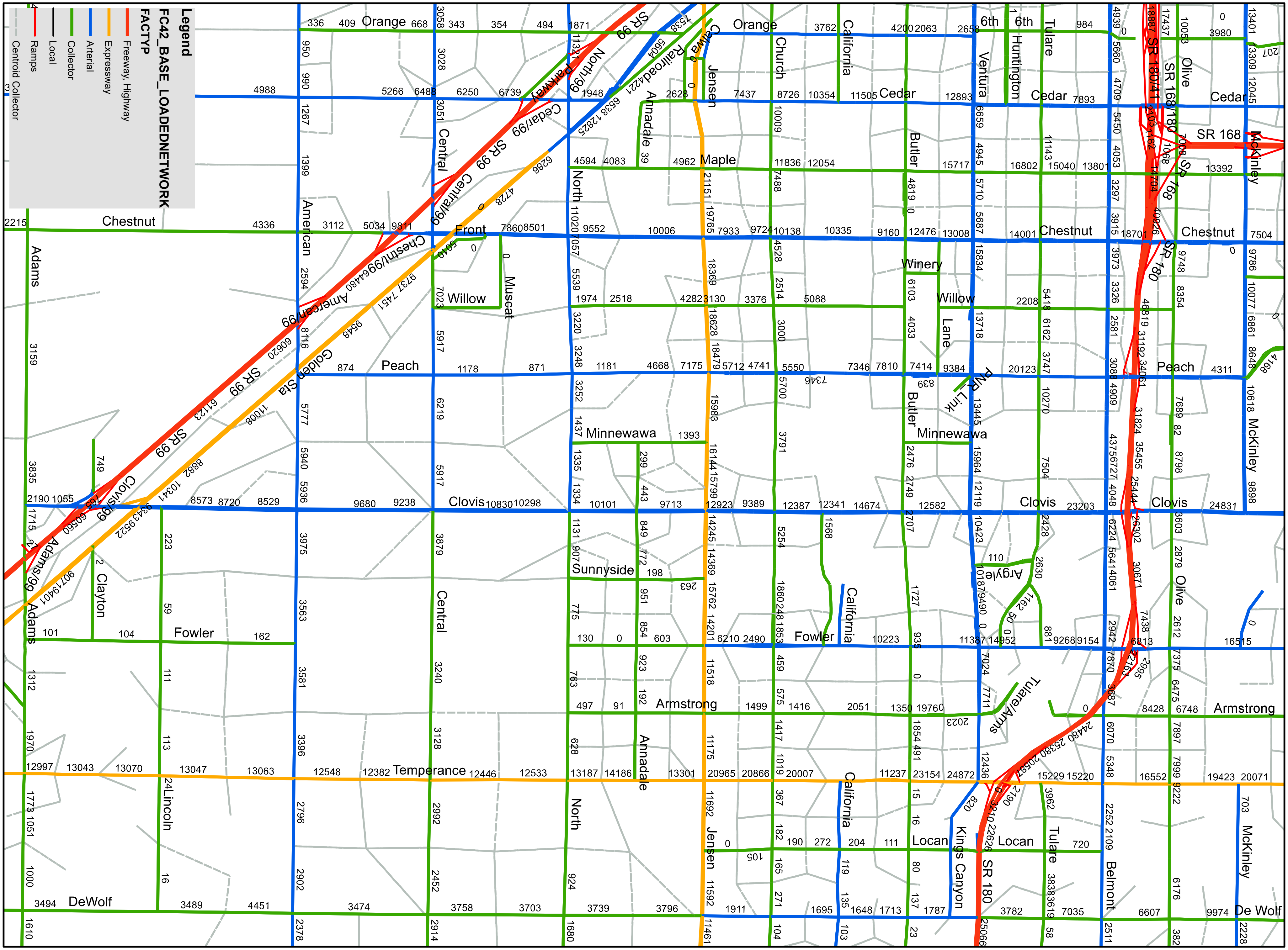
Party Number	Party Type	Statewide Vehicle Type	At Fault	Party Direction	Movement Preceding Collision
1	2 - Pedestrian	N - Pedestrian	Yes	East	- - Not Stated
2	1 - Driver (including Hit and Run)	A - Passenger Car/Station Wagon	No	East	B - Proceeding Straight

Victims: 1

Party Number	Victim Role	Victim Gender	Victim Age	Victim Degree of Injury
1	3 - Pedestrian	M - Male	45	5 - Suspected Serious Injury

APPENDIX E

2042 Future Loaded Network


Legend
FC42_BASE_LOADEDNETWORK
FACTYP
Freeway, Highway
Expressway
Arterial
Collector
Local
Ramps
Centroid Collector
Orange
Cedar
Maple
Chestnut
Front
Willow
Peach
Minnewawa
Clovis
Sunnyside
Fowler
Armstrong
Temperance
Locan
DeWolf
De Wolf
Adams
Clayton
Lincoln
American
Central
Muscat
North
Annadale
Jensen
Church
California
Butler
Winery
Lane
Ventura
6th
Huntington
Tulare
Olive
McKinley
Belmont
Kings Canyon
SR 99
SR 168
SR 180
SR 180/41
PNR_Link
Argyle
Golden Sta
Railroad
Tulare/Arms
North/99
Cedar/99
Central/99
Chestnut/99
American/99
Clovis/99
Adams/99
Parkway

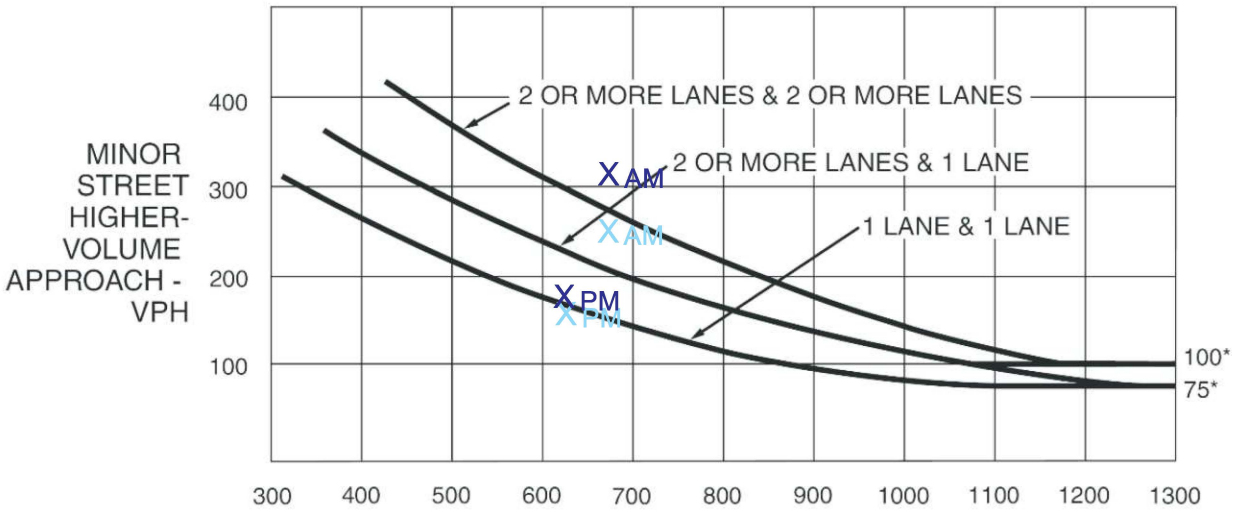
APPENDIX F

TRAFFIC SIGNAL WARRANTS

Church Ave @ Willow Ave

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Legend:

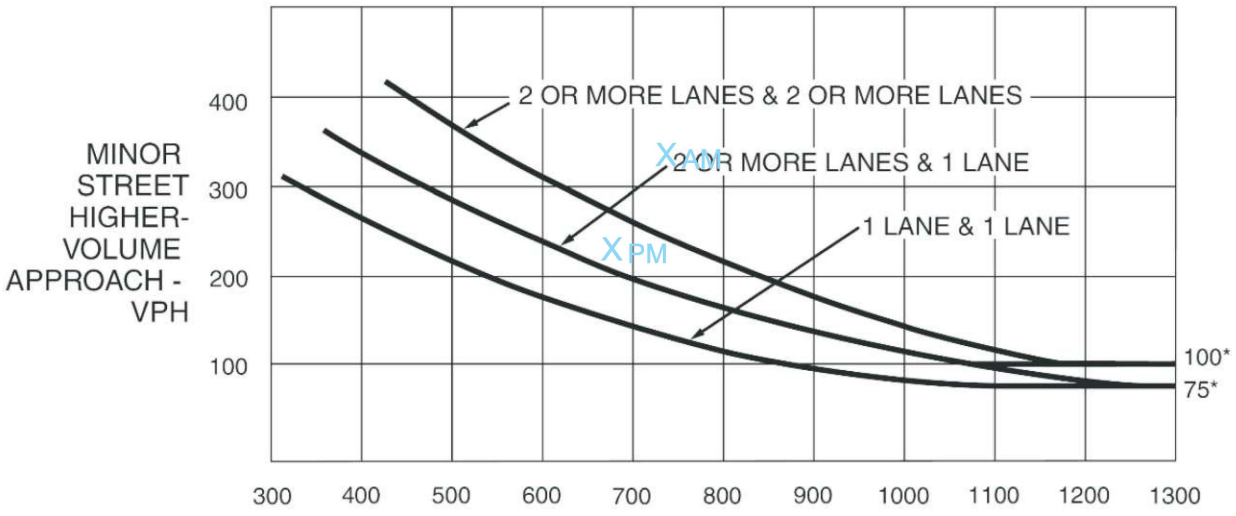
X AM X PM Existing

X AM X PM Existing + Project

Church Ave @ Willow Ave

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



MAJOR STREET—TOTAL OF BOTH APPROACHES—
VEHICLES PER HOUR (VPH)

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Legend:

X_{AM} X_{PM} Near Term + Project

24 Hour Roadway Segment Count

Church Avenue, East of Willow Avenue

City of Fresno

10/25/2021

Time	East Bound	West Bound	Total
12:00-1:00 AM	63	72	135
1:00-2:00 AM	37	42	80
2:00-3:00 AM	37	42	80
3:00-4:00 AM	77	87	163
4:00-5:00 AM	112	127	239
5:00-6:00 AM	349	396	745
6:00-7:00 AM	443	502	944
7:00-8:00 AM	663	752	1415
8:00-9:00 AM	486	550	1036
9:00-10:00 AM	319	362	681
10:00-11:00 AM	331	375	705
11:00-12:00 AM	323	366	689
12:00-1:00 PM	430	487	917
1:00-2:00 PM	377	428	805
2:00-3:00 PM	465	527	992
3:00-4:00 PM	450	510	960
4:00-5:00 PM	424	481	905
5:00-6:00 PM	551	752	1303
6:00-7:00 PM	278	315	594
7:00-8:00 PM	222	252	474
8:00-9:00 PM	168	191	359
9:00-10:00 PM	106	121	227
10:00-11:00 PM	78	89	167
11:00-12:00 PM	58	66	124
Total	**6849**	**7891**	**14739**

Note: Traffic Counts estimated based on PM peak hour intersection turning movement count at Church Avenue/ Willow Avenue taken on 10/5/2021 and 24 hour roadway segment count at peach Avenue/ North Avenue taken on 9/13/18.

24 Hour Roadway Segment Count

Willow Avenue, North of Church Avenue

City of Fresno

10/25/2021

Time	North Bound	South Bound	Total
12:00-1:00 AM	38	42	80
1:00-2:00 AM	17	18	35
2:00-3:00 AM	14	15	29
3:00-4:00 AM	20	22	42
4:00-5:00 AM	25	27	51
5:00-6:00 AM	115	126	241
6:00-7:00 AM	146	160	305
7:00-8:00 AM	225	247	472
8:00-9:00 AM	170	186	356
9:00-10:00 AM	112	123	234
10:00-11:00 AM	141	154	295
11:00-12:00 AM	132	144	276
12:00-1:00 PM	156	171	327
1:00-2:00 PM	196	215	411
2:00-3:00 PM	219	240	459
3:00-4:00 PM	234	257	491
4:00-5:00 PM	228	250	478
5:00-6:00 PM	291	319	610
6:00-7:00 PM	139	153	292
7:00-8:00 PM	173	190	363
8:00-9:00 PM	101	111	212
9:00-10:00 PM	43	47	90
10:00-11:00 PM	29	32	61
11:00-12:00 PM	37	40	77
Total	**3000**	**3289**	**6289**

Note: Traffic Counts estimated based on PM peak hour intersection turning movement count at Church Avenue/ Willow Avenue taken on 10/5/2021 and 24 hour roadway segment count at peach Avenue/ North Avenue taken on 9/13/18.

Highest Four Hour Count and Eight Hour Count

Church Avenue, East of Willow Avenue

Total of Both Directions on Major Street

10/25/2021

Time	East Bound	West Bound	Total
7:00-8:00 AM	663	752	**1415**
5:00-6:00 PM	551	752	**1303**
8:00-9:00 AM	486	550	**1036**
2:00-3:00 PM	465	527	**992**
3:00-4:00 PM	450	510	**960**
6:00-7:00 AM	443	502	**944**
12:00-1:00 PM	430	487	**917**
4:00-5:00 PM	424	481	**905**
1:00-2:00 PM	377	428	805
5:00-6:00 AM	349	396	745
10:00-11:00 AM	331	375	705
11:00-12:00 AM	323	366	689
9:00-10:00 AM	319	362	681
6:00-7:00 PM	278	315	594
7:00-8:00 PM	222	252	474
8:00-9:00 PM	168	191	359
4:00-5:00 AM	112	127	239
9:00-10:00 PM	106	121	227
10:00-11:00 PM	78	89	167
3:00-4:00 AM	77	87	163
12:00-1:00 AM	63	72	135
11:00-12:00 PM	58	66	124
1:00-2:00 AM	37	42	80
2:00-3:00 AM	37	42	80

Legend		
xx	Highest Four Hour Count	
xx	Highest Eight Hour Count	

Highest Four Hour Count and Eight Hour Count

Willow Avenue, North of Church Avenue

Highest Minor Street Direction

10/25/2021

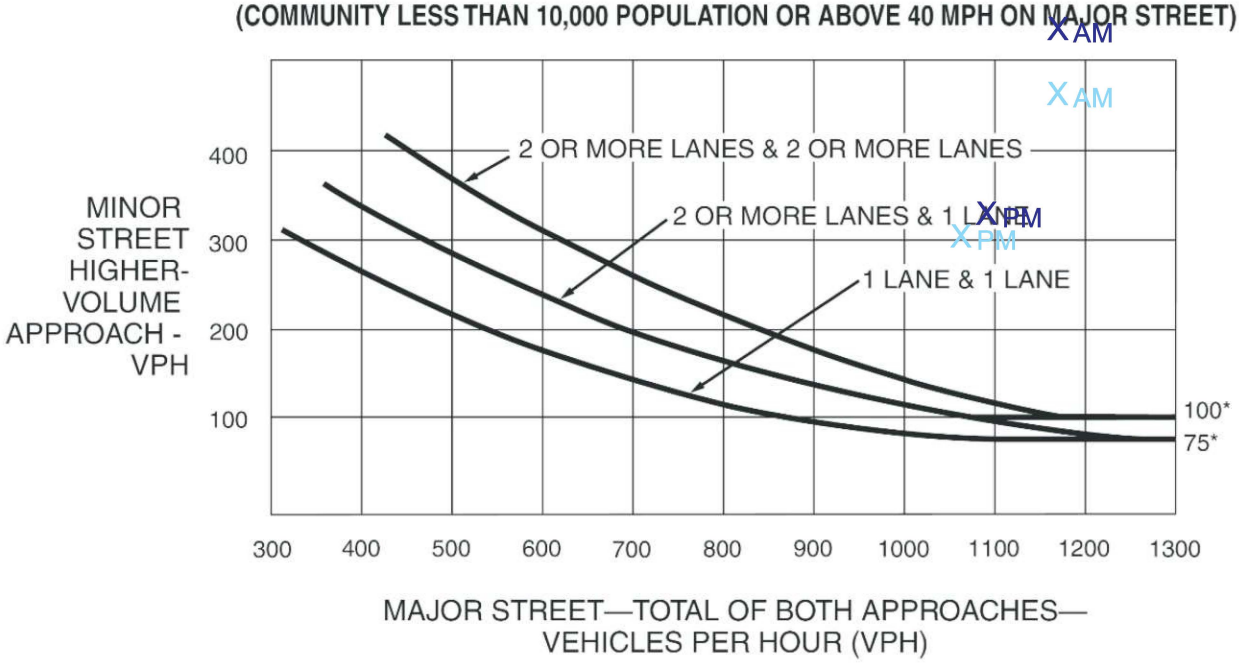
Time	South Bound
5:00-6:00 PM	**319**
3:00-4:00 PM	**257**
4:00-5:00 PM	**250**
7:00-8:00 AM	**247**
2:00-3:00 PM	**240**
1:00-2:00 PM	**215**
7:00-8:00 PM	**190**
8:00-9:00 AM	**186**
12:00-1:00 PM	171
6:00-7:00 AM	160
10:00-11:00 AM	154
6:00-7:00 PM	153
11:00-12:00 AM	144
5:00-6:00 AM	126
9:00-10:00 AM	123
8:00-9:00 PM	111
9:00-10:00 PM	47
12:00-1:00 AM	42
11:00-12:00 PM	40
10:00-11:00 PM	32
4:00-5:00 AM	27
3:00-4:00 AM	22
1:00-2:00 AM	18
2:00-3:00 AM	15

Legend	
xx	Highest Four Hour Count
xx	Highest Eight Hour Count

Church Ave @ Willow Ave

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Legend:

X_{AM} X_{PM} 2042 No Project

X_{AM} X_{PM} 2042 + Project

Warrant 1A: Minimum Vehicular Volume

The warrant is satisfied when, for each of any 8 hours of an average day, the traffic volumes given in the table below exist on the major street and on the higher-volume minor street approach to the intersection.

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total ofboth approaches)	Vehicles per hour on higher-volume minor-street approach (one direction only)
Major Street	Minor Street		
1	1	500	150
2 or more	1	600	150
2 or more	2 or more	600	200
1	2 or more	500	200

When the 85-percentile speed of major-street exceeds 40 mph in either an urban or rural area, or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the Minimum Vehicular Volume warrant is 70 percent of the requirements above.

Analysis

	No of lanes
Major Street	1
Minor Street	2

Time	Major Street(Church Avenue)		Minor Street (Willow Avenue)		Warrants MET/NOT
	Volume on major street (total of both approaches)	Threshhold RURAL 350	Veh/hour on higher volume minor street (one direction only)	Threshhold RURAL 140	
7:00 AM	1415		247		MET
5:00 PM	1303		319		MET
8:00 AM	1036		186		MET
2:00 PM	992		240		MET
3:00 PM	960		257		MET
6:00 AM	944		160		MET
12:00 PM	917		171		MET
4:00 PM	905		250		MET

Number of hours for which warrant met	8
Percentage by which warrant met	100.0%

Warrant	MET

Warrant 1B: Interruption of Continuous Traffic

The warrant is satisfied when, for each of any 8 hours of an average day, the traffic volumes given in the table below exist on the major street and on the higher-volume minor street approach to the intersection, and signal installation will not seriously disrupt progressive traffic flow.

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total ofboth approaches)	Vehicles per hour on higher-volume minor-street approach (one direction only)
Major Street	Minor Street		
1	1	750	75
2 or more	1	900	75
2 or more	2 or more	900	100
1	2 or more	750	100

The major-street and minor -street volumes are for the same 8 hours. During those 8 hours, the direction of higher volume on the minor street may be on one approach during some hours and on the opposite approach during other hours.

When the 85-percentile speed of major-street exceeds 40 mph in either an urban or rural area, or when the intersection lies within the built-up area of an isolated community having a population of less than 10,000, the Interruption of Continuous Traffic warrant is 70 percent of the requirements above.

Analysis

	No of lanes
Major Street	1
Minor Street	2

Time	Major Street(Church Avenue)		Minor Street (Willow Avenue)		Warrants MET/NOT
	Volume on major (total of both approaches)	Threshhold RURAL 525	Veh/hour on higher volume minor (one direction only)	Threshhold RURAL 70	
7:00 AM	1415		247		MET
5:00 PM	1303		319		MET
8:00 AM	1036		186		MET
2:00 PM	992		240		MET
3:00 PM	960		257		MET
6:00 AM	944		160		MET
12:00 PM	917		171		MET
4:00 PM	905		250		MET

Number of hours for which warrant met	8
Percentage by which warrant met	100.0%

Warrant	**MET**

Fresno COG Vehicle Miles Traveled Analysis Tool Summary Report

Tool Version: *Version 1.38* *Report Date:* *8/3/2022*

Project Information

Name:	autumn ridge
Jurisdiction	Jurisdiction
APN No.	48102001

Project Land Use

Residential	Single-family:	199	DU	Multi-family:	0	DU
	Total:	199	DU	Percent Affordable:	0	%
Non-Residential	Office:	0	EMP	Others:		TSF

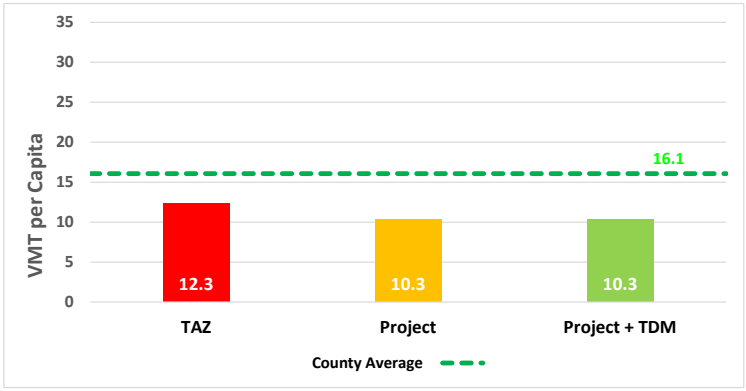
Project TDM measures (VMT reduction strategies)

TDM Strategy	Included in the project	TDM Quantification	% VMT/Capita Reduction	% VMT/Employment Reduction	
Implement Project Specific Vanpool Program	No		N/A		
Implement Project Specific Carpool Program	No			N/A	

Project VMT Results

Residential

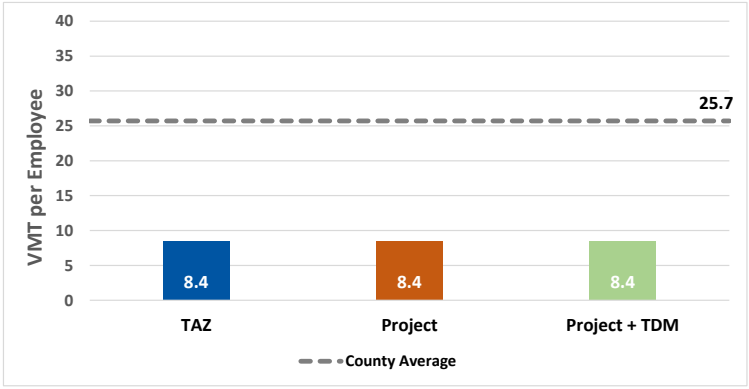
Project's VMT/Capita (10.3) is less than County VMT/Capita (14.0 using 13% as threshold)



Project VMT per Capita:	10.3
County VMT / Capita:	16.1
Significant Impact:	No
Project VMT per Capita with TDM Measures:	10.3
Significant Impact with TDM measures:	No

Office

Project's VMT/Employee (8.4) is less than County's VMT/Employee (22.4 using 13% as threshold)



Project VMT per Employee:	8.4
County VMT / Employee:	25.7
Significant Impact:	No
Project VMT per Capita with TDM Measures:	8.4
Significant Impact with TDM measures:	No

BIOLOGICAL RESOURCE EVALUATION

DR HORTON

AUTUMN RIDGE PROJECT

AUGUST 2020

BIOLOGICAL RESOURCE EVALUATION

AUTUMN RIDGE PROJECT, FRESNO COUNTY, CALIFORNIA

Prepared for:

DR Horton – Central Valley Division
419 W Murray Avenue
Visalia, CA 93291
Contact Person: Cliff Ronk, Entitlements Manager
Phone: 559-280-0998

Consultant:

601 E Pollasky Ave, Suite 301
Clovis, CA 93612
Contact: Curtis Uptain
Phone: (559) 449-2400
Fax: (559) 435-2905

Project #200272

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EXECUTIVE SUMMARY

This Biological Resource Evaluation report includes the results of a database search and on-site biological survey conducted by Quad Knopf, Inc. (QK) at the Autumn Ridge Project site. The primary focus of this report is to provide regulatory agencies with biological resource information about the condition and sensitivity of natural resources currently existing on and adjacent to the Project. Included is information about sensitive natural communities, special-status plant and wildlife species, wildlife movement corridors, and wetlands and water. The report includes an analysis of potential impacts to those resources and recommended measures to minimize and avoid impacts.

The proposed Project is to the southeast of the City of Fresno, within Fresno County, California. The 38.37-acre Project site is approximately 3.25 miles east of State Route 99. It is bounded by the San Joaquin Valley Railroad to the north, a housing development and retention pond to the south, an undeveloped lot to the east, and South Willow Avenue to the west.

The Project is the construction of a single-family residential subdivision that includes a 5-acre Open Space – Park. The single-family residential subdivision will consist of 38 lots, resulting in approximately 5.1 units per acre. An access drive will be constructed to the west of the Project site to allow access from S. Willow Avenue and a stubbed access point will be constructed to the east of the site in order to facilitate connections for future subdivisions.

A review of the literature and agency databases was conducted to obtain information on the occurrences of natural communities and special-status species known from the vicinity of the Project. A biological reconnaissance survey was conducted on August 13, 2020, by QK Environmental Scientist Dylan Ayers. The on-site survey consisted of walking meandering pedestrian transects spaced 50 to 100 feet apart throughout the Biological Survey Area.

No special-status species or diagnostic signs of special status species was present. Habitat on the site was not suitable to support any special-status plant species. There is little potential for special status wildlife species to occur on the site. The San Joaquin Kit Fox, Swainson's Hawk, American Badger, and burrowing owl are absent from the site. The Project will have no effect on these species. Nesting migratory birds and raptors have some potential to occur at the Project. BMPs and avoidance measures for nesting birds are recommended to ensure project impacts are minimized.

SECTION 1 - INTRODUCTION

1.1 - Project Location

The proposed Project is just outside of the southeast boundary of the City of Fresno, within Fresno County, California (Figures 1-1 and 1-2). It is approximately 3.25 miles east of State Route (SR) 99 near East Jensen Avenue and South Peach Avenue. The 38.37-acre Project site is bounded by San Joaquin Valley Railroad to the north, a housing development and retention pond to the south, an undeveloped lot to the east, and South Willow Avenue to the west.

The approximate latitude and longitude are 36.719999 and -119.725448. The Project is within the Malaga U.S. Geological Survey (USGS) 7.5-minute quadrangle and the eight surround quadrangles include Clovis, Round Mountain, Sanger, Selma, Conejo, Caruthers, Fresno South, and Fresno North. The Project site lies within Township 14S, Section 18, and Range 21E of the Mount Diablo meridian.

1.2 - Project Description

The Project, known as the Autumn Ridge Project, is the construction of a single-family residential subdivision that includes an Open Space – Park of approximately five acres. The single-family residential subdivision will consist of 38 lots, with approximately 5.1 units per acre. An access drive will be constructed to the west of the Project site to allow access from S. Willow Avenue and a stubbed access point will be constructed to the east of the Project site to facilitate connections for future subdivisions.

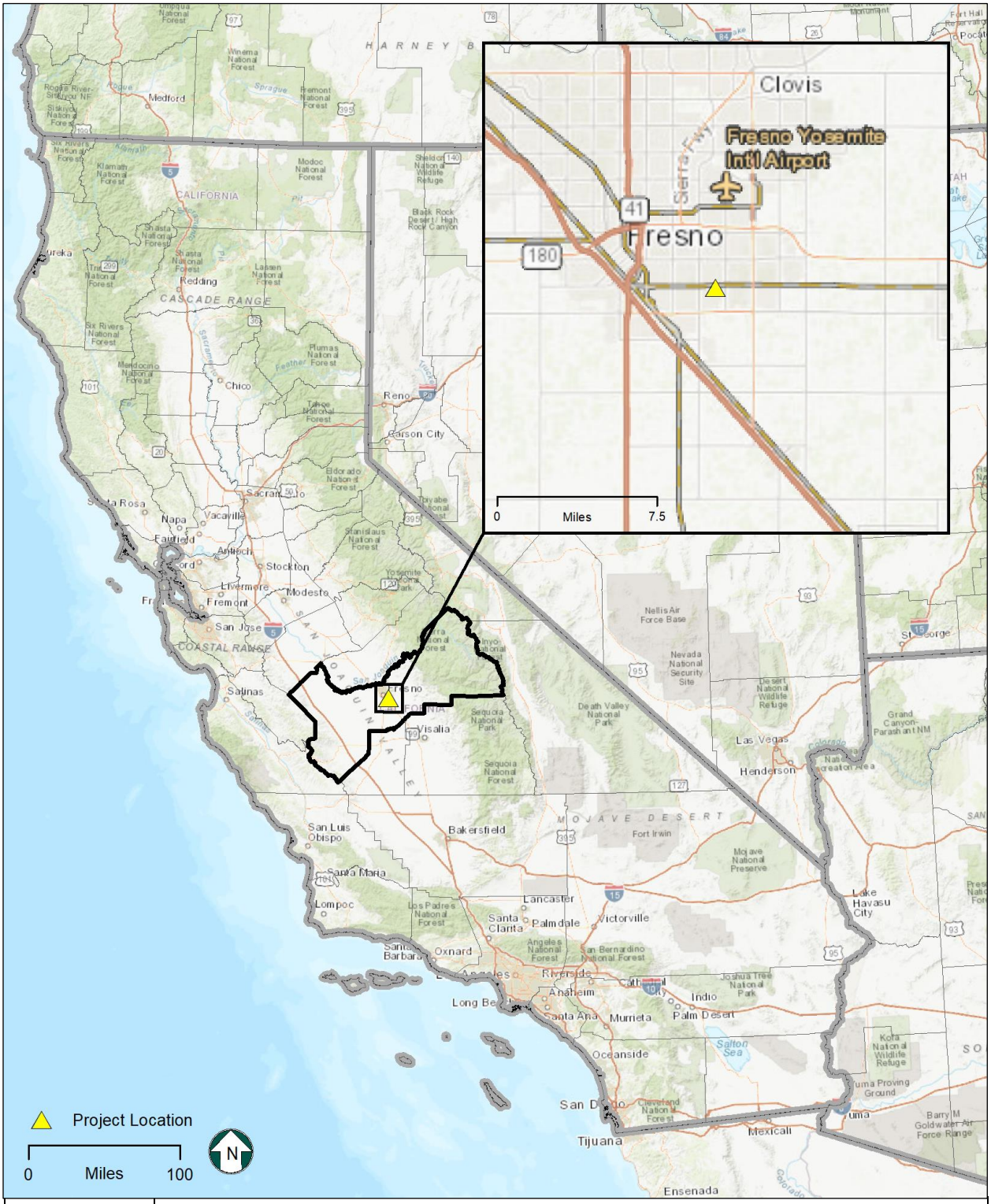

Figure 1-1
Regional Map
Autumn Ridge Project,
Fresno County, California

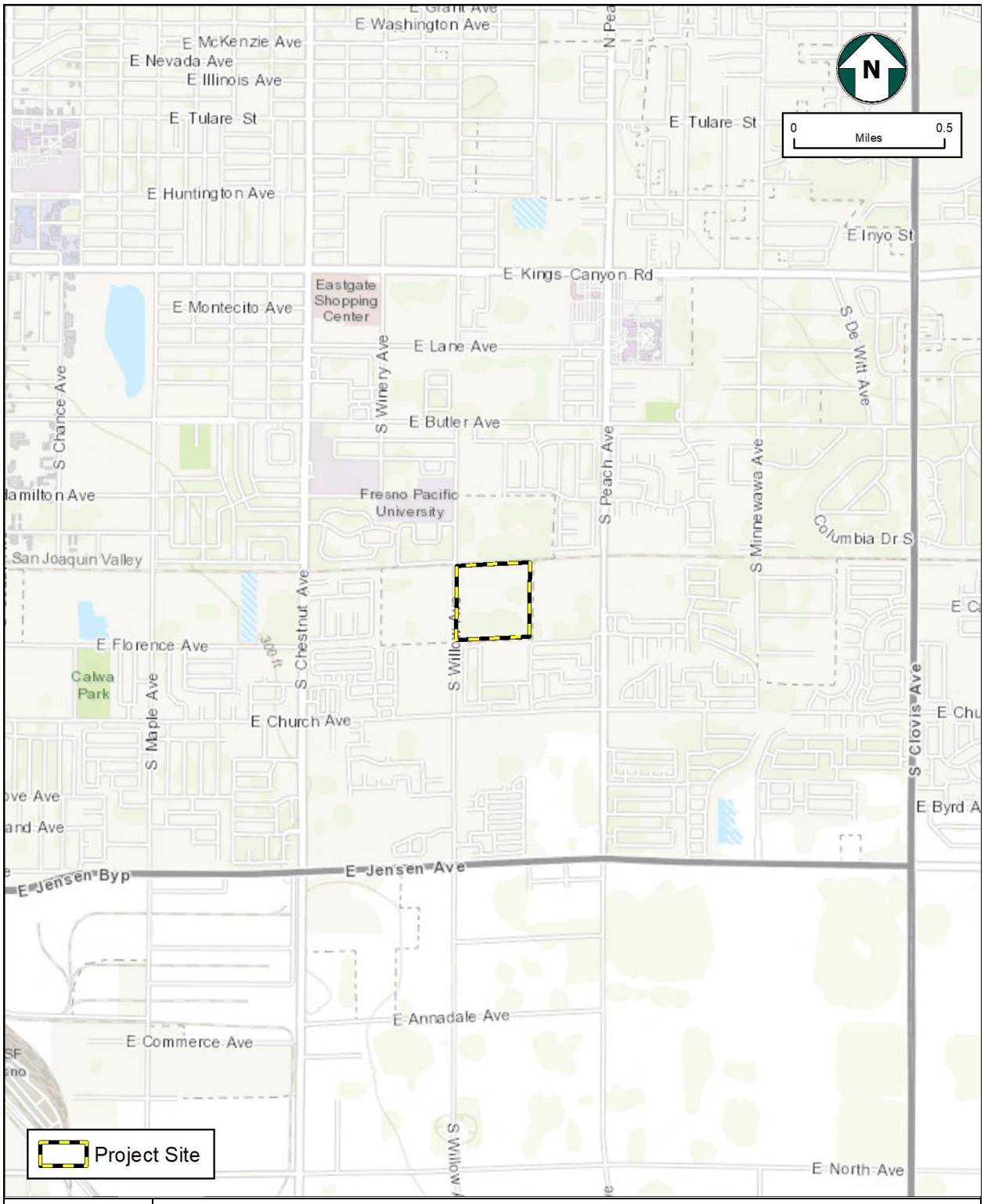

Figure 1-2
Project Vicinity Map
Autumn Ridge Project,
Fresno County, California

1.3 - Purpose, Goals, and Objectives for this Report

This Biological Resource Evaluation (BRE) report provides results of a biological survey conducted by Quad Knopf, Inc. (QK) at the Autumn Ridge Project site. The primary focus of this report is to provide regulatory agencies with biological resource information about the condition and sensitivity of natural resources currently existing on and adjacent to the Project site. This report provides information about sensitive natural communities, special-status species, wildlife movement corridors, and wetlands and waters, and provides an analysis of potential impacts to those resources and recommended measures to minimize and avoid impacts.

SECTION 2 - METHODS

2.1 - Literature Review and Database Analysis

The following sources were reviewed for information on special-status biological resources in the Project vicinity:

- CDFW's California Natural Diversity Database (CDFW 2020a)
- CDFW's Biogeographic Information and Observation System (CDFW 2020b)
- CDFW's Special Animals List (CDFW 2020c)
- CDFW's California Wildlife Habitat Relationships (CWHR) System (Mayer and Laudenslayer 1988)
- California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California (CNPS 2020)
- USFWS Information for Planning and Consultation (IPAC) system (USFWS 2020a)
- USFWS Critical Habitat Mapper (USFWS 2020b)
- USFWS National Wetlands Inventory (USFWS 2020c)
- USGS National Hydrography Dataset (USGS 2020)
- Federal Emergency Management Agency (FEMA) flood zone maps (FEMA 2020)
- U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2020)
- Current and historical aerial imagery (Google LLC 2020, Netroline 2020)

QK conducted a review of the literature and agency databases to obtain information on occurrences of natural communities and special-status species known from the vicinity of the Project. The California Natural Diversity Database (CDFW 2020a), California Native Plant Society (CNPS) Database (CNPS 2020), and U.S. Fish and Wildlife Service (USFWS) Threatened and Endangered Species List (USFWS 2020a) were reviewed in August 2020 to assess whether occurrences of sensitive natural communities, federally-listed species, State-listed species, other species of special concern, or USFWS Critical Habitat Units that have been documented within the *Malaga, Clovis, Round Mountain, Sanger, Selma, Conejo, Caruthers, Fresno South, and Fresno North* U.S. Geological Survey (USGS) 7.5-minute quadrangles that encompass and surround the Project site. To satisfy other standard search criteria, California Natural Diversity Database (CNDDB) records within a 10-mile radius of the Project were queried separately from the broader database search. The results of the database search are presented in Appendix A.

The IPAC list from the USFS provides a list of special-status species, including migratory birds that are known to occur within the region of the selected quadrangles, but it does not provide any information on records of occurrences. The CNDDB provides element-specific spatial information on individual documented occurrences of special-status species and sensitive natural vegetation communities. The CNPS database provides similar information but at a much lower spatial resolution than the CNDDB and includes additional plant species that are considered sensitive by CNPS. Wildlife species designated as "Fully Protected" by California Fish and Game Code Sections 5050 (Fully Protected reptiles and amphibians),

3511 (Fully Protected birds), and 4700 (Fully Protected mammals) are also included in the final list of species that were evaluated in this report.

A review of the National Wetlands Inventory (NWI; USFWS 2020b) was completed to identify whether wetlands had previously been documented on or adjacent to the Project site. The NWI, which is operated by the USFWS, is a collection of wetland and riparian maps that depicts graphic representations of the type, size, and locations of wetland, deep water, and riparian habitats in the United States. Regional hydrologic information from the USGS National Hydrologic dataset (NHD) was obtained to evaluate the potential occurrence of blueline streams within the Project area.

Soils data were obtained from the Natural Resource Conservation District, United States Department of Agriculture (USDA 2020), climate information was obtained from Weather Underground, and land use information was obtained from available aerial imagery. Information about flood zones were obtained from the Federal Emergency Management Agency, Department of Homeland Security (FEMA 2020).

Results of the database inquiries were reviewed to extract pertinent information on site conditions and evaluate the potential for sensitive biological resources to occur within or near the Project site. Only those resources with potential to be present and affected by the project were included and considered in this document. The potential presence of natural communities and special-status species was based on distributional ranges overlapping the Project and the presence of habitat and/or primary constituent habitat elements that would support those sensitive biological resources.

2.2 - Reconnaissance Survey

A biological reconnaissance survey was conducted on August 13, 2020, by QK biologist Dylan Ayers. The reconnaissance survey consisted of walking meandering pedestrian transects spaced 50 to 100 feet apart throughout accessible portions of the Biological Survey Area (BSA), which included the Project site and a surrounding 500-foot buffer. The survey was conducted to determine the locations and extent of land use and natural vegetation communities, the potential for occurrences of special-status plant and wildlife species, and to verify the presence of wetlands and waters. A list of all plants, wildlife, and wildlife sign (e.g. scat, burrows, feather, tracks, etc.) observed was compiled. Representative photographs were taken at key areas to document waters and habitat conditions at the Project site (Appendix B).

SECTION 3 - ENVIRONMENTAL SETTING

3.1 - Topography

The Project site occurs on relatively flat, level terrain at an approximate elevation of 306 feet above mean sea level (see Figure 1-2). Most of the Project site has been previously disturbed by current and historical agriculture activities. Historical aerial imagery shows the land has been farmed for decades (Google LLC 2020).

3.2 - Climate

The climatic conditions of the region are typical of the southern San Joaquin Valley, consisting of a hot, dry summers and mild, wet winters, which is characteristic of a Mediterranean climate. Average maximum temperatures range from approximately 54.6°F in January to 98.3°F in July, with several days recorded above 100°F each summer (WRCC 2020). The average annual precipitation is 10.89 inches, with the most rain occurring from October through April. During the winter months, a dense fog often occurs after rain events.

3.3 - Land Use

The Project site is just outside the southeastern boundary of the City of Fresno in an area of residential development, undeveloped lots, and agriculture. To the south and east of the Project there is a mix of residential, rural residential, undeveloped lots, and agricultural uses. Areas to the north and west are mostly consisting of residential, commercial, and industrial uses with some scattered undeveloped or vacant properties (Figure 3-1). The Project site is zoned for Residential Single-Family, Medium Density. Fresno Pacific University is located to the northwest of the Project (see Figure 1-2).

3.4 - Soils

Two soil types occur within the Project site (Figure 3-2, USDA-NRCS 2020).

Atwater Soil: The Atwater series consists of very deep, well drained soils formed in granitic alluvium. Atwater soils occur on gently undulating to rolling dunes formed from granitic alluvium. They occur at elevations of less than 500 feet, in a semiarid, mesothermal climate with mean annual rainfall of 9 to 20 inches, with hot, dry summers and cool, moist winters. This soil is well drained with moderately rapid permeability and slow runoff. These soils are used mainly for production of truck crops, grapes (*Vitis* sp.), tree fruits, nuts, grain, and alfalfa (Medicago sativa). Vegetation consists of annual grasses, weeds, and low-growing shrubs. Atwater series soils are not hydric.

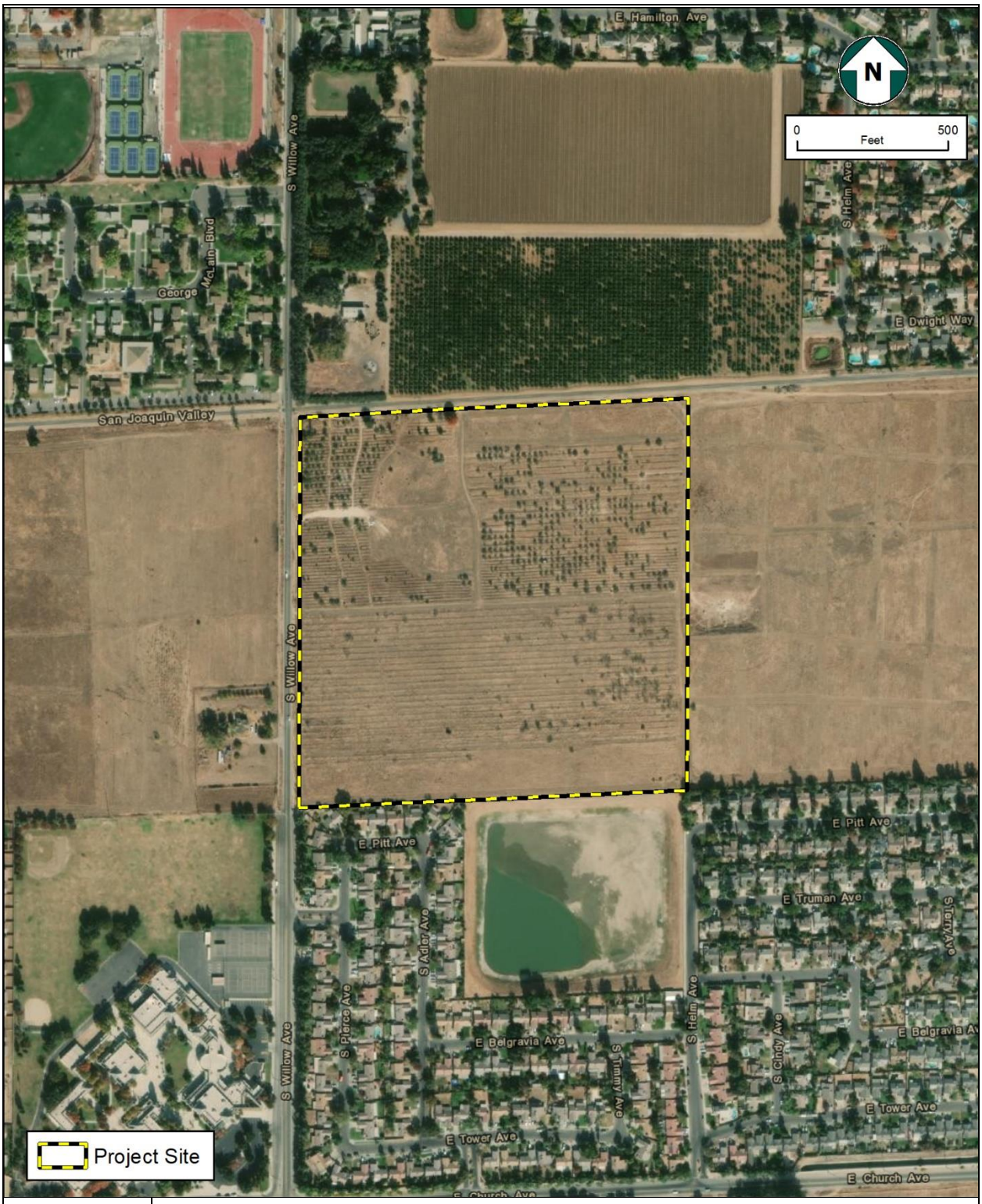

Figure 3-1
Land Use Map
Autumn Ridge Project,
Fresno County, California

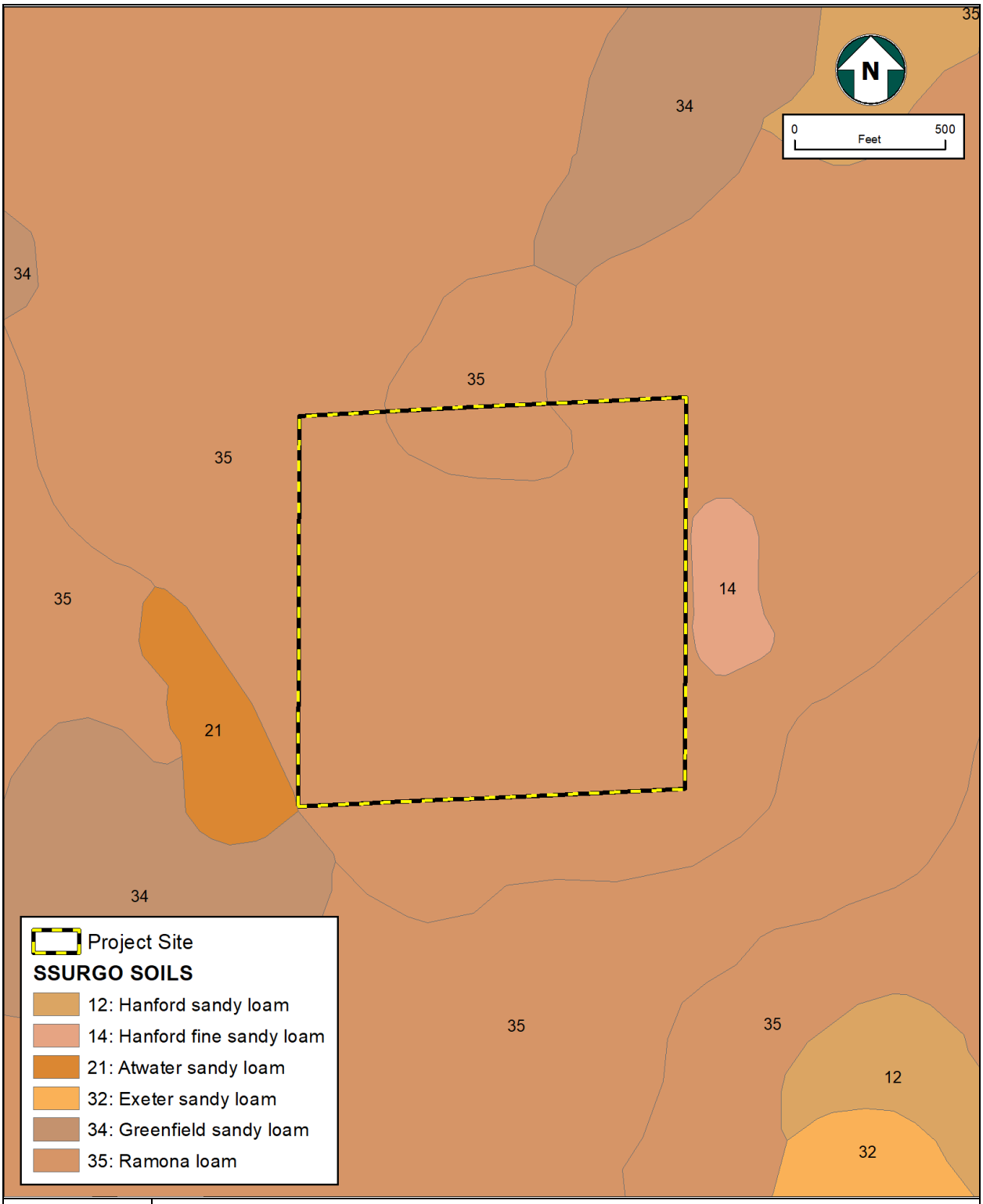

Figure 3-2
Soils Map
Autumn Ridge Project,
Fresno County, California

Ramona Soil: The Ramona series is a member of the fine-loamy, mixed, thermic family of Typic Haploxeralfs. The Ramona soils are nearly level to moderately steep. They are on terraces and fans at elevations of 250 to 3,500 feet. They formed in alluvium derived mostly from granitic and related rock sources. The climate is dry sub humid mesothermal with warm dry summers and cool moist winters. Mean annual precipitation is 10 to 20 inches. Ramona soils are mostly used for production of grain, grain-hay, pasture, irrigated citrus, olives (*Olea europaea*), truck crops, and deciduous fruits. Uncultivated areas have a cover of annual grasses, forbs, chamise, or chaparral. Ramona soils are not hydric.

3.5 - Hydrology

The Project site is in the South Valley Floor Hydrologic Unit, within the Tulare Lake Hydrologic Region (CDWR 2020). The Tulare Lake Hydrologic Region encompasses approximately 10.5 million acres and includes the drainage area south of the San Joaquin River within the San Joaquin Valley. The Kings, Kaweah, Tule, and Kern rivers, which drain the west face of the Sierra Nevada Mountains, provide the bulk of the surface water supply native to the basin. Imported surface supplies enter the basin through the San Luis Canal/California Aqueduct System, the Friant-Kern Canal, and the Delta-Mendota Canal. Of these significant water features, the Kings River is the nearest to the Project, occurring as close as 12.5 miles east of the site. The Kings River flows west out of the mountains, southwest through the cities of Sanger and Kingsburg, and then south where it ultimately joins with the Tule River.

No wetlands or other water features occur on the Project site. The National Hydrography database (NHD) and National Wetlands Inventory (NWI) shows one stream feature, the Braley Canal, and one pond feature near the site. A freshwater pond, identified as PUBFx (USFWS 2020c), corresponds with a dry basin found within the BSA to the east of the site. A large, inundated retention pond occurs directly south of the Project and a dry basin occurs just east of the site. Both these features occur within the BSA and can be seen in Figure 3-3 (and in Figure 3-5). Both features are manmade and had no hydrologic connection with the Project site. The Project site occurs within 0.2% annual flood zone as defined by the FEMA (Figure 3-4, FEMA 2020).

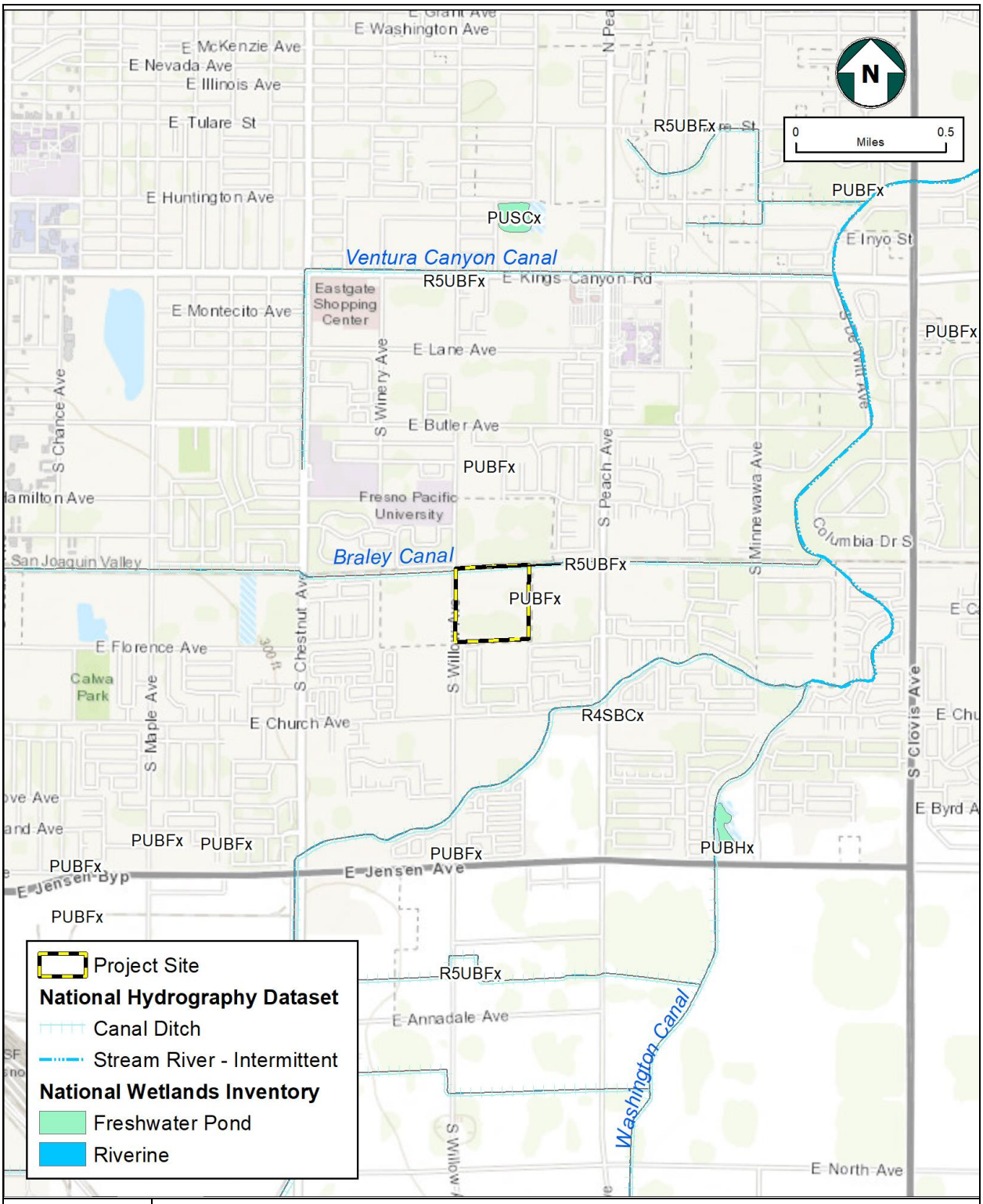

Figure 3-3
NWI/NHD Map
Autumn Ridge Project,
Fresno County, California

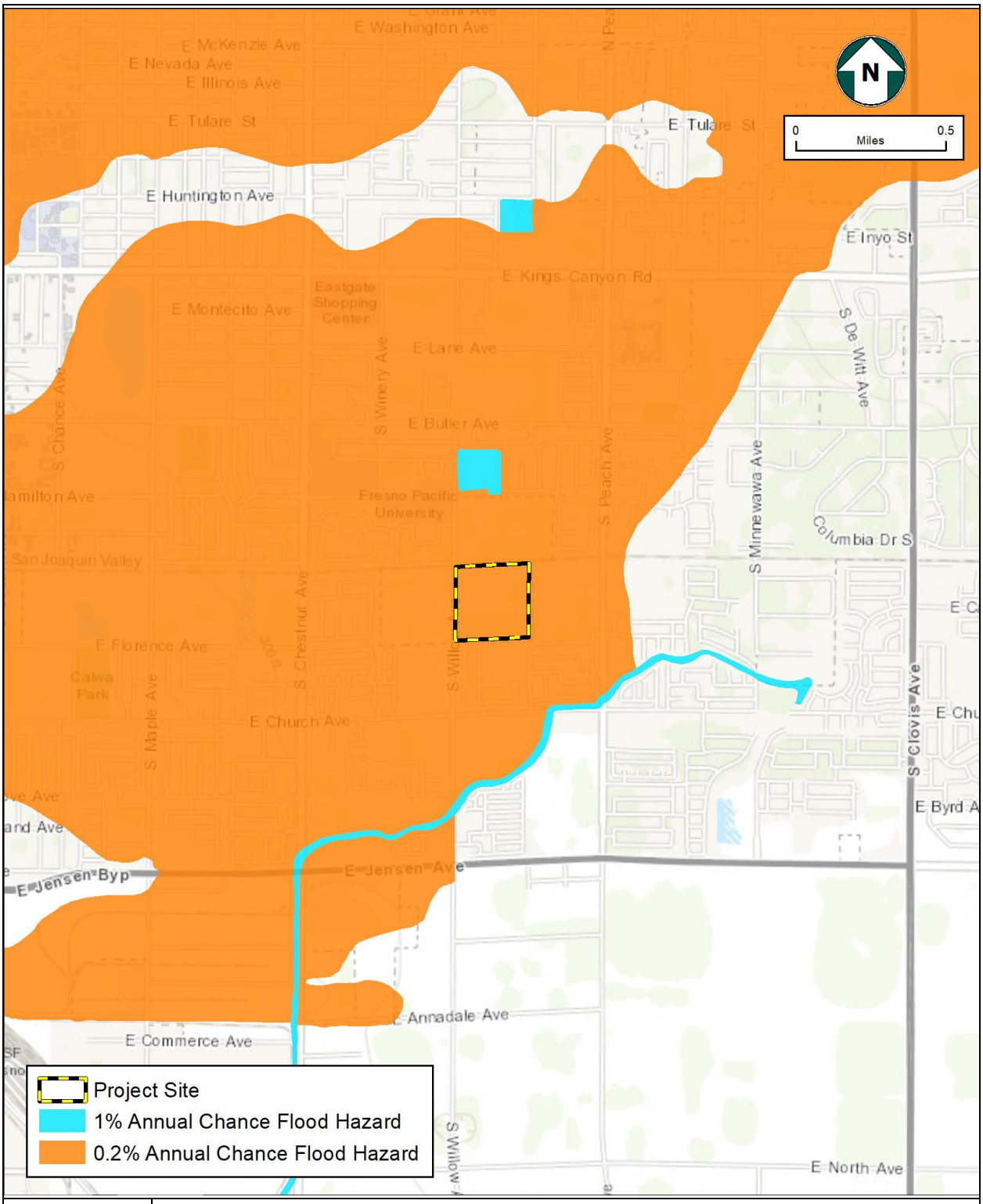

Figure 3-4
FEMA Flood Zone Map
Autumn Ridge Project,
Fresno County, California

3.6 - General Biological Conditions

The Project is surrounded by residential developments, fallowed lands, orchards, light commercial areas, a school facility, a railroad, and unused lands. One plant community occurs in this area, Annual Grassland (Mayer and Laudenslayer 1988). Grassland habitat occurs throughout the site and shows signs of being routinely disked. A grassfire had recently occurred on-site and more than half of the on-site grassland habitat had been burned. The site was previously an orchard and some trees were still present, mostly on the northern half of the site. Trash from dumping and multiple on-site homeless camps were found across the site but most of this use was concentrated near the main entrance at South Willow Avenue.

The Annual Grassland community was dominated by wild oat (*Avena fatua*) with some ripgut brome (*Bromus diandrus*) and barley (*Hordeum* sp.) occurring in limited areas. Most of the grasses on-site were turned over and desiccated after recent disking, making identification difficult. Sub-dominant herbaceous plant species present included black mustard (*Brassica nigra*), prickly lettuce (*Lactuca serriola*), telegraph weed (*Heterotheca grandiflora),* horseweed (*Erigeron canadensis*), and black mustard (*Brassica nigra*).

The existing agricultural trees on-site consisted of pistachio (*Pistacia vera)* with several large walnut (*Juglans* sp.) trees scattered in the northern half of the site. Multiple large ornamental trees were present within the BSA, primarily within adjacent residential areas. These areas contain common ornamental shrubs and herbaceous species.

Most of the Project site is covered in small mammal burrows (Figure 3-5). Burrow complexes with confirmed ground squirrel activity were recorded to show the general distribution of burrows on-site. Several burrow complexes were discovered within accessible areas of the BSA which included a dry basin east of the site. One large den entrance was present inside this basin, though it was not clear if the excavation was manmade or created by an animal. Two adult red-tailed hawks were observed on-site though no active raptor nests were found within the BSA.

No wetlands occur on the Project site, though a large retention pond exists to the south of the site within the BSA and a dry basin was east of the site within the BSA (Figure 3-5). The dry basin showed no signs of being inundated recently and its use is not clear.

Figure 3-5
Biological Resources Map
Autumn Ridge Project,
Fresno County, California

SECTION 4 - FINDINGS

4.1 - Sensitive Natural Communities

4.1.1 - RESULTS OF LITERATURE REVIEW AND DATABASE SEARCHES

Only one sensitive natural vegetation community, Northern Claypan Vernal Pool, is known to occur within 10-miles of the Project. The nearest occurrence is 9.4-miles northwest of the Project.

4.1.2 - PRESENCE OF SENSITIVE NATURAL COMMUNITIES

There are no occurrences of any sensitive natural community, including Northern Claypan Vernal Pool, at the Project site.

4.2 - Special-Status Plants

4.2.1 - RESULTS OF LITERATURE REVIEW AND DATABASE SEARCHES

There were 12 special-status plant species identified in the CNDDB, CNPS, and USFWS databases that occur in the Project Region (Table 4-1). There are seven special-status plant species with historical occurrence records within 10 miles of the Project site. None of these special-status plants are known to historically occur on the Project site.

Table 4-1
Special-Status Plant Species Occurring in the Region of the Autumn Ridge Project
(Source: CNDDB 2020, CNPS 2020, and USFWS 2020)

Scientific Name	Common name	Status
Castilleja campestris var.	succulent owl's-clover	1B.2, FT
Caulanthus californicus	California jewelflower	1B.1, FE
Eryngium spinosepalum	spiny-sepaled button-celery	1B.2
Imperata brevifolia	California satintail	2B.1
Lagophylla dichotoma	forked hare-leaf	1B.1
Leptosiphon serrulatus	Madera leptosiphon	1B.2
Mielichhoferia shevockii	Shevock's copper moss	1B.2
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	1B.2, FT
Pseudobahia peirsonii	San Joaquin adobe sunburst	1B.1, FT
Sagittaria sanfordii	Sanford's arrowhead	1B.2
Tropidocarpum capparideum	caper-fruited tropidocarpum	1B.1
Tuctoria greenei	Greene's tuctoria	1B.1, FE

Sources:
California Department of Fish and Wildlife. 2020. California Natural Diversity Data Base, California Department of Fish and Wildlife Sacramento, CA. Quads: Malaga, Clovis, Round Mountain, Sanger, Selma, Conejo, Caruthers, Fresno South, and Fresno North

California Native Plant Society (CNPS). 2020. Inventory of Rare and Endangered Plants (online edition, v6-05b 4-11-05). Rare Plant Scientific Advisory Committee. California Native Plant Society. Sacramento, CA. Quads: Malaga, Clovis, Round Mountain, Sanger, Selma, Conejo, Caruthers, Fresno South, and Fresno North

United States Fish and Wildlife Service. 2020. Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the U.S.G.S 7 ½ Minute Quad. USFWS. Sacramento, CA. Quads: Malaga, Clovis, Round Mountain, Sanger, Selma, Conejo, Caruthers, Fresno South, and Fresno North

Abbreviations:

1A	California Native Plant Society List 1A Species- Plants Presumed Extinct in California
1B.1	California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Seriously Endangered in California
1B.2	California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Fairly Endangered in California.
1B.3	California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Not Very Endangered in California
FE	Federal Endangered Species
FT	Federal Threatened Species

4.2.2 - PRESENCE OF SPECIAL-STATUS PLANTS

No special-status plant species were present within the BSA. Although the field survey did not coincide with the optimum survey period for all sensitive plant species that could exist on the site, there is no habitat that would support special status plant species within the Project site because of the repeated disking, trash dumps, recent grassfire, historical land use, and the presence of multiple homeless camps. Based upon existing habitat conditions, only Sanford's arrowhead (*Sagittaria sanfordii*) could potentially occur in the inundated areas of the adjacent retention pond that occurs to the south of the Project. It is unlikely that this species would occur because of the repeated mowing that occurs in this pond when it is dry, fluctuating water levels, high temperatures and low oxygen content, and the high levels of maintenance associated with this managed feature.

4.3 - Special-Status Wildlife

4.3.1 - RESULTS OF LITERATURE REVIEW AND DATABASE SEARCHES

There were 22 special-status wildlife species identified in the CNDDB, CNPS, and USFWS database queries that could potentially occur on the Project site (Table 4-2). There were 30 special-status wildlife species documented within a 10-mile radius of the Project site. There are no historical records on-site though the site is located at the southeastern edge of 10-mile occurrence records for 9 special-status wildlife species.

4.3.2 - PRESENCE OF SPECIAL-STATUS WILDLIFE

No special-status wildlife species or their sign were observed within the BSA. Most of the Project site is highly disturbed and contains no habitat that would support most of the special-status wildlife species listed in Table 4-2. There are no vernal pools or wetlands that would support aquatic species such as the crustaceans, red-legged frog, and tiger salamander. The delta smelt, pond turtle, listed snake species, horned lizard, and blunt-nosed leopard lizard are also unlikely to occur at the Project due to the lack of appropriate habitat.

Table 4-2
Special-Status Wildlife Species Occurring in the Region of the Autumn Ridge Project
(Source: CNDDB 2020, CNPS 2020, and USFWS 2020)

Scientific Name	Common name	Status
Invertebrates		
Bombus crotchii	Crotch bumble bee	CC
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	FT
Crustaceans		
Branchinecta lynchi	vernal pool fairy shrimp	FT
Fish		
Hypomesus transpacificus	delta smelt	FE, CT
Amphibians		
Ambystoma californiense	California tiger salamander	FT
Rana draytonii	California red-legged frog	FT
Reptiles		
Anniella pulchra	Northern California legless lizard	CSC
Arizona elegans occidentails	California glossy snake	CSC
Emys marmorata	western pond turtle	CSC
Gambelia sila	blunt-nosed leopard lizard	FE, CE, FP
Phrynosoma blainvillii	coast horned lizard	CSC
Thamnophis gigas	giant garter snake	FT, CT
Birds		
Agelaius tricolor	tricolored blackbird	CT, CSC
Athene cunicularia	burrowing owl	CSC
Buteo swainsoni	Swainson's hawk	CT
Coccyzus americanus occidentalis	western yellow-billed cuckoo	FT, CE
Vireo bellii pusillus	least Bell's vireo	FE, CE
Mammals		
Antrozous pallidus	pallid bat	CSC
Dipodomys nitratoides exilis	Fresno kangaroo rat	FE, CE
Eumops perotis californicus	western mastiff bat	CSC
Taxidea taxus	American badger	CSC
Vulpes macrotis mutica	San Joaquin kit fox	FE, CT

Sources:
California Department of Fish and Wildlife. 2020. California Natural Diversity Data Base, California Department of Fish and Wildlife Sacramento, CA. Quads: Malaga, Clovis, Round Mountain, Sanger, Selma, Conejo, Caruthers, Fresno South, and Fresno North.
California Native Plant Society (CNPS). 2020. Inventory of Rare and Endangered Plants (online edition, v6-05b 4-11-05). Rare Plant Scientific Advisory Committee. California Native Plant Society. Sacramento, CA. Quads: Malaga, Clovis, Round Mountain, Sanger, Selma, Conejo, Caruthers, Fresno South, and Fresno North
United States Fish and Wildlife Service. 2020. Federal Endangered and Threatened Species that Occur in or may be Affected by Projects U.S.G.S 7 ½ Minute Quads. USFWS. Sacramento, CA. Quads: Malaga, Clovis, Round Mountain, Sanger, Selma, Conejo, Caruthers, Fresno South, and Fresno North
Abbreviations:
FE Federal Endangered Species
FT Federal Threatened Species

FP Fully Protected Animal, CDFW
MBTA Species Protected Under the Auspices of the Migratory Bird Treaty Act
CC Califonria Candidate Species
CE California Endangered Species
CT California Threatened Species
CSC California Department of Fish and Game Species of Special Concern
G1 Global Conservation Status: Critically Imperiled
G2 Global Conservation Status: Imperiled
G3 Global Conservation Status: Vulnerable

The San Joaquin kit fox is unlikely to occur on any portion of the Project site. The nearest record of occurrence for this species was from the 1980's and is more than 8.4 miles southeast of the Project near Sanger. The annual grassland habitat that exists on-site is limited and highly degraded and disturbed by surrounding urban development, trash dumping, repeated disking, a recent grassfire, multiple homeless camps, and nearby road traffic. One inactive mammal den entrance was found off the site but within the BSA at a dry basin. The entrance was unusually large and was accompanied by other oddly sized entrances within 30 feet of the entrance. Each void contained trash and other foreign materials. No diagnostic sign of any large mammal was found in or near the opening. While there are abundant prey items on-site, site conditions documented within the BSA make it unlikely that San Joaquin Kit fox would be present, even as transient foragers. Likewise, the American badger, which has similar habitat requirements, is unlikely to occur on any portion of the Project site. Proposed Project activities would have no effect on these species.

The Swainson's hawk is unlikely to occur at the Project. The most recent record of occurrence in the region was from 2016 on the west side of State Route 99, 3.5 miles southwest of the Project. While there is foraging habit on-site, there were no potential Swainson's hawk nests observed on the site, there were few trees of a size that would support nesting Swainson's hawks, and the disturbances and human activity in the area limit the potential for Swainson's hawks to use the site as a breeding area. Sixteen small mammal burrow complexes were mapped during the reconnaissance survey, but many more active burrows and burrow complexes likely exist on-site. Two red-tailed hawks were observed hunting on the southern half of the site and other raptors may use the site to forage.

4.4 - Nesting Migratory Birds and Raptors

4.4.1 - PRESENCE OF NESTING BIRDS AND RAPTORS

There were no nests of migratory birds or raptors on the Project site at the time of the survey. There was one walnut tree on-site that could potentially serve as nesting habitat, but most of the existing trees were either dead or degraded pistachio trees. Many of the trees were eliminated by the recent fire. More than two-dozen mourning doves, which are a ground nesting species, were observed during the reconnaissance survey. No ground nests were found. A pair of red-tailed hawks was hunting on the southern side of the site, but no active nest was present. There is nesting habitat outside the Project site within the BSA, but that habitat is limited mostly to ornamental tree species. There are several large eucalyptus trees (*Eucalyptus* sp.) north of the site adjacent to an existing active orchard, but no nests were found in those trees or in any other tree observed within the BSA.

4.5 - Critical Habitat, Movement Corridors, and Linkages

4.5.1 - Results of Literature Review and Database Searches

No designated Critical Habitat occurs on the Project site. The nearest USFWS-designated Critical Habitat Unit is for Fleshy Owl's Clover, located approximately 10.2 miles to the northeast of the Project (Figure 4-1).

4.5.2 - Presence of Movement Corridors and Linkages

There are no important movement corridors or linkages that intersect the Project site.

4.6 - Wetlands and Other Waters

4.6.1 - Results of Literature Review and Database Searches

No wetland features are known to exist at the Project site (see Figures 3-3 and 3-5). The NHD identified one blueline feature, the Bradley Canal, occurring along the northern border of the Project. The NWI shows one freshwater pond feature located outside of the site on the eastern border of the Project.

4.6.2 - Presence of Wetlands and Other Waters

All wetland features and blueline features identified by the NWI and NHD database search were visited during the survey. There were wetlands or stream features on-site. The Braley Canal does not exist on-site and the freshwater pond indicated by NWI was located off of the site This pond, more accurately described as a dry basin, showed no evidence of recent inundation and did not support any wetland vegetation. Small mammal burrow entrances were common within this basin and the basin contained at least one large burrow entrance. The presence of these burrows indicate that the site has been dry for quite some time. A large, inundated retention pond occurs off the project site but within the BSA to the south of the site. It is a managed feature that appears to be maintained regularly. No wetland vegetation occurs around the edges of this feature.

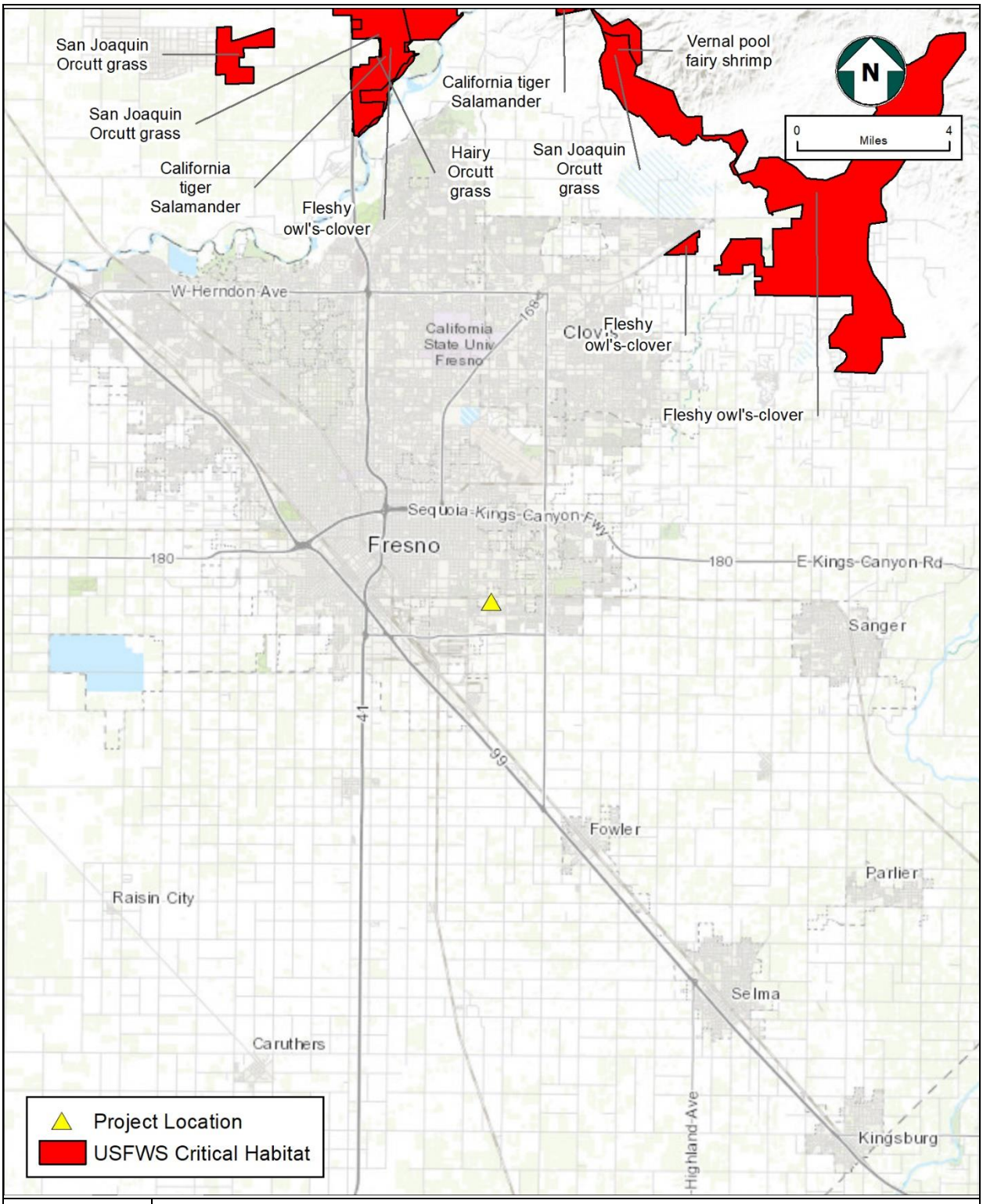

Figure 4-1
Critical Habitat Map
Autumn Ridge Project,
Fresno County, California

SECTION 5 - POTENTIAL PROJECT IMPACTS

5.1 - Potential Impacts to Sensitive Vegetation Communities and Special-Status Plant Species

No sensitive vegetation communities or special-status plant species occur on-site. The only habitat that could potentially support special-status plant species is in the inundated retention pond south of the project site within the BSA, where Sanford's arrowhead could potentially occur. However, it is unlikely that Sanford's arrowhead would occur. The Project would not impact sensitive natural communities or special-status plant species.

5.2 - Potential Impacts to Special-Status Wildlife Species

Some special status species could potentially be present at the Project, but their potential for occurrence, even as transients, is very unlikely. The San Joaquin kit fox, American badger, and western burrowing owl are unlikely to occur on or near the Project and Project activities would have no effect on these species. No potential nests of the Swainson's hawk were present on the Project site or within the BSA. The Project will result in the removal of on-site agricultural trees, but the loss of these trees will not represent a loss in nesting habitat for the Swainson's hawk. No special-status wildlife species or diagnostic signs of special-status wildlife species were observed on the Project site, and the degraded condition of the site would tend to preclude those species from occurring. The Project is anticipated to have no impact to special-status wildlife species.

5.3 - Potential Impacts to Nesting Birds and Raptors

Although there were no active bird nests observed on the Project site, there is a potential for bird nests to become established prior to Project development. Accordingly, there would be a potential for Project activities to result in the loss of active migratory bird and raptor nests, and to cause nest abandonment or nest failure and interference with breeding bird behaviors including foraging, feeding, and rearing behaviors. These impacts would be limited to the areas of the Project site that support nesting and foraging habitat. Similarly, there could be active bird nests off site but within the BSA that could be impacted by Project development.

5.4 - Potential Impacts to Movement Corridors and Linkages

Project activities would not impact any movement corridors or wildlife linkages.

5.5 - Potential Impacts to Wetlands and Waters

No wetland or stream features exist on the Project and there would be no impacts to wetland or stream resources.

SECTION 6 - RECOMMENDATIONS

Although there were no special-status plant or wildlife species found on the site, there is some potential that Project activities could attract wildlife of various species and lead to possible impacts, We recommend that the below list of Best Management Practices (BMP) be followed.

- A worker environmental Awareness Training Program should be prepared and presented to all workers that will be on-site during construction activities;
- Project-related vehicles should observe a 20 mph speed limit in all project areas, except on County roads and State and federal highways; this is particularly important at night when animals are most active. To the extent possible, nighttime construction should be minimized. Off-road traffic outside of designated project areas should be prohibited;
- the contractor should cover all excavated, steep-walled holes or trenches more than 2 feet deep at the close of each working day with plywood or similar materials, or provide one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, the contractor should thoroughly inspect them for trapped animals;
- Wildlife are attracted to den-like structures such as pipes and may enter stored pipe becoming trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly examined for wildlife before the pipe is subsequently buried, capped, or otherwise used or moved in anyway.
- All trash and food items should be discarded into closed containers and properly disposed at the end of each workday;
- To prevent harassment, mortality of wildlife, or destruction of dens by dogs or cats, no pets should be permitted on project sites; and

To ensure the protection of nesting migratory birds and raptors, it is recommended that:

- If Project activities are scheduled during the breeding bird season, from January 15th through September 15th, then a preconstruction survey for nesting birds should be conducted within the project footprint and within 500-feet from the outside boundaries of the Project footprint. Construction activities should not be conducted within 250 feet of an active bird nest or within 500 feet of an active raptor nest. That avoidance distance could be reduced if a biological monitor determines that activities are not affecting the breeding success of the nesting birds.

SECTION 7 - SUMMARY AND CONCLUSIONS

Based on the findings of biological field investigations, there is no potential for special-status plant species and little potential for special status wildlife species to occur on the site. The San Joaquin Kit Fox, Swainson's Hawk, American Badger, and burrowing owl are absent from the site. The Project will have no effect to these species. Nesting migratory birds and raptors have some potential to occur at the Project. BMPs and avoidance measures for nesting birds are recommended to ensure project impacts are minimized.

This Biological Resource Evaluation report has been performed in accordance with professionally accepted biological investigation practices conducted at this time and in this geographic area. The findings and opinions conveyed in this report are based on findings derived from a comprehensive database and literature search and an on-site field examination. The biological investigation is limited by the scope of work performed. Survey results for certain taxa conducted as part of this assessment may not have been performed during a blooming period or particular portion of the season when positive identification of one or more species would be possible, if present, and therefore, cannot be considered definitive. The biological surveys are limited also by environmental conditions present at the time of the surveys. In general, biological (or protocol) surveys do not guarantee that the organisms are not present and would not be discovered in the future within the site. Mobile animal species could occupy the site on a transient basis or re-establish populations in the future. No other guarantees or warranties, expressed or implied, are provided.

SECTION 8 - REFERENCES

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APPENDIX A

DATABASE SEARCH RESULTS
AUTUMN RIDGE PROJECT, FRESNO, FRESNO COUNTY, CALIFORNIA

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Clovis (3611976) OR Malaga (3611966) OR Conejo (3611956) OR Selma (3611955) OR Fresno South (3611967) OR Fresno North (3611977) OR Sanger (3611965) OR Round Mountain (3611975) OR Caruthers (3611957))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Anniella pulchra northern California legless lizard	ARACC01020	None	None	G3	S3	SSC
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Ardea alba great egret	ABNGA04040	None	None	G5	S4	
Arizona elegans occidentalis California glossy snake	ARADB01017	None	None	G5T2	S2	SSC
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Bombus crotchii Crotch bumble bee	IIHYM24480	None	Candidate Endangered	G3G4	S1S2	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2S3	
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Castilleja campestris var. succulenta succulent owl's-clover	PDSCR0D3Z1	Threatened	Endangered	G4?T2T3	S2S3	1B.2
Caulanthus californicus California jewelflower	PDBRA31010	Endangered	Endangered	G1	S1	1B.1
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
Dipodomys nitratoides exilis Fresno kangaroo rat	AMAFD03151	Endangered	Endangered	G3TH	SH	
Efferia antiochi Antioch efferian robberfly	IIDIP07010	None	None	G1G2	S1S2	
Egretta thula snowy egret	ABNGA06030	None	None	G5	S4	
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Eryngium spinosepalum spiny-sepaled button-celery	PDAPI0Z0Y0	None	None	G2	S2	1B.2
Eumops perotis californicus western mastiff bat	AMACD02011	None	None	G5T4	S3S4	SSC
Imperata brevifolia California satintail	PMPOA3D020	None	None	G4	S3	2B.1
Lagophylla dichotoma forked hare-leaf	PDAST5J070	None	None	G2	S2	1B.1
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lasthenia chrysantha alkali-sink goldfields	PDAST5L030	None	None	GNR	SNR	1B.1
Leptosiphon serrulatus Madera leptosiphon	PDPLM09130	None	None	G3	S3	1B.2
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Lytta molesta molestan blister beetle	IICOL4C030	None	None	G2	S2	
Metapogon hurdi Hurd's metapogon robberfly	IIDIP08010	None	None	G1G2	S1S2	
Northern Claypan Vernal Pool Northern Claypan Vernal Pool	CTT44120CA	None	None	G1	S1.1	
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Nycticorax nycticorax black-crowned night heron	ABNGA11010	None	None	G5	S4	
Orcuttia inaequalis San Joaquin Valley Orcutt grass	PMPOA4G060	Threatened	Endangered	G1	S1	1B.1
Perognathus inornatus San Joaquin Pocket Mouse	AMAFD01060	None	None	G2G3	S2S3	
Phalacrocorax auritus double-crested cormorant	ABNFD01020	None	None	G5	S4	WL
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G3G4	S3S4	SSC
Pseudobahia peirsonii San Joaquin adobe sunburst	PDAST7P030	Threatened	Endangered	G1	S1	1B.1
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Spea hammondii western spadefoot	AAABF02020	None	None	G3	S3	SSC
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Tropidocarpum capparideum caper-fruited tropidocarpum	PDBRA2R010	None	None	G1	S1	1B.1
Tuctoria greenei Greene's tuctoria	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	
Vulpes macrotis mutica San Joaquin kit fox	AMAJA03041	Endangered	Threatened	G4T2	S2	

Record Count: 44

IPaC **U.S. Fish & Wildlife Service**

Last login July 22, 2020 10:07 AM MDT

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

180239.02

LOCATION

Fresno, Madera and Tulare counties, California

DESCRIPTION

Residential housing devleopment with small road bridge construction over canal.

Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Fisher Pekania pennanti — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/3651

Fresno Kangaroo Rat Dipodomys nitratoides exilis — Endangered
There is final critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/5150

San Joaquin Kit Fox Vulpes macrotis mutica — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/2873

Birds

NAME	STATUS
Yellow-billed Cuckoo Coccyzus americanus There is proposed critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Blunt-nosed Leopard Lizard Gambelia silus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/625	Endangered
Giant Garter Snake Thamnophis gigas No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog Rana draytonii There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander Ambystoma californiense There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/321	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp *Branchinecta conservatio* There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Fleshy Owl's-clover *Castilleja campestris ssp. succulenta* There is final critical habitat for this species. Your location overlaps the critical habitat. https://ecos.fws.gov/ecp/species/8095	Threatened
Greene's Tuctoria *Tuctoria greenei* There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/1573	Endangered
Hairy Orcutt Grass *Orcuttia pilosa* There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2262	Endangered
Hartweg's Golden Sunburst *Pseudobahia bahiifolia* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1704	Endangered

Keck's Checker-mallow Sidalcea keckii There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5704	Endangered
San Joaquin Adobe Sunburst Pseudobahia peirsonii No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2931	Threatened
San Joaquin Orcutt Grass Orcuttia inaequalis There is final critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/5506	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

This location overlaps the critical habitat for the following species:

NAME	TYPE
Fleshy Owl's-clover Castilleja campestris ssp. succulenta https://ecos.fws.gov/ecp/species/8095#crithab	Final

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Burrowing Owl Athene cunicularia This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the conlinental USA https://ecos.fws.gov/ecp/species/9737	Breeds Mar 15 to Aug 31
California Thrasher Toxostoma redivivum This is a Bird of Conservation Concern (BCC) throughout its range in the conlinental USA and Alaska.	Breeds Jan 1 to Jul 31

Clark's Grebe Aechmophorus clarkii This is a Bird of Conservation Concern (BCC) throughout its range in the conlinental USA and Alaska.	Breeds Jan 1 to Dec 31
Common Yellowthroat Geothlypis trichas sinuosa This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the conlinental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31
Costa's Hummingbird Calypte costae This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the conlinental USA https://ecos.fws.gov/ecp/species/9470	Breeds Jan 15 to Jun 10
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lawrence's Goldfinch Carduelis lawrencei This is a Bird of Conservation Concern (BCC) throughout its range in the conlinental USA and Alaska. https://ecos.fws.gov/ecp/species/9464	Breeds Mar 20 to Sep 20
Lewis's Woodpecker Melanerpes lewis This is a Bird of Conservation Concern (BCC) throughout its range in the conlinental USA and Alaska. https://ecos.fws.gov/ecp/species/9408	Breeds Apr 20 to Sep 30
Long-billed Curlew Numenius americanus This is a Bird of Conservation Concern (BCC) throughout its range in the conlinental USA and Alaska. https://ecos.fws.gov/ecp/species/5511	Breeds elsewhere
Marbled Godwit Limosa fedoa This is a Bird of Conservation Concern (BCC) throughout its range in the conlinental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Nuttall's Woodpecker Picoides nuttallii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the conlinental USA https://ecos.fws.gov/ecp/species/9410	Breeds Apr 1 to Jul 20

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the conterminous USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Rufous Hummingbird selasphorus rufus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the conterminous USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the conterminous USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Song Sparrow Melospiza melodia — Breeds Feb 20 to Sep 5
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the conterminous USA

Spotted Towhee Pipilo maculatus clementae — Breeds Apr 15 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the conterminous USA
https://ecos.fws.gov/ecp/species/4243

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the conterminous USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Whimbrel Numenius phaeopus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the conterminous USA and Alaska.
https://ecos.fws.gov/ecp/species/9483

Willet Tringa semipalmata — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the conterminous USA and Alaska.

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the conterminous USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper

Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

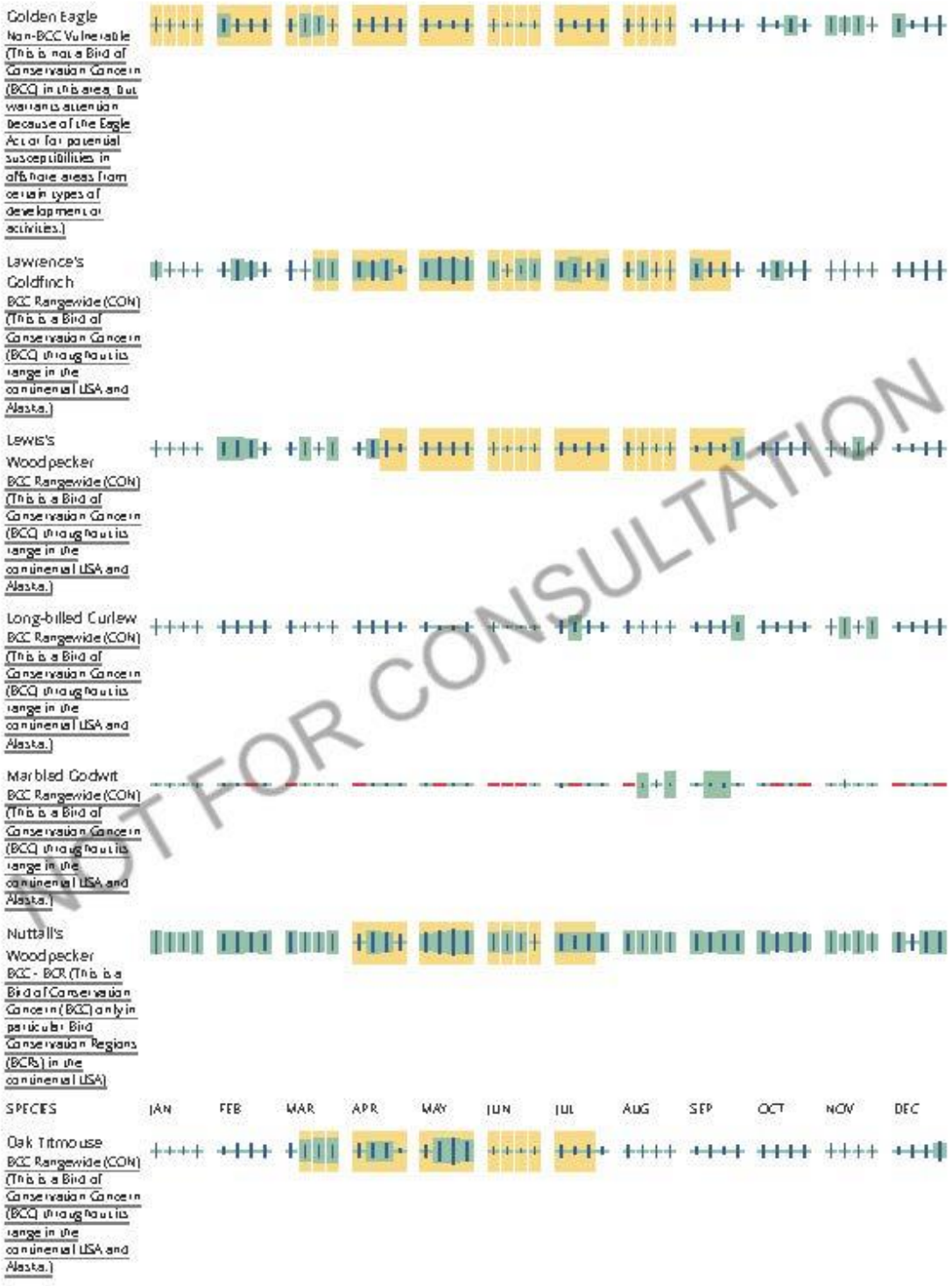
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

■ probability of presence ■ breeding season | survey effort — no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Divine Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

The area of this project is too large for IPaC to load all NWI wetlands in the area. The list below may be incomplete. Please contact the local U.S. Fish and Wildlife Service office or visit the NWI map for a full list.

FRESHWATER EMERGENT WETLAND

- PEM1C
- PEM1Ah
- PEM1A
- PEM1Kx
- PEM1Cx
- PEM1F
- PEM1Fx
- PEM1Fh
- PEM1Ax
- PEM1Ch
- PEM1Cd
- PEM1B

FRESHWATER FORESTED/SHRUB WETLAND

- PFOC
- PFOA
- PSSA
- PSSC
- PFOAh
- PFOCh
- PSSCx
- PSSCh
- PSSAx

FRESHWATER POND

- PUBHx
- PUBFx
- PUBKx
- PUBF
- PUBK
- PUBHh
- PUBH
- PUSCx
- PUSCh
- PUSA
- PUSAh
- PUBFh
- PABF
- PABFx
- PUSKx
- PUSC
- PUSJx
- PABKx
- PAB4F
- PABFh

LAKE

- L2UBFh
- L2UBKx
- L1UBHx
- L2UBFx
- L2UBF
- L2USKx
- L2USCh
- L2USAh
- L2UBHx

RIVERINE

- R4SBCx
- R4SBC
- R2USC
- R2USA

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:
Consultation Code: 08ESMF00-2020-SLI-2419
Event Code: 08ESMF00-2020-E-07460
Project Name: 180239.02

July 22, 2020

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2020-SLI-2419

Event Code: 08ESMF00-2020-E-07460

Project Name: 180239.02

Project Type: DEVELOPMENT

Project Description: Residential housing devleopment with small road bridge construction over canal.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/36.68749995797155N119.68750015652256W

Counties: Fresno, CA | Madera, CA | Tulare, CA

Endangered Species Act Species

There is a total of 19 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Fisher *Pekania pennanti* Population: SSN DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3651	Endangered
Fresno Kangaroo Rat *Dipodomys nitratoides exilis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5150 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/37/office/11420.pdf	Endangered
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Birds

NAME	STATUS
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Blunt-nosed Leopard Lizard *Gambelia silus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/625	Endangered
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp *Branchinecta conservatio* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp *Lepidurus packardi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Fleshy Owl's-clover *Castilleja campestris ssp. succulenta* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8095	Threatened
Greene's Tuctoria *Tuctoria greenei* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1573	Endangered
Hairy Orcutt Grass *Orcuttia pilosa* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2262	Endangered
Hartweg's Golden Sunburst *Pseudobahia bahiifolia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1704	Endangered
Keck's Checker-mallow *Sidalcea keckii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5704	Endangered
San Joaquin Adobe Sunburst *Pseudobahia peirsonii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2931	Threatened
San Joaquin Orcutt Grass *Orcuttia inaequalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5506	Threatened

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Fleshy Owl's-clover *Castilleja campestris ssp. succulenta* https://ecos.fws.gov/ecp/species/8095#crithab	Final

APPENDIX B

REPRESENTATIVE PHOTOGRAPHS
AUTUMN RIDGE PROJECT, FRESNO, FRESNO COUNTY, CALIFORNIA

Photograph 1: Aerial view of Project site taken from northwest corner or site.
GPS Coordinates: 36.7227211, -119.7286453 facing southeast.
Photograph taken by Dylan Ayers on August 13, 2020.

Photograph 2: Aerial view of Project site taken from southwest corner or site.
GPS Coordinates: 36.7173386, -119.7283859, facing northeast.
Photograph taken by Dylan Ayers on August 13, 2020.

Photograph 3: Aerial view of Project site taken from southeast corner or site
GPS Coordinates: 36.7192688, -119.7289963, facing northwest.
Photograph taken by Dylan Ayers on August 13, 2020.

Photograph 4: Aerial view of Project site taken from northeast corner or site
GPS Coordinates: 36.7229614, -119.7219009, facing southwest.
Photograph taken by Dylan Ayers on August 13, 2020.

Photograph 5: Aerial view of northern half of Project.
GPS Coordinates: 36.7211876, -119.7290192, facing east.
Photograph taken by Dylan Ayers on August 13, 2020.

Photograph 6: Aerial view of southern half of Project.
GPS Coordinates: 36.7187729, -119.7289658, facing east
Photograph taken by Dylan Ayers on August 13, 2020.

Photograph 7: Aerial view of site entrance from Willow Avenue. Dumped trash and homeless camp also pictured.
GPS Coordinates: 36.7209091, -119.7258911, facing west.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 8: Aerial view of northeastern corner of site with railroad and offsite area pictured.
GPS Coordinates: 36.7220039, -119.7250214, facing north.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 9: Aerial view of northern half of site with ag trees, looking south towards dry basin on left, retention pond on right.
GPS Coordinates: 36.721508, -119.724968, facing southeast.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 10: Aerial view of dry basin on east side of site.
GPS Coordinates: 36.7205009, -119.7215576, facing southwest.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 11 Aerial view of inundated retention pond on southern side of site.
GPS Coordinates: 36.7191658, -119.7229156, facing southwest.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 12: View of red-tailed hawk perched in tree on southern half of site.
GPS Coordinates: 36.7190399, -119.7230301, facing west.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 13: View of burnt area of site showing high volume of small mammal burrow entrances.
GPS Coordinates: 36.743280, -119.677695, facing north.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 14: View of unburnt area in northwest corner of site. Active mammal burrow complex pictured.
GPS Coordinates: 36.743714, -119.677796, facing east.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 15: View of active small mammal burrow complex beneath pistachio tree.
GPS Coordinates: 36.7208824, -119.7269897, facing north.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 16: View of dry basin on west side of site, taken from within basin.
GPS Coordinates: 36.7198486, -119.7226486, facing northwest.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 17: Large mammal den entrance found within dry basin. Possibly manmade.
GPS Coordinates: 36.7201042, -119.7230606, facing northeast.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 18: View of small mammal burrow entrances found within dry basin.
GPS Coordinates: 36.7201042, -119.7224808, facing southwest.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 17: View burned lands off-site in BSA, looking west from southeastern corner of site border of site taken from southwest corner of site.
GPS Coordinates: 36.7184601, -119.7230225, facing east.
Photograph taken by Dylan Ayers on August 13, 2020

Photograph 18: View of northern border of site taken from northwest corner of site.
GPS Coordinates: 36.7217712, -119.7273788, facing east.
Photograph taken by Dylan Ayers on August 13, 2020

TECHNICAL MEMORANDUM

Date: September 23, 2020

Project: Cultural resources records search for the Autumn Ridge Project, City of Fresno, Fresno CA

To: Jaymie Brauer

From: Robert Parr, MS, RPA, Senior Archaeologist

Subject: Cultural Resources Records Search Results (RS #20-269)

Background

This Technical Memo is to provide a cultural record search and to determine whether the proposed project would impact cultural resources.

Project Description

The proposed Tentative Subdivision Map (TSM) would allow the applicant, D.R. Horton, the ability to construct a single-family residential subdivision. The proposed TSM intends to create residential lots and the appurtenant infrastructure consistent with the General Plan designation of Medium Density Residential and proposed Zoning designation of RS-5 (Residential Single-Family, Medium Density), respectively. In addition, there is an approximate five-acre portion of the project site that has a dual-designation as Open Space – Park and Medium Density Residential land uses by the City's General Plan. As mentioned in the City's General Plan, all new parks, open space, and public facilities (such as school sites) carry dual land use designations, so that if that facility is not needed, private and public development consistent with zoning and development standards may be approved. Future development of single-family homes will be consistent with these designations and would be evaluated by the City through the subsequent building permit submittal. In addition, the project will require an annexation into the City of Fresno and a Prezone to RS-5.

Project Location

The proposed Project is located on the northern edge of the City of Visalia, Tulare County California, on Pratt Road and Riverway Drive (Figures 1 and 2). It is within the Visalia California U.S. Geological Survey (USGS) 7.5-minute quadrangle, and within portions of Sections 13 and 18, T.18S, R.24E and R.25E, Mount Diablo Base and Meridian. The St. Johns River runs along the northern property boundary. There is residential development to the south and undeveloped agricultural lands to the east and west of the site.

Results

A cultural resources records search (RS #20-211) was conducted at the Southern San Joaquin Valley Information Center, CSU Bakersfield for the Pratt Family Ranch Residential Development Project. A Sacred Lands File Search was also requested from the Native American Heritage Commission. On May 26, 2020, the NAHC response letter indicated negative results. This letter is included with this memo.

The records search covered an area within one-half mile of the project and included a review of the *National Register of Historic Places*, *California Points of Historical Interest*, *California Registry of Historic Resources, California Historical Landmarks, California State Historic Resources Inventory*, and a review of cultural resource reports on file.

The records search indicated that the subject property had never been surveyed for cultural resources. No cultural resources have been recorded on the property and it is not known if any exist there. One cultural resource survey has been conducted within a half mile of the project (Nuss and Beazley 2016). No resources have been recorded within a half mile radius of the project.

Visalia General Plan certified EIR, Section 3.12 *Cultural Resources*, notes several recognized historical resources in the City (City of Visalia, 2014). However, these sites are not in close proximity to the Project.

Conclusions

Based on the results of cultural records search findings and the lack of historical or archaeological resources previously identified within a half mile radius of the proposed Project, the potential to encounter subsurface cultural resources is minimal. Additionally, the Project construction would be conducted within the partially developed and previously disturbed parcel. The potential to uncover subsurface historical or archaeological deposits is would be considered unlikely.

However, there is still a possibility that historical or archaeological materials may be exposed during construction. Grading and trenching, as well as other ground-disturbing actions have the potential to damage or destroy these previously unidentified and potentially significant cultural resources within the project area, including historical or archaeological resources. Disturbance of any deposits that have the potential to provide significant cultural data would be considered a significant impact. To reduce the potential impacts of the Project on cultural resources, the following measures are recommended to be included on the final site plans and all construction

plans and specs. With implementation of CUL-1 and CUL-2, the Project would have a less than significant impact.

CUL-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 archaeologist can evaluate 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 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. Implementation of the mitigation measure below would ensure that the proposed Project would not cause a substantial adverse change in the significance of a historical resource.

CUL-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. The specific protocol, guidelines, and channels of communication outlined by the Native American Heritage Commission, in accordance with Section 7050.5 of the Health and Safety Code, Section 5097.98 of the Public Resources Code (Chapter 1492, Statutes of 1982, Senate Bill 297), and Senate Bill 447 (Chapter 44, Statutes of 1987), shall be followed. Section 7050.5(c) shall guide the potential Native American involvement, in the event of discovery of human remains, at the direction of the county coroner.

Robert E. Parr, MS, RPA
Senior Archaeologist

References
(Note: Alpha-numeric designation in parentheses following the citation refer to IC report reference number.)

Nuss, Andrew and Matthew Beazley

TECHNICAL MEMORANDUM

2016 Archaeological Assessment TCNS ID #140292, American Towers, LLC, Visalia, Tulare County, California. (TU-01778)

Attachment A- Figures

Attachment B- Native American Heritage Commission Sacred Lands File Response

200180

MEMO

Date:	February 11, 2022	**Project No.:**	200272
To:	Israel Trejo, Senior Planner, City of Fresno		
From:	Ernie Escobedo, Clovis Branch Manager, QK		
Subject:	Fiscal Analysis – Autumn Ridge		
cc:	Chris Lang, Planner, City of Fresno		
	Ethan Davis, Associate Planner, QK		
	Trevor Stearns, Associate Planner, QK		

Introduction

The City of Fresno, in 2019, conducted an evaluation of its Tax Sharing Agreement (Agreement) with the County of Fresno. Its purpose was to determine if the revenues collected under that agreement were sufficient in providing adequate levels of service to annexed territory without negatively impacting the General Fund. The evaluation was completed by Economic and Planning Systems, Inc. (EPS) in October 2019 and presented to the City Council in June 2020. The report stated that the Agreement did not allow the City of Fresno to collect appropriate funds to support newly annexed projects. As a result, the City allowed the Agreement to expire.

The City of Fresno is now requiring Developers with proposed projects to conduct a fiscal analysis to determine whether the costs of delivering services are sufficiently funded by the taxes collected from the project. This memorandum will explain the fiscal impact of the proposed Autumn Ridge Project on the City of Fresno's General Fund.

The Project consists of a Vesting Tentative Map (Tract No. 6345) dividing a 38.72-acre parcel into 199 single family residential lots. The project is located on the east side of Willow Avenue, approximately 600 feet northeast of the intersection of Willow and Church Avenues. The site is directly adjacent to an existing single-family residential subdivision to the south, unincorporated vacant properties to the west, unincorporated agricultural property to the north and undeveloped vacant land to the east and west. The Project is within a County Island consisting of three other parcels, totaling approximately 119 acres. Public infrastructure, such as water, sewer, and storm drain facilities are within close proximity to the Project site. The construction of the new main lines that will be required of the Project, will also allow for the other parcels to easily connect once development occurs.

MEMO

Cost Methodology

Summary of City Services

This fiscal analysis relies on the financial information and methodology utilized in the EPS report analysis. The list of City services evaluated in the EPS report can be seen in **Table 1: List of City Services.** The annual cost for those services, including total costs and costs net of dedicated, non-operating revenues, is outlined in **Table 2: City General Fund Costs**.

The EPS report also references additional costs to the City beyond these services, including existing debt service for the Convention Center and associated parking, Chukchansi Park Stadium, and deferred infrastructure costs for annexed land needing improvement. Deferred infrastructure costs are calculated on a per project basis, as different project areas have varying infrastructure needs. Some projects located farther from City limits may require larger up-front or ongoing maintenance costs due to the likelihood they contain existing development. For projects closer to the existing city limits or surrounded by the City, there may be limited or no deferred infrastructure costs in excess of those already accounted for in the City budget. This project specifically, is surrounded the City limits as is assumed for County Islands. The Project site is adjacent to the existing City limits and will produce little to no deferred infrastructure costs. For this reason, debt service has been included in this analysis while deferred infrastructure costs have been omitted.

Table 1: List of City Services by Department

Administration
City Council
Office of the Mayor
City Clerk
Finance
Personnel Services
Information Services
Public Safety
Police
Fire
Public Works
Public Works
Transportation (FAX)
Other Services
General City Purpose
Development and Resource Management (DARM)

Convention Center Debt Service
Parks and Recreation
Source: Click here to enter text. (Economic & Planning Systems, Inc. , 2019)

Table 2: City General Fund Costs by Department

Item	Total	Net	% of Net Total
City Council	$4,637,100	$4,637,100	100%
Office of the Mayor	$4,133,600	$4,133,600	100%
City Clerk	$910,200	$910,200	100%
Finance	$7,388,500	$5,913,100	80%
Personnel Services	$35,989,600	$3,215,700	9%
Information Services	$356,400	$356,400	100%
Police	$180,875,300	$154,314,000	85%
Fire	$69,266,300	$54,428,000	79%
Public Works	$9,092,700	$5,833,500	64%
Parks and Recreation	$29.529.500	$14,927,500	51%
Transportation (FAX)	$9,394,200	$9.097.200	97%
City Attorney	$6,380,900	$6,230,900	98%
General City Purpose	$46,088,900	$0	0%
DARM	$51,617,300	$7,891,00	15%
TOTAL	**$455,660,500**	**$271,888,200**	**60%**

Source: Click here to enter text. (Economic & Planning Systems, Inc. , 2019)

Analyzing Per Capita Costs

To determine per capita costs, total net costs are divided by the City's total population. There are two populations which can be used for determining per capita costs. The EPS report identifies a resident city population of 542,012 and a city service population of 630,422. The per capita costs for the General Fund plus debt service for the resident city population is shown in Table 3: City Costs Per Capita.

While service population was considered, it is not applicable to this Project because it is a residential development. Therefore, resident per capita costs will be used to calculate the Project's fiscal impact within this analysis.

Table 3: City Costs Per Capita

Item	Net	Per Capita Cost (Resident Population)
City Council	$4,637,100	$8.72
Office of the Mayor	$4,133,600	$7.78
City Clerk	$910,200	$1.71
Finance	$5,913,100	$11.12
Personnel Services	$3,215,700	$6.05
Information Services	$356,400	$0.67
Police	$154,314,000	$290.29
Fire	$54,428,000	$102.39
Public Works	$5,833,500	$10.97
Parks and Recreation	$14,927,500	$28.08
Transportation (FAX)	$9,097,200	$17.11
City Attorney	$6,230,900	$11.72
General City Purpose	$0	$0.00
DARM	$7,891,00	$14.84
SUB TOTAL	**$271,888,200**	**$511.47**
Add: Debt Service Per Capita (resident population)		$15.72
ADJUSTED ANNUAL GENERAL FUND COSTS PER CAPITA		**$527.19**

Source: (Economic & Planning Systems, Inc. , 2019)

Project Revenue Analysis

Costs per Unit

To convert the per capita costs to per housing unit costs, the cost per capita has been multiplied by the average estimated persons per household of 3.07. Average persons per household was determined by dividing the total occupied housing units by the current population, as estimated by the US Census Bureau American Community Survey (ACS). The Autumn Ridge Project is planned for 199 units. Calculations for both persons per household and costs per unit can be seen in **Table 4**: Average Annual Costs per Unit.

Table 4: Average Annual Costs per Unit

Total Occupied Housing Units	Current Estimated Population	Average Persons Per Household	Costs Per Capita	Costs Per Unit
172,815[1]	542,012[2]	3.07	$527.19	$1,618.48

[1] U.S. Census Bureau American Community Survey, Table DP04.
[2] U.S. Census Bureau American Community Survey, Table DP05.

Revenue Per Unit

For the purposes of this analysis, three revenue sources have been evaluated:

- Revenue from property taxes
- Revenue from sales taxes
- Revenue from other sources, including room taxes, real estate transfer taxes, franchise fees, and license and permit fees

Total estimated annual revenues originating from all three of these sources are shown in **Table 8: Total Annual Estimated Revenue.**

To determine the Project's contribution to revenues collected from property tax, a property value analysis was conducted using the assessed values of homes from a new subdivision that is within 3 miles of the subject project. This new subdivision is actively selling homes and consists of similar product type and lot sizes. Based on current selling prices from this nearby subdivision, the estimated average selling price of Autumn Ridge is determined to be $445,315[1].

Under State law, property taxes are limited to one percent of the assessed value per Proposition 13. Of that one percent, the City and County were allocated approximately 44.63 percent[2]. Under the now expired tax sharing agreement between the City and County of Fresno, the City was allocated 38% of the remaining revenue. Using these percentages, the projected property tax revenue to the City of Fresno would be approximately $635.90 per

[1] Reflects a point in time capture of average assessed value. The ultimate value of future housing units will vary with market fluctuation. Estimated property values will be reassessed prior to the formation of the proposed Community Facilities District (CFD).
[2] According to Fresno County Tax Collector's Schedule of Levies for 2018/2019 for Tax Rate Area 005-367 directly east of the Project.

unit. These calculations may be reviewed in **Table 5: Annual Estimated Property Tax Revenue Per Unit**.

Sales taxes generated by the proposed project have also been included for consideration in this analysis. Sales tax per capita was calculated using the ratio of sales tax revenue identified in the City's Adopted Fiscal Year 2019/2020 Budget to the total population estimated by the California Department of Finance for the same year. This calculation can be seen in

Table 6: Estimated Annual Sales Tax Revenue per Unit**.**

Other revenue sources were also considered as part of this fiscal analysis. According to the Fresno Adopted Budget for Fiscal Year 2020/2021, revenues collected from residents also include room tax, real estate transfer tax, franchise fees, and license and permit fees. These other revenue sources are expected to be generated by the Project at some level annually. As shown in **Table 7: Estimated Annual Revenue from Other Sources,** revenue per capita received from these additional sources totals approximately $333.13 per unit.

Table 5: Annual Estimated Property Tax Revenue Per Unit

Average Sales Price per Home	Property Tax Rate	Annual Property Tax Collected	City/County Portion of Revenue	City/County Annual Shared Revenue	City of Fresno MOU Split w/ County	City of Fresno Annual Revenue
$445,315	1.0%	$4,453	44.63%	$1,987.44	38%	$755.23

Table 6: Estimated Annual Sales Tax Revenue per Unit

Total Sales Tax Revenue	Estimated Population	Sales Tax Revenue per Capita	Persons Per Household	Annual Sales Tax Revenue per Unit
$102,501,000 [1]	542,012 [2]	$189	3.07	$580.57

[1] City of Fresno 2019/2020 Adopted Budget
[2] California Department of Finance

Table 7: Estimated Annual Revenue from Other Sources

Total Sales Tax Revenue	Estimated Population	Sales Tax Revenue per Capita	Persons Per Household	Annual Sales Tax Revenue per Unit
$ 58,814,800 [1]	542,012 [2]	$108.51	3.07	$333.13

[1] Other revenue sources include Room Tax, Real Estate Transfer Tax, Franchise Fees, and License and Permit Fees. Dollar amount has been sources from the City of Fresno 2019/2020 Adopted Budget.
[2] California Department of Finance

Table 8: Total Annual Estimated Revenue

Revenue Source	Estimated Revenue per Unit
Property Taxes	$755.23
Sales Tax	$580.57
Other	$333.13
Total Annual Estimated Revenue per Unit	**$1,668.93**

Conclusion

When accounting for the costs of City services in comparison to revenues generated from property tax, sales tax, and other revenues, it is anticipated that the Autumn Ridge Project would have an overall net surplus to the General Fund of $50.46 per unit per year, as shown in **Table 9: Estimated Annual Surplus,** which will not include a deferred maintenance cost, due to the location of the Project site in relation to the existing City limits. When extrapolated to include all 199 homes in the community the Autumn Ridge project will contribute $10,041 to the General Fund annually. These calculations assume a 38% allocation of property taxes to the City of Fresno and an average assessed value of $445,315. This fiscal analysis should be revised in the event that a different allocation of property taxes be negotiated prior to annexation.

In light of the estimated surplus, the applicant proposes the project be annexed into the City without the creation of a new community facilities district (CFD).

Table 9: Estimated Annual Surplus

Item	Estimated Revenue/Costs per Unit
Annual Estimated Revenue per Unit	$1,668.93[1]
Annual Estimated Costs per Unit	$1,618.48
Total Annual Surplus per Unit	**$50.46**

[1] Assumes a 38% property tax allocation to the City of Fresno.

Environmental Noise & Vibration Assessment

Autumn Ridge Residential Development

Fresno, California

BAC Job # 2021-154

Prepared For:

Quad Knopf, Inc.

Attn: Ernie Escobedo
601 Pollasky Avenue, Suite 301
Clovis, CA 93612

Prepared By:

Bollard Acoustical Consultants, Inc.

Dario Gotchet, Senior Consultant

December 3, 2021

BOLLARD
Acoustical Consultants

CEQA Checklist

NOISE AND VIBRATION **– Would the Project Result in:**	**NA – Not Applicable**	**Potentially Significant Impact**	**Less than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
a) Generation of 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**

Introduction

The proposed Autumn Ridge Residential Development (project) is located east of S. Willow Avenue and south of an existing San Joaquin Valley Railroad (SJVR) track in Fresno, California. The project proposes the construction of approximately 201 single-family residential lots and a neighborhood park. Existing land uses in the immediate project vicinity include residential and agricultural to the north, residential to the south, agricultural to the west, and undeveloped land to the east. The project site location and site plan are shown on Figures 1 and 2, respectively.

The purposes of this assessment are to quantify the existing noise and vibration environments, identify potential noise and vibration impacts resulting from the project, identify appropriate mitigation measures, and provide quantitative and qualitative analyses of impacts associated with the project. Specifically, impacts are identified if project-related activities would cause a substantial increase in ambient noise or vibration levels at existing sensitive uses in the project vicinity, or if traffic, railroad, or project-generated noise or vibration levels would exceed applicable federal, state, or City of Fresno noise or vibration standards at existing or proposed sensitive uses.

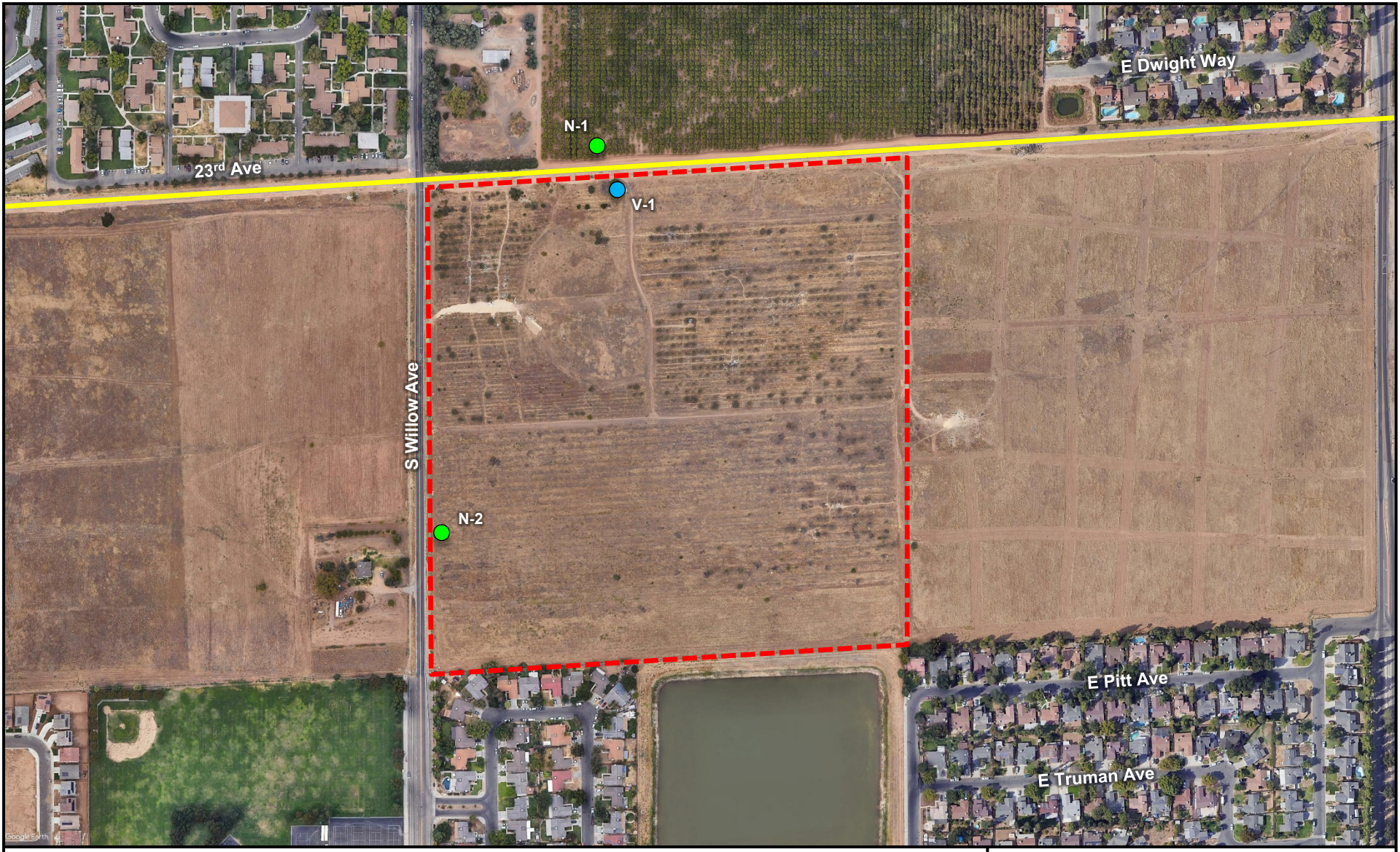
Noise and Vibration Fundamentals

Noise

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are designated as sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or Hertz (Hz). Definitions of acoustical terminology are provided in Appendix A.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals of pressure) as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in decibel levels correspond closely to human perception of relative loudness. Noise levels associated with common noise sources are provided in Figure 3.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by filtering the frequency response of a sound level meter by means of the standardized A-weighting network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels.



Legend

- Project Area Boundary (Approximate)
- Existing SJVR Track
- Noise Measurement Locations (Long-Term)
- Vibration Measurement Location (Long-Term)

N

Scale (Feet)

0 150 300

Autumn Ridge
Fresno, California

Project Area

Figure 1

BOLLARD Acoustical Consultants

Legend

- Existing SJVR Track
- Proposed 6' Block Walls (Traffic Noise Barriers)
- Proposed 8' Block Wall (Railroad Noise Barrier)
- Recommended STC-32 Windows – Upper-Floors Only (Impact 9 Recommendation)

N

Scale (Feet)

0 100 200

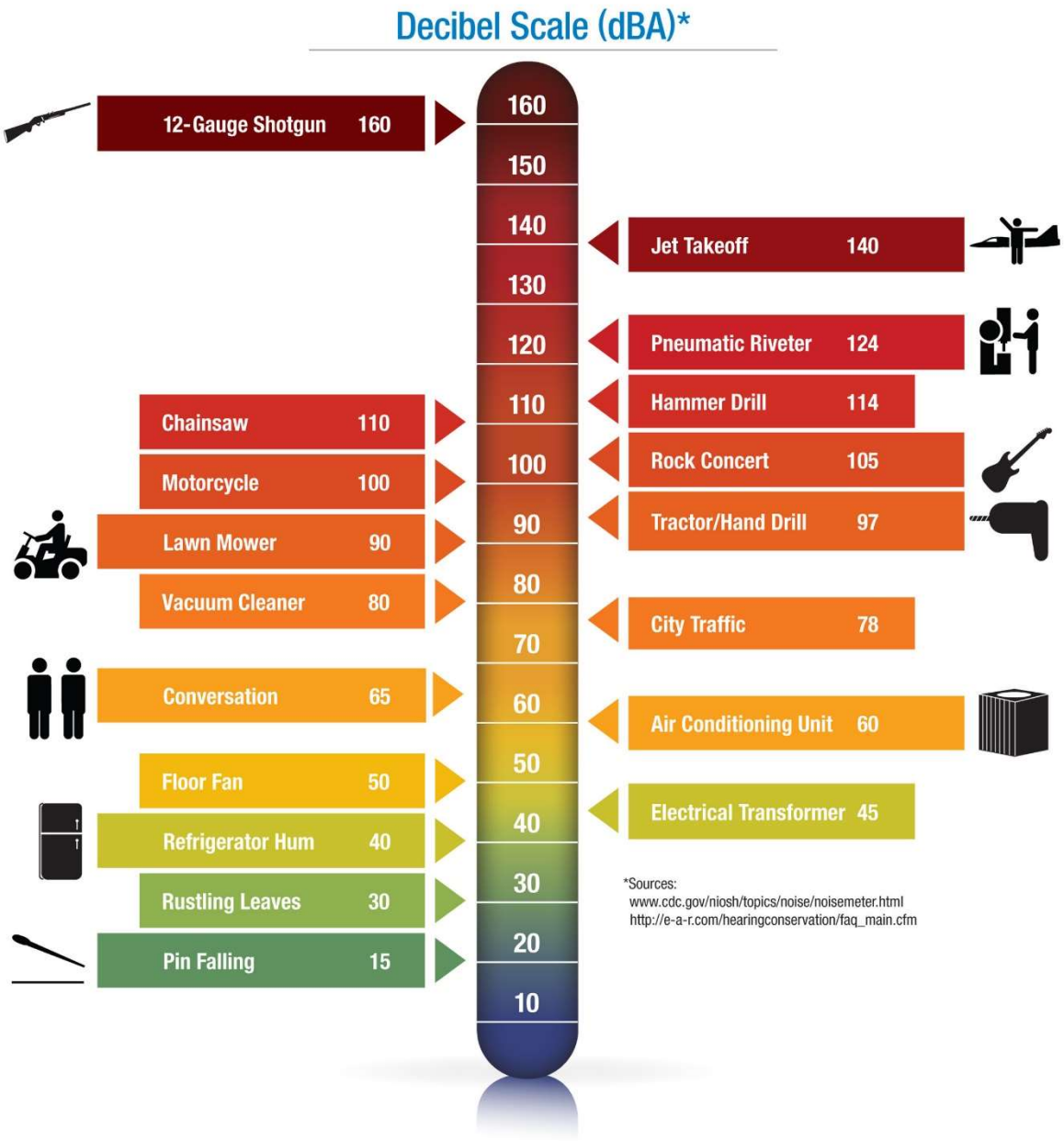
Autumn Ridge
Fresno, California

Site Plan

Figure 2

BOLLARD Acoustical Consultants

Figure 3
Noise Levels Associated with Common Noise Sources



Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given noise environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}). The L_{eq} is the foundation of the day-night average noise descriptor (DNL or L_{dn}) and shows very good correlation with community response to noise.

The DNL is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because DNL represents a 24-hour average, it tends to disguise short-term variations in the noise environment. DNL-based noise standards are commonly used to assess noise impacts associated with traffic, railroad, and aircraft noise sources.

Vibration

According to the Federal Transit Administration Noise and Vibration Impact Assessment Guidelines (FTA-VA-90-06), ground-borne vibration can be a serious concern for nearby neighbors of a transit system route or maintenance facility, causing buildings to shake and rumbling sounds to be heard. In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads.

Train wheels rolling on rails create vibration energy that is transmitted through the track support system into the ground, creating vibration waves that propagate through the various soil and rock strata to the foundations of nearby buildings. The vibration propagates from the foundation throughout the remainder of the building structure. The maximum vibration amplitudes of the floors and walls of a building often will be at the resonance frequencies of various components of the building.

Vibration can be described in terms of acceleration, velocity, or displacement. A common practice is to monitor vibration measures in terms of peak particle velocities (IPS, PPV inches/second) or RMS velocity in terms of VdB.

Human response to vibration is difficult to quantify. Vibration can be felt or heard well below the levels that produce any damage to structures. The duration of the event has an effect on human response, as does frequency. Generally, as the duration and vibration frequency increase, the potential for adverse human response increases.

According to the Transportation and Construction-Induced Vibration Guidance Manual (Caltrans, April 2020), operation of construction equipment and construction techniques generate ground vibration. Traffic traveling on roadways can also be a source of such vibration. At high enough amplitudes, ground vibration has the potential to damage structures and/or cause cosmetic damage. Ground vibration can also be a source of annoyance to individuals who live or work close to vibration-generating activities. However, traffic, rarely generates vibration amplitudes high enough to cause structural or cosmetic damage.

Regulatory Setting: Criteria for Acceptable Noise and Vibration Exposure

Federal

Federal Transit Administration (FTA)

The City of Fresno does not currently have adopted standards for groundborne vibration. As a result, vibration impact criteria established by the U.S. Department of Transportation's Federal Transit Administration (FTA) criteria were applied to the assessment of railroad operations at the project site. The FTA vibration impact criteria are based on maximum overall levels for a single event, such as train passbys. These vibration impact criteria, identified in Table 6-3 of the FTA's Transit Noise and Vibration Impact Assessment Manual (September 2018), have been reproduced in Table 1 of this report.

Table 1
FTA Groundborne Vibration Impact Criteria

Land Use Category	Groundborne Vibration Impact Levels (VdB re 1 micro-inch/sec)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1 – Buildings where vibration would interfere with interior operations	65[4]	65[4]	65[4]
Category 2 – Residences and buildings where people normally sleep	72	75	80
Category 3 – Institutional land uses with primarily daytime use	75	78	83

[1] "Frequent Events" is defined as more than 70 vibration events of the same source per day.
[2] "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
[3] "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day.
[4] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. For equipment that is more sensitive, a detailed vibration analysis must be performed.

Source: 2018 FTA Transit Noise and Vibration Impact Assessment Manual, Table 6-3

State of California

California Environmental Quality Act (CEQA)

The State of California has established regulatory criteria that are applicable to this assessment. Specifically, Appendix G of the State of California Environmental Quality Act (CEQA) Guidelines are used to assess the potential significance of impacts pursuant to local General Plan policies, Municipal Code standards, or the applicable standards of other agencies. According to Appendix G of the CEQA guidelines, the project would result in a significant noise or vibration impact if the following occur:

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 other applicable standards of other agencies?

B. Generation of excessive groundborne vibration or groundborne noise levels?

C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

It should be noted that audibility is not a test of significance according to CEQA. If this were the case, any project which added any audible amount of noise to the environment would be considered significant according to CEQA. Because every physical process creates noise, the use of audibility alone as significance criteria would be unworkable. CEQA requires a substantial increase in noise levels before noise impacts are identified, not simply an audible change.

California Department of Transportation (Caltrans)

As mentioned previously, the City of Fresno does not currently have adopted standards for groundborne vibration. As a result, the vibration impact criteria developed by the California Department of Transportation (Caltrans) was applied to the assessment of project construction activities. The Caltrans guidance criteria for building structure and vibration annoyance are presented in Tables 2 and 3, respectively.

Table 2
Caltrans Guidance for Building Structure Vibration Criteria

Structure and Condition	Limiting PPV (in/sec)
Historic and some old buildings	0.5
Residential structures	0.5
New residential structures	1.0
Industrial buildings	2.0
Bridges	2.0
Source: 2020 Caltrans Transportation and Construction Vibration Guidance Manual, Table 14.	

Table 3
Caltrans Guidance for Vibration Annoyance Potential Criteria

	Maximum PPV (in/sec)	
Human Response	Transient Sources	Continuous/Frequent Intermittent Sources
Severe/very disturbing	2.0	0.4 to 3.6
Strongly perceptible	0.9	0.1
Distinctly perceptible	0.24	0.035
Barely/slightly perceptible	0.035	0.012
Note: *Source: 2020 Caltrans Transportation and Construction Vibration Guidance Manual, Tables 4 & 6.*		

Local

Fresno General Plan

The Noise and Safety Element (Chapter 9) of the Fresno General Plan contains the City's noise-related policies. The specific policies which are generally applicable to this project are reproduced below:

NS-1-a **Desirable and Generally Acceptable Exterior Noise Environment.** Establish 65 dB DN/CNEL as the standard for the desirable maximum average exterior noise levels for defined usable exterior areas of residential and noise-sensitive uses for noise but designate 60 dB DNL/CNEL (measured at the property line) for noise generated by stationary sources impinging upon residential and noise-sensitive uses. Maintain 65 dB DNL/CNEL as the maximum average exterior noise levels for non-sensitive commercial land uses and maintain 70 dB DNL/CNEL as maximum average exterior noise level for industrial land uses, both to be measured at the property line of parcels where noise is generated which may impinge on neighboring properties.

NS-1-b **Conditionally Acceptable Exterior Noise Exposure Range.** Establish the conditionally acceptable noise exposure level range for residential and other noise sensitive uses to be 65 dB DNL/CNEL or require appropriate noise reducing mitigation measures as determined by a site specific acoustical analysis to comply with the desirable and conditionally acceptable exterior noise level and the required interior noise level standards set in Table 4 (General Plan Table 9-2).

NS-1-c **Generally Unacceptable Exterior Noise Exposure Range.** Establish the exterior noise exposure of greater than 65 dB DNL/CNEL to be generally unacceptable for residential and other noise sensitive uses for noise generated by sources in Policy NS-1-a, and study alternative less noise-sensitive uses for these areas if otherwise appropriate. Require appropriate noise reducing mitigation measures as determined by a site specific acoustical analysis to comply with the generally desirable or generally acceptable exterior noise level and the required 45 dB L_{eq} interior noise level standards set in Table 4 (General Plan Table 9-2) as conditions of permit approval.

NS-1-e **Update Noise Ordinance.** Update the Noise Ordinance to ensure that noise exposure information and specific standards for both exterior and interior noise and measurement criteria are consistent with this General Plan and changing conditions within the city and with noise control regulations or policies enacted after the adoption of this element.

Table 4
Noise Exposure from Transportation (Non-Aircraft) Noise Sources

Noise-Sensitive Land Use	Maximum Exterior Noise Level (dB)[1] DNL/CNEL (dB)	Maximum Interior Noise Level (dB) L_{eq}[2]	
Residential	65	45	--
Transient Lodging	65	45	--
Hospitals, Nursing Homes	65	45	--
Theatres, Auditoriums, Music Halls	--	--	35
Churches, Meetings Halls	65	--	45
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45

[1] Where the location of an outdoor activity area is unknown or is not applicable, the exterior noise level standard shall be applied to the property line of the receiving land use.
[2] As determined for a typical worst-case hour during periods of use.
Source: Fresno General Plan, Noise and Safety Element, Table 9-2

Table 5
Noise Exposure from Stationary (Non-Transportation) Noise Sources

Noise Level Descriptor	Daytime (7am to 10pm)	Nighttime (10pm to 7am)
Hourly Equivalent Sound Level (L_{eq}), dB	50	45
Maximum Sound Level (L_{max}), dB	70	60

[1] The Department of Development and Resource Management Director, on a case-by-case basis, may designate land uses other than those shown in this table to be noise-sensitive, and may require appropriate noise mitigation measures.
[2] As determined at outdoor activity areas. Where the location of outdoor activity areas are unknown or not applicable, the noise exposure standard shall be applied at the property line of the receiving land use. When ambient noise levels exceed or equal the levels in this table, mitigation shall only be required to limit noise to the ambient plus 5 dB.
Source: Fresno General Plan, Noise and Safety Element, Table 9-3

NS-1-f **Performance Standards.** Implement performance standards for noise reduction for new residential and noise sensitive uses exposed to exterior community noise levels from transportation sources above 65 dB DNL/CNEL, as shown on (General Plan) Figure NS-3: Future Noise Contours, or as identified by a project-specific acoustical analysis based on the target acceptable noise levels set in Table 4 (General Plan Table 9-2) and Policies NS-1-a through NS-1-c.

NS-1-g Noise mitigation measures which help achieve the noise level targets of this plan include, but are not limited to, the following:

- Facades with substantial weight and insulation;
- Installation of sound-rated windows for primary sleeping and activity areas;
- Installation of sound-rated doors for all exterior entries at primary sleeping and activity areas;

- Greater building setbacks and exterior barriers;
- Acoustic baffling of vents for chimneys, attic and gable ends;
- Installation of mechanical ventilation systems that provide fresh air under closed window conditions.

The aforementioned measures are not exhaustive and alternative designs may be approved by the City, provided that a qualified Acoustical Consultant submits information demonstrating that the alternative design(s) will achieve and maintain the specific targets for outdoor activity areas and interior spaces.

NS-1-h **Interior Noise Level Requirement.** Comply with the State Code requirement that any new multifamily residential, hotel, or dorm buildings must be designed to incorporate noise reduction measures to meet the 45 dB DNL interior noise criterion and apply this standard as well to all new single-family residential and noise sensitive uses.

NS-1-i **Mitigation by New Development.** Require an acoustical analysis where new development of industrial, commercial, or other noise generating land uses (including transportation facilities such as roadways, railroads, and airports) may result in noise levels that exceed the noise level exposure criteria established by Tables 4 and 5 (General Plan Tables 9-2 and 9-3) to determine impacts and require developers to mitigate these impacts in conformance with those tables as a condition of permit approval through appropriate means.

Noise mitigation measures may include:

- The screening of noise sources such as parking and loading facilities, outdoor activities, and mechanical equipment;
- Providing increased setbacks for noise sources from adjacent dwellings;
- Installation of walls and landscaping that serve as noise buffers;
- Installation of soundproofing materials and double-glazed windows; and
- Regulating operations, such as hours of operation, including deliveries and trash pickup.

Alternative acoustical designs that achieve the prescribed noise level reduction may be approved by the City, provided a qualified Acoustical Consultant submits information demonstrating that the alternative designs will achieve and maintain the specific targets for outdoor activity areas and interior spaces. As a last resort, developers may propose to construct noise walls along roadways when compatible with aesthetic concerns and neighborhood character. This would be a developer responsibility, with no City funding.

NS-1-j **Significance Threshold.** Establish, as a threshold of significance for the City's environmental review process, that a significant increase in ambient noise levels is assumed if the project would increase noise levels in the immediate vicinity by 3 dB

DNL/CNEL or more above the ambient noise limits established in this General Plan Update.

NS-1-k **Proposal Review.** Review all new public and private development proposals that may potentially be affected by or cause a significant increase in noise levels, per Policy NS-1-i, to determine conformance with the policies of this Noise Element. Require developers to reduce the noise impacts of new development on adjacent properties through appropriate means.

NS-1-o **Sound Wall Guidelines.** Acoustical studies and noise mitigation measures for projects shall specify the heights, materials, and design for sound walls and other noise barriers. Aesthetic considerations shall also be addressed in these studies and mitigation measures such as variable noise barrier heights, a combination of a landscaped berm with wall, and reduced barrier height in combination with increased distance or elevation differences between noise source and noise receptor, with a maximum allowable height of 15 feet. The City will develop guidelines for aesthetic design measures of sound walls and may commission area wide noise mitigation studies that can serve as templates for acoustical treatment that can be applied to similar situations in the urban area.

Fresno Municipal Code

The provisions of the Fresno Municipal Code which would be most applicable to this project are reproduced below.

15-2506. Noise.

The provisions of this section apply to noise sources resulting from and relating to new development or the expansion of a use or activity. Should there be a conflict between this section and any rule or regulation set forth in an airport plan, the airport plan shall govern. Exceptions to this section are listed in Subsection G. Noise-Related Definitions are located in Section 15-6802. All projects are subject to FMC Chapter 10, Article 1, Noise Regulations.

B. **Transportation Noise Standards.** The standards listed in Table 4 (Municipal Code Table 15-2506-B) represent maximum allowable noise exposure from transportation-related (vehicles and trains) noise sources.

Table 6
Noise Exposure from Transportation Noise Sources

Noise-Sensitive Land Use	Maximum Exterior Noise Level (dB)[1,2] DNL/CNEL (dB)	Maximum Interior Noise Level (dB) L_{eq}	
Residential	65[3]	45	--
Transient Lodging	65[3]	45	--
Medical Care Facility	65[3]	45	--
Religious Assembly Facility, Meeting Hall	65[3]	--	45
Theatre, Auditorium	--	--	35
Office Building	--	--	45
School, Library, Museum	--	--	45
Other Noise-Sensitive Uses	As determined by the Review Authority		

[1] Exterior noise areas exclude a) front and side yards, b) outdoor areas for projects along Bus Rapid Transit (BRT) corridors and/or within Activity Centers (where application of the standards will be determined to the realization of mixed-use, multi-modal oriented-objectives. Interior noise areas include a) rear yards and courtyards and b) balconies or roof decks (no adjacent to BRT) if they are included in on-site open space calculations.
[2] Where the location of exterior areas is unknown or not applicable, the exterior noise level standard shall be applied at the property line.
[3] While 65 dB is the maximum level, projects should strive to reach 60 dB.
Source: Fresno Municipal Code, Table 15-2506-B.

C. **Land Use Compatibility for New Development Proposed near Transportation Noise Sources.** Table 7 (Municipal Code Table 15-2506-C) establishes the range of acceptable and unacceptable transportation noise exposure levels in order to determine whether a project is allowed to be sited near a transportation noise source and if noise attenuation measures would be required.

1. **A: Satisfactory.** The project may be permitted without requiring noise attenuation.
2. **B: Analysis Required.** The project is required to provide an analysis that details noise reduction measures that shall be integrated into the project design in order to reduce noise exposure to a conforming level.
3. **C: Acoustic Study Required.** The project is required to perform an acoustic study (see Subsection A of this section) and incorporate the resulting noise attenuation measures to reduce noise exposure to a conforming level.
4. **D: Not Allowed.** The project shall not be permitted.
5. **E: Restricted.** Only the specified project types shall be permitted.

Table 7
Land Use Compatibility for New Development Proposed Near Transportation Noise Sources

Noise-Sensitive Land Use	DNL/CNEL (dB)	Requirements and Limitations
Residential, Transient Lodging, Medical Care Facility, Religious Assembly Facility, Meeting Hall, School, Library, Museum	Less than 65	Satisfactory
	65 to 70	Analysis and integration of noise reduction measures in project design
	70 to 75	Acoustic study and noise attenuation measures required
	Over 75	Not allowed
Theatre, Auditorium, Concert Hall, Amphitheater	Less than 70	Analysis and integration of noise reduction measures in project design
	Over 70	Not allowed
Office Building	Less than 70	Satisfactory
	70 to 75	Analysis and integration of noise reduction measures in project design
	Over 75	Acoustic study and noise attenuation measures required
Industrial	Less than 75	Satisfactory
	Over 75	Acoustic study and noise attenuation measures required
Outdoor Sports and Recreation, Parks	Less than 65	Satisfactory
	65 to 80	Acoustic study and noise attenuation measures required; avoid uses involving concentrations of people or animals
	Over 80	Limited to open space; avoid uses involving concentrations of people or animals

D. **Stationary Noise Sources.**

1. New or expanded development of noise-sensitive uses shall not be permitted if noise levels, due to existing stationary noise sources, would exceed the standards of Table 8 (Municipal Code Table 15-2506-D). Such projects shall be permitted with the incorporation of noise attenuation measures stipulated in an acoustic study per Subsection A to reduce the noise exposure to compliant levels.
2. New or expanded development of major noise-generating stationary uses shall not be permitted if noise levels impinging on existing adjacent noise-sensitive uses would exceed the standards of Table 8 (Municipal Code Table 15-2506-D). Such projects shall be permitted with the incorporation of noise attenuation measures stipulated in an acoustic study per Subsection A to reduce the noise exposure to compliant levels.
3. The Director shall determine uses that qualify as "noise-sensitive."

4. When ambient noise levels exceed or equal the levels in this table, mitigation shall only be required to limit noise to the ambient plus five dB.

Table 8
Noise Exposure from Stationary Noise Sources[1]

Noise Level Descriptor	Daytime (7am to 10pm)	Nighttime (10pm to 7am)
Hourly Equivalent Sound Level (L_{eq}), dB	50	45
Maximum Sound Level (L_{max}), dB	70	60

[1] As determined at outdoor activity areas. Where the location of outdoor activity area is unknown or not applicable, the noise exposure standard shall be applied at the property line of the receiving land use.

Source: Fresno Municipal Code, Table 15-2506-D

H. **Exemptions.**

1. **Noise-Sensitive Sites Adjacent to Elevated Noise-Generating Land Uses.** In instances where noise-generating land uses are elevated 12 feet or more (i.e., elevated State Routes) from the natural grade of a noise-sensitive site, and the Review Authority determines that a masonry wall would not mitigate outdoor noise to acceptable levels, a wall may be waived, however the interior of the noise-sensitive use shall not exceed the indoor space standards in Table 6 (Municipal Code Table 15-2506-B).
2. **Emergencies.** The emission of sound for the purpose of alerting persons to the existence of an emergency, or the emission of sound in the performance of emergency work.
3. **Warning Devices.** Warning devices necessary for the protection of the public safety, such as police, fire, and ambulance sirens.
4. **Special Events.** Occasional outdoor gatherings, public dances, shows, and sporting and entertainment events, provided that such events are conducted pursuant to a permit or license issued by the City.
5. **Municipal Solid Waste Collection.** Collection of solid waste, vegetative waste, and recyclable materials by the City or under contract with the City.
6. **Public Works Construction Projects, Maintenance, and Repair.** Street, utility, and similar construction projects undertaken by or under contract to the City, or the State of California or a public utility regulated by the California Public Utilities Commission, as well as maintenance and repair operations conducted by such parties, including street sweeping, debris and litter removal, removal of downed wires, restoring electrical service, repairing traffic signals, unplugging sewers, vacuuming catch basins, repairing of damaged poles, removal of abandoned vehicles, repairing of water hydrants and mains, gas lines, oil lines, sewers, storm drains, roads, and sidewalks.
7. **Schools.** School bells and school-sanctioned outdoor activities such as pep rallies, sports games, and band practice.
8. **Religious Assembly Facilities and Other Similar Organizations.** Unamplified bells, chimes, or other similar devices used by religious assembly facilities and other

houses of religious worship, as such devices are played between the time period of 7 a.m. and 10 p.m. and the playing period does not exceed five minutes in any one hour.

9. **Agricultural.** Noise resulting from Crop Cultivation.
10. **Public Utility Facilities.** Facilities including, but not limited to, 60-cycle electric power transformers and related equipment, sewer lift stations, municipal wells, and pumping.

Environmental Setting – Existing Ambient Noise and Vibration Environment

Noise-Sensitive Land Uses in the Project Vicinity

Noise-sensitive land uses are generally defined as locations where people reside or where the presence of unwanted sound could adversely affect the primary intended use of the land. Places where people live, sleep, recreate, worship, and study are generally considered to be sensitive to noise because intrusive noise can be disruptive to these activities.

The noise-sensitive land uses which would potentially be affected by the project consist of nearby residential receptors. Existing agricultural land uses are also located nearby but are not considered to be noise-sensitive. The project area and nearby land uses are shown on Figure 1.

Existing Traffic Noise Levels along Project Area Roadway Network

The FHWA Traffic Noise Model (FHWA-RD-77-108) was used to develop existing noise contours expressed in terms of DNL for major roadways within the project study area. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions. Estimates of the hourly distribution of traffic for a typical 24-hour period were used to develop DNL values from L_{eq} values.

Traffic data in the form of AM and PM peak hour movements for existing conditions were obtained from the client prepared by VRPA Technologies, Inc. Average daily traffic volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions. Using these data and the FHWA Model, traffic noise levels were calculated. The traffic noise level at 50 feet from the roadway centerline and distances from the centerlines of selected roadways to the 60 dB, 65 dB, and 70 dB DNL contours are summarized in Table 9.

In many cases, the actual distances to noise level contours may vary from the distances predicted by the FHWA Model. Factors such as roadway curvature, roadway grade, shielding from local topography or structures, elevated roadways, or elevated receivers may affect actual sound propagation. It is also recognized that existing sensitive land uses within the project vicinity are located varying distances from the centerlines of the local roadway network. The 50-foot reference distance is utilized in this assessment to provide a reference position at which changes in existing and future traffic noise levels resulting from the project can be evaluated. Appendix B contains the FWHA Model inputs for existing conditions.

Table 9
Existing (2021) Traffic Noise Modeling Results

Seg.	Intersection	Direction	DNL 50 Feet from Roadway	Distance to Contour (feet)		
				70 dB DNL	65 dB DNL	60 dB DNL
1	(1) Butler Ave / Willow Ave	North	--	--	--	--
2		South	63	16	35	75
3		East	65	24	53	113
4		West	65	23	49	105
5	(2) Church Ave / Willow Ave	North	63	16	35	75
6		South	61	13	28	61
7		East	65	22	47	100
8		West	64	21	45	97
9	(3) Jensen Ave / Willow Ave	North	62	14	29	63
10		South	60	10	23	49
11		East	71	59	127	273
12		West	71	62	133	287
13	(4) N. Project Driveway / Willow Ave	North	63	16	35	75
14		South	63	16	35	75
15		East	--	--	--	--
16		West	--	--	--	--
17	(5) S. Project Driveway / Willow Ave	North	63	16	35	75
18		South	63	16	35	75
19		East	--	--	--	--
20		West	--	--	--	--

Blank cell = no traffic data was provided
Source: FHWA-RD-77-108 with inputs from VRPA. Appendix B contains the FHWA Model inputs.

Existing Overall Ambient Noise Environment at the Project Site

The existing ambient noise environment at the project site is defined primarily by noise from traffic on S. Willow Avenue, and by intermittent railroad operations on the adjacent SJVR track. To generally quantify the existing ambient noise environment at the project site, BAC conducted long-term (72-hour) ambient noise level measurements at two (2) locations from October 5th to 7th, 2021. The long-term noise survey locations are shown on Figure 1, identified as sites N-1 and N-2. Photographs of the noise survey location are provided in Appendix C.

Larson Davis Laboratories (LDL) Models LxT and 831 precision integrating sound level meters were used to complete the noise level measurement survey. The meters were calibrated immediately before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all specifications of the American National Standards Institute requirements for Type 1 sound level meters (ANSI S1.4).

The long-term noise level measurement survey results are summarized in Table 10. The detailed results of the long-term ambient noise survey are contained in Appendix D in tabular format and graphically in Appendix E.

Table 10
Summary of Long-Term Noise Survey Measurement Results – October 5-7, 2021[1]

Site Description[2]	Date	DNL (dBA)	Average Measured Hourly Noise Levels (dBA)			
			Daytime[3]		Nighttime[4]	
			L_{eq}	L_{max}	L_{eq}	L_{max}
N-1: Approximately 50' from center of SJVR track	Tuesday, October 5, 2021	61	46	60	55	63
	Wednesday, October 6, 2021	61	55	65	54	60
	Thursday, October 7, 2021	52	49	65	44	58
N-2: Approximately 50' from centerline of S. Willow Ave	Tuesday, October 5, 2021	64	62	78	57	78
	Wednesday, October 6, 2021	64	62	79	56	74
	Thursday, October 7, 2021	63	62	78	55	75

[1] Detailed summaries of the noise monitoring results are provided in Appendices D and E.
[2] Long-term noise survey locations are shown on Figure 1.
[3] Daytime hours: 7:00 a.m. to 10:00 p.m.
[4] Nighttime hours: 10:00 p.m. to 7:00 a.m.
Source: Bollard Acoustical Consultants, Inc. (2021)

Long-term noise measurement site N-1, located immediately adjacent to the project site (due to security purposes), was specifically selected to be representative of the railroad noise level environment at the project site. Long-term noise measurement site N-2, located along the western boundary of the project site, was specifically selected to be representative of the S. Willow Avenue traffic noise level environment at the project site. The Table 10 data indicate that measured existing day-night average and average hourly noise levels at the project site were generally consistent during the 72-hour monitoring period.

Existing Ambient Vibration Environment at the Project Site

The primary source of vibration at the project site would be associated with railroad activity on the adjacent SJVR track to the north. During site visit on March 4th, 2021, vibration levels were below the threshold of perception at the project site. Nonetheless, to quantify existing vibration levels at the project site, BAC conducted long-term (72-hour) vibration measurements from October 5th to 7th, 2021 at approximately 50 feet from the SJVR track. The long-term vibration survey location is shown on Figure 1, identified as site V-1. Photographs of the vibration survey equipment are provided in Appendix C.

A Larson-Davis Laboratories Model LxT precision integrating sound level meter equipped with a vibration transducer was used to complete the measurements. The results are presented graphically in Appendix F and are summarized in Table 11.

Table 11
Summary of Railroad Vibration Monitoring Results – October 5-7, 2021

Date	Number of Train Passbys	Highest Measured Train Passby Vibration Level, (VdB)[1]
Tuesday, October 5, 2021	1	81
Wednesday, October 6, 2021	2	80
Thursday, October 7, 2021	0	--

[1] Long-term vibration survey location shown on Figure 1 (site V-1).
Source: Bollard Acoustical Consultants, Inc. (2021)

The Table 11 data indicate that measured maximum railroad passby vibration levels at the project site ranged from 80 VdB to 81 VdB.

Impacts and Mitigation Measures

Thresholds of Significance

For the purposes of this report, noise and vibration impacts are considered significant if the project would 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 other applicable standards of other agencies; or

- Generation of excessive groundborne vibration or groundborne noise levels; or

- 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.

The project site is not within the vicinity of a private airstrip, an airport land use plan, or within two miles of a public airport. Therefore, the last threshold listed above is not discussed further.

The following criteria based on standards established by the Federal Transit Administration (FTA), California Department of Transportation (Caltrans), Fresno General Plan Municipal Code were used to evaluate the significance of environmental noise and vibration resulting from the project:

- A significant noise impact would be identified if the project would expose persons to or generate noise levels that would exceed applicable noise standards established by the Fresno General Plan or Municipal Code.

- A significant impact would be identified if off-site traffic noise exposure or on-site activities generated by the project would substantially increase noise levels at existing sensitive receptors in the vicinity. A substantial increase would be identified relative to the noise level increase significance criteria established in Policy NS-1-j of the Fresno General Plan.

- A significant impact would be identified if project construction activities or railroad operations would expose sensitive receptors to excessive groundborne vibration levels. Specifically, an impact would be identified if groundborne vibration levels due to these sources would exceed the FTA (railroad operations) or Caltrans (construction activities) groundborne vibration impact criteria provided in Tables 1-3.

Noise Impacts Associated with Project-Generated Increases in Off-Site Traffic

With development of the project, traffic volumes on the local roadway network will increase. Those increases in daily traffic volumes will result in a corresponding increase in traffic noise levels at existing uses located along those roadways. The FHWA Model was used with traffic input data from the traffic impact analysis (prepared by VRPA Technologies, Inc.) to predict project traffic noise level increases relative to Existing (2021) and Cumulative (2042) conditions.

Impact 1: Increases in Existing Traffic Noise Levels due to the Project

Traffic data in the form of AM and PM peak hour movements for Existing and Existing Plus Project conditions in the project area roadway network were obtained from the project transportation impact analysis completed by VRPA Technologies, Inc. Average daily traffic (ADT) volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions.

Existing versus Existing Plus Project traffic noise levels on the local roadway network are shown in Table 12. The following section includes an assessment of predicted traffic noise levels relative to the noise level increase significance criteria identified in Policy NS-1-j of the Fresno General Plan. The Table 12 data are provided in terms of DNL at a standard distance of 50 feet from the centerlines of the project-area roadways. Appendix B contains the FWHA Model inputs.

It should be noted that the FHWA Model predictions presented in Table 12 are based on inputs that include peak hour traffic volumes, day/night and truck type percentages (e.g., medium and heavy trucks), vehicle speed, and distances from roadway centerlines. The FHWA Model does not account for non-traffic ambient noise sources such as nearby wildlife (e.g., birds chipping) or other anthropogenic noise sources within an area (e.g., distant traffic from other roadways, recreational activities, commercial or industrial operations, etc.).

Table 12
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Existing vs. Existing Plus Project Conditions

Seg.	Intersection	Direction	Traffic Noise Level at 50 feet, dB (DNL)			Substantial Increase?
			E	E+P	Increase	
1	(1) Butler Ave / Willow Ave	North	--	--	--	No
2		South	62.7	63.6	0.9	No
3		East	65.3	65.5	0.2	No
4		West	64.8	65.2	0.4	No
5	(2) Church Ave / Willow Ave	North	62.6	63.2	0.6	No
6		South	61.3	61.8	0.5	No
7		East	64.5	64.6	0.1	No
8		West	64.3	64.4	0.1	No
9	(3) Jensen Ave / Willow Ave	North	61.5	62.1	0.6	No
10		South	59.8	59.9	0.1	No
11		East	71.1	71.1	0.0	No
12		West	71.4	71.5	0.1	No
13	(4) N. Project Driveway / Willow Ave	North	62.6	63.6	1.0	No
14		South	62.7	63.4	0.7	No
15		East	--	51.4	51.4	Yes
16		West	--	--	--	No
17	(5) S. Project Driveway / Willow Ave	North	62.6	63.4	0.8	No
18		South	62.7	63.2	0.5	No
19		East	--	51.4	51.4	Yes
20		West	--	--	--	No

Blank cell = no traffic data was provided

Source: FHWA-RD-77-108 with inputs from VRPA. Appendix B contains the FHWA Model inputs.

As stated previously, the FHWA Model does not account for non-traffic ambient noise sources such as nearby wildlife or other anthropogenic noise sources within an area. Consideration of such sources typically results in higher ambient noise levels (i.e., existing no project) than those predicted by the FHWA Model alone.

As indicated in Table 12, the proposed project's contribution to traffic noise level increases is predicted to exceed applicable General Plan Policy NS-1-j increase significance criterion of 3 dB DNL along two (2) of the roadway segments evaluated in the existing conditions analysis – segments 15 and 19, which are access points to the development located on the project site. Specifically, the traffic noise level increases along roadway segments 15 and 19 are calculated to be approximately 51 dB DNL.

As discussed above, baseline ambient conditions are considerably higher than baseline traffic noise levels alone. When project traffic noise generation is compared to the measured ambient day-night average (DNL) levels within the vicinity of roadway segments 15 and 19 on the project site (approximately 64 dB DNL at site N-2), the project-generated traffic noise level increases along the roadway segments are calculated be less than 1 dB DNL (0.4 dB DNL). This is a more accurate representation of actual project-related noise level increases than the "traffic-only" noise increases shown in Table 12. Thus, project-related increases in traffic noise levels would not

substantially exceed measured ambient noise conditions in the project area relative to the applicable General Plan Policy NS-1-j increase significance criterion. Finally, although existing residential uses were not identified within 50 feet from the centerline of roadway segments 15 and 19 (located within the project area), it should be noted that the predicted Existing Plus Project traffic noise level of approximately 51 dB DNL at 50 feet along the segments is well below the Fresno General Plan and Municipal Code exterior noise level standard of 65 dB DNL applicable to transportation noise sources affecting residential uses.

Based on the analysis presented above, including consideration of measured existing ambient noise conditions within the project area, off-site traffic noise impacts related to increases in traffic resulting from the implementation of the project (Existing vs. Existing Plus Project conditions) are identified as being ***less than significant***.

Impact 2: Increases in Cumulative Traffic Noise Levels due to the Project

Traffic data in the form of AM and PM peak hour movements for Cumulative and Cumulative Plus Project conditions in the project area roadway network were obtained from the project transportation impact analysis completed by VRPA Technologies, Inc. Average daily traffic (ADT) volumes were conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions.

Cumulative versus Cumulative Plus Project traffic noise levels on the local roadway network are shown in Table 13. The following section includes an assessment of predicted traffic noise levels relative to the noise level increase significance criteria identified in Policy NS-1-j of the Fresno General Plan. The Table 13 data are provided in terms of DNL at a standard distance of 50 feet from the centerlines of the project-area roadways. Appendix B contains the FWHA Model inputs.

Table 13
Traffic Noise Modeling Results and Project-Related Traffic Noise Increases
Cumulative vs. Cumulative Plus Project Conditions

Seg.	Intersection	Direction	Traffic Noise Level at 50 feet, dB (DNL)			Substantial Increase?
			C	C+P	Increase	
1	(1) Butler Ave / Willow Ave	North	--	--	--	No
2		South	65.2	65.8	0.6	No
3		East	67.8	67.9	0.1	No
4		West	67.5	67.7	0.2	No
5	(2) Church Ave / Willow Ave	North	65.3	65.6	0.3	No
6		South	64.3	64.5	0.2	No
7		East	67.0	67.0	0.0	No
8		West	66.7	66.8	0.1	No
9	(3) Jensen Ave / Willow Ave	North	64.6	64.9	0.3	No
10		South	62.1	62.1	0.0	No
11		East	73.9	73.9	0.0	No
12		West	74.2	74.2	0.0	No
13	(4) N. Project Driveway / Willow Ave	North	65.3	65.8	0.5	No
14		South	65.2	65.7	0.5	No
15		East	--	51.4	51.4	Yes
16		West	--	--	--	No
17	(5) S. Project Driveway / Willow Ave	North	65.3	65.7	0.4	No
18		South	65.2	65.6	0.4	No
19		East	--	51.4	51.4	Yes
20		West	--	--	--	No

Blank cell = no traffic data was provided

Source: FHWA-RD-77-108 with inputs from VRPA. Appendix B contains the FHWA Model inputs.

As stated previously, the FHWA Model does not account for non-traffic ambient noise sources such as nearby wildlife or other anthropogenic noise sources within an area. Consideration of such sources typically results in higher ambient noise levels (i.e., cumulative no project) than those predicted by the FHWA Model alone.

The Table 13 data indicate that the proposed project's contribution to traffic noise level increases is predicted to exceed applicable General Plan Policy NS-1-j increase significance criterion of 3 dB DNL along two (2) of the roadway segments evaluated in the cumulative conditions analysis – segments 15 and 19 (access points to the development located on the project site). Specifically, the traffic noise level increases along roadway segments 15 and 19 are calculated to be approximately 51 dB DNL.

Future (cumulative) no project noise levels with consideration of future ambient conditions would be considerably higher than future plus project traffic noise levels alone. Assuming a future no project ambient noise level of 66 dB DNL at the project site, which includes an increase of 2 dB DNL relative to the measured ambient day-night noise level of 64 dB DNL at ambient noise measurement site N-2 (equivalent to a 50% increase in traffic volumes relative to existing traffic conditions), future plus project traffic noise level increases along roadway segments 15 and 19 are calculated be less than 1 dB DNL (0.4 dB DNL), which would not exceed the applicable

General Plan Policy NS-1-j increase significance criterion of 3 dB DNL. Finally, although existing residential uses were not identified within 50 feet from the centerline of roadway segments 15 and 19 (located within the project area), it should be noted that the predicted Cumulative Plus Project traffic noise level of approximately 51 dB DNL at 50 feet along the segments is well below the Fresno General Plan and Municipal Code exterior noise level standard of 65 dB DNL applicable to transportation noise sources affecting residential uses.

Based on the analysis presented above, including consideration of measured existing and estimated future ambient noise conditions within the project area, off-site traffic noise impacts related to increases in traffic resulting from the implementation of the project (Cumulative vs. Cumulative Plus Project conditions) are identified as being ***less than significant***.

Off-Site Noise Impacts Associated with Proposed Park Activities

Future activities occurring within the proposed park at the northwest corner of the project area have been identified as a primary noise source associated with the project. The location of the proposed park is shown on Figure 2. The nearest existing noise-sensitive uses have been identified as residences located to north and northwest of the proposed park. An analysis of future park activity noise levels at those nearby existing residential uses follows.

Impact 3: Project Park Noise Levels at Existing Residential Uses

Noise generated by community parks varies depending on whether the parks are intended for passive or active use. Passive use includes picnic and sitting areas whereas active use incudes playing fields and play structures. For the purposes of this analysis, it was conservatively assumed that the proposed park could generate noise levels resembling an active-use park during worst-case hours. BAC file data for parks of this variety indicate average and maximum noise levels of up to 55 dB L_{eq} and 70 dB L_{max} (respectively) at a distance of 100 feet.

The Fresno General Plan and Municipal Code establish noise level standards of 50 dB L_{eq} and 70 dB L_{max} for stationary (non-transportation) noise sources affecting noise-sensitive (residential) uses during daytime hours (7:00 a.m. to 10:00 p.m.). During nighttime hours (10:00 p.m. to 7:00 a.m.), the General Plan and Municipal Code establish noise level limits of 45 dB L_{eq} and 60 dB L_{max}. For the purposes of this analysis, it is reasonable to assume that future usage of the proposed community park would occur during daytime hours only.

The outdoor activity areas (backyards) of the nearest existing residences to the north and northwest are located approximately 420 feet and 450 feet (respectively) from the effective noise center of the proposed park. Based on the reference noise levels cited above, and assuming standard spherical spreading loss (-6 dB per doubling of distance), park activity noise levels are projected to range from 42 dB L_{eq} to 43 dB L_{eq} and 57 dB L_{max} to 58 dB L_{max} at the backyards of the nearest residences. Thus, noise levels associated with project park activities are predicted to satisfy the applicable Fresno General Plan and Municipal Code daytime noise level standards of 50 dB L_{eq} and 70 dB L_{max}.

BAC measurement site N-2, located approximately 50 feet from the centerline of S. Willow Avenue, is believed to be representative of the ambient noise level environment along the

roadway. The nearest existing residences to the north and northwest of the proposed park also maintain a separation of approximately 50 feet from the centerline of S. Willow Avenue. The results from the BAC ambient noise level survey, presented in Table 8 of this report, indicate that measured day-night average noise levels at site N-2 were approximately 64 dB DNL. As mentioned previously, a project-generated increase in noise levels of 3 dB DNL or more would be required for a finding of a significant impact at a noise-sensitive receiver according to the FICON increase significance criteria. Given the measured day-night average noise level of 64 dB DNL and based on the predicted noise levels cited above, the increases in ambient day-night average noise levels resulting from project park activities are calculated to be less than 0.1 dB DNL at the nearest existing residences to the north and northwest, which would be well below the General Plan Policy NS-1-j increase significance criterion of 3 dB DNL.

Because project park noise levels are predicted to satisfy the applicable Fresno General Plan and Municipal Code noise level limits at the nearest existing noise-sensitive uses, and because noise exposure from park activities is not expected to significantly increase ambient noise levels at those uses relative to the applicable General Plan increase significance criterion, this impact is identified as being ***less than significant***.

Off-Site Noise Impacts Associated with Project Construction Activities

Impact 4: Project Construction Noise Levels at Existing Residential Uses

During project construction, heavy equipment would be used for grading excavation, paving, and building construction, which would increase ambient noise levels when in use. Noise levels would vary depending on the type of equipment used, how it is operated, and how well it is maintained. Noise exposure at any single point outside the project work area would also vary depending upon the proximity of equipment activities to that point. The outdoor activity areas (backyards) of the nearest existing residences are located approximately 30 feet away from where construction activities could occur on the project site.

Table 14 includes the range of maximum noise levels for equipment commonly used in general construction projects at full-power operation at a distance of 50 feet. Not all of these construction activities would be required of this project. The Table 14 data also include predicted maximum equipment noise levels at the backyards of the nearest existing residences located approximately 30 feet away, which assume a standard spherical spreading loss of 6 dB per doubling of distance.

Table 14
Reference and Projected Noise Levels for Construction Equipment

Equipment Description	Reference Maximum Noise Level at 50 Feet (dBA)	Projected Maximum Noise Level at 30 feet (dBA)
Air compressor	80	84
Backhoe	80	84
Ballast equalizer	82	86
Ballast tamper	83	87
Compactor	82	86
Concrete mixer	85	89
Concrete pump	82	86
Concrete vibrator	76	80
Crane, mobile	83	87
Dozer	85	89
Generator	82	89
Grader	85	86
Impact wrench	85	89
Loader	80	89
Paver	85	84
Pneumatic tool	85	89
Pump	77	89
Saw	76	81
Scarifier	83	80
Scraper	85	87
Shovel	82	89
Spike driver	77	86
Tie cutter	84	81
Tie handler	80	88
Tie inserter	85	84
Truck	84	89

Source: Federal Transit Administration Noise and Vibration Impact Assessment Manual, Table 7-1 (2018)

Based on the equipment noise levels in Table 14, worst-case project construction equipment maximum noise levels at the backyards of the nearest existing residential uses located 30 feet away could range from 80 to 89 dB. Thus, depending upon the location, equipment types and associated duration of operations within the project area, it is possible that worst-case on-site project construction noise levels could potentially exceed the applicable Fresno General Plan and Municipal Code noise level criteria at the nearest existing residential uses. Further, it is possible that a portion of the project construction equipment could result in substantial short-term increases over ambient maximum noise levels at the nearest existing residential uses. As a result, noise impacts associated with project on-site construction activities are identified as being **potentially significant.**

Mitigation for Impact 4: On-Site Construction Noise Control Measures

MM-4: To the maximum extent practical, the following measures should be incorporated into the project on-site construction operations:

- All on-site noise-generating construction activities should be restricted to daytime hours (7:00 a.m. to 10:00 p.m.), Monday through Friday.
- The project shall utilize temporary construction noise control measures including the use of temporary noise barriers, or other appropriate measures as mitigation for noise generated during construction.
- All equipment and vehicles should be powered off when not in use. Unnecessary idling of internal combustion engines should be prohibited.
- All mobile or fixed noise-producing equipment used on the project site that are regulated for noise output by a federal, state, or local agency shall comply with such regulations while in the course of project activity.
- Select quiet equipment, particularly air compressors, whenever possible. All noise-producing project equipment and vehicles using internal combustion engines should be equipped with manufacturer-recommended mufflers and be maintained in good working condition. Electrically powered equipment should be used instead of pneumatic or internal combustion powered equipment, where feasible.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive uses.
- Project area and site access road speed limits shall be established and enforced during the construction period.
- Nearby residences shall be notified of construction schedules so that arrangements can be made, if desired, to limit their exposure to short-term increases in ambient noise levels.

Significance of Impact 4 after Mitigation: *Less than Significant*

Off-Site Vibration Impacts Associated with Project Construction Activities

Impact 5: Project Construction Vibration Levels at Existing Residential Uses

During project construction, heavy equipment would be used for grading, excavation, paving, and building construction, which would generate localized vibration in the immediate vicinity of the construction. The nearest existing sensitive structures (residences) are located approximately 50 feet from construction activities which could occur within the project site.

Table 15 includes the range of vibration levels for equipment commonly used in general construction projects at a distance of 25 feet. The Table 15 data also include predicted equipment vibration levels at the nearest existing residences to the project site located approximately 50 feet away.

Table 15
Reference and Projected Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV at 25 Feet[1]	Projected PPV at 50 Feet
Hoe ram	0.089	0.032
Large bulldozer	0.089	0.032
Caisson drilling	0.089	0.032
Loaded trucks	0.076	0.027
Jackhammer	0.035	0.012
Small bulldozer	0.003	0.001
Source: 2018 FTA Transit Noise and Vibration Impact Assessment Manual (Table 7-4) and BAC calculations		

As shown in Table 15, vibration levels generated from project construction activities at the nearest residences located approximately 50 feet away are predicted to be well below the Caltrans thresholds for damage to residential structures of 0.5 in/sec PPV shown in Table 2 (building structure vibration criteria). In addition, the projected equipment vibration levels in Table 15 are within the range of the "barely/slightly perceptible" human response threshold as defined by Caltrans in Table 3 (vibration annoyance potential threshold criteria). Therefore, on-site construction within the project area is not expected to result in excessive groundborne vibration levels at nearby existing residential uses.

Because vibration levels due to project construction activities are expected to satisfy the applicable Caltrans groundborne impact vibration criteria, this impact is identified as being ***less than significant***.

Noise Impacts Upon the Development

The California Supreme Court issued an opinion in *California Building Industry Association v. Bay Area Air Quality Management District (2015)* holding that CEQA is primarily concerned with the impacts of a project on the environment and generally does not require agencies to analyze the impact of existing conditions on a project's future users or residents. Nevertheless, the City of Fresno has policies that address existing/future conditions affecting the proposed project, which are discussed in the following section.

On-Site Traffic Noise Impacts at Proposed Development

Impact 6: Future Exterior Traffic Noise Levels at Proposed Development

The FHWA Model was used with future traffic data to predict future S. Willow Avenue traffic noise levels at the proposed residential uses of the development. The future (Cumulative Plus Project) average daily traffic (ADT) volume for S. Willow Avenue was calculated using data provided in the project traffic impact analysis prepared by VRPA Technologies, Inc. Specifically, the future S. Willow Avenue ADT volume adjacent to the project site was conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions. The predicted future S. Willow Avenue traffic noise levels at the proposed development are summarized in Table 16. Detailed FHWA Model inputs and results are provided in Appendix G.

Table 16
Predicted Future Exterior S. Willow Avenue Traffic Noise Levels at the Project Site[1]

Location	Receiver Description	Distance (ft)[2]	Offset (dB)[3]	Future Exterior DNL (dB)
Park	Neighborhood park	220		55
Residences (Lots 1-4, 189-199)	Backyards	60		64
	First-floor building facades	70		63
	Upper-floor building facades	70	+2	65

[1] A complete listing of FHWA Model inputs and results are provided in Appendix G.
[2] Distances scaled from center of park and other said locations to roadway centerline using the provided site plans.
[3] An offset of +2 dB was applied at upper-floors for reduced ground absorption of sound at elevated locations.
Source: Bollard Acoustical Consultants, Inc. (2021)

The Fresno General Plan does not currently have adopted noise level criteria for park uses affected by transportation noise sources. However, the Fresno Municipal Code establishes a land use compatibility noise level limit of 65 dB DNL or less as satisfactory for new proposed park uses. As indicated in Table 16, the predicted future S. Willow Avenue traffic noise level of 55 dB DNL at the proposed park would satisfy the Municipal Code land use compatibility noise level limit of 65 dB DNL for park uses.

The project site plans indicate that 6-foot-tall block walls (traffic noise barriers) are proposed to be constructed along residential lots adjacent to S. Willow Avenue. The locations of the proposed barriers along the roadway are shown on Figure 2. The results presented in Table 17 below contain predicted future S. Willow Avenue traffic noise levels at the nearest residential ground level locations (i.e., backyards and first-floor building facades) with consideration of the noise attenuation that would be provided by the proposed 6-foot-tall walls. Complete listings of inputs and elevation assumptions used for the barrier insertion loss evaluation are provided in Appendix H. Because elevated upper-floor building facades of the residences constructed adjacent to S. Willow Avenue would not receive shielding from the proposed 6-foot-tall walls, attenuated noise levels for those locations were not included in Table 17.

Table 17
Predicted Future Exterior Willow Avenue Traffic Noise Levels with Proposed 6' Noise Barriers[1]

Location	Receiver Description	Future Exterior DNL w/Barriers (dB)[2]
Residences (Lots 1-4, 189-199)	Backyards	58
	First-floor building facades	57

[1] Locations of proposed traffic noise barriers are illustrated on Figure 2.
[2] Predicted noise levels include consideration of shielding provided by proposed 6-foot-tall noise barriers at the locations illustrated on Figure 2. A complete listing of inputs and elevation assumptions used for the barrier insertion loss evaluation are provided as Appendix H.
Source: Bollard Acoustical Consultants, Inc. (2021)

As indicated in Table 17, future exterior S. Willow Avenue traffic noise levels at the backyards proposed nearest to the roadway are predicted to satisfy the Fresno General Plan and Municipal Code 65 dB DNL exterior noise level standard applicable to residential uses. The predicted

exterior compliance above includes consideration of the shielding that would be provided by the construction of 6-foot-tall noise barriers along S. Willow Avenue, as proposed.

Because future traffic noise level exposure is predicted to satisfy applicable Fresno General Plan and Municipal Code exterior noise level criteria at the proposed development, this impact is identified as being ***less than significant***.

Impact 7: Future Interior Traffic Noise Levels at Proposed Residential Uses

After construction of the proposed 6-foot-tall traffic noise barriers at the locations shown on Figure 2, future S. Willow Avenue traffic noise level exposure is predicted to be approximately 57 dB DNL at the nearest first-floor residential building facades (Appendix H-2). Due to reduced ground absorption of sound at elevated positions, and lack of shielding provided by the proposed walls, noise levels at the upper-floor building facades of those residences are predicted to approach 65 dB DNL. The Fresno General Plan and Municipal Code establish an interior noise level standard of 45 dB L_{eq} within residential interior areas for transportation noise sources. In addition, Policy NS-1-h of the General Plan requires compliance with a State Building Code requirement of 45 dB DNL within the interior areas of new residential uses. To satisfy the applicable General Plan and Municipal Code interior noise level limits of 45 dB DNL/L_{eq}, minimum noise reductions of 12 and 20 dB would be needed for compliance within the first- and upper-floor interior areas (respectively) of residences constructed nearest to S. Willow Avenue.

Standard building construction (stucco siding, STC-27 windows, door weather-stripping, exterior wall insulation, composition plywood roof), typically results in an exterior to interior noise reduction of approximately 25 dB with windows closed and approximately 15 dB with windows open. This level of noise reduction would be adequate to reduce future S. Willow Avenue traffic noise levels within all levels of residences in this development to 45 dB DNL/L_{eq} or less, which result in satisfaction of the applicable General Plan and Municipal Code interior noise level criteria cited above. As a result, consideration of additional building facade construction improvements for future traffic noise would not be warranted for the residential buildings of the development provided that mechanical ventilation (air conditioning) is included to allow occupants to close doors and windows as desired for additional acoustical isolation. Based on the analysis provided above, this is impact is identified as being ***less than significant***.

On-Site Railroad Noise Impacts at Proposed Development

Impact 8: Future Exterior Railroad Noise Levels at Proposed Residential Uses

As mentioned previously, BAC ambient noise measurement site N-1 was specifically selected to be representative of the existing ambient noise level environment associated with SJVR operations at the project site. According to the data from the 72-hour ambient noise monitoring effort, railroad activity adjacent to the project site consisted of approximately two (2) daily railroad passbys (evenly distributed between daytime and nighttime hours). The noise generation for individual train passbys varies depending on train length, speed, warning horn usage, track condition and number of locomotives. From the results of the long-term railroad noise survey conducted at site N-1, it was determined that the existing railroad noise exposure adjacent to the project site is approximately 61 dB DNL at a distance of 50 feet from the center of the track. The

measured noise levels at site N-1 included noise generated from locomotives, rail cars, warning horns, and bells from a nearby at-grade crossing at S. Willow Avenue.

The degree by which rail activity will increase on the SJVR track adjacent the project site is difficult to predict. Ultimately, daily rail activity is limited by the capacity of the track. As such, it is unlikely that rail activity adjacent to the project site would increase by more than 50% along this track in the future. A 50% increase in activity corresponds to a 2 dB increase in noise exposure. Conservatively assuming a 2 dB increase over existing levels, future railroad noise levels were projected at the proposed development. The results of those projections are summarized in Table 18.

Table 18
Predicted Future Exterior SJVR Railroad Noise Levels at the Project Site

Location	Receiver Description	Distance (ft)[1]	Offset (dB)[2]	Future Exterior DNL (dB)[3]
Park	Neighborhood park	160		55
Residence (Lot 103)	Backyard	150	-5	51
	First-floor building facade	145		56
	Upper-floor building facades	145	+2	58
Residences (Lots 104-115)	Backyards	210	-7	47
	First-floor building facades	160		55
	Upper-floor building facades	160	+2	57
Residence (Lot 74)	Backyard	80		60
	First-floor building facade	75		60
	Upper-floor building facades	75	+2	62

[1] Distances scaled from center of park and other said locations to center of track using the provided site plans.
[2] An offset of +2 dB was applied at upper-floors for reduced ground absorption of sound at elevated locations. Negative offsets applied to account for reduced view of track and/or intervening proposed building shielding.
[3] Predicted future railroad noise levels based on a reference noise level of 63 dB DNL at 50 feet, which includes a +2 dB increase relative to measured ambient conditions to account for a 50% increase in future operations.
Source: Bollard Acoustical Consultants, Inc. (2021)

The data in Table 18 above contains predicted future railroad noise levels at the proposed development. However, the project site plans indicate that an 8-foot-tall block wall (railroad noise barrier) is proposed to be constructed along northern end of the project area adjacent to the SJVR track. The location of the proposed barrier along the railroad track is illustrated on Figure 2. The following results presented in Table 19 contain predicted future railroad noise levels at the nearest residential ground level locations (i.e., backyards and first-floor building facades) with consideration of the noise attenuation that would be provided by the proposed 8-foot-tall wall, which is calculated to provide approximately 5 to 7 dB of railroad noise attenuation at those locations. Because elevated upper-floor building facades of the residences constructed adjacent to the SJVR track would not receive shielding from the proposed 8-foot-tall wall, attenuated noise levels for those locations were not included in Table 19.

Table 19
Predicted Future Exterior SJVR Railroad Noise Levels with Proposed 8' Noise Barrier[1]

Location	Receiver Description	Future Exterior DNL w/Barrier (dB)[2]
Park	Neighborhood park	51
Residence (Lot 103)	Backyard	46
	First-floor building facade	46
Residences (Lots 104-115)	Backyards	42
	First-floor building facades	50
Residence (Lot 74)	Backyard	54
	First-floor building facade	53

[1] Location of proposed railroad noise barrier is illustrated on Figure 2.
[2] Predicted noise levels include consideration of shielding provided by proposed 8-foot-tall noise barrier at the location illustrated on Figure 2, which is calculated to provide approximately 5-7 dB of attenuation at the receivers above (dependent upon on distance to barrier).
Source: Bollard Acoustical Consultants, Inc. (2021)

As mentioned previously, the Fresno Municipal Code establishes a land use compatibility noise level limit of 65 dB DNL or less as satisfactory for new proposed park uses. As indicated in Table 19, the predicted future railroad noise level of 51 dB DNL at the proposed park would satisfy the Municipal Code land use compatibility noise level limit of 65 dB DNL for park uses. The predicted compliance at the park includes consideration of attenuation that would be provided by the construction of an 8-foot-tall noise barrier adjacent to the SJVR track, as proposed.

The Table 19 data indicate that future exterior railroad noise level exposure at the backyards proposed nearest to the track is predicted to satisfy the Fresno General Plan and Municipal Code 65 dB DNL exterior noise level standard applicable to residential uses. The predicted exterior compliance at the nearest backyards includes consideration of attenuation that would be provided by the construction of an 8-foot-tall noise barrier adjacent to the SJVR track, as proposed.

Because future railroad noise level exposure is predicted to satisfy applicable Fresno General Plan and Municipal Code exterior noise level criteria at the proposed development, this impact is identified as being ***less than significant***.

Impact 9: Future Interior Railroad Noise Levels at Proposed Residential Uses

After construction of the proposed 8-foot-tall railroad noise barrier at the location illustrated on Figure 2, future railroad noise level exposure is calculated to be approximately 53 dB DNL or less at the nearest first-floor residential building facades. Due to reduced ground absorption of sound at elevated positions, and lack of shielding provided by the proposed 8-foot wall, noise levels at the nearest upper-floor building facades are predicted to approach 62 dB DNL. The Fresno General Plan and Municipal Code establish an interior noise level standard of 45 dB L_{eq} within residential interior areas for transportation noise sources. In addition, Policy NS-1-h of the General Plan requires compliance with a State Building Code requirement of 45 dB DNL within the interior areas of new residential uses. To satisfy the applicable General Plan and Municipal Code interior noise level limits of 45 dB DNL/L_{eq}, minimum noise reductions of 8 and 17 dB would

be needed for compliance within the first- and upper-floor interior areas (respectively) of residences constructed nearest to the SJVR track.

Standard building construction (stucco siding, STC-27 windows, door weather-stripping, exterior wall insulation, composition plywood roof), typically results in an exterior to interior noise reduction of approximately 25 dB with windows closed and approximately 15 dB with windows open. This level of noise reduction would be adequate to reduce future railroad noise levels within all levels of residences in this development to 45 dB DNL/L_{eq} or less, which result in satisfaction of the applicable General Plan and Municipal Code interior noise level criteria cited above. Nonetheless, mechanical ventilation (air conditioning) should be provided for all residences of the development to allow occupants to close doors and windows as desired for additional acoustical isolation. Because future railroad noise levels are expected to satisfy the applicable General Plan and Municipal Code interior noise level criteria, this is impact is identified as being ***less than significant***.

Although this impact is identified as being less than significant relative to compliance with applicable Fresno General Plan and Municipal Code day-night average (DNL) interior noise level criteria, it should be noted that analysis of the data obtained from BAC noise survey site N-1 revealed that individual train passby events were measured to have maximum noise levels ranging from 85 dB L_{max} to 91 dB L_{max} at a distance of 50 feet. Based on those measured maximum (L_{max}) train passby noise levels, it is recommended that all upper-floor bedroom windows of the lots identified on Figure 2 from which the SJVR track would be visible (i.e., north, east, and west-facing windows) be upgraded to a minimum STC rating of 32. The window assembly upgrades are recommended to reduce the potential for sleep disturbance from adjacent railroad operations. It is further recommended that disclosure statements be provided to all prospective residents of this development notifying of elevated noise levels during nighttime railroad passages.

On-Site Noise Impacts Associated with Proposed Park Activities

Impact 10: Park Noise Levels at Proposed Residential Uses

An analysis of park noise exposure at existing residential uses was presented in **Impact 3** of this report. As indicated in that impact discussion, it was conservatively assumed that the proposed park could generate noise levels resembling an active-use park during worst-case hours. The impact discussion further cites that BAC file data for active-use parks indicate average and maximum noise levels of up to 55 dB L_{eq} and 70 dB L_{max} (respectively) at a distance of 100 feet.

The Fresno General Plan and Municipal Code establish noise level standards of 50 dB L_{eq} and 70 dB L_{max} for stationary (non-transportation) noise sources affecting noise-sensitive (residential) uses during daytime hours (7:00 a.m. to 10:00 p.m.). During nighttime hours (10:00 p.m. to 7:00 a.m.), the General Plan and Municipal Code establish noise level limits of 45 dB L_{eq} and 60 dB L_{max}. For the purposes of this analysis, it is reasonable to assume that future usage of the proposed community park would occur during daytime hours only.

The outdoor activity areas (backyards) of the nearest proposed residences maintain a separation of approximately 250 to 300 feet from the effective noise center of the proposed park. Based on

the reference noise levels cited above, assuming standard spherical spreading loss (-6 dB per doubling of distance), and including shielding that would be provided by the building envelopes of proposed residences, park activity noise levels are projected to range from 38 dB L_{eq} to 40 dB L_{eq} and 53 dB L_{max} to 55 dB L_{max} at the backyards of the nearest proposed residences. Thus, noise levels associated with project park activities are predicted to satisfy the applicable Fresno General Plan and Municipal Code daytime noise level standards of 50 dB L_{eq} and 70 dB L_{max} at the nearest proposed residences of the development. As a result, this impact is identified as being ***less than significant***.

On-Site Railroad Vibration Impacts Upon the Development

Impact 11: Railroad Operations Vibration Levels at Proposed Residential Uses

As indicated in Table 11, measured railroad passby vibration levels at site V-1 ranged from 80 VdB to 81 VdB at a distance of 50 feet from the center of the SJVR track. The Table 11 data also indicate that a maximum of two railroad events per day were identified over the 72-hour monitoring period. According to the FTA groundborne vibration impact assessment criteria provided in Table 1, a numeric standard of 80 VdB for "Infrequent Events" (defined as fewer than 30 vibration events of the same kind per day) is applied to residences and buildings where people normally sleep.

Based on the highest measured train passby vibration level at the 50-foot distance (81 VdB), vibration exposure from railroad operations is projected to be approximately 72 VdB at the building facade of the residence proposed nearest to the SJVR track, located approximately 75 feet away on Lot 74. The projected train passby vibration level of 72 VdB would satisfy the applicable FTA groundborne vibration impact assessment criterion of 80 VdB.

Based on the measured railroad operations vibration levels at the project site and the analysis provided above, this impact is identified as being ***less than significant***.

This concludes BAC's noise and vibration assessment of the Autumn Ridge Residential Development project in Fresno, California. Please contact BAC at (530) 537-2328 or info@bacnoise.com if you have any comments or questions regarding this report.

Appendix A
Acoustical Terminology

Acoustics The science of sound.

Ambient Noise The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.

Attenuation The reduction of an acoustic signal.

A-Weighting A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.

Decibel or dB Fundamental unit of sound. A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.

CNEL Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.

Frequency The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.

IIC Impact Insulation Class (IIC): A single-number representation of a floor/ceiling partition's impact generated noise insulation performance. The field-measured version of this number is the FIIC.

L_{dn} Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

L_{eq} Equivalent or energy-averaged sound level.

L_{max} The highest root-mean-square (RMS) sound level measured over a given period of time.

Loudness A subjective term for the sensation of the magnitude of sound.

Masking The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.

Noise Unwanted sound.

Peak Noise The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the "Maximum" level, which is the highest RMS level.

RT_{60} The time it takes reverberant sound to decay by 60 dB once the source has been removed.

STC Sound Transmission Class (STC): A single-number representation of a partition's noise insulation performance. This number is based on laboratory-measured, 16-band (1/3-octave) transmission loss (TL) data of the subject partition. The field-measured version of this number is the FSTC.

Appendix B-1
FHWA Highway Traffic Noise Prediction Model Data Inputs
Autumn Ridge Residential Development
File Name: 01 Existing
Model Run Date: 11/30/2021

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	(1) Butler Ave / Wilow Ave	North							
2		South	4,325	83	17	2	1	40	50
3		East	7,965	83	17	2	1	40	50
4		West	7,060	83	17	2	1	40	50
5	(2) Church Ave / Willow Ave	North	4,250	83	17	2	1	40	50
6		South	3,170	83	17	2	1	40	50
7		East	6,640	83	17	2	1	40	50
8		West	6,270	83	17	2	1	40	50
9	(3) Jensen Ave / Willow Ave	North	2,500	83	17	2	1	45	50
10		South	1,685	83	17	2	1	45	50
11		East	12,310	83	17	2	2	55	50
12		West	13,285	83	17	2	2	55	50
13	(4) N. Project Driveway / Willow Ave	North	4,250	83	17	2	1	40	50
14		South	4,325	83	17	2	1	40	50
15		East							
16		West							
17	(5) S. Project Driveway / Willow Ave	North	4,250	83	17	2	1	40	50
18		South	4,325	83	17	2	1	40	50
19		East							
20		West							

Appendix B-2
FHWA Highway Traffic Noise Prediction Model Data Inputs
Autumn Ridge Residential Development
File Name: 02 Existing+Project
Model Run Date: 11/30/2021

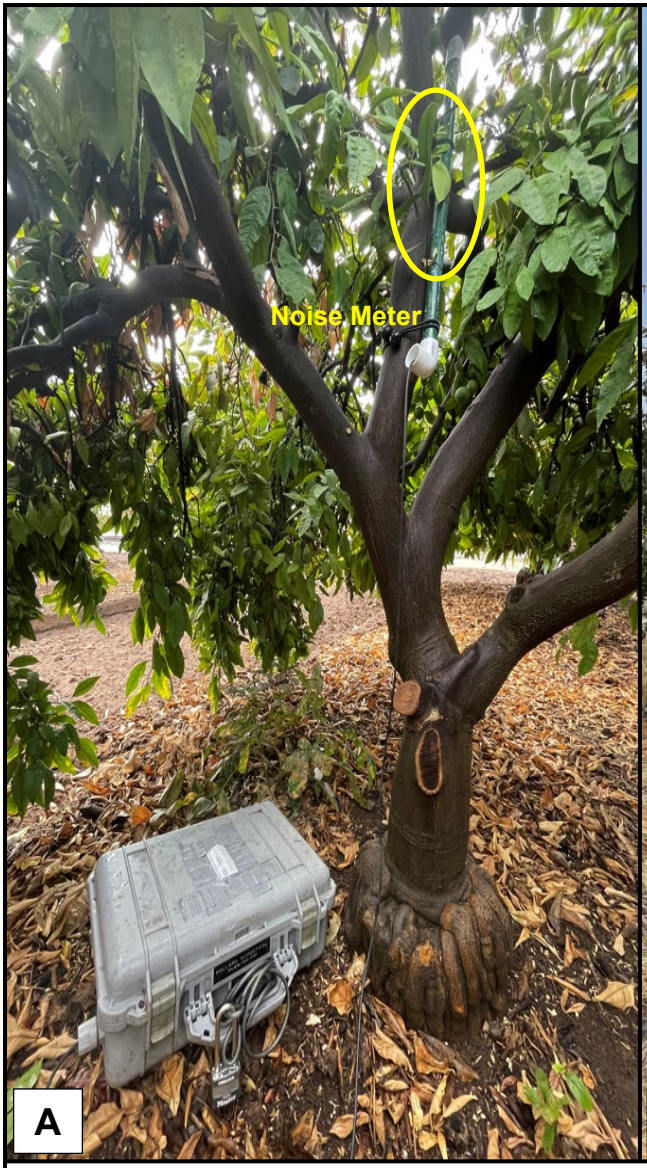
Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	(1) Butler Ave / Wilow Ave	North							
2		South	5,380	83	17	2	1	40	50
3		East	8,345	83	17	2	1	40	50
4		West	7,735	83	17	2	1	40	50
5	(2) Church Ave / Willow Ave	North	4,885	83	17	2	1	40	50
6		South	3,550	83	17	2	1	40	50
7		East	6,690	83	17	2	1	40	50
8		West	6,475	83	17	2	1	40	50
9	(3) Jensen Ave / Willow Ave	North	2,865	83	17	2	1	45	50
10		South	1,700	83	17	2	1	45	50
11		East	12,345	83	17	2	2	55	50
12		West	13,600	83	17	2	2	55	50
13	(4) N. Project Driveway / Willow Ave	North	5,345	83	17	2	1	40	50
14		South	5,095	83	17	2	1	40	50
15		East	870	83	17	1	1	25	50
16		West							
17	(5) S. Project Driveway / Willow Ave	North	5,095	83	17	2	1	40	50
18		South	4,890	83	17	2	1	40	50
19		East	865	83	17	1	1	25	50
20		West							

Appendix B-3
FHWA Highway Traffic Noise Prediction Model Data Inputs
Autumn Ridge Residential Development
File Name: 03 Cumulative
Model Run Date: 11/30/2021

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	(1) Butler Ave / Wilow Ave	North							
2		South	7,790	83	17	2	1	40	50
3		East	14,160	83	17	2	1	40	50
4		West	13,040	83	17	2	1	40	50
5	(2) Church Ave / Willow Ave	North	7,840	83	17	2	1	40	50
6		South	6,265	83	17	2	1	40	50
7		East	11,650	83	17	2	1	40	50
8		West	10,895	83	17	2	1	40	50
9	(3) Jensen Ave / Willow Ave	North	5,005	83	17	2	1	45	50
10		South	2,830	83	17	2	1	45	50
11		East	23,630	83	17	2	2	55	50
12		West	25,335	83	17	2	2	55	50
13	(4) N. Project Driveway / Willow Ave	North	7,840	83	17	2	1	40	50
14		South	7,790	83	17	2	1	40	50
15		East							
16		West							
17	(5) S. Project Driveway / Willow Ave	North	7,840	83	17	2	1	40	50
18		South	7,790	83	17	2	1	40	50
19		East							
20		West							

Appendix B-4
FHWA Highway Traffic Noise Prediction Model Data Inputs
Autumn Ridge Residential Development
File Name: 04 Cumulative+Project
Model Run Date: 11/30/2021

Segment	Intersection	Direction	ADT	Day %	Night %	% Med. Trucks	% Hvy. Trucks	Speed	Distance
1	(1) Butler Ave / Wilow Ave	North							
2		South	8,850	83	17	2	1	40	50
3		East	14,540	83	17	2	1	40	50
4		West	13,720	83	17	2	1	40	50
5	(2) Church Ave / Willow Ave	North	8,485	83	17	2	1	40	50
6		South	6,650	83	17	2	1	40	50
7		East	11,700	83	17	2	1	40	50
8		West	11,105	83	17	2	1	40	50
9	(3) Jensen Ave / Willow Ave	North	5,370	83	17	2	1	45	50
10		South	2,845	83	17	2	1	45	50
11		East	23,665	83	17	2	2	55	50
12		West	25,650	83	17	2	2	55	50
13	(4) N. Project Driveway / Willow Ave	North	8,930	83	17	2	1	40	50
14		South	8,680	83	17	2	1	40	50
15		East	870	83	17	1	1	25	50
16		West							
17	(5) S. Project Driveway / Willow Ave	North	8,680	83	17	2	1	40	50
18		South	8,475	83	17	2	1	40	50
19		East	865	83	17	1	1	25	50
20		West							



Legend

A: Noise measurement site N-1 facing south towards SJVR track and project site
B: Noise measurement site N-2 facing southwest towards S. Willow Avenue
C: Vibration measurement site V-1 north towards SJVR track from project site

Autumn Ridge
Fresno, California

Noise & Vibration Survey Photographs

Appendix C

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Appendix D-1
Long-Term Ambient Noise Monitoring Results - Site N-1
Autumn Ridge Residential Development - Fresno, California
Tuesday, October 05, 2021

Hour	Leq	Lmax	L50	L90
12:00 AM	44	60	43	40
1:00 AM	64	85	41	39
2:00 AM	46	69	39	37
3:00 AM	43	60	39	38
4:00 AM	44	57	42	39
5:00 AM	46	63	45	42
6:00 AM	48	57	48	45
7:00 AM	53	64	52	49
8:00 AM	50	60	49	46
9:00 AM	44	61	42	40
10:00 AM	41	57	38	35
11:00 AM	44	71	38	35
12:00 PM	40	56	39	36
1:00 PM	43	67	39	36
2:00 PM	40	51	39	35
3:00 PM	43	57	41	36
4:00 PM	42	57	40	37
5:00 PM	44	61	42	39
6:00 PM	46	64	44	40
7:00 PM	47	57	45	41
8:00 PM	46	61	45	42
9:00 PM	46	57	44	41
10:00 PM	43	62	41	40
11:00 PM	42	57	41	39

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	53	40	46	64	42	55
Lmax (Maximum)	71	51	60	85	57	63
L50 (Median)	52	38	43	48	39	42
L90 (Background)	49	35	39	45	37	40

Computed DNL (dB)	61
% Daytime Energy	18%
% Nighttime Energy	82%

GPS Coordinates	36°43'19.33" N
	119°43'33.21" W

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Appendix D-2
Long-Term Ambient Noise Monitoring Results - Site N-1
Autumn Ridge Residential Development - Fresno, California
Wednesday, October 06, 2021

Hour	Leq	Lmax	L50	L90
12:00 AM	41	56	39	38
1:00 AM	40	55	39	37
2:00 AM	40	55	38	37
3:00 AM	39	53	38	36
4:00 AM	42	56	41	39
5:00 AM	46	55	46	43
6:00 AM	47	62	46	44
7:00 AM	48	69	47	45
8:00 AM	44	55	44	41
9:00 AM	42	60	40	37
10:00 AM	66	92	40	36
11:00 AM	42	58	39	35
12:00 PM	45	64	42	37
1:00 PM	45	60	41	34
2:00 PM	50	71	40	36
3:00 PM	48	71	40	36
4:00 PM	44	68	41	37
5:00 PM	45	61	44	41
6:00 PM	47	61	46	43
7:00 PM	47	73	44	42
8:00 PM	44	53	44	42
9:00 PM	46	61	44	42
10:00 PM	64	87	43	41
11:00 PM	43	58	41	39

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	66	42	55	64	39	54
Lmax (Maximum)	92	53	65	87	53	60
L50 (Median)	47	39	42	46	38	41
L90 (Background)	45	34	39	44	36	39

Computed DNL (dB)	61
% Daytime Energy	64%
% Nighttime Energy	36%

GPS Coordinates	36°43'19.33" N
	119°43'33.21" W

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Appendix D-3
Long-Term Ambient Noise Monitoring Results - Site N-1
Autumn Ridge Residential Development - Fresno, California
Thursday, October 07, 2021

Hour	Leq	Lmax	L50	L90
12:00 AM	40	52	39	38
1:00 AM	41	58	39	37
2:00 AM	45	67	39	38
3:00 AM	42	58	40	38
4:00 AM	42	53	42	40
5:00 AM	44	55	44	42
6:00 AM	49	65	47	44
7:00 AM	49	59	49	47
8:00 AM	49	68	46	42
9:00 AM	49	69	44	43
10:00 AM	48	68	41	38
11:00 AM	46	67	39	35
12:00 PM	41	59	39	35
1:00 PM	47	73	42	39
2:00 PM	57	89	42	38
3:00 PM	44	57	43	38
4:00 PM	52	74	41	37
5:00 PM	44	58	42	38
6:00 PM	46	62	45	41
7:00 PM	45	53	45	41
8:00 PM	44	58	43	41
9:00 PM	44	59	43	41
10:00 PM	44	52	43	41
11:00 PM	43	58	42	40

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	57	41	49	49	40	44
Lmax (Maximum)	89	53	65	67	52	58
L50 (Median)	49	39	43	47	39	41
L90 (Background)	47	35	40	44	37	40

Computed DNL (dB)	52
% Daytime Energy	84%
% Nighttime Energy	16%

GPS Coordinates	36°43'19.33" N
	119°43'33.21" W

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Appendix D-4
Long-Term Ambient Noise Monitoring Results - Site N-2
Autumn Ridge Residential Development - Fresno, California
Tuesday, October 05, 2021

Hour	Leq	Lmax	L50	L90
12:00 AM	53	73	44	42
1:00 AM	60	88	42	40
2:00 AM	51	74	40	38
3:00 AM	51	74	41	38
4:00 AM	53	77	43	41
5:00 AM	57	77	46	43
6:00 AM	60	79	50	47
7:00 AM	65	79	61	51
8:00 AM	65	86	54	49
9:00 AM	59	76	46	42
10:00 AM	60	83	44	36
11:00 AM	59	75	44	36
12:00 PM	59	75	44	39
1:00 PM	59	76	45	38
2:00 PM	60	75	47	37
3:00 PM	63	79	58	41
4:00 PM	62	78	52	39
5:00 PM	63	77	56	44
6:00 PM	62	74	54	43
7:00 PM	62	86	52	43
8:00 PM	59	74	49	43
9:00 PM	59	73	47	42
10:00 PM	58	88	43	41
11:00 PM	54	75	42	40

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	65	59	62	60	51	57
Lmax (Maximum)	86	73	78	88	73	78
L50 (Median)	61	44	50	50	40	43
L90 (Background)	51	36	41	47	38	41

Computed DNL (dB)	64
% Daytime Energy	84%
% Nighttime Energy	16%

GPS Coordinates	36°43'9.23" N
	119°43'38.36" W

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Appendix D-5
Long-Term Ambient Noise Monitoring Results - Site N-2
Autumn Ridge Residential Development - Fresno, California
Wednesday, October 06, 2021

Hour	Leq	Lmax	L50	L90
12:00 AM	53	72	41	39
1:00 AM	50	72	40	38
2:00 AM	49	70	39	38
3:00 AM	49	72	39	37
4:00 AM	52	73	42	39
5:00 AM	56	75	47	44
6:00 AM	59	76	48	45
7:00 AM	66	91	60	48
8:00 AM	62	84	50	43
9:00 AM	59	75	43	39
10:00 AM	58	73	43	37
11:00 AM	60	75	44	36
12:00 PM	61	77	46	37
1:00 PM	60	76	46	36
2:00 PM	66	97	51	39
3:00 PM	63	80	57	40
4:00 PM	63	82	54	41
5:00 PM	63	77	55	44
6:00 PM	62	75	53	46
7:00 PM	60	74	49	44
8:00 PM	59	78	47	43
9:00 PM	57	73	46	43
10:00 PM	61	84	45	42
11:00 PM	55	72	42	40

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	66	57	62	61	49	56
Lmax (Maximum)	97	73	79	84	70	74
L50 (Median)	60	43	49	48	39	42
L90 (Background)	48	36	41	45	37	40

Computed DNL (dB)	64
% Daytime Energy	88%
% Nighttime Energy	12%

GPS Coordinates	36°43'9.23" N
	119°43'38.36" W

Appendix D-6
Long-Term Ambient Noise Monitoring Results - Site N-2
Autumn Ridge Residential Development - Fresno, California
Thursday, October 07, 2021

Hour	Leq	Lmax	L50	L90
12:00 AM	50	73	40	38
1:00 AM	54	84	39	38
2:00 AM	51	73	40	39
3:00 AM	49	72	41	39
4:00 AM	51	71	43	40
5:00 AM	55	78	45	43
6:00 AM	59	75	49	45
7:00 AM	65	77	60	50
8:00 AM	62	78	51	44
9:00 AM	61	76	48	44
10:00 AM	61	83	46	41
11:00 AM	60	76	46	37
12:00 PM	60	75	46	37
1:00 PM	61	84	45	38
2:00 PM	61	79	51	39
3:00 PM	63	82	58	42
4:00 PM	62	79	53	40
5:00 PM	63	76	55	42
6:00 PM	62	81	53	43
7:00 PM	61	75	52	43
8:00 PM	59	79	47	42
9:00 PM	59	75	46	42
10:00 PM	58	76	45	42
11:00 PM	56	73	44	41

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	65	59	62	59	49	55
Lmax (Maximum)	84	75	78	84	71	75
L50 (Median)	60	45	50	49	39	43
L90 (Background)	50	37	42	45	38	41

Computed DNL (dB)	63
% Daytime Energy	89%
% Nighttime Energy	11%

GPS Coordinates	36°43'9.23" N
	119°43'38.36" W

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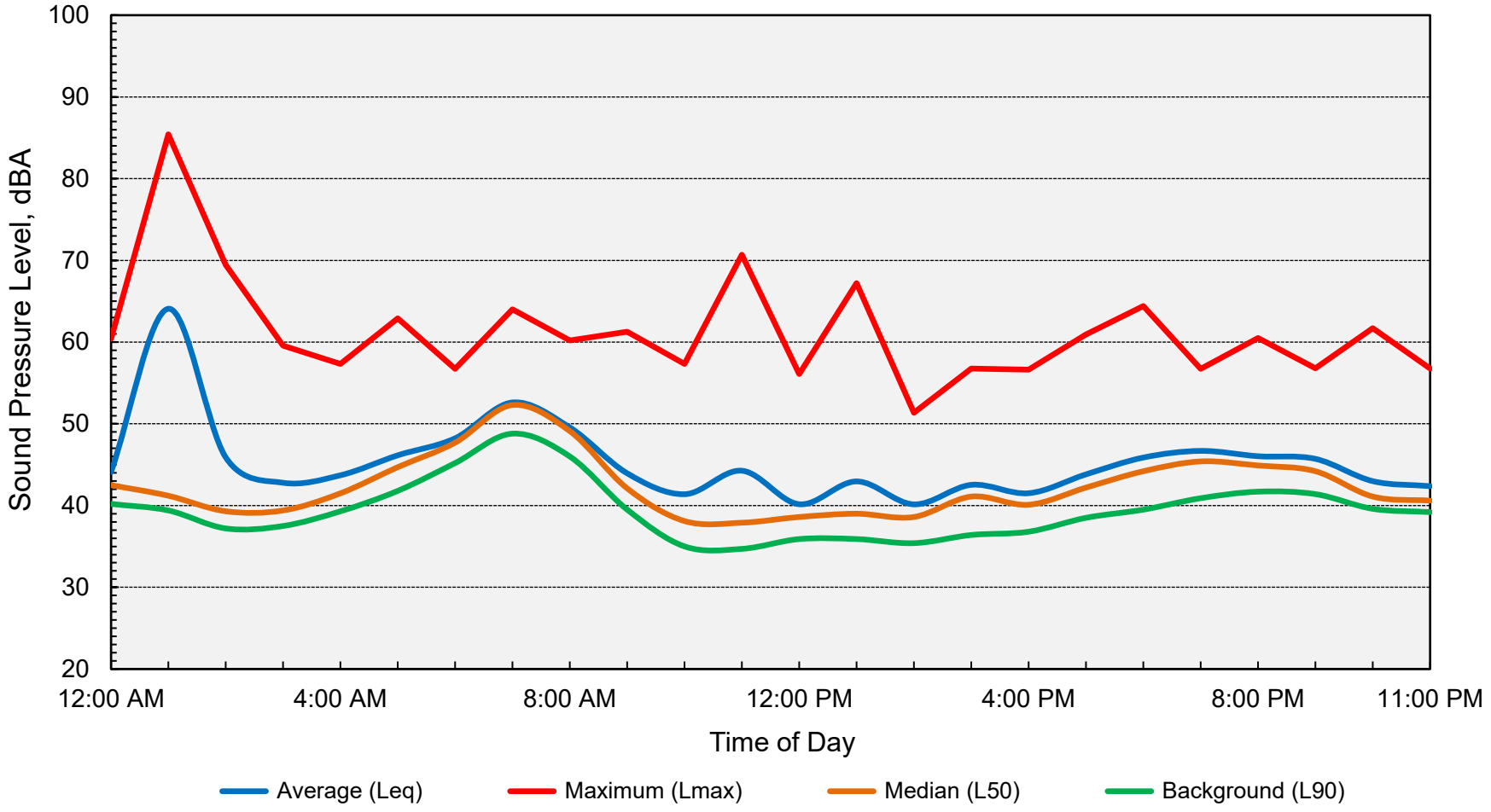
Appendix E-1
Long-Term Ambient Noise Monitoring Results - Site N-1
Autumn Ridge Residential Development - Fresno, California
Tuesday, October 05, 2021



Computed DNL = 61 dB

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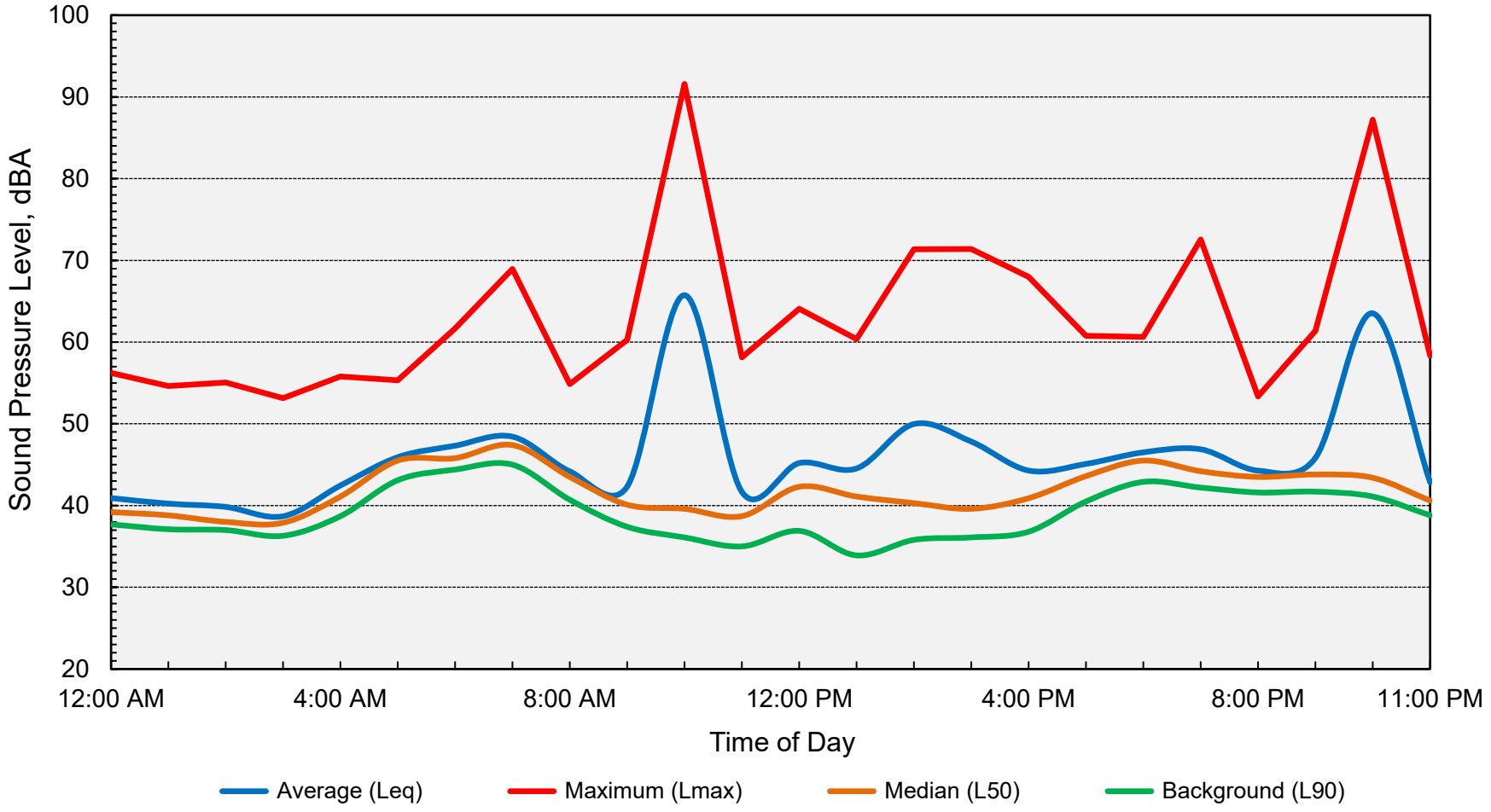
Appendix E-2
Long-Term Ambient Noise Monitoring Results - Site N-1
Autumn Ridge Residential Development - Fresno, California
Wednesday, October 06, 2021



Computed DNL = 61 dB

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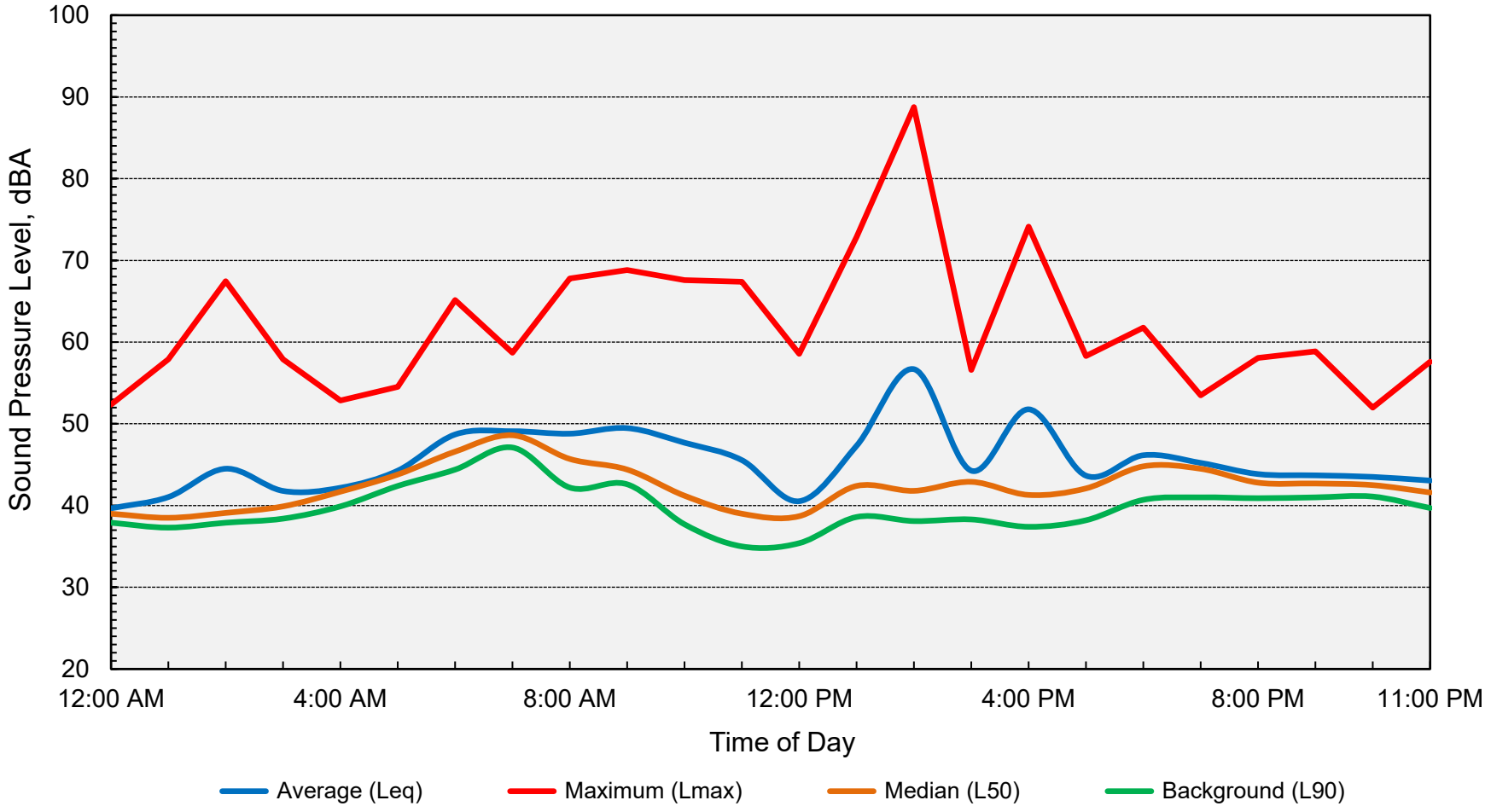
Appendix E-3
Long-Term Ambient Noise Monitoring Results - Site N-1
Autumn Ridge Residential Development - Fresno, California
Thursday, October 07, 2021



Computed DNL = 52 dB

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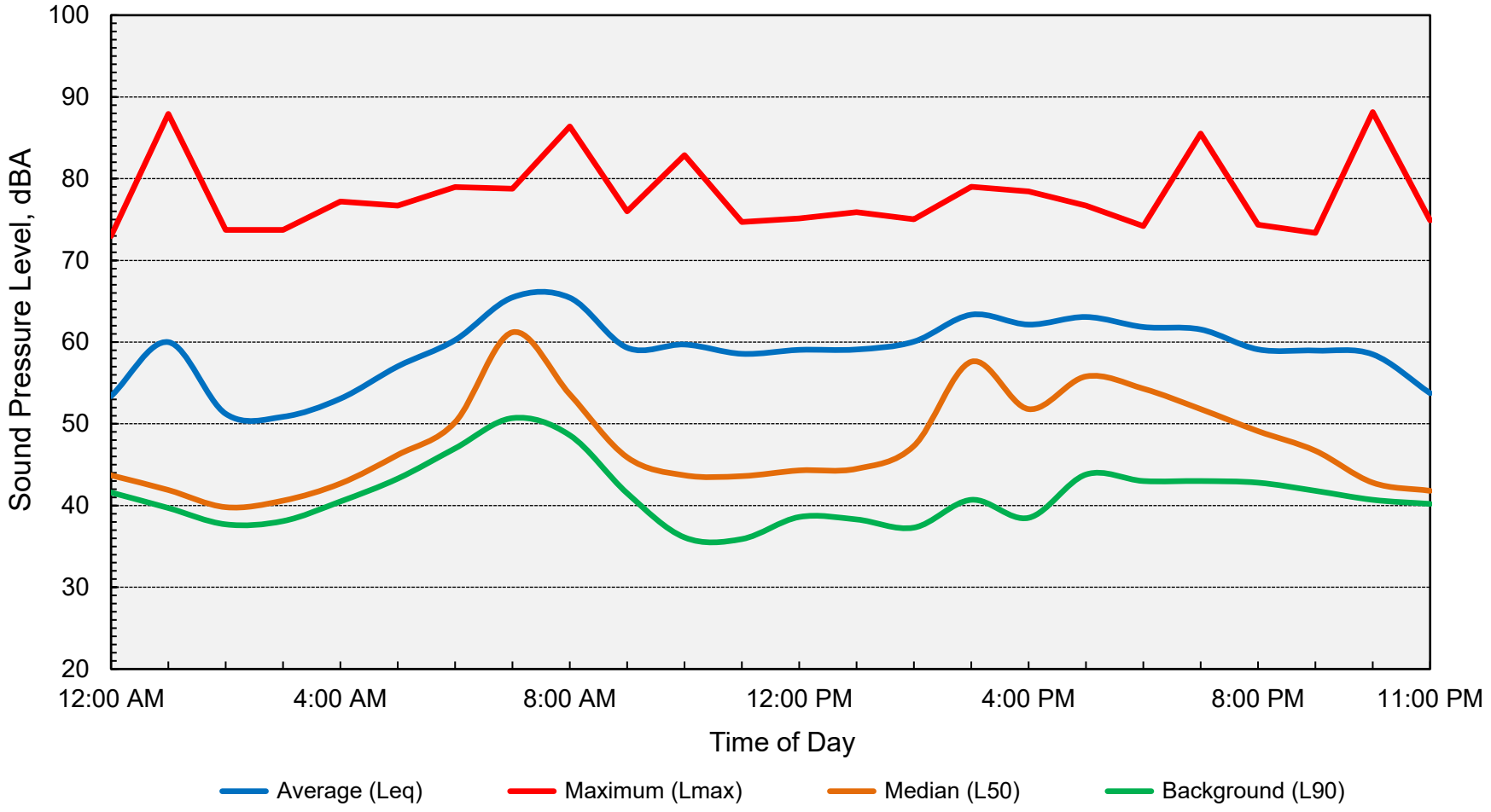
Appendix E-4
Long-Term Ambient Noise Monitoring Results - Site N-2
Autumn Ridge Residential Development - Fresno, California
Tuesday, October 05, 2021



Computed DNL = 64 dB

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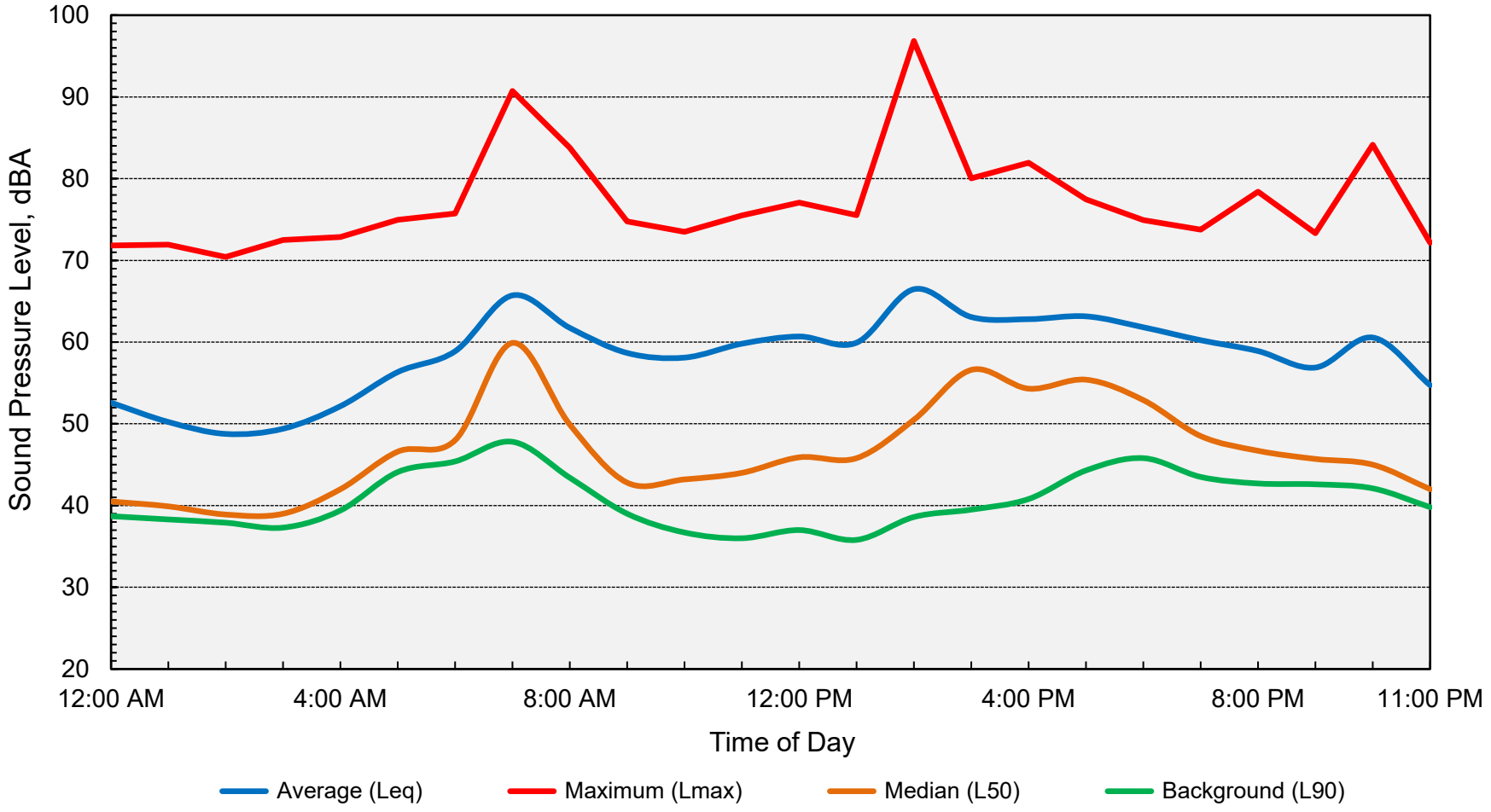
Appendix E-5
Long-Term Ambient Noise Monitoring Results - Site N-2
Autumn Ridge Residential Development - Fresno, California
Wednesday, October 06, 2021



Computed DNL = 64 dB

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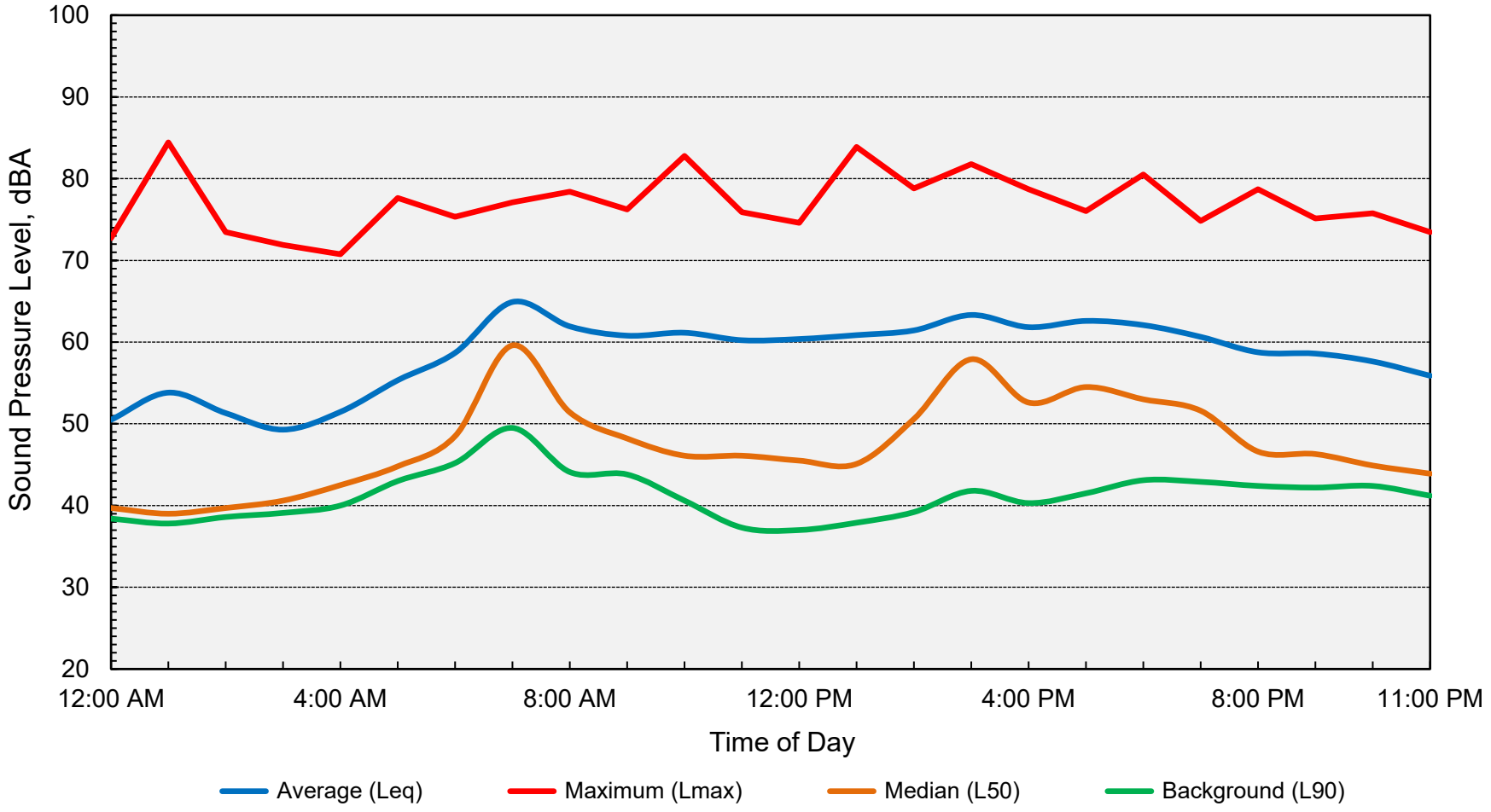
Appendix E-6
Long-Term Ambient Noise Monitoring Results - Site N-2
Autumn Ridge Residential Development - Fresno, California
Thursday, October 07, 2021



Computed DNL = 63 dB

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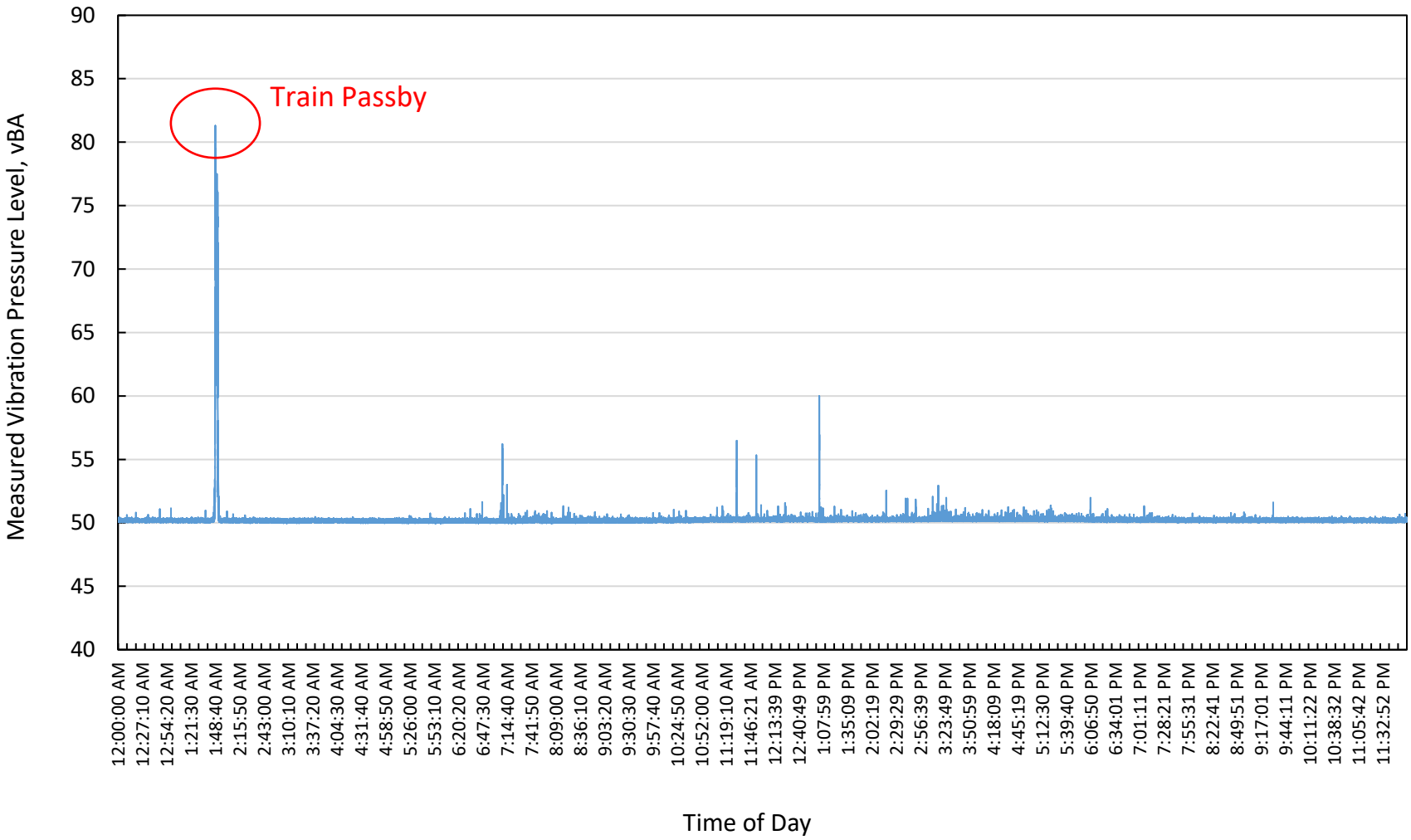
Appendix F-1
Long-Term Ambient Vibration Measurement Results - Site V-1
Autumn Ridge Residential Development - Fresno, California
Tuesday, October 5, 2021



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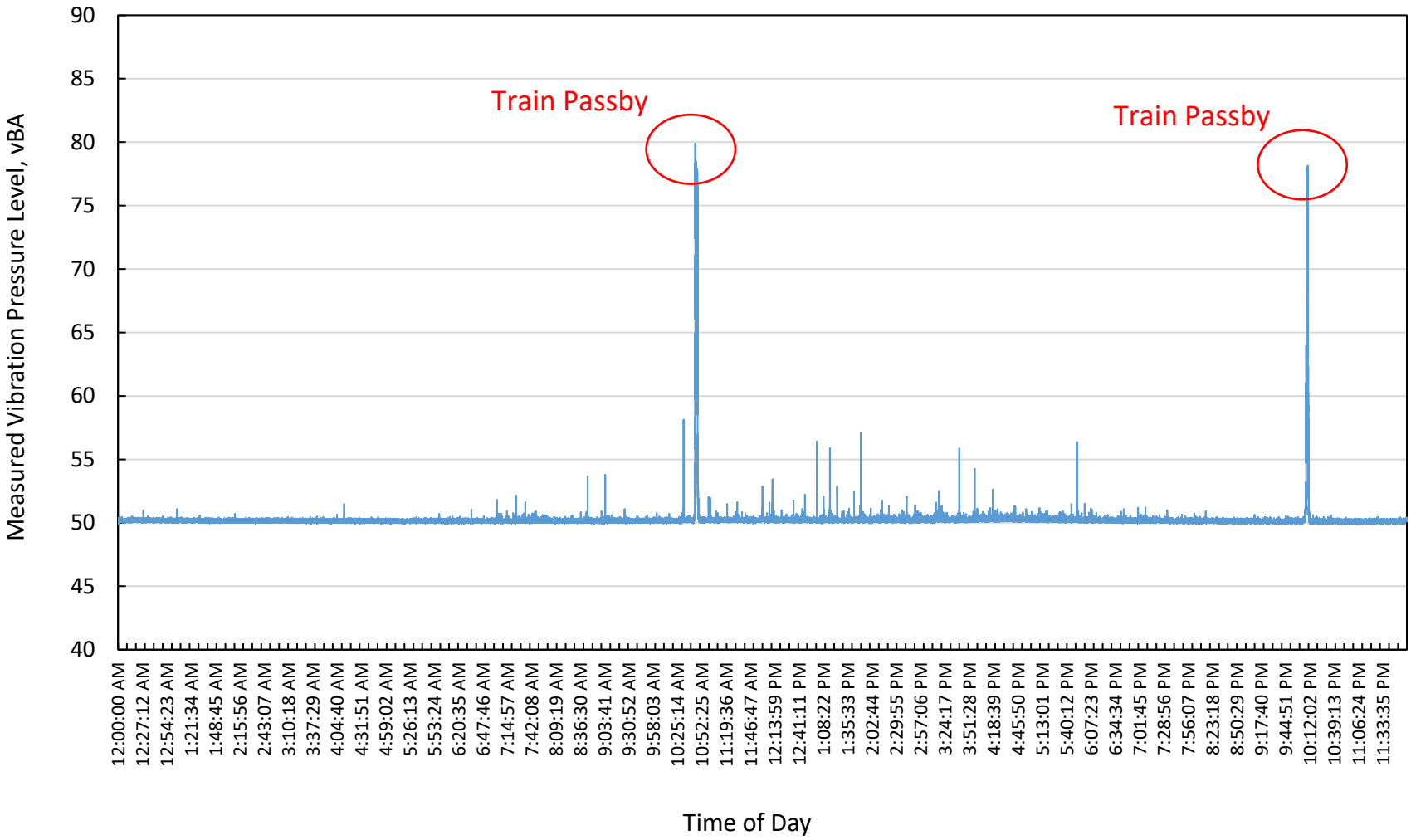
Appendix F-2
Long-Term Ambient Vibration Measurement Results - Site V-1
Autumn Ridge Residential Development - Fresno, California
Wednesday, October 6, 2021



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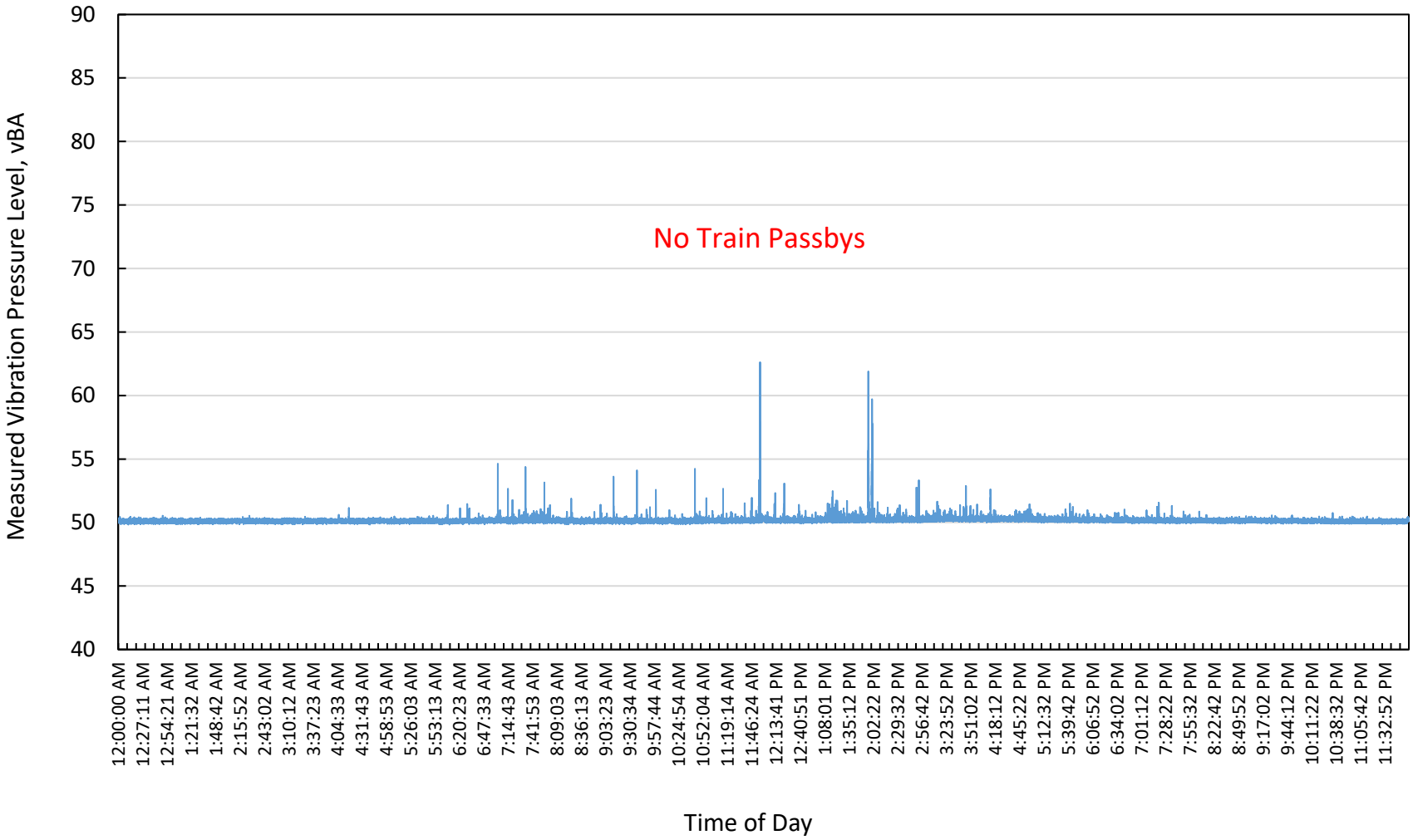
Appendix F-3
Long-Term Ambient Vibration Measurement Results - Site V-1
Autumn Ridge Residential Development - Fresno, California
Thursday, October 7, 2021



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Appendix G
FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Prediction Worksheet

Project Information:

Job Number: 2021-154
Project Name: Autumn Ridge Residential Development
Roadway Name: S. Willow Avenue

Traffic Data:

Year: Future (2042)
Daily Traffic Volume: 8,680
Percent Daytime Traffic: 87
Percent Nighttime Traffic: 13
Percent Medium Trucks (2 axle): 2
Percent Heavy Trucks (3+ axle): 1
Assumed Vehicle Speed (mph): 40
Intervening Ground Type (hard/soft): **Soft**

Traffic Noise Levels:

				DNL (dB)			
Location	**Receiver Description**	**Distance**	**Offset (dB)**	**Autos**	**Medium Trucks**	**Heavy Trucks**	**Total**
Park	Neighborhood park	220		54	46	48	55
Residences (Lots 1-4, 189-199)	Backyards	60		62	54	56	64
	First-floor building facades	70		61	53	55	63
	Upper-floor building facades	70	2	63	55	57	65

Traffic Noise Contours (No Calibration Offset):

DNL Contour, dB	Distance from Centerline, (ft)
75	11
70	23
65	50
60	108

Notes:

1. Future daily traffic volume (Cumulative Plus Project) for roadway was conservatively estimated by applying a factor of 5 to the sum of AM and PM peak hour conditions obtained from the project traffic impact analysis prepared by VRPA Technologies, Inc.

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Appendix H-1
FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:

Job Number: 2021-154
Project Name: Autumn Ridge Residential Development
Roadway Name: S. Willow Avenue

Noise Level Data:

Year: Future (2042)
Auto (DNL) dB: 62
Medium Truck (DNL) dB: 54
Heavy Truck (DNL) dB: 56

Site Geometry:

Receiver Description: Backyards: Lots 1-4, 189-199
Centerline to Barrier Distance (C_1): 50
Barrier to Receiver Distance (C_2): 10
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 0
Receiver Elevation: 5
Base of Barrier Elevation: 0
Starting Barrier Height 6

Barrier Effectiveness:

Top of Barrier Elevation (ft)	Barrier Height (ft)	DNL (dB) Autos	DNL (dB) Medium Trucks	DNL (dB) Heavy Trucks	DNL (dB) Total	Barrier Breaks Line of Sight to… Autos?	Medium Trucks?	Heavy Trucks?
6	6	56	48	51	**58**	Yes	Yes	Yes
7	7	54	47	50	**56**	Yes	Yes	Yes
8	8	53	45	49	**55**	Yes	Yes	Yes
9	9	51	44	47	**53**	Yes	Yes	Yes
10	10	50	43	46	**52**	Yes	Yes	Yes
11	11	49	42	45	**51**	Yes	Yes	Yes
12	12	48	41	44	**50**	Yes	Yes	Yes
13	13	48	40	43	**49**	Yes	Yes	Yes
14	14	47	40	42	**49**	Yes	Yes	Yes

Notes:
1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s).
2. Barrier heights assume that the difference in elevation between the roadway and lots are within +/- 2 feet. Should a difference greater than +/- 2 feet be present, an additional analysis would be warranted. Nonetheless, the barrier heights are relative to lot or roadway elevation, whichever is greater.

Appendix H-2
FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Barrier Effectiveness Prediction Worksheet

Project Information:

Job Number: 2021-154
Project Name: Autumn Ridge Residential Development
Roadway Name: S. Willow Avenue

Noise Level Data:

Year: Future (2042)
Auto (DNL) dB: 61
Medium Truck (DNL) dB: 53
Heavy Truck (DNL) dB: 55

Site Geometry:

Receiver Description: 1st-Floor Building Facades: Lots 1-4, 189-199
Centerline to Barrier Distance (C_1): 50
Barrier to Receiver Distance (C_2): 20
Automobile Elevation: 0
Medium Truck Elevation: 2
Heavy Truck Elevation: 8
Pad/Ground Elevation at Receiver: 0
Receiver Elevation: 5
Base of Barrier Elevation: 0
Starting Barrier Height 6

Barrier Effectiveness:

Top of Barrier Elevation (ft)	Barrier Height (ft)	DNL (dB) Autos	DNL (dB) Medium Trucks	DNL (dB) Heavy Trucks	DNL (dB) Total	Barrier Breaks Line of Sight to… Autos?	Medium Trucks?	Heavy Trucks?
6	6	55	47	50	**57**	Yes	Yes	Yes
7	7	53	46	50	**56**	Yes	Yes	Yes
8	8	52	45	49	**54**	Yes	Yes	Yes
9	9	51	44	48	**53**	Yes	Yes	Yes
10	10	50	43	46	**52**	Yes	Yes	Yes
11	11	49	42	45	**51**	Yes	Yes	Yes
12	12	49	41	45	**51**	Yes	Yes	Yes
13	13	48	40	44	**50**	Yes	Yes	Yes
14	14	47	40	43	**49**	Yes	Yes	Yes

Notes:
1. Standard receiver elevation is five feet above grade/pad elevations at the receiver location(s).
2. Barrier heights assume that the difference in elevation between the roadway and lots are within +/- 2 feet. Should a difference greater than +/- 2 feet be present, an additional analysis would be warranted. Nonetheless, the barrier heights are relative to lot or roadway elevation, whichever is greater.