California Environmental Quality Act

Initial Study

Ventura Alternative Education Campus and Administrative Office Project

Fresno, California

(State Clearinghouse No. 2018101040)

Lead Agency and Project Sponsor:

Fresno Unified School District

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Executive Summary

The Ventura Alternative Education Campus and Administrative Office Project (project) encompasses the construction and operation of an alternative educational campus plus District-level administrative offices on an approximately 12.65-acre site in the City of Fresno. The Alternative Education Campus would serve up to 1,350 students however, the maximum number of students on the campus at any one time would be approximately 800 in grades 7 through 12 and 60 pre-K students in an early learning center. The campus would have approximately 138 employees, including administrators, faculty, and support staff. The campus would include 44 classrooms, administrative offices, a multi-purpose building, hardcourt areas, and landscaping. Development of the proposed campus would also include demolition of six existing buildings at the site. The proposed offices would include the operation of District-level administrative activities in four existing buildings, which would function separately from the proposed campus and accommodate up to 130 employees. Additionally, the project would include implementation of a Removal Action Work Plan (RAW) to remove approximately 6,600 cubic yards of contaminated soil from the project site pursuant to the regulations and oversight of the California Department of Toxic Substances Control (DTSC).

Based on the California Environmental Quality Act Guidelines (CEQA Guidelines), the purpose of this Initial Study is to provide Fresno Unified School District ("District") with environmental information on the project to use as the basis for deciding whether to prepare an Environmental Impact Report or a Negative Declaration for the project.

The conclusions of the Initial Study are as follows:

1. The Initial Study identified a number of potentially significant environmental effects of the project in the following subject areas: aesthetics, air quality, biological resources, cultural resources, noise, transportation, and tribal cultural resources. The District can avoid or reduce to an insignificant level these impacts by incorporating in the project the mitigation measures listed in Summary Table of Mitigation Measures on the following pages.
2. The project would have a less than significant impact or no impact on many of the environmental resources and conditions evaluated in the Initial Study. The Initial Study explains why there would be no impacts or the impacts would be less than significant.
3. Based on items 1 and 2, above, the District should adopt a Mitigated Negative Declaration for the project.

Summary Table of Mitigation Measures

Aesthetics	**Aesthetics: Mitigation for Potential Lighting and Glare Impacts** **AE-1.** The following measures shall be incorporated into development and operation of the project in order to reduce impacts from lighting and glare: a. All parking area lighting shall have full cut-off type fixtures. A full cut-off type fixture is a luminaire or lighting fixture that, by design of the housing, does not allow any light dispersion or direct glare to shine above a 90-degree horizontal plane from the base of the fixture. Full cut-off type fixtures must be installed in a horizontal position as designed. b. All external signs and lighting shall be lit from the top and shine downward except where uplighting is required for safety or security purposes. The lighting shall also be, as much as physically possible, contained to the target area. c. Exterior building lighting for security or aesthetics shall be full cut-off or a shielded type design to minimize any upward distribution of light. d. Non-essential lighting shall be turned off by 10:00 pm.
Air Quality	**Air Quality: Mitigation Measures to Reduce Localized Pollutant Concentrations** The following measures shall be implemented to reduce potential expose of sensitive receptors to localized concentrations of construction-generated PM at nearby sensitive receptors and land uses during project construction. The term "construction" as used here

	shall refer broadly to pre-operational site preparation activities (e.g. excavation and grading) and includes all applicable activities involved in implementing the Removal Action Workplan. **AQ-1.** On-road diesel vehicles shall comply with Section 2485 of Title 13 of the California Code of Regulations. This regulation limits idling from diesel-fueled commercial motor vehicles with gross vehicular weight ratings of more than 10,000 pounds and licensed for operation on highways. It applies to California and non-California based vehicles. In general, the regulation specifies that drivers of said vehicles: a. Shall not idle the vehicle's primary diesel engine for greater than 5 minutes at any location, except as noted in Subsection (d) of the regulation; and, b. Shall not operate a diesel-fueled auxiliary power system to power a heater, air conditioner, or any ancillary equipment on that vehicle during sleeping or resting in a sleeper berth for greater than 5.0 minutes at any location when within 1,000 feet of a restricted area, except as noted in Subsection (d) of the regulation. **AQ-2.** Off-road diesel equipment shall comply with the 5-minute idling restriction identified in Section 2449(d)(2) of the California Air Resources Board's In-Use Off-road Diesel regulation. The specific requirements and exceptions in the regulations can be reviewed at the following web sites: www.arb.ca.gov/msprog/truck-idling/2485.pdf and ww.arb.ca.gov/regact/2007/ordiesl07/frooal.pdf. **AQ-3.** Signs shall be posted at the project site construction entrance to remind drivers and operators of the state's five-minute idling limit. **AQ-4.** To the extent available, replace fossil-fueled equipment with alternatively-fueled (e.g., natural gas) or electrically-driven equivalents. **AQ-5.** Construction truck trips shall be scheduled, to the extent possible, to occur during non-peak hours. **AQ-6.** The burning of vegetative material shall be prohibited. **AQ-7.** The proposed project shall comply with SJVAPCD Regulation VIII for the control of fugitive dust emissions. Regulation VIII can be obtained on the SJVAPCD's website at website URL: https://www.valleyair.org/rules/1ruleslist.htm. At a minimum, the following measures shall be implemented: a. All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover. b. All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant. c. All land clearing, grubbing, scraping, excavation, land leveling, grading, and cut & fill activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking. d. When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained. e. Trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.) f. Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.

	g. On-road vehicle speeds on unpaved surfaces of the project site shall be limited to 15 mph. h. Sandbags or other erosion control measures shall be installed sufficient to prevent silt runoff to public roadways from sites with a slope greater than one percent. i. Excavation and grading activities shall be suspended when winds exceed sustained speeds of 20 miles per hour (Regardless of wind speed, an owner/operator must comply with Regulation VIII's 20 percent opacity limitation). **AQ-8.** The above measures for the control of construction-generated emissions shall be included on site grading and construction plans.
Biological Resources	**Biological Resources: Mitigation for Potential Impacts to Migratory Bird Nesting** 1. <u>Avoidance:</u> If feasible, any vegetation removal within the project area shall take place between September 1 and February 1 to avoid impacts to nesting birds in compliance with the Migratory Bird Treaty Act (MBTA). No surveys will be required if project timing occurs outside the bird breeding season. If vegetation removal must occur during the nesting season, project construction may be delayed due to actively nesting birds and their required protective buffers. 2. <u>Pre-construction Surveys:</u> If construction is to begin during the nesting season (February 1 through August 31), a qualified biologist shall conduct a pre-construction survey within 14 days prior to initiation of disturbance activities. This survey will search for nest sites within the project area. If the pre-construction survey does not detect any active nests, then no further action is required. If the survey does detect an active nest, then the District shall implement the following: 3. <u>Minimization/Establish Buffers:</u> If any active nests are discovered, the District shall contact the United States Fish and Wildlife Service and/or California Department of Fish and Wildlife to determine protective measures required to avoid take. These measures could include fencing an area where a nest occurs or shifting construction work temporally or spatially away from the nesting birds. Biologists would be required on site to monitor construction activity while protected migratory birds are nesting in the project area. If an active nest is found after the completion of the pre-construction surveys and after construction begins, all construction activities shall stop until a qualified biologist has evaluated the nest and erected the appropriate buffer around the nest.
Cultural Resources	**Cultural Resources: Mitigation for Potential Discovery of Subsurface Cultural Resources** **CR-1**: If previously unknown subsurface resources are encountered before or during excavation or 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 District on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines and the City of Fresno'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. **CR-2:** 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 Section 15064.5 of the CEQA Guidelines. 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. **CR-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.
Geology and Soils	**Geology and Soils: Mitigation for Potential Discovery of Subsurface Paleontological/ Geological Resources** **GS-1:** 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 District 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.
Noise	**Noise: Reduction of Construction-Generated Noise Levels** **N-1:** The following measures shall be implemented to reduce construction-generated noise levels. The term “construction” as used here shall refer broadly to pre-operational site preparation activities (e.g. excavation and grading) and includes all applicable activities involved in implementing the Removal Action Workplan. a. Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the hours of 7:00 a.m. and 10:00 p.m. Construction activities shall be prohibited on Sundays and legal holidays. b. Construction truck trips shall be scheduled, to the extent feasible, to occur during non-peak hours and truck haul routes shall be selected to minimize impacts to nearby residential dwellings.

	c. Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation. d. Stationary construction equipment (e.g., portable power generators) should be located at the furthest distance possible from nearby residences. If deemed necessary, portable noise barriers shall be erected sufficient to shield nearby residences from direct line-of-sight of stationary construction equipment. e. When not in use, all equipment shall be turned off and shall not be allowed to idle. Provide clear signage that posts this requirement for workers at the entrances to the site. **Noise: Reduction of Long-term Operational Noise Impacts** **N-2:** The following shall be implemented to reduce long-term operational noise impacts of the project: a. An acoustical analysis shall be prepared for the proposed project prior to final design. The acoustical analysis shall identify noise-reduction measures to be incorporated sufficient to achieve an exterior average-hourly noise-level of 50 dBA Leq, or less, at the property line of the nearest noise-sensitive land use for on-site building mechanical equipment and vehicle parking areas. Onsite recreational uses shall be evaluated in comparison to the City of Fresno's average-daily noise standard of 60 dBA CNEL. Noise-reduction measures to be incorporated may include, but are not limited to, the selection of alternative or quieter equipment and construction of noise barriers (i.e., walls). b. Noise-generating maintenance activities, such as landscape maintenance and waste-collection activities, shall be limited to between the hours of 7:00 a.m. to 10:00 p.m. **Noise: Compatibility of Proposed School Uses with On-site Noise Levels** **N-3:** Prior to final site design, an acoustical analysis shall be prepared for structures to be used for educational instruction purposes that are located within the projected future 65 dBA CNEL/Ldn noise contour of Ventura Avenue. The acoustical analysis shall include evaluation of predicted interior noise levels for occupied rooms. Noise-reduction measures shall be identified sufficient to achieve applicable exterior and interior noise standards (e.g., 65 dBA CNEL/Ldn and 45 dBA CNEL/Ldn, respectively). Based on the analysis prepared for this project, the projected future 65 dBA CNEL/Ldn noise contour of Ventura Avenue would extend 84 feet from the roadway centerline.
Transportation	**Transportation: Mitigation for Transportation Circulation System Compatibility** **T-1:** Prior to operation of the project, the following improvements shall be implemented at the Tenth Street / Ventura Avenue intersection: a. Signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches. b. Include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg. **T-2:** The District shall be responsible for contributing its proportionate share (20.75 percent, per Table 17-2) of the installation of improvements at the intersection of Tenth Street and Ventura Avenue identified in the Existing plus Project scenario. **T-3:** To ensure that future project driveways do not negatively impact traffic operations, proposed project driveways shall be placed in line with existing roadways connected to the

	east, or be offset by at least 125 feet from the roadways connecting to the east side of Tenth Street. **T-4:** The project shall retain the Class II Bike Lane along the frontage to Ventura Avenue. **T-5:** The project shall retain existing walkways that are in a good state and compliant with requirements of the Americans With Disabilities Act (ADA) along its frontages to Ventura Avenue, Ninth Street, Lane Avenue and Tenth Street. The District shall act to ensure that any gaps be filled and that the project reconstruct walkways where needed to conform to current California Building Code and ADA requirements. **T-6:** The District shall prepare a school signage and striping plan in the vicinity of the project and implement the plan prior to opening day of the school component of the project. Additionally, the District shall provide the plan to the City of Fresno for review and approval prior to its implementation. **T-7:** The District, working with the City of Fresno, shall seek to implement a Safe Routes to School plan for the project and seek grant funding to help build walkways where they are lacking within a one-mile radius of the proposed project site. **T-8:** During the project's removal action, no truck trips involving the transport of soil shall occur between the hours of 4:00 PM to 6:00 PM on weekdays. Additionally, no such truck trips shall occur during operation of the 2019 Big Fresno Fair (scheduled October 2 through 14, 2019).
Tribal Cultural Resources	**Tribal Cultural Resources: Mitigation for Potential Discovery of Subsurface Resources** **TC-1:** If subsurface tribal cultural resources are discovered during excavation and/or construction activities, construction shall stop in the immediate vicinity of the find and a qualified tribal cultural resources professional shall be consulted to determine whether the resources require further study. If the resources are determined to be significant, mitigation measures shall be identified by the cultural resources professional and recommended to the District. If human remains are discovered, the procedures of Mitigation Measure CR-3 shall also apply.
Utilities and Service Systems	**Utilities and Service Systems: Water Supply Infrastructure Improvements** **US-1:** The project shall include the following water supply infrastructure improvements, installed in a manner compliant with City of Fresno standards, specifications, and policies: a. Construction of a 12-inch replacement water main in East Ventura Boulevard from South Tenth Street west across the project frontage b. Construction of an 8-inch replacement water main in South Tenth Street between East Ventura Boulevard and East Lane Avenue. **c.** Construction of a 12-inch replacement water main in Ventura Boulevard between South Cedar Avenue and South Tenth Street.

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A. Project Background Information

1. Project Title, Lead Agency, and Lead Agency Contact Information

- Project Title: Ventura Alternative Education Campus and Administrative Offices Project
- Lead Agency: Fresno Unified School District
- Contact: Alex Belanger, Assistant Superintendent
  Facilities Management & Planning
  4600 N. Brawley Avenue, Fresno, CA 93722
  Phone: (559) 457-3074
  Email: William.Belanger@fresnounified.org

2. Project Location

The location proposed for the project is on the south side of Ventura Avenue between Ninth Street and Tenth Street in the City of Fresno (see Table A-1 and Figures 1, 2, and 3). The proposed site would encompass approximately 12.65 acres, which includes land for public improvements. The site is surrounded by existing urban development, with a mixture of single-family and multi-family residences to the east, south, and west and commercial development to the north.

TABLE A-1
Project Location

City	City of Fresno
County	Fresno
Zip Code	93702
Assessor's Parcel Number	470-021-01T; 470-054-04T, 09T, 10T, 11T, 12T, 13T, 14T, 16T; 470-124-07T, 09T; 470-133-01T
Nearest Existing Major Cross Streets	Ventura Avenue and Tenth Street
Elevation	Approximately 305 ft. AMSL
USGS Map	Fresno South Quadrangle
Section, Township & Range	Portion of Section 11, Township 14 South, Range 20 East., Mount Diablo Base and Meridian
Latitude/Longitude	36°44'05"N, -119°45'31"W

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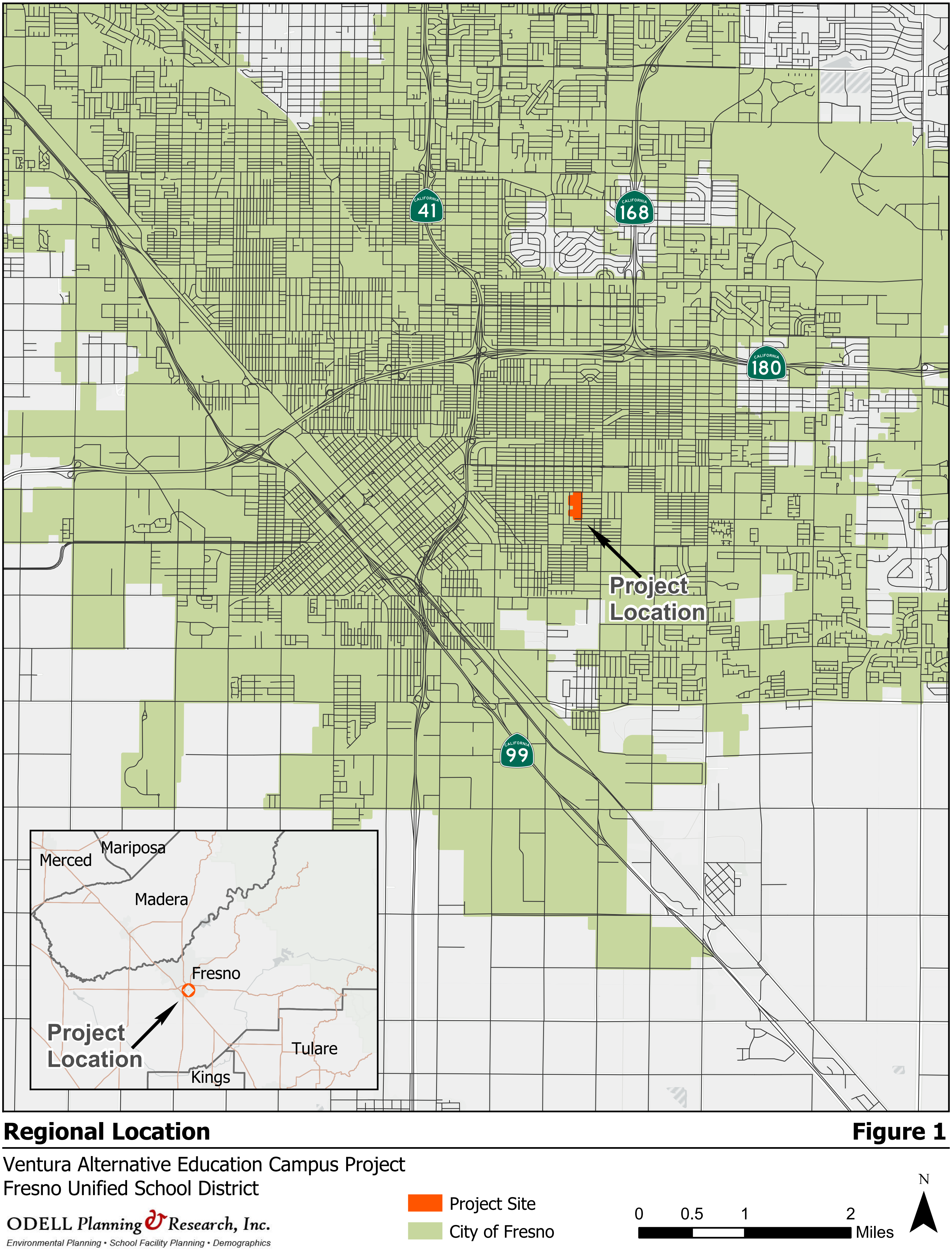

Regional Location

Figure 1

Ventura Alternative Education Campus Project
Fresno Unified School District

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Environmental Planning • School Facility Planning • Demographics

Project Site **Figure 2**

Ventura Avenue Alternative Education Campus Project
Fresno Unified School District

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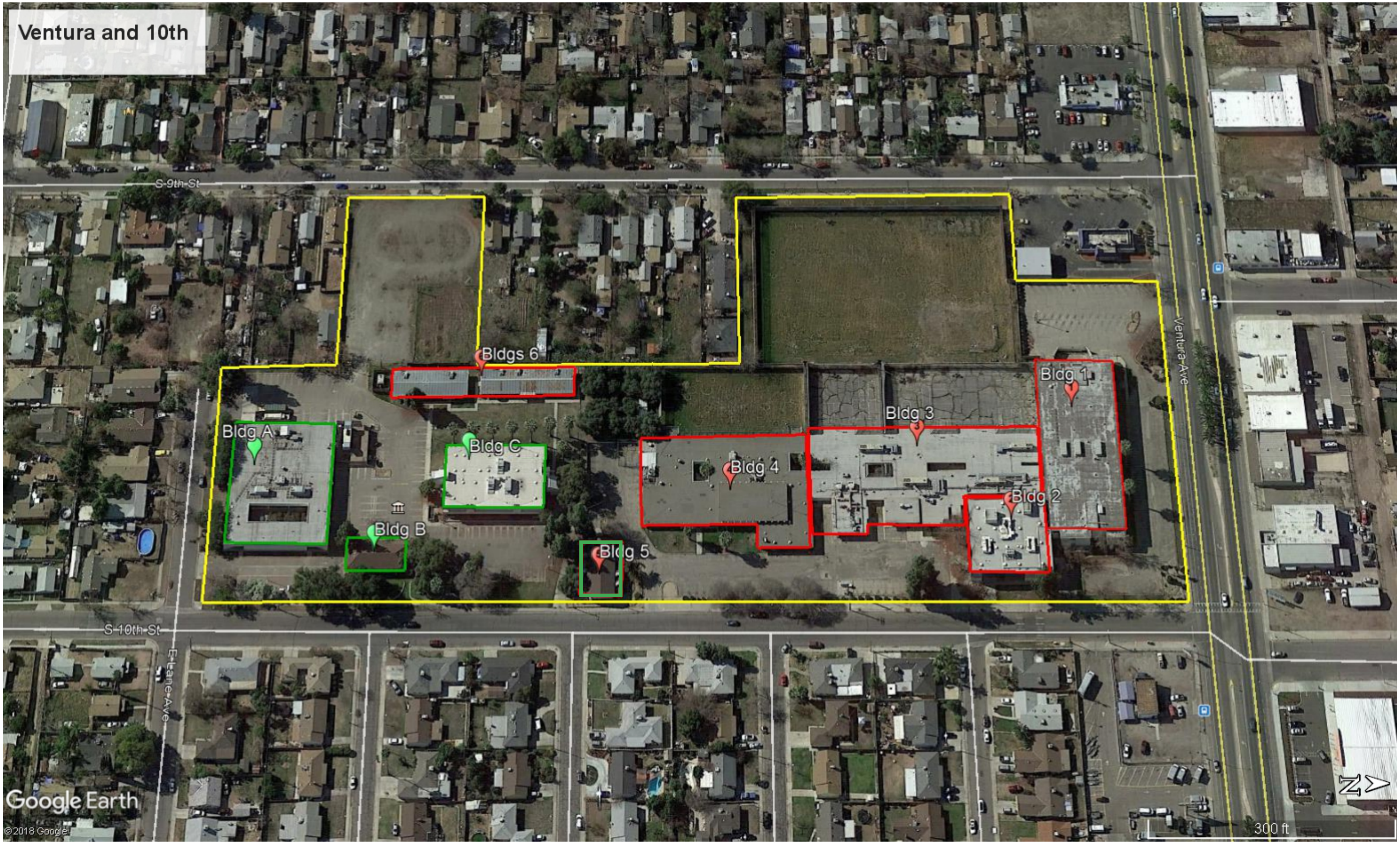
Project Site

0 50 100 200 US Feet

N



Notes:
- Building 5, originally identified for removal in the RFC, is now proposed to be maintained.
- "Buildings 6" refers to two separate buildings located adjacent to each other.

Existing Buildings on Project Site

Figure 3

Ventura Avenue Alternative Education Campus Project
Fresno Unified School District

ODELL Planning & Research, Inc.
Environmental Planning • School Facility Planning • Demographics

- Project Site Boundary
- Buildings to be maintained as administrative offices
- Buildings to be demolished

N

3. Project Description

Following are the major design, construction, and operational characteristics of the proposed project:

- ***Project Type:*** The project encompasses the demolition of existing structures on the site, implementation of a Removal Action Workplan (RAW) to remove contaminated soil from the project site, construction and operation of an alternative education campus on the site, and operation of administrative offices in existing buildings separate from the alternative education school.
- ***Project Objectives:*** To provide consolidated and expanded alternative education opportunities for Fresno Unified School District's student population which accommodate a variety of student needs, an early learning center for pre-K students, and expanded capacity for District administrative operations in a centralized location.
- ***Removal Action:*** The project would include implementation of a Removal Action Workplan (RAW) to remove contaminated soil from the project site pursuant to the regulations and oversight of the California Department of Toxic Substances Control (DTSC). The removal action focuses on the removal and disposal of soils contaminated with chemicals of concern (COCs) to reduce the threat to human health and to provide a permanent solution that reduces the toxicity, mobility, and volume of contaminated soil. The RAW will set forth details for using a mechanical backhoe-type excavator to excavate the contaminated soil and stockpile it on the site for waste-profile laboratory testing. Follow-up soil sampling is planned to provide greater certainty of the lateral and vertical extents of contaminated soil, but a conservative estimate of the volume of contaminated soil based on experience with similar sites is approximately 6,600 cubic yards (entailing up to 500 truck trips). Following removal of contaminated soil, excavated areas will be tested to ensure that cleanup goals have been achieved, and the site would be backfilled with clean soil[1]. The removal action is planned to begin in late 2019 and would be completed prior to the beginning of construction of the Alternative Education Campus.
- ***Planned Grade Levels and Enrollment:*** The Alternative Education campus would serve up to 1,350 students; however, the maximum number of students on the campus at any one time would be approximately 800 in grades 7 through 12 and 60 pre-K students in an early learning center. Not all students would be on the site at one time as student instruction would be provided through a combination of conventional classroom settings and alternative settings where students spend less time physically present at the campus (e.g. independent study, E-Learn).
- ***Estimated Employment:*** The project site would have 268 employees (130 at the Alternative Education Campus, 138 at the administrative offices), including administrators, faculty, and support staff. Not all employees would be on the campus at the same time.
- ***Operational Schedule:*** The Alternative Education Campus would be in regular session on weekdays from late August to early June. The school may host special events and classes during evenings, on weekends, and during the summer recess. The administrative office would operate year-round during the day.
- ***Planned Facilities:*** The Alternative Education Campus is planned to include 44 classrooms, administrative offices, a career technical education program (CTE), a continuation school, independent study, Educational Resource Center (ERC), E-Learn academy, a health building, a cafeteria/student union building, an early learning center, hardcourt recreation areas, and parking areas. The administrative offices would entail occupation of four buildings currently existing on the project site (see Figure 3).

4. Actions Required to Implement Project

The Fresno Unified School District must undertake the following actions in order to implement the project:

- Complete the California Environmental Quality Act process for the project. This would involve either the

[1] The District does not intend to bring backfill soil onto the site for the near-term future (i.e., in the next year). The post-soil removal would entail backfill and compaction to 80 percent for all excavations of greater than 2 feet, leaving these areas depressed to 2 feet. All edges are to be sloped to a minimum of 1:1 ratio. The work will borrow material from central areas of the site to a depth not to exceed 1 foot. The overall work will be a balanced site, requiring no import. At completion of grading effort, the site will be smooth, with gradual transitions in grade. The deep excavation areas shall be obvious depressions that will require future compaction for site improvements or building pads.

adoption of a mitigated negative declaration for the project or the preparation of an environmental impact report. Based on the results of this Initial Study, Fresno Unified should consider the adoption of a mitigated negative declaration for the project;

- Adopt and implement the Mitigation Monitoring and Reporting Program identified in Part F of this Initial Study;
- Approve the project;
- Complete the California Department of Education school site approval process;
- Secure approvals, permits, and agreements, as necessary, from agencies and utilities that are responsible for public facilities the project would construct, modify, or otherwise affect within or near the site.

5. Project Schedule

The project is expected to be completed in three phases, with the initial phase consisting of the demolition of six existing buildings and initiation of the removal action during 2019.

The second phase of the project will focus on the reuse of the four remaining buildings located on the southern portion of the property for District administrative offices. The administrative offices would tentatively begin operations in late 2019.

The final phase of the project would entail the construction of the Alternative Education Campus. Funding for this phase of the project has yet to be identified, so the timeline is less predictable. It is anticipated this phase would begin in the next 3 to 10 years.

6. Project Setting

a. Existing Land Uses

Located in an urbanized area of southeast Fresno, the proposed school site consists of 12 parcels ranging in size from 0.06 acres to 9.14 acres, with a total area of approximately 12.65 acres. The site has previously been in use as the Fresno County Juvenile Hall and for office/administrative purposes by the Fresno County Probation Department. The 12 parcels have been utilized as a single project site.

The 9.14-acre parcel, which comprises most of the proposed school site, is the location of Fresno County's former Juvenile Hall and was also previously used by the Fresno County Probation Department. There are nine existing buildings on the site as well as turfed recreational areas, asphalt-paved parking areas, landscaping, and lighting.

Nearby land uses include urban single-family residences, multi-family residences, and commercial uses near the northern portion of the project site along Ventura Avenue.

b. Public Land Use Policy

General Plan

The 2014 *Fresno General Plan* provides adopted public land use policy for the City of Fresno. The General Plan's Land Use and Circulation Map shows that the majority of the proposed site (11.64 acres) is designated as Neighborhood Mixed Use, with the remainder (1.01 acres) designated Medium Density Residential.

The General Plan describes the Neighborhood Mixed Use designation as providing for "mixed-use districts of local-serving, pedestrian-oriented commercial development, such as convenience shopping and professional offices in two- to three-story buildings." Additional detail is provided as follows:

> *Development is expected to include ground-floor neighborhood retail uses and upper-level housing or offices, with a mix of small lot single family houses, townhomes, and multi-family dwelling units on side streets, in a horizontal or vertical mixed-use orientation. The built form will have a scale and character that is consistent with pedestrian-orientation, to attract and promote a walk-in clientele, with small lots and frequent roadway and pedestrian connections permitting convenient access from residences to commercial space. Automobile-oriented uses are not permitted.* (Fresno General Plan, p. 3-41)

The Medium Density Residential use is described in the General Plan as "intended for areas with predominantly single-family residential development, but can also accommodate a mix of housing types, including small-lot starter homes, zero-lot-line developments, duplexes, and townhouses." The General Plan notes that much of the City's established neighborhoods fall within this designation.

The *Fresno General Plan* puts forth goals related to Urban Form, Land Use, and Design which focus on "establishing a structural framework for the city, enhancing the character of neighborhoods and districts, creating vibrant centers of activity and a public realm that is engaging and livable, crafting a tapestry of distinctive, connected communities, and strengthening Fresno's identity and sense of place." These goals include the following:

- Increase opportunity, economic development, business and job creation.
- Support a successful and competitive Downtown.
- Emphasize conservation, successful adaptation to climate and changing resource conditions, and performance effectiveness in the use of energy, water, land, buildings, natural resources, and fiscal resources required for the long-term sustainability of Fresno.
- Emphasize achieving healthy air quality and reduced greenhouse gas emissions.
- Provide for a diversity of districts, neighborhoods, housing types (including affordable housing), residential densities, job opportunities, recreation, open space, and educational venues that appeal to a broad range of people throughout the City.
- Develop Complete Neighborhoods and districts with an efficient and diverse mix of residential densities, building types, and affordability which are designed to be healthy, attractive, and centered by schools, parks, and public and commercial services to provide a sense of place and that provide as many services as possible within walking distance.
- Promote a city of healthy communities and improve quality of life in established neighborhoods.
- Emphasize increased land use intensity and mixed-use development at densities supportive of greater use of transit in Fresno.
- Improve Fresno's visual image and enhance its form and function through urban design strategies and effective maintenance.
- Recognize, respect, and plan for Fresno's cultural, social, and ethnic diversity, and foster an informed and engaged citizenry.

The General Plan also gives specific attention to the "Ventura Avenue - Kings Canyon Road Corridor", which includes the project site. Running from Downtown to the Southeast Development Area (SEDA), the corridor is described as offering many opportunities for mixed-use development on both under-utilized properties and vacant land. Much of the corridor west of Chestnut Avenue is expected to evolve over time as a "Main Street" environment, intended to encourage characteristics such as active storefronts, outdoor seating, and pedestrian-oriented design. This land use and design type promotes primarily one to two story retail uses, with moderate office and minimal multi-family as supportive uses.

Downtown Neighborhoods Community Plan

The project site is located within the Downtown Neighborhoods Community Plan Area. The Downtown Neighborhoods Community Plan (DNCP) identifies itself as "a highly articulated and informed extension of the Fresno General Plan… [which] provides updated policy direction for Downtown and the neighborhoods immediately adjacent to it." The stated goal of the DNCP is to capitalize on positive momentum for Downtown revitalization and put specific policies and actions into place to guide the rejuvenation of the Downtown neighborhoods that brings about lasting prosperity and improvements, to be achieved by:

- Establishing Downtown as the heart of Fresno;
- Reviving and/or transforming each of the Plan's planning areas based upon their unique identity;
- Establishing mixed-use neighborhood centers at important intersections that are within easy walking distance of surrounding residences and connect to existing and future transit networks;

- Improving the quality of the Community Plan Area's corridors by introducing street trees, traffic-calming measures, pedestrian amenities such as crosswalks, street lights and street furniture, and creating bicycle-friendly corridors; and
- Creating a framework for improving neighborhoods in order to attract private investment back to the center of the City and fostering a sense of pride in Downtown and its surrounding neighborhoods that inspires residents and property owners to not only transform and refurbish their own properties.

The Southeast Neighborhoods area where the site is located includes an area generally bounded by Freeway 41 to the west, Chestnut Avenue to the east, Freeway 180 to the north, and a southern boundary that jogs from Chestnut Avenue and Kings Canyon Road to California and East Avenues. The Ventura Avenue-Kings Canyon Road corridor is a significant focal point for implementing the objectives of the DNCP in this area. For example, the Urban Form and Land Use vision for the Southeast Neighborhoods area calls for introducing infill buildings along principal corridors (including Ventura Avenue) in order to revive the corridors, and creating more intense, mixed-use nodes at or near large intersections (Downtown Neighborhoods Community Plan, p. 1-14). Additionally, the plan calls for working to construct "a variety of new, highly visible, strategically located, quality, commercial/retail/mixed-use centers within the Downtown Neighborhoods... to support the market demand of nearby residents," and Ventura Avenue between 10th Street and Cedar Avenue is specifically identified as a potential location for a commercial/retail center (Downtown Neighborhoods Community Plan, p. 2-16).

c. Zoning

The City of Fresno's Zoning Map zoning for the project site is "NMX" (Neighborhood Mixed Use) and "RS-5" (Residential Single-Family, Medium Density).

The majority of the proposed site (11.64 acres) is zoned NMX. The NMX zone is described in the City of Fresno Development Code as "provid[ing] for a scale and character of development that is pedestrian-orientated, designed to attract and promote a walk-in clientele, with small lots and frequent pedestrian connections permitting convenient access from residences to commercial space."

Development is expected to include ground-floor neighborhood retail uses and upper-level housing or offices, with a mix of small lot single-family houses, townhomes, and multi-family dwelling units on side streets, in a horizontal or vertical mixed-use orientation. Schools are included as a permitted use in the NMX zone district, as are Government Offices (not allowed on the ground floor of portions of the site which abut a major street, but allowed in the interior of all sites) and Business and Professional Offices.

Two parcels (APN 470-142-07T, 470-133-01T) totaling 1.01 acres are zoned RS-5. Areas zoned "RS" are generally intended to provide for a variety of single-family residences, and among them the RS-5 zone allows for the most variety and intensity of uses. Schools are listed as a permitted use in the RS-5 district, but no office/administrative uses are listed as permissible in RS-5 or any other RS districts.

In the immediate vicinity of the project site, parcels located to the east, south, and west are zoned RS-5 and parcels to the north are zoned NMX.

d. Streets and Highways

Ventura Avenue and Tenth Street are the existing streets nearest the project site. In the vicinity of the project area, Ventura Avenue is a divided four-lane arterial roadway and Tenth Street is a two-lane local roadway. Ninth Street, which is adjacent to portions of the project site's western boundaries, is a two-lane local roadway.

(Please see Part E, Section 17, for additional information on streets and highways.)

e. Public Utilities and Services

The project site would be served by City of Fresno's water and sewer systems. Existing sewer and water facilities are located at the proposed site as a result of prior development at the site. The location, design, and modification of the water and sewer facilities would be subject to review and approval by the City of Fresno.

Stormwater drainage systems are provided by the Fresno Metropolitan Flood Control District (FMFCD). The project site is within the "II2" drainage area per FMFCD's Master Plan. Location, design, and modification of the stormwater drainage facilities would be subject to review and approval by FMFCD.

The Fresno Police Department provides law enforcement services for the City of Fresno in which the proposed school site is situated. The Fresno Fire Department provides fire protection services for this area.

(Please see Part E, Sections 15 and 19, for additional information on Public Utilities and Services.)

7. Request for Preliminary Comment

Fresno Unified distributed a Request for Preliminary Comment for the proposed school project to responsible, trustee and other agencies that might have an interest in the project. The Request for Preliminary Comment provided an opportunity for the agencies to comment on the potential environmental effects of the project, including whether an Environmental Impact Report, Mitigated Negative Declaration, or Negative Declaration should be prepared for the project. The District also sent the Request for Preliminary Comment to residents and property owners in the project vicinity.

8. Other Public Agencies Whose Approval is Required

Implementation of the proposed school project would require approvals from the following public agencies in addition to Fresno Unified:

TABLE A-2
Responsible Agencies

Public Agency	Approval(s)
California Department of Education, School Facilities Planning Division	Review and approve proposed school site for conformance with applicable state rules and regulations governing the siting of public schools
California Department of Toxic Substances Control	Responsible for ensuring that the proposed school sites are free of contamination or, if the properties were previously contaminated, that they have been cleaned up to a level that protects the students and staff who will occupy the new schools. Review and approve compliance with Education Code sections 17213.1 and 17213.2
City of Fresno	Planning Commission: Determine if the project is consistent with the City of Fresno General Plan Staff: Review and approve the location, design, and construction of street, water, and sewer improvements
Fresno Metropolitan Flood Control District (FMFCD)	Approve design and construction of flood control facilities in accordance with the plans and policies of FMFCD

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B. Environmental Factors Potentially Affected

Based on the evaluations in Part E, the project would have a less than significant impact on the environmental factors listed in the following table. Those factors that require mitigation to be incorporated into the project to be less than significant are noted with an "X".

TABLE B-1
Environmental Factors Potentially Affected

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

C. Determination

Based on this Initial Study, I find that the Ventura Alternative Education Campus Project could have significant effects on the environment, but mitigation measures incorporated in the project by the Fresno Unified School District will avoid or reduce the effects to less than significant. Therefore, a Mitigated Negative Declaration will be prepared.

Signature Date 7/26/19

Alex (William) Belanger
Print Name

Assistant Superintendent
Title

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D. Evaluation of Environmental Impacts

1. State CEQA Guidelines Appendix G: Environmental Checklist Form

Part E in this Initial Study addresses all of the environmental issues that Appendix G in the State CEQA Guidelines[2] suggests an Initial Study should address. In addition, it addresses several environmental issues that the California Department of Education requires be considered in the selection and approval of a school site.

The discussion of each impact in Part E concludes with a determination that the impact is potentially significant, less than significant with mitigation, less than significant, or does not involve any impact (no impact).

The "potentially significant" determination is applied if there is substantial evidence that an effect may be significant. Under the State CEQA Guidelines, a significant effect, or impact, on the environment means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. (sec. 15382) The District must prepare an Environmental Impact Report for the project if the Initial Study identifies one or more potentially significant impacts.

The "less than significant impact with mitigation incorporated" determination applies when the incorporation by the District of mitigation measures in the project would reduce an impact from potentially significant to less than significant. This Initial Study describes each mitigation measure the District has incorporated in the project to reduce potentially significant impacts to a less than significant level.

The "less than significant" determination applies when the project would not result in a significant effect on a resource or condition. The less than significant determination used only in cases where no mitigation measures are required to reduce an impact to a less than significant level.

The "no impact" determination applies when the project would have no impact on a resource or condition or the resource or condition does not apply to the project or its location. The no impact determination is used only in cases where no mitigation measures are required to avoid or eliminate an impact.

The discussion of impacts in this Initial Study lists each potential impact as stated in Appendix G, provides an analysis of the impact, describes each mitigation measure required to avoid the impact or reduce it to an insignificant level, and concludes with a determination of the level of significance of the impact. References to documents that would provide background information on an impact are provided where applicable.

This Initial Study incorporates by reference all documents and other sources of information cited in Parts E and H, Sources Consulted.

2. Existing Laws, Regulations, Policies, and Mitigation Measures

Introduction: In some cases, an impact that might appear significant is determined to be less than significant because it is subject to state, regional, or local laws, regulations, or policies, the application of which would reduce the impact to a less than significant level or avoid the impact entirely. In evaluating impacts, this Initial Study considered the applicable laws, regulations, and policies to determine the effect they would have on preventing or reducing potentially significant impacts. The Initial Study, however, does not cite them as mitigation measures because they would apply to the project regardless of the outcome of the Initial Study.

[2] This report uses the recently updated version of the Appendix G Checklist, which went into effect on December 28, 2018. A copy of the proposed Appendix G Checklist can be viewed at: http://resources.ca.gov/ceqa/docs/2018_CEQA_FINAL_TEXT_122818.pdf

For the proposed project, applicable laws, regulations, and policies include but are not limited to the following:

State of California: The selection and approval of a site for a public school in California is subject to numerous state rules and regulations, most of which the California Department of Education administers and protect the health and safety of students and staff at the school. Before the Department of Education will approve a school site and the school becomes eligible for state funding, a school district must certify that "the proposed site is suitable for educational purposes and is free, or will be free prior to occupancy, from hazards that could be considered harmful to student and staff health and safety. The school district has complied with and will comply with all applicable laws and policies associated with the acquisition of the school site, including commitments for Department of Toxic Substances Control required activities…" (SFPD 4.03, 2). The state requirements include but are not limited to the following:

- *Education Code Section 17210-17224:* Specifies the environmental review process the Department of Toxic Substance Control (DTSC) administers for new school sites. DTSC ensures that proposed school sites are free of contamination or, if the properties were previously contaminated, that they have been cleaned up to a level that protects the students and staff who will occupy the new school. All proposed school sites that will receive State funding for acquisition or construction are required to go through a rigorous environmental review and cleanup process under DTSC's oversight.
- *Education Code Section 17212.5; California Code of Regulations, Title 5, Section 14010 Geological and Other Environmental Hazards Report:* District must prepare a Geological Hazards Report and other environmental hazards report as described in Appendix H of the *School Site Selection and Approval Guide, 2000 Edition*. This will include a survey of high-pressure pipelines, liquid storage tanks, railroads, airports, electrical transmission lines, and areas subject to flooding, dam inundation, seismic faulting, and liquefaction.
- *Education Code Section 17213, Public Resources Code Section 21151.8; and California Code of Regulations, Title 5, Section 14011[h],[i]; Title 14, Section 15093:* Requires District Board to adopt findings stating: (1) the proposed school site is not a current or former waste disposal site; (2) the site is not a hazardous substance release site; (3) the site does not contain pipelines; and (4) whether a qualified freeway and/or qualified traffic corridor is located within 500 feet of the site. In addition, requires board-adopted findings for hazardous air emitters and hazardous material handlers located within a 1/4 mile of the site
- *Education Code Section 17215 and California Code of Regulations, Title 21, Division 2.5, Chapter 2.1:* airports: Requires providing a notice to the State Department of Education if a proposed school site is within two nautical miles, measured by air line, of that point on an airport runway or a potential runway included in an airport master plan that is nearest to the site. The Department of Education is required to consult with the Department of Transportation as to the safety of the site in relation to airport operations.
- *Public Resources Code Section 21151.2 and Government Code sections 53094, 65402[c]:* Require consultation with local Planning Commission to determine compatibility of proposed school site with general plan.
- *Public Resources Code Section 21151.4:* Addresses CEQA consultation requirements for the proposed construction or alteration of a facility within one-quarter mile of school that might reasonably be anticipated to emit or handling of hazardous or acutely hazardous material
- *Title 5, California Code of Regulations, Article 2, Section 14010, Standards for School Site Selection:* The standards address: possible hazards related to power line easements, railroads, airports, major streets, above ground pipelines, underground pipelines, above ground storage tanks, traffic, noise, seismicity, geology, soils, flooding, dam flood inundation, incompatible zoning, and other safety-related factors.
- *Title 24, California Code of Regulations, Part 1 through Part 12:* Specifies the State of California building regulations for public schools. The Division of the State Architect is responsible for administering the regulations.

San Joaquin Valley Air Pollution Control District
(https://www.valleyair.org/rules/1ruleslist.htm)

Regulation VIII – Fugitive PM10 Prohibitions and Regulation IX – Mobile and Indirect Sources

Fresno County Department of Public Health, Environmental Health
http://www.co.fresno.ca.us/DivisionPage.aspx?id=990

Public Health is responsible for permitting and inspecting retail food businesses, including school cafeterias, reviewing construction plans and inspection of new and remodeled food facilities, investigating complaints regarding violations involving unsanitary conditions, investigates suspected food borne illnesses, etc.

City of Fresno

- City of Fresno General Plan
- City of Fresno Citywide Development Code
- Standard Construction Drawings
- National pollutant Discharge Elimination System (NPDES) Construction General Permit

Fresno Unified School District Facilities Master Plan

The Fresno Unified School District Facilities Master Plan provides guidance and direction for future facilities needs of the District and the costs involved to implement them. It also provides an assessment of existing facilities and prioritizes improvements. Standards and guidelines for school design and construction are also provided in the plan. Since the Facilities Master Plan's initial approval in April 2009, school staff, consultants and department staff continued to implement the plan. High School Master Plans have been integrated into the original plan.

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E. Environmental Checklist

The questions in Part E, Sections 1-21, are from the State CEQA Guidelines, Appendix G: Environmental Checklist Form, Evaluation of Environmental Impacts (as updated December 28, 2018).

1. Aesthetics

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

Except as provided in Public Resources Code Section 21099, Would the project:

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

The impact of the project on scenic resources would be less than significant. The City of Fresno General Plan Master EIR discusses views of downtown Fresno, the San Joaquin River, and the Sierra Nevada (General Plan MEIR, 2014). The project would not diminish views of any of these identified scenic features due to its distance from these features and because its design characteristics (e.g. building height, size, and lighting) would be similar to development existing at the site and in the vicinity.

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

There are no scenic highways or other scenic resources located in the project vicinity, thus no impacts would result from the project.

c. In non-urbanized area, 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 located in a highly urbanized area within the City of Fresno. As mentioned in the Project Description, the project is located on the site of the former Fresno County Juvenile Hall and other government administrative office uses, and development of the project would entail removal of six buildings to accommodate construction of the proposed Alternative Education Campus facilities (see Figure 3 in Part A for a map of which existing buildings would be removed and which would be maintained).

Applicable regulations governing visual character and scenic quality can be found in the City of Fresno's Citywide Development Code and the Downtown Neighborhoods Community Plan (DNCP). The DNCP in particular contains several goals and policies which provide very specific guidance as to the intended urban form and design of the project site's vicinity. These goals and policies include introducing infill buildings along principal corridors in order to revive the corridors; creating more intense, mixed-use nodes at or near large intersections (DNCP, page 1-14); providing minimal setbacks and street trees (DNCP, page 2-11); developing pedestrian-oriented buildings that face and are accessed from the street (DNCP, page 2-11); and promoting highly visible, pedestrian-scale ground level street scale development (DNCP, page 2-12).

The proposed educational and office administrative facilities are consistent with common visual elements in an urban setting as what exists and is planned for the project site and its vicinity. Residents in the area may consider the change in visual character an adverse impact. This change, however, is consistent with what the City of Fresno has planned for in the Southeast Neighborhoods area and along the Ventura Avenue – Kings Canyon Road Corridor. Schools are typically a common and congruent visual feature within mixed-use and residential areas. The proposed Alternative Education Campus and administrative office facilities would be visually compatible with existing and planned development.

The project entails demolishing the former juvenile hall facilities to accommodate the proposed Alternative Education Campus and also renovating existing office buildings to be used as administrative offices. While noting that determinations of aesthetic value can often be subjective, the former juvenile hall facilities have been broadly criticized as an eyesore in the area, and redevelopment of the site with the proposed Alternative Education Campus provides an opportunity to fill this space with a use that is visually appealing and compelling. Further, the project is consistent with the vision put forth in the DNCP of promoting redevelopment along key corridors, and the District will coordinate with the City of Fresno during the process of creating a site plan and architectural drawings for the proposed campus.

For these reasons, the impacts of the project regarding visual character and quality would be less than significant.

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

The project may increase light and glare in its vicinity. While existing facilities at the site have utilized exterior lighting in the past, more recently lighting at the site has been relatively limited as prior uses relocated away from the site.

As part of the proposed project, buildings and parking areas will be lighted in pre-dawn and evening hours for the safety and security of the students and staff. Headlights from vehicles arriving and departing the campus and administrative offices during early morning and evening hours would also be a potential source of glare resulting from the project. It is noted that while educational facilities projects can be associated with substantial generation of light and glare from intense evening events (e.g. lighted night-time sporting events with heavy attendance), the nature of the project's operation would not include such intense evening events.

The potential project-related lighting and glare would not be unusual within the urban development that exists in the area surrounding the site. However, to ensure that adjacent existing and future land uses are not significantly impacted, the following mitigation measures will be incorporated in the project.

- **Mitigation Measure AE-1:** Mitigation for Lighting and Glare.

  The following measures shall be incorporated into development and operation of the project in order to reduce impacts from lighting and glare:

  a. All parking area lighting shall have full cut-off type fixtures. A full cut-off type fixture is a luminaire or lighting fixture that, by design of the housing, does not allow any light dispersion or direct glare to shine above a 90-degree horizontal plane from the base of the fixture. Full cut-off type fixtures must be installed in a horizontal position as designed.

  b. All external signs and lighting shall be lit from the top and shine downward except where uplighting is required for safety or security purposes. The lighting shall also be, as much as physically possible, contained to the target area.

c. Exterior building lighting for security or aesthetics shall be full cut-off or a shielded type design to minimize any upward distribution of light.

d. Non-essential lighting shall be turned off by 10:00 pm.

Level of Significance After Mitigation: With implementation of the recommended mitigation measures, this impact will be less than significant.

2. Agriculture and Forestry Resources

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				✓
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?				✓
c. Conflict with existing zoning for, or cause rezoning of, forestland, timberland, or timberland zoned Timberland Production?				✓
d. Result in the loss of forestland or conversion of forestland to non-forest use?				✓
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forestland to non-forest use?				✓

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?

The project would have no impacts on agricultural or forestry resources. The project site is located in a completely urbanized area that does not include any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. No agricultural-zoned areas or properties under Williamson Act contract are located at the project site or in its vicinity. Additionally, there are no forestland or timberland areas within the City of Fresno city limits.

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

This impact is addressed in Section 2(a) above.

c. Conflict with existing zoning for, or cause rezoning of, forestland, timberland, or timberland zoned timberland production?

This impact is addressed in Section 2(a) above.

d. Result in the loss of forestland or conversion of forestland to non-forest use?

This impact is addressed in Section 2(a) above.

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 forestland to non-forest use?

This impact is addressed in Section 2(a) above.

3. Air Quality

This section is based on an Air Quality Analysis completed for the project (included as Appendix 1 of the Initial Study). Table 3-1 provides definitions for the air quality terms used in this section.

TABLE 3-1
Air Quality Definitions

Carbon Monoxide (CO)

A colorless, odorless gas resulting from the incomplete combustion of hydrocarbon fuels. CO interferes with the blood's ability to carry oxygen to the body's tissues and results in numerous adverse health effects. Over 80 percent of the CO emitted in urban areas is contributed by motor vehicles. CO is a criteria air pollutant.

Nitrogen Oxides (Oxides of Nitrogen, NOx)

A general term pertaining to compounds of nitric oxide (NO), nitrogen dioxide (NO_2) and other oxides of nitrogen. Nitrogen oxides are typically created during combustion processes and are major contributors to smog formation and acid deposition. NO2 is a criteria air pollutant and may result in numerous adverse health effects.

Particulate Matter (PM)

Any material, except pure water, that exists in the solid or liquid state in the atmosphere. The size of particulate matter can vary from coarse, wind-blown dust particles to fine particle combustion products.

PM2.5

Includes tiny particles with an aerodynamic diameter less than or equal to a nominal 2.5 microns. This fraction of particulate matter penetrates most deeply into the lungs.

PM10 (Particulate Matter)

A criteria air pollutant consisting of small particles with an aerodynamic diameter less than or equal to a nominal 10 microns (about 1/7 the diameter of a single human hair). Their small size allows them to make their way to the air sacs deep within the lungs where they may be deposited and result in adverse health effects. PM10 also causes visibility reduction.

Reactive Organic Gas (ROG)

A photochemically reactive chemical gas, composed of non-methane hydrocarbons, that may contribute to the formation of smog. Also, sometimes referred to as Non-Methane Organic Gases (NMOGs). (See also Volatile and Hydrocarbons.)

Sulfur Dioxide (SO_2)

A strong smelling, colorless gas that is formed by the combustion of fossil fuels. Power plants, which may use coal or oil high in sulfur content, can be major sources of SO_2 and other sulfur oxides contribute to the problem of acid deposition. SO_2 is a criteria air pollutant.

Source: California Air Resources Board. *Glossary of Air Pollution Terms* (2015)

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?		✓		
b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality?			✓	
c. Expose sensitive receptors to substantial pollutant concentrations?		✓		
d. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			✓	

Would the project:

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

In accordance with San Joaquin Valley Air Pollution Control District (SJVAPCD)-recommended methodology for the assessment of air quality impacts, projects that result in significant air quality impacts at the project level are also considered to have a significant cumulative air quality impact. As noted in Section 3(b) below, short-term construction and long-term operational emissions would not exceed applicable thresholds. In addition, the proposed project's contribution to localized concentrations of emissions, including emissions of CO, TACs, and odors, are considered less than significant. However, as noted in Section 3(c), the proposed project could result in a significant contribution to localized PM concentrations for which the SJVAB is currently designated non-attainment. For this reason, implementation of the proposed project could conflict with air quality attainment or maintenance planning efforts. This impact would be considered potentially significant. Refer to Section 3(b) and 3(c) for additional discussion of air quality impacts.

Mitigation Measure: Implement Mitigation Measures AQ-1 through AQ-8 (refer to Section 3(c) below)

Level of Significance after Mitigation: With mitigation, short-term construction activities would be required to comply with SJVPACD Regulation VIII (Fugitive PM10 Prohibitions). Mandatory compliance with SJVAPCD Regulation VIII would reduce emissions of fugitive dust from the project site and minimize the project's potential to adversely affect nearby sensitive receptors. Compliance with SJVAPCD Regulation VIII would reduce fugitive emissions of PM by approximately 50 percent, or more. Additional measures have also been included to minimize emissions generated by onsite equipment and vehicles. With mitigation, this impact would be considered less than significant.

b. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality?

The proposed project is located in the City of Fresno, which is within the San Joaquin Valley Air Basin (SJVAB). The SJVAB is designated nonattainment for the national 8-hour ozone and PM2.5 standards. On September 25, 2008, the U.S. EPA redesignated the San Joaquin Valley to attainment for the PM10 NAAQS and approved the PM10 Maintenance Plan (SJVAPCD 2019). Potential air quality impacts associated with the proposed project could potentially occur during project construction or operational phases. Short-term construction and long-term air quality impacts associated with the proposed project are discussed, as follows:

Short-term Construction Emissions

Short-term increases in emissions would occur during the construction process. Construction-generated emissions are of temporary duration, lasting only as long as construction activities occur, but have the potential to represent a significant air quality impact. The construction of the proposed project would result in the temporary generation of emissions associated with site grading and excavation, paving, motor vehicle exhaust associated with construction equipment and worker trips; as well as, the movement of construction equipment on unpaved surfaces. Short-term construction emissions would result in increased emissions of ozone-precursor pollutants (i.e., ROG and NOx) and emissions of PM. Emissions of ozone-precursors would result from the operation of on-road and off-road motorized vehicles and equipment. Emissions of airborne PM are largely dependent on the amount of ground disturbance associated with site preparation activities and can result in increased concentrations of PM that can adversely affect nearby sensitive land uses.

Short-term construction emissions associated with the proposed project were calculated using the CalEEMod computer program[3]. Emissions were quantified for demolition, removal action workplan (RAW) for contaminated soils/grading, asphalt paving, facility construction, and application of architectural coatings. Detailed construction information, including construction schedules and equipment requirements, have not been identified for the proposed project. Default construction phases and equipment assumptions contained in the CalEEMod model were, therefore, relied upon for the calculation of construction-generated emissions. Two excavators were included in the modeling for RAW activities, based on information derived from the RAW report prepared for this project. The export of contaminated soil is estimated to require approximately 500 truckloads. To be conservative, construction of the project was assumed to begin in 2019 and extend through year 2020. Due to anticipated reductions in future fleet-average emission rates, emissions for post year 2020 conditions would be less.

Estimated annual and daily construction-generated emissions are discussed in greater detail, as follows:

Annual Construction Emissions

The proposed project would generate maximum uncontrolled annual emissions of approximately 0.47 tons/year of ROG, 2.28 tons/year of NOx, 2.00 tons/year of CO, 0.01 tons/year of SO_2, 0.01 tons/year of PM10, and 0.23 tons/year of PM2.5 (refer to Table 3-2). Estimated construction-generated emissions would not exceed the SJVAPCD's significance thresholds of 10 tons/year of ROG, 10 tons/year of NOx, or 15 tons/year of PM10 or PM2.5.

Table 3-2
Annual Construction Emissions

Construction Phase	Uncontrolled Maximum Annual Emissions (TPY)[1]					
	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction Year 1						
Demolition	0.04	0.45	0.24	0.00	0.09	0.03
RAW and Grading	0.02	0.23	0.11	0.00	0.05	0.03
Building Construction	0.11	0.96	0.76	0.00	0.09	0.06
Total:	0.16	1.64	1.11	0.00	0.23	0.11
Construction Year 2						
Building Construction	0.23	2.04	1.70	0.00	0.20	0.12
Paving	0.02	0.14	0.15	0.00	0.01	0.01
Architectural Coating	0.22	0.10	0.15	0.00	0.02	0.01
Total:	0.47	2.28	2.00	0.01	0.23	0.14
Maximum Annual Emissions:	0.47	2.28	2.00	0.01	0.23	0.14
Significance Thresholds:	10	10	None	None	15	15

[3] Modeling assumptions and output files from CalEEMod Version 2016.3.2 for the project are included in Appendix A of the Air Quality and Greenhouse Gas Analysis (Initial Study Appendix 1).

Exceeds Thresholds/Significant Impact?:	No	No	No	No	No	No

1. Based on CalEEMod computer modeling. Totals may not sum due to rounding. Does not include emission control measures. Construction start date has not yet been identified. To be conservative, emissions modeling assumes construction could begin in 2019. Future year emissions would be less.

Refer to Appendix A of Initial Study Appendix 1 for modeling results and assumptions.

Source: Ambient 2019

Daily Construction Emissions

Estimated average-daily construction emissions are summarized in Table 3-3. The proposed project would generate maximum uncontrolled average-daily emissions of approximately 7.76 lbs/day of ROG, 35.78 lbs/day of NOx, 32.92 lbs/day of CO, 8.72 lbs/day of PM10, and 4.84 lbs/day of PM2.5. The highest average-daily emissions would generally occur during the demolition of the existing structures, and RAW excavation and grading activities. Emissions of SO_2 would be negligible (i.e., less than 0.1 lbs/day). Estimated average-daily on-site construction emissions would not exceed the SJVAPCD's significance thresholds of 100 lbs/day for each of the criteria air pollutants evaluated.

Table 3-3
Daily On-Site Construction Emissions

Construction Phase	**Uncontrolled Daily Emissions (lbs/day)[1]**					
	ROG	**NOx**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Demolition	3.51	35.78	22.06	0.04	8.68	2.71
RAW and Grading	2.84	31.03	19.56	0.04	8.72	4.85
Building Construction – Year 1	2.51	22.38	18.22	0.03	1.37	1.29
Building Construction – Year 2	2.07	18.72	16.44	0.03	0.76	0.69
Paving	2.01	14.07	14.65	0.02	0.11	0.11
Architectural Coating	3.68	1.68	1.83	0.00	0.11	0.11
Maximum Daily On-site Emissions:	7.76	35.78	32.92	0.05	8.72	4.84
Significance Thresholds:	100	100	100	100	100	100
Exceeds Thresholds/Significant Impact?:	No	No	No	No	No	No

1. Based on CalEEMod computer modeling. Totals may not sum due to rounding. Does not include emission control measures, including dust control per Regulation VIII.

2. Average daily on-site emissions are based on total on-site emissions divided by the total number of construction days.

3. Maximum daily on-site emissions assumes building construction, paving, and architectural coating application could potentially occur simultaneously.

Refer to Appendix A of Initial Study Appendix 1 for modeling results and assumptions.

Source: Ambient 2019

Short-term construction of the proposed project would not result in a significant impact to regional or local air quality conditions. Furthermore, it is important to note that project construction, including RAW excavation and grading activities, would be required to comply with SJVPACD Regulation VIII (Fugitive PM10 Prohibitions). Mandatory compliance with SJVAPCD Regulation VIII would further reduce emissions of fugitive dust from the project site and minimize the project's potential to adversely affect nearby sensitive receptors. With compliance with SJVAPCD Regulation VIII, emissions of PM would be reduced by approximately 50 percent, or more. Given that project-generated emissions would not exceed applicable SJVAPCD significance thresholds, this impact would be considered less than significant.

Long-term Operational Emissions

Long-term operational emissions of criteria air pollutants associated with the proposed project were calculated using the CalEEMod computer program. Modeling was conducted based on traffic data derived, in part, from the Traffic Impact Analysis prepared for the proposed project (JLB 2019). Mobile source emissions were conservatively based on the default fleet distribution assumptions contained in the model. All other modeling assumptions were based on the default parameters contained in the CalEEMod computer model[4]. Localized concentrations of TACs were evaluated based on the Air Toxics Health Risk Assessment (ATHRA) prepared for this project (AECOM 2019). Localized concentrations of other pollutants, including fugitive dust, mobile-source CO, and odors were qualitatively assessed. As previously noted, an estimated date of project construction and opening date are dependent, in part, on yet-to-be-identified funding. To be conservative, operation of the project was assumed to begin in 2020. Due to anticipated reductions in future fleet-average mobile-source and energy emission rates, emissions for post-year 2020 operational conditions would be less.

Estimated annual operational emissions for the proposed project are summarized in Table 3-4. As depicted, the proposed project would generate approximately 0.7 tons/year of ROG, 4.3 tons/year of NOx, 3.3 tons/year of CO, 0.8 tons/year of PM10, and 0.3 tons/year of PM2.5. Operational emissions of SO_2 would be negligible (i.e., less than 0.1 tons/year). Operational emissions would be projected to decline in future years, with improvements in fuel-consumption emissions standards. Operational emissions would not exceed SJVAPCD's mass-emissions significance thresholds.

Estimated average-daily on-site operational emissions are also summarized in Table 3-64 Average-daily on-site operational emissions would be largely associated with area sources (e.g., landscape maintenance activities and use of consumer products) and the use of natural-gas fired appliances. Average-daily on-site emissions of ROG would total approximately 6 lbs/day. Average-daily on-site emissions of other pollutants would be negligible (i.e., less than 0.1 lbs/day). Average-daily on-site emissions would not exceed the SJVAPCD's recommended localized ambient air quality significance thresholds of 100 lbs/day for each of the criteria air pollutants evaluated.

Table 3-4
Long-term Operational Emissions (Unmitigated)

Season	Uncontrolled Daily Emissions (tons/year)[1]					
	ROG	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
Area Source	0.30	0.00	0.00	0.00	0.00	0.00
Energy Use	0.01	0.08	0.07	0.00	0.00	0.00
Mobile Source[2]	0.53	6.27	5.00	0.02	1.33	0.38
Total:	0.84	6.35	5.07	0.02	1.33	0.38
Significance Thresholds (tons):	10	10	None	None	15	None
Exceeds Thresholds/Significant Impact?:	No	No	--	--	No	--
Average Daily On-site Emissions (lbs)[3]:	6.0	Negligible				
Significance Thresholds (lbs):	100	100	100	100	100	100
Exceeds Thresholds/Significant Impact?:	No	No	No	No	No	No

1. Emissions were calculated using the CalEEMod computer program. Does not include implementation of emissions control measures.

2. Fleet distribution data for the project is not available. Mobile source emissions are conservatively based on default vehicle fleet distribution for Fresno County, which includes all vehicle types/classifications, including medium and heavy-duty vehicles. Actual emissions would likely be lower.

3. Based on calculated annual operational emissions from area sources and an average of 200 operational days annually.

Totals may not sum due to rounding.

Refer to Appendix A of Initial Study Appendix 1 for modeling results and assumptions.

Source: Ambient 2019

[4] Modeling assumptions and output files from CalEEMod Version 2016.3.2 for the project are included in Appendix A of the Air Quality and Greenhouse Gas Analysis (Initial Study Appendix 1).

Long-term operation of the proposed project would not result in a significant impact to regional or local air quality conditions. It is important to note that estimated operational emissions are conservatively based on the default vehicle fleet distribution assumptions contained in the model, which include contributions from medium and heavy-duty trucks. Mobile sources associated with schools typically consist largely of light-duty vehicles. As a result, actual operational emissions would likely be slightly less than indicated. This impact is considered less than significant.

c. Expose sensitive receptors to substantial pollutant concentrations?

Nearby sensitive land uses consist predominantly of residential land uses. The nearest residential land uses are located adjacent to the western boundary of the project site. Residential land uses are also located to the south and east of the project site (refer to Figure 1). Long-term operational and short-term construction activities and emission sources that could adversely impact these nearest sensitive receptors are discussed, as follows:

Short-term Construction

Naturally Occurring Asbestos

Naturally-occurring asbestos, which was identified by Air Resources Board (ARB) as a Toxic Air Contaminant (TAC) in 1986, is located in many parts of California and is commonly associated with ultramafic rock. The project site is not located near any areas that are likely to contain ultramafic rock (DOC 2000). As a result, risk of exposure to asbestos during the construction process would be considered less than significant.

Diesel-Exhaust Emissions

Implementation of the proposed project would result in the generation of Diesel Particulate Matter (DPM) emissions during construction associated with the use of off-road diesel equipment for site grading and excavation, paving and other construction activities. Health-related risks associated with diesel-exhaust emissions are primarily associated with long-term exposure and associated risk of contracting cancer. For residential land uses, the calculation of cancer risk associated with exposure of to TACs are typically calculated based on a 25 to 30- year period of exposure. The use of diesel-powered construction equipment, however, would be temporary and episodic and would occur over a relatively large area. Assuming that construction activities involving the use of diesel-fueled equipment would occur over an approximate 18-month period, project-related construction activities would constitute less than six percent of the typical exposure period. As a result, exposure to construction-generated DPM would not be anticipated to exceed applicable thresholds (i.e., incremental increase in cancer risk of 20 in one million). In addition, implementation of Mitigation Measure AQ-1 would result in further reductions of on-site DPM emissions. For these reasons, this impact would be considered less than significant.

Localized PM Concentrations

The proposed project will require the excavation and removal of contaminated soils at the project site. Excavation activities would likely require the use of excavators, front-end loaders, and various other types of off-road equipment. A Removal Action Workplan (RAW) has been prepared for the proposed project, which identifies various measures to be implemented to control airborne emissions generated during RAW activities, including the preparation of a dust control plan. The dust control plan will include requirements for the monitoring of airborne contaminants during the RAW activities to ensure that localized concentrations at nearby receptors would not exceed applicable ambient air quality standards.

Fugitive dust emissions would also be associated with other construction-related activities, including building demolition, material handling, and vehicle travel on unpaved and paved surfaces. On-site off-road equipment and trucks would also result in short-term emissions of diesel-exhaust PM, which could contribute to elevated localized concentration at nearby receptors. Uncontrolled emissions of fugitive dust may also contribute to increased occurrences of Valley Fever and potential increases in nuisance impacts to nearby receptors. For these reasons, localized uncontrolled concentrations of construction-generated PM, particularly activities not specifically addressed in the RAW, would be considered to have a potentially significant impact.

Mitigation Measures AQ-1 through AQ-8: Measures to Reduce Localized Pollutant Concentrations.

The following measures shall be implemented to reduce potential expose of sensitive receptors to localized concentrations of construction-generated PM at nearby sensitive receptors and land uses during project construction. The term "construction" as used here shall refer broadly to pre-operational site preparation activities (e.g. excavation and grading) and includes all applicable activities involved in implementing the Removal Action Workplan.

AQ-1. On-road diesel vehicles shall comply with Section 2485 of Title 13 of the California Code of Regulations. This regulation limits idling from diesel-fueled commercial motor vehicles with gross vehicular weight ratings of more than 10,000 pounds and licensed for operation on highways. It applies to California and non-California based vehicles. In general, the regulation specifies that drivers of said vehicles:

a. Shall not idle the vehicle's primary diesel engine for greater than 5 minutes at any location, except as noted in Subsection (d) of the regulation; and,

b. Shall not operate a diesel-fueled auxiliary power system to power a heater, air conditioner, or any ancillary equipment on that vehicle during sleeping or resting in a sleeper berth for greater than 5.0 minutes at any location when within 1,000 feet of a restricted area, except as noted in Subsection (d) of the regulation.

AQ-2. Off-road diesel equipment shall comply with the 5-minute idling restriction identified in Section 2449(d)(2) of the California Air Resources Board's In-Use Off-road Diesel regulation. The specific requirements and exceptions in the regulations can be reviewed at the following web sites: www.arb.ca.gov/msprog/truck-idling/2485.pdf and ww.arb.ca.gov/regact/2007/ordiesl07/frooal.pdf.

AQ-3. Signs shall be posted at the project site construction entrance to remind drivers and operators of the state's five-minute idling limit.

AQ-4. To the extent available, replace fossil-fueled equipment with alternatively-fueled (e.g., natural gas) or electrically-driven equivalents.

AQ-5. Construction truck trips shall be scheduled, to the extent possible, to occur during non-peak hours.

AQ-6. The burning of vegetative material shall be prohibited.

AQ-7. The proposed project shall comply with SJVAPCD Regulation VIII for the control of fugitive dust emissions. Regulation VIII can be obtained on the SJVAPCD's website at website URL: https://www.valleyair.org/rules/1ruleslist.htm. At a minimum, the following measures shall be implemented:

a. All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.

b. All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.

c. All land clearing, grubbing, scraping, excavation, land leveling, grading, and cut & fill activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.

d. When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.

e. Trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.)

f. Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.

g. On-road vehicle speeds on unpaved surfaces of the project site shall be limited to 15 mph.

h. Sandbags or other erosion control measures shall be installed sufficient to prevent silt runoff to public roadways from sites with a slope greater than one percent.

i. Excavation and grading activities shall be suspended when winds exceed sustained speeds of 20 miles per hour (Regardless of wind speed, an owner/operator must comply with Regulation VIII's 20 percent opacity limitation).

AQ-8. The above measures for the control of construction-generated emissions shall be included on site grading and construction plans.

Level of Significance after Mitigation: With mitigation, short-term construction activities would be required to comply with SJVPACD Regulation VIII (Fugitive PM10 Prohibitions). Mandatory compliance with SJVAPCD Regulation VIII would reduce emissions of fugitive dust from the project site and minimize the project's potential to adversely affect nearby sensitive receptors. Compliance with SJVAPCD Regulation VIII would reduce fugitive emissions of PM by approximately 50 percent, or more. Additional measures have also been included to minimize emissions generated by onsite equipment and vehicles. With mitigation, this impact would be considered less than significant.

Long-term Operation

<u>Localized Mobile-Source CO Emissions</u>

Carbon monoxide is the primary criteria air pollutant of local concern associated with the proposed project. Under specific meteorological and operational conditions, such as near areas of heavily congested vehicle traffic, CO concentrations may reach unhealthy levels. If inhaled, CO can be absorbed easily by the blood stream and can inhibit oxygen delivery to the body, which can cause significant health effects ranging from slight headaches to death.

Mobile-source emissions of CO are a direct function of traffic volume, speed, and delay. Transport of CO is extremely limited because it disperses rapidly with distance from the source under normal meteorological conditions. For this reason, modeling of mobile-source CO concentrations is typically recommended for sensitive land uses located near signalized roadway intersections that are projected to operate at unacceptable levels of service (i.e., LOS E or F). Localized CO concentrations associated with the proposed project would be considered less-than-significant impact if: 1) traffic generated by the proposed project would not result in deterioration of a signalized intersection to LOS E or F; or 2) the project would not contribute additional traffic to a signalized intersection that already operates at LOS E or F.

Signalized intersections in the project area include the intersections of Orange Avenue/Ventura Avenue, Cedar Avenue/Ventura Avenue and Cedar Avenue/Butler Avenue. With implementation of the proposed traffic improvements, these intersections are projected to operate at LOS D, or better, for Existing plus Project, Near Term plus Project, and Cumulative Year 2035 plus Project conditions (JBL 2019). In comparison to the CO screening criteria, implementation of the proposed project would not result in or contribute to unacceptable levels of service (i.e., LOS E, or worse) at nearby signalized intersections. As a result, the proposed project would not be anticipated to contribute substantially to localized CO concentrations that would exceed applicable standards. For this reason, this impact would be considered less than significant.

<u>Toxic Air Contaminants</u>

An air toxics health risk assessment (ATHRA) was prepared for the proposed project site by AECOM in April 2019. The ATHRA included an analysis of all identified sources located within one-quarter mile of the project site (see Appendix 1 for list of emission sources that were identified and included in the analysis). Source categories included in the ATHRA included on-site and off-site truck travel, on-site truck idling, transportation refrigeration units, commercial cooking emissions, gasoline storage and dispensing, stationary emergency engine usage, coating and miscellaneous material usage. Predicted onsite health risks for onsite students and staff are summarized in Table 3-5.

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Table 3-5
Summary of Health Risk Assessment Results for the Proposed School Site

Receptor	Predicted Risk	Risk Threshold	Exceeds Threshold?
Student			
Cancer Risk	7.23E-06	1.00E-05	No
Chronic Hazard Index	1.11E-02	1.0	No
Acute Hazard Index	5.96E-03	1.0	No
Staff			
Cancer Risk	5.49E-07	1.00E-05	No
Chronic Hazard Index	1.11E-02	1.0	No
Acute Hazard Index	5.96E-03	1.0	No
Sources: Ambient 2019; AECOM 2019			

Based on the analysis conducted, predicted cancer risk and non-cancer hazard index for onsite student and staff exposures were determined to not exceed the SJVAPCD's significance thresholds. In addition, implementation of the proposed project would not result in the long-term operation of any major onsite stationary sources of TACs, nor would project implementation result in a significant increase in diesel-fueled vehicles traveling along area roadways. For these reasons, long-term exposure to TACs would be considered less than significant.

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

Other emissions potentially associated with the proposed project would be predominantly associated to the generation of odors during project construction. The occurrence and severity of odor impacts depends on numerous factors, including: the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. While offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and regulatory agencies.

Construction of the proposed project would involve the use of a variety of gasoline or diesel-powered equipment that would emit exhaust fumes. Exhaust fumes, particularly diesel-exhaust, may be considered objectionable by some people. In addition, pavement coatings and architectural coatings used during project construction would also emit temporary odors. However, construction-generated emissions would occur intermittently throughout the workday and would dissipate rapidly within increasing distance from the source. As a result, short-term construction activities would not expose a substantial number of people to frequent odorous emissions. In addition, no major sources of odors have been identified in the project area. This impact would be considered less than significant.

4. Biological Resources

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or		✓		

regulations, or by the California Department of Fish and Wildlife or U. S. Fish and Wildlife Service?				
b. Have a substantially adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U. S. Wildlife Service?				✓
c. Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				✓
d. Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?				✓
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				✓
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				✓

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

The project site is located in a highly developed area that has been occupied with urbanized uses for over a century. Such land is of limited habitat value for sensitive plant and wildlife species due to the amount of disturbance from humans, vehicles, and domestic animals on a regular basis. As discussed in the City of Fresno General Plan Master EIR, urban land provides poor quality habitat for any special status species, and special status species are not expected to occur within urban areas (General Plan MEIR, p. 5.4-9). However, migratory birds could nest on the project site and vicinity, most of which are protected by the Migratory Bird Treaty Act (USCA 1918). Construction-related disturbance could result in nest abandonment or direct mortality of eggs, chicks, and/or fledglings. To avoid impacts to nesting migratory birds, Mitigation Measure BR-1, below, is incorporated into the project.

Mitigation Measure BR-1: Mitigation for Potential Impacts to Migratory Bird Nesting

1. Avoidance: If feasible, any vegetation removal within the project area shall take place between September 1 and February 1 to avoid impacts to nesting birds in compliance with the Migratory Bird Treaty Act (MBTA). No surveys will be required if project timing occurs outside the bird breeding season. If vegetation removal must occur during the nesting season, project construction may be delayed due to actively nesting birds and their required protective buffers.

2. Pre-construction Surveys: If construction is to begin during the nesting season (February 1 through August 31), a qualified biologist shall conduct a pre-construction survey within 14 days prior to initiation of disturbance activities. This survey will search for nest sites within the project area. If the pre-construction survey does not detect any active nests, then no further action is required. If the survey does detect an active nest, then the District shall implement the following:

3. Minimization/Establish Buffers: If any active nests are discovered, the District shall contact the United States Fish and Wildlife Service and/or California Department of Fish and Wildlife to determine protective measures required to avoid take. These measures could include fencing an area where a nest occurs or shifting construction work temporally or spatially away from the nesting birds. Biologists would be required on site to monitor construction activity while protected migratory birds are nesting in the project area. If an active nest is found after the completion of the pre-construction surveys and after construction begins, all construction activities shall stop until a qualified biologist has evaluated the nest and erected the appropriate buffer around the nest.

b. Would the project have a substantially adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U. S. Wildlife Service?

There are no riparian or sensitive natural communities within the project area, thus no impact would occur.

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

No impact would occur. There are no federally protected wetlands within the project area. Implementation of typical ground disturbance and erosion control Best Management Practices (BMPs) and compliance with grading permits will ensure that there is no impact to storm drainage facilities or nearby canals.

d. Would the project interfere substantially with the movement of any resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The project will not result in impacts that substantially interfere with wildlife movements. The site does not appear to constitute a "movement corridor" for native wildlife (USFWS 1998) that would attract wildlife to move through the site. As discussed above, the project is located on a heavily disturbed site in a highly urbanized area. The project site is bordered by busy arterial and residential streets, a condition which restricts access for wildlife. Smaller wildlife species and birds are not expected to be further inhibited by the project as compared with existing development and uses.

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

No impact would occur. The project would not conflict with local policies or ordinances protecting biological resources.

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

The City of Fresno is not located within the boundaries of any Habitat Conservation Plan or Natural Conservation Community Plan, so the project would not conflict any provisions of any local, regional, or state habitat conservation plan.

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5. Cultural Resources

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource pursuant to State CEQA Guidelines § 15064.5?		✓		
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to State CEQA Guidelines § 15064.5?		✓		
c. Disturb any human remains, including those interred outside of formal cemeteries?		✓		

Would the project:

a. Cause a substantial adverse change in the significance of a historical resource pursuant to State CEQA Guidelines Section 15064.5?

The project would include demolition, building alteration, and site preparation activities (including excavation to 5.5 feet below ground surface entailed in the Removal Action) which could potentially impact known and/or undiscovered historical resources. Research and analysis of the potential impacts are discussed as follows:

Southern San Joaquin Valley Information Center

During preparation of this Initial Study, project information was distributed to the Southern San Joaquin Valley Information Center (SSJVIC) for review and comment regarding potential impacts to cultural resources. SSJVIC conducted a Cultural Resources Records Search for the project, which consisted of searching the National Register of Historic Places, the Historic Property Directory, the California Register of Historic Places, the California Points of Historical Interest, the California Inventory of Historic Resources, and the California State Historic Landmarks. The Cultural Resources Records Search indicated the following: 1) no previous cultural resource studies have been conducted within the project site area; 2) there have been four studies conducted within a one-half mile radius; 3) there are no recorded cultural resources within the project area and it is not known if any exist there; 4) there are five known resources within the one-half mile radius, consisting of four single-family residences and the Fresno Assembly Center-Temporary Detention Camp for Japanese Americans located at the Fresno Fairgrounds. Regarding the known resources located offsite within a one-half mile radius, development of the project would not impact any identified historic resources in the area due to the project site's distance from these resources.

Given the project site's lack of prior cultural resources survey history, SSJVIC's comment letter recommended a field survey of vacant land by a qualified professional consultant prior to ground disturbance activities, and that any existing structures 45 years or older be evaluated for historical significance by a qualified professional consultant prior to alteration and/or demolition. SSJVIC also recommended contacting the state Native American Heritage Commission (NAHC), which had previously occurred during preparation of this Initial Study. No Native American areas of concern were identified as a result of consultation with the NAHC.

Historic Architectural Survey Report (HASR)

Karana Hattersly-Drayton, M.A., Architectural Historian, prepared a Historic Architectural Survey Report (HASR), included as Appendix 2 of this Initial Study. The HASR includes an overview of the history and development of both the City of Fresno and the project site itself, and it includes documentation and evaluation of the buildings currently located on the project site. Each building was evaluated for the potential of the proposed project to significantly impact a historic resource.

Of the six buildings slated for demolition, none meet the threshold for listing on the National Register of Historic Places, the California Register of Historical Resources or Fresno's Local Register of Historic Resources. Of the four buildings slated for adaptive reuse, two buildings (Map Reference #5, the former Old Peoples Home Recreation Hall/1940) and the original school building for the Fresno County Orphanage (Map Reference #9/circa 1910) are eligible for listing on Fresno's Local Register and thus should be treated as historical resources pursuant to CEQA (see Figure 1 of Appendix 2 for reference). In addition, the HASR determined that demolition entailed in the project of the six post-1957 buildings will not create a substantial adverse change in the qualities that have made these two buildings eligible as historical resources under CEQA. Based on this information, the project's impact on historic buildings is considered less than significant.

Downtown Neighborhoods

As mentioned elsewhere in this Initial Study, the project site is located within the Southeast Neighborhoods area of the City of Fresno's Downtown Neighborhoods Community Plan (DNCP). Prior to its adoption in October 2016, the DNCP included an evaluation of cultural and historic resources within the plan area. The Draft EIR prepared for the DNCP includes the following description of cultural resources in the Southeast Neighborhoods:

> *Historic integrity throughout the Southeast area is somewhat fragmented, due to alterations and large areas that have been more recently developed. Several neighborhoods have retained their original character from the early 20th century, including the trees and landscape features that remain from their initial periods of development. While these neighborhoods may not meet criteria for designated historic districts, they deserve special planning consideration to protect historic elements and to guide infill.* (Downtown Neighborhoods Community Plan Draft EIR, p. 5.5-15)

Per the DNCP Draft EIR, there are 30 previously identified potentially historic properties in the Southeast Neighborhoods area, and 26 properties have been designated by the City of Fresno as historic resources; these historic resources include the Huntington Boulevard Historic District (Huntington Boulevard between First Street and Cedar Avenue), Roosevelt High School, and a grouping of historic industrial properties in the southwestern portion of the area near the railroad and SR-41. Development of the project would not impact any historic resources in the area identified in the DNCP Draft EIR due to the project site's distance from these resources.

Subsurface Resources

Development of the project, particularly demolition and grading activities, could potentially impact yet-to-be-discovered archaeological or other subsurface resources within the project site area. In the event that subsurface historical or archaeological resources are discovered during construction, the following mitigation measures will be incorporated into the project.

Mitigation Measures CR-1 through CR-3: Mitigation for Potential Discovery of Subsurface Cultural Resources

- **Mitigation Measure CR-1:** If previously unknown subsurface resources are encountered before or during excavation or 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 District on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines and the City of Fresno'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.

- **Mitigation Measure CR-2:** 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 Section 15064.5 of the CEQA Guidelines. 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.
- **Mitigation Measure CR-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.

Level of Significance after Mitigation: With incorporation of the proposed mitigation measures, the project’s potential impact to subsurface resources will be less than significant.

b. Cause a substantial adverse change in the significance of an archeological resource pursuant to State CEQA Guidelines Section 15064.5?

This impact is addressed in Section 5(a) above.

c. Disturb any human remains, including those interred outside of dedicated cemeteries?

This impact is addressed in Section 5(a) above.

6. Energy Resources

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			✓	

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

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

The plans for all public school projects in California must be submitted to the Division of the State Architect (DSA) for plan review and must comply with DSA and California Energy Commission (CEC) requirements. These requirements ensure that schools, including the proposed project by Fresno Unified, would not result in the inefficient, wasteful, or unnecessary consumption of energy. Regarding the proposed administrative office component of the project, by repurposing existing buildings the project would avoid energy consumption occurring from construction of totally new buildings. The repurposed buildings would also be upgraded with energy-efficient equipment and fixtures that would comparatively reduce consumption of energy during the project's operation. Further, as an infill development project located adjacent to transit service (including a Bus Rapid Transit Line), the project will ideally offer a net reduction in energy consumed for transportation to the campus and offices during the project's operation (i.e. by reducing automobile-based trips). For these reasons, the impact of the proposed project on energy resources would be less than significant.

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

Based on the information provided in Section 6(a) above, the project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

7. Geology and Soils

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury or death involving:				
(i) rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			✓	
(ii) strong seismic ground shaking?			✓	
(iii) seismic-related ground failure, including liquefaction?			✓	
(iv) landslides?			✓	
b. Result in substantial soil erosion or the loss of topsoil?			✓	
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in			✓	

on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				
d. Be located on expansive soil, as defined in Table 18-a-B of the Uniform Building Code (1994), creating substantial risks to life or property?			✓	
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				✓
f. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		✓		

Would the project:

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

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

ii. Strong seismic ground shaking?

iii. Seismic-related ground failure, including liquefaction?

iv. Landslides?

The District retained AECOM to prepare a "Geological/Environmental Hazards Report" for the proposed project site, which has been included as Appendix 3 of this Initial Study. The study was prepared following the requirements of California Education Code Section 17212. This Initial Study uses information from the study to evaluate the proposed school project.

The conclusions and recommendations of the Geological/Environmental Hazards Report for geologic and soils conditions included the following:

- The Project Site is not located within the boundaries of an Alquist-Priolo Earthquake Fault Zone, and no active faults are known to traverse the Project Site;
- Moderate ground shaking caused by events on distant and nearby active faults is considered a possible seismic hazard at the Project Site; however, this would be true for any potential school site within the school district boundaries;
- With depth to groundwater greater than 50 feet and the moderate ground shaking potential at the site, the risk of liquefaction is considered negligible;
- The risk of seismic settlement is considered negligible based on the soil type mapped at the site (see Sections 4.2.2 and 5.3 of Appendix 3 for reference);
- The site is not located within an area of soils known to have moderately high-to-high expansion potential, and the soil type mapped at the site does not appear likely to present an expansive soil hazard (see Section 4.2.2 plus figure titled "Expansive Soils" in Appendix 3). Therefore, the risk of expansive soils at the site is considered negligible to low;
- The Project Site is located in an area with little or no subsidence;
- The Project Site and surrounding area is generally flat and not a landslide prone area. Based on this, the potential for slope instability is low.

As a standard part of the school project design process, the District would retain a qualified consultant to prepare a full Geotechnical Engineering Investigation Report, including on-site borings and testing of soil samples. Also, an engineering geology and seismology study should be conducted in accordance with CGS Note 48. The design parameters identified in the analyses would be subject to review and approval by California Division of the State Architect, and the District would incorporate approved standards in the project design. Therefore, impacts related to geology and soils would be less than significant.

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

Impacts regarding soil erosion and/or loss of topsoil would be less than significant. The project entails redevelopment of the former Juvenile Hall and local government administrative buildings, thus the site already contains several buildings and hard surfaces. The proposed administrative offices would utilize existing buildings on the site, and the proposed Alternative Education Campus would generally be located within the foot of previously disturbed and developed areas.

The potential for water-or wind-borne erosion and loss of topsoil would exist during the construction phase of the proposed project, primarily due to clearing, grubbing, excavation, and grading activities. Once construction is completed, the potential for erosion would be minimal because the ground would be covered by buildings, hard surfaces, and landscaping. The project would be subject to requirements of the State Water Quality Control Board and the San Joaquin Valley Air Pollution Control District. General Construction Permit, Order No. 2012-0006-DWQ, issued by the State Water Quality Control Board in 2012, regulates construction projects of one acre or more, including the proposed project. Projects obtain coverage under the permit by developing and implementing the Storm Water Pollution Prevention Plans, which must specify best management practices that a project would employ to minimize pollution of storm water. Best management practices include erosion controls, sediment controls, wind erosion controls, non-storm water management controls, and waste management and controls (i.e. good housekeeping practices).

The intent of San Joaquin Valley Air Pollution Control District Regulation VIII (Fugitive PM10 Prohibitions) is to reduce ambient concentrations of fine particulate matter (PM10) by requiring actions to prevent, reduce or mitigate anthropogenic fugitive dust emissions. The regulation includes specific measures for construction projects.

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?

As discussed in Section 7(a), the Geological/Environmental Hazards Report prepared for the project determined that the risk of liquefaction is considered negligible; the risk of seismic settlement is considered negligible; the risk of expansive soils at the site is considered negligible to low; and the project site is located in an area with little or no subsidence. Therefore, this impact is considered less than significant.

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

As noted in Section 7(a) and discussed in the Geological/Environmental Hazards Report, the site is not located within an area of soils known to have moderately high-to-high expansion potential, and the soil type mapped at the site does not appear likely to present an expansive soil hazard (see Section 4.2.2 plus figure titled “Expansive Soils” in Appendix 3). Therefore, the risk of expansive soils at the site is considered negligible to low, and this impact is considered less than significant.

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?

No impact would occur. The project would connect to the City of Fresno’s sewer system and would not involve the use of septic tanks or alternative wastewater disposal systems.

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

The project area contains no known surface-level paleontological resources or unique geological features. However, the possibility exist that such resources may be discovered during project excavation and grading activities. The District has incorporated in the project the following mitigation measure to protect any subsurface resources that may be discovered.

- **Mitigation Measure GS-1:** Mitigation for Potential Discovery of Subsurface Paleontological/Geological Resources

  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 District 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.

8. Greenhouse Gas Emissions

A technical analysis of greenhouse gas emissions was conducted for the project (Ambient 2019; Appendix 1 of this Initial Study) for the proposed project.

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

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

Implementation of the proposed project would contribute to increases of GHG emissions that are associated with global climate change. To evaluate the potential significance of the project's GHG generation, the Air Quality and Greenhouse Gas Analysis (Initial Study Appendix 1) utilizes a GHG efficiency threshold based on the project's service population, which is calculated by dividing the GHG emissions inventory goal (allowable emissions) by the estimated service population of the individual project. As discussed in the report, for most development projects the service population is defined as the sum of the number of jobs and the number of residents provided by a project. However, this traditional definition of service population may not be applicable to all projects, depending on the end use (e.g., with regard to schools, the student and employee population is the primary generator of GHG emissions with a majority of the school's emissions being associated with student vehicle trips). Therefore, the calculated GHG efficiency of the proposed project was expanded to include the proposed student and employee population. GHG efficiency for the proposed project was calculated for years 2020 and 2030 to be consistent with state GHG-reduction target years. The methodology used for quantification of the target efficiency threshold applied to the proposed project is summarized in Table 8-1.

Table 8-1
Project-Level GHG Efficiency Threshold Calculation

	Year 2020	Year 2030
Land Use Sectors GHG Emissions Target[1]	287,000,000	168,000,000
Population[2]	40,619,346	44,085,600
Employment[3]	18,195,720	20,908,816
Service Population	58,815,066	64,994,416
GHG Efficiency Threshold (MTCO2e/SP/yr)	4.9	2.6

Based on AB 32 Scoping Plan's land use inventory sectors for years 2020 and 2030; Includes transportation sources.

1. California Air Resources Board. California 1990 Greenhouse Gas Emissions Level and 2020 Limit — by Sector and Activity (Land Use-driven sectors only) MMT CO2e - (based upon IPCC Fourth Assessment Report Global Warming Potentials)

2. California Department of Finance Demographic Research Unit Report P-2 "State and County Population Projections by Race/Ethnicity and Age (5-year groups)" 2010 through 2060 (as of July 1). Published 12/15/2014

3. California Department of Finance Employment Development Department. Industry Employment Projections Labor Market Information Division 2010-2020 (Published 5/23/2012) and 2012-2022 (Published 9/19/2014)

Source: Ambient 2019

Short-term and long-term GHG emissions associated with the development of the proposed project are evaluated as follows:

Short-term Greenhouse Gas Emissions

Short-term annual GHG emissions associated with the proposed project were calculated using the CalEEMod computer program and are summarized in Table 8-2. Based on the modeling conducted, annual emissions of GHGs associated with construction of the proposed project would total approximately 654.6 MTCO2e. There would also be a small amount of GHG emissions from waste generated during construction; however, this amount is speculative. Actual emissions would vary, depending on various factors including construction schedules, equipment required, and activities conducted. Assuming an average project life of 30 years, amortized construction-generated GHG emissions would total approximately 21.8 MTCO2e/yr. Amortized construction-generated GHG emissions were included in the operational GHG emissions inventory for the evaluation of project-generated GHG emissions (see Table 8-3).

Table 8-2
Short-Term Construction GHG Emissions

Construction Year	Total GHG Emissions ($MTCO_2e$)
Year 1	251.6
Year 2	403.0
Total:	654.6
Amortized Construction Emissions:	21.8

Refer to Appendix A of Air Quality and Greenhouse Gas Analysis (Initial Study Appendix 1) for modeling results and assumptions.

Source: Ambient 2019

Long-term Greenhouse Gas Emissions

Estimated long-term increases in GHG emissions associated with the proposed project were calculated using the CalEEMod computer program and are summarized in Table 8-3. Based on the modeling conducted, operational GHG emissions would total approximately 2,431.7 MTCO2e/year in 2020 and approximately 2,401.1 MTCO2e/year in 2030. With the inclusion of amortized construction emissions, operational GHG emissions would total approximately 2,453.5 MTCO2e/year in 2020 and approximately 2,422.9 MTCO2e/year in 2030. Based on these estimates and assuming an on-site population as projected by the District, the calculated GHG efficiency for the proposed project would be 2.48 MTCO2e/SP/yr in 2020 and 2.45 MTCO2e/SP/yr in 2030.

Table 8-3
Long-Term Operational GHG Emissions

Emissions Source	Total GHG Emissions ($MTCO_2e$ per year)	
	Year 2020	Year 2030
Energy Use	204.4	175.8
Mobile Sources	2,196.1	2,195.8
Waste Generation	22.2	22.2
Water Use	9.0	7.3
Total Project Operational Emissions:	2,431.7	2,401.1
Amortized Construction Emissions:	21.8	21.8
Net Increase:	2,453.5	2,422.9
Project GHG Efficiency ($MTCO_2e$/SP/yr):	2.48	2.45
GHG Efficiency Threshold ($MTCO_2e$/SP/yr):	4.9	2.6
Exceeds Threshold/Significant Impact?	No	No

Refer to Appendix A of Air Quality and Greenhouse Gas Analysis (Initial Study Appendix 1) for modeling results and assumptions.
Source: Ambient 2019

Based on the modeling conducted, the calculated GHG efficiency for the proposed project would not exceed the thresholds of 4.9 MTCO2e/SP/yr in 2020 or 2.6 MTCO2e/SP/yr in 2030. As depicted in Table 8-3, operational GHG emissions associated with the proposed project would be predominantly associated with mobile sources. It is important to note that mobile-source emissions were conservatively calculated, based on the default fleet-distribution assumptions contained in the model, which includes medium and heavy-duty vehicles. Mobile sources associated with schools typically consist largely to light-duty vehicles and buses. As a result, actual mobile-source emissions would be less. Nonetheless, because the GHG efficiency for the proposed project would not exceed the efficiency thresholds for 2020 or 2030, this impact would be considered less than significant.

b. Would the project conflict with any applicable plan, policy, or regulation of an agency adopted to reduce the emissions of greenhouse gases?

As discussed in Section 8(a) above, the proposed project would not result in increased GHG emissions that would conflict with AB 32 GHG-reduction targets. The proposed project would be designed to meet current building energy-efficiency standards, which includes measures to reduce overall energy use, water use, and waste generation. The project would also be designed to promote the use of alternative means of transportation, such as bicycle use, and to provide improved pedestrian access that would link the project site to nearby land uses. These improvements would help to further reduce the project's GHG emissions and would also help to reduce community-wide GHG emissions. For these reasons, the proposed project would not conflict with local or state GHG-reduction planning efforts. This impact would be considered less than significant.

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9. Hazards and Hazardous Materials

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			✓	
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			✓	
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			✓	
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			✓	
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?			✓	
f. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				✓
g. Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?				✓

Would the project:

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

Construction of the project would involve the transport and use of fuels, lubricants, greases, solvents, and architectural coatings including paints. Operation of the project would involve hazardous materials used for cleaning and maintenance purposes: cleansers, solvents, paints, pesticides, and fertilizers. The school would be subject to state and local regulations governing the routine transport, use, and disposal of hazardous materials and the release of hazardous materials into the environment.

The California Education Code requires that the proposed school site undergo an environmental review process overseen by the California Department of Toxic Substances Control (DTSC). The purpose of the process is to determine if a release or threatened release of any hazardous materials found on the proposed site or presence of any naturally occurring hazardous materials on the site present a risk to human health or the environment. The District, working with DTSC, must identify and implement measures that would mitigate any hazardous conditions before the California Department of Education approves the school site and provide funding for the project.

As part of this process, a Preliminary Environmental Assessment Report (PEA) was prepared by AECOM Technical Services, Inc., which was based on evaluation of the project site conducted during November and December of 2018. During soil testing conducted as part of the PEA, soil contaminated with arsenic, lead, organochlorine pesticides, and polychlorinated biphenyls (PCBs) was found near nine of the structures at the site. The arsenic appears to be from import fill material brought to the site. The lead is likely from lead-based paints that were used on the structures. The organochlorine pesticides are likely from termite-killing chemicals used to protect the structures. The PCBs are likely from window caulking. The depth of soil contamination varies between 1.5 to 5.5 feet below ground surface, depending on the area. A conservative estimate of the volume of contaminated soil is approximately 6,600 cubic yards. ("Preliminary Environmental Assessment Report", AECOM 2019). The PEA recommended that a Removal Action Workplan (RAW) be prepared to address the on-site soils containing elevated concentrations of arsenic, lead, organochlorine pesticides (OCPs), and polychlorinated biphenyls (PCBs) near some of the existing buildings and in a large paved parking lot.

The RAW will be developed for review by DTSC and the general public. The RAW will set forth details for using a mechanical backhoe-type excavator to excavate the contaminated soil and stockpile it on the site for waste-profile laboratory testing. Dust control measures and dust monitoring will be used during excavation and stockpiling to minimize dust transport. The stockpiles will be underlain and covered with plastic sheeting to prevent mixing of contaminated and uncontaminated soil, or transport of contaminated soil via wind or rain. After the waste-profile laboratory testing is complete, an appropriate permitted landfill will be selected based on the results of the testing. If the soil is determined to be non-hazardous waste, it will likely be disposed of at the Waste Connections Inc. Avenal Disposal Site, 201 Hydril Road, Avenal, California, 93204. If the soil is determined to be hazardous waste, it will likely be disposed of at the Clean Harbors Buttonwillow Landfill, 2500 West Lokern Road, Buttonwillow, California, 93206, or at the Chemical Waste Management Disposal Site, 35251 Old Skyline Road, Kettleman City, California, 93239. After the disposal facility is determined, the soil will be loaded into end-dump trailers/trucks that will be covered with tarps prior to leaving the site for the disposal facility. It is estimated that up to 500 truck trips will be required to transport all of the contaminated soil to the disposal facility.

As described above, the removal action includes measures set forth in the RAW to prevent hazardous effects from occurring during the removal of contaminated soil at the site, in addition to oversight of the removal action process by DTSC. Further, the project in general is subject to compliance with existing regulations pertaining to hazards and hazardous materials which function to prevent or reduce the risk of adverse effects from occurring. Based on these factors, impacts pertaining to hazards and hazardous materials are considered less than significant.

b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

This impact is addressed in Section 9(a) above.

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

The proposed project involves the construction and operation of a public alternative educational school campus plus administrative offices. The only other existing or proposed school site within one-quarter mile is Winchell Elementary School, located approximately 650 feet southwest of project site. The proposed administrative offices would not emit any hazardous emissions or handle hazardous materials, substances, or waste. The potential for the project to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste is addressed in Section 9(a) above and was determined to be less than significant.

d. Be located on a site that 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?

A review of the California Department of Toxic Substances Control's EnviroStor web site did not result in the identification of any hazardous materials sites within the project site's boundaries or its immediate vicinity. However, per the Draft Removal Action Workplan prepared for the project (AECOM, May 2019), the project site appears on regulatory agency lists in relation to removal of asbestos and other waste from the site at various times, and removal of a 3,000-gallon diesel underground storage tank (UST) from the site in 1999 [AECOM, 2018]. The fiberglass UST was located north of Building A and was removed from the site in 1999 (Figure 2). No holes were observed in the UST when it was removed. A soil sample was collected from beneath the UST, at a depth of 13 feet below ground surface (bgs), and analyzed for petroleum hydrocarbons, but no petroleum hydrocarbons were detected. Fresno County did not require further investigation or remediation. Based on this information, impacts pertaining to this issue would be less than significant.

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

The project site is not within two nautical miles of a public or private airport and is not within an area subject to an airport land use plan. Because the project site is a considerable distance from the nearest airports and is not subject to an airport land use plan, the project would not result in airport-related safety hazards for students and staff at the project site. Moreover, the project would not result in a change in airport traffic patterns, including an increase in traffic or change that results in substantial safety risks. Therefore, no impact would occur.

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

All schools have emergency response/evacuation plans. Research conducted for this Initial Study did not identify any adopted emergency response plans or emergency evacuation plans the project could impair. This impact is considered less than significant.

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

The project site is in an urban area and not within or near an area subject to wildland fires, thus no impact would occur.

h. CEQA Guidelines Section 15186, Public Resources Code Section 21151.8, Education Code Section 17213, and California Code of Regulations, Title 5, Section 14011[h], establish requirements for evaluating the safety of potential school sites. The purpose of the requirements is to ensure that potential health hazards resulting from exposure to any hazardous materials, wastes, and substances that may exist on a site will be carefully examined and disclosed in a negative declaration or EIR, and that the lead agency will consult with other agencies in this regard. The EIR or negative declaration must address the following concerns under the aforementioned sections:

Is the proposed school site:

- **The site of a current or former hazardous waste or solid waste disposal facility and, if so, have the wastes have been removed;**
- **A hazardous substance release site identified by the Department of Toxic Substances Control in a current list adopted pursuant to Section 25356 of the Health and Safety Code for removal or remedial action pursuant to Chapter 6.8 (commencing with Section 25300) of Division 20 of the Health and Safety Code;**

- **The site of one or more buried or above ground pipelines that carry hazardous substances, acutely hazardous materials, or hazardous wastes, as defined in Division 20 of the Health and Safety Code? This does not include a natural gas pipeline used only to supply the school or neighborhood; and**
- **Within 500 feet of the edge of the closest traffic lane of a freeway or other busy traffic corridor.**

The project site has been evaluated through a Geological/Environmental Hazards Report, an Air Toxics Health Risk Assessment, and a Preliminary Environmental Assessment in coordination with the California Department of Toxic Substances Control (DTSC) for potential threats to human health on the project site, which included extensive testing. A Removal Action Workplan (RAW) will be prepared and implemented for the project to remediate potential hazards prior to construction and operation of the proposed Alternative Education Campus. Based on these documents and required actions, the project is consistent with the applicable regulations for proposed school sites, and impacts are considered less than significant.

10. Hydrology and Water Quality

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

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

The City of Fresno's water supply and wastewater treatment systems would serve the project. The water supply system complies with applicable water quality standards and the wastewater discharge system complies with applicable waste discharge requirements. The design and operational characteristics of the project related to water and wastewater would not incrementally or directly cause the City's systems to violate the applicable requirements. Therefore, this is a less than significant impact.

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

The project site lies within the Kings Groundwater Subbasin, a hydrologic region that includes portions of Fresno, Tulare and Kings Counties and is part of the larger San Joaquin Valley Groundwater Basin. The Kings Subbasin is critically overdrafted.

The City of Fresno obtains its water supply from a combination of groundwater, surface water entitlements, and recycled water. While historically the City of Fresno relied entirely on groundwater for its water supply, according to the City's 2015 Urban Water Management Plan, it will have transitioned to a supply comprised of about 46 percent groundwater, 50 percent surface water, and 4 percent recycled water in the Year 2020 (City of Fresno UMWP, p. 7-13). Although the City has transitioned toward increasing surface water supplies and implementing measures to promote groundwater conservation and recharge, groundwater is likely to remain a major source of the City's water supply.

The water demand for the project demand for the project is not expected to significantly differ from the mixed-use and residential land use designations planned for the site in the City of Fresno General Plan. Generally, school facilities and office buildings generate less overall demand for water than residential uses. Additionally, unlike more commonplace school sites designed with large turfed areas for athletics and recreation that require significant amounts of water for irrigation, the project would be designed with minimal turfed athletic and recreational areas, thus reducing the project's demand for water. Further, the project's potential impact specifically to groundwater supplies would be lessened because the City has adopted policies and developed facilities to increase utilization of surface water and recycled water while reducing or holding constant its use of groundwater to meet future water demands within the City's service area. For these reasons, the project would have a less than significant impact on groundwater supplies.

Regarding groundwater recharge, the existing project site has previously been developed with impermeable roads, buildings, and hardcourt surfaces. As such, development of the project, which entails new construction and repurposing of facilities on a footprint similar to the existing development at the site, would not substantially change groundwater recharge conditions at the site. Therefore, this impact is considered less than significant.

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

i. Result in substantial erosion or siltation on- or off-site;

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

iv. Impede or redirect flood flows?

No streams or rivers exist on the project site. Grading required for the proposed project would change the existing drainage pattern within the project site, and the additional covered surfaces would increase the amount of surface runoff and, potentially, the rate of runoff. The runoff would have the potential to degrade surface and groundwater quality if not properly controlled.

The Fresno Metropolitan Flood Control District (FMFCD) is responsible for managing urban stormwater runoff within the greater Fresno area. Fresno Unified must comply with FMFCD requirements for the design, construction, and operation of on-and-off site stormwater improvements necessary to serve the project. Before beginning construction, Fresno Unified must prepare a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP is a site-specific plan that is designed to control the discharge of pollutants from the construction site to local storm drains and waterways. FMFCD is responsible to ensure Permit compliance within the boundaries of the area's National Pollutant Discharge Elimination System (NPDES) Permit boundary. FMFCD’s focus is on ensuring that construction sites are managed to minimize the amount of sediment discharged off-site and into the local storm drain system.

The impacts of the project on stormwater would be less than significant because the project must comply with FMFCD requirements, which include the preparation of a SWPPP.

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

No impact would result as project site is not located in a flood hazard, tsunami, or seiche zone.

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

The Sustainable Groundwater Management Act (SGMA) was signed into law in 2014 to remedy unsustainable groundwater depletion in groundwater basins in California. SGMA requires the development and adoption of Groundwater Sustainability Plans (GSPs) by 2020 and that all high and medium priority groundwater basins (including the Kings Sub-basin) must reach sustainability by 2040. SGMA gives local agencies the authorities to manage groundwater in a sustainable manner and allows for limited state intervention when necessary to protect groundwater resources.

The City of Fresno is participating with other local agencies in the North Kings Groundwater Sustainability Agency (North Kings GSA), a joint powers agency formed in December 2016 to implement SGMA for a northern portion of the Kings Subbasin. The North Kings GSA, consistent with SGMA, is developing a GSP targeted for completion before the legislated deadline of January 31, 2020. This document will be developed in compliance with the California Department of Water Resources’ Groundwater Sustainability Plan Emergency Regulations. Developed pursuant to Water Code Section 10733.2, the regulations describe the components of groundwater sustainability plans, intra-basin coordination agreements, and the methods and criteria to be used by DWR to evaluate those plans and coordination agreements.

As discussed above in Section 10(b), the proposed Alternative Education Campus and administrative office facilities are not expected to adversely affect groundwater supplies or recharge. As such, the project is not expected to conflict with or obstruct the GSP ultimately adopted by the North Kings GSA. No other potential conflicts pertaining to water quality planning and/or groundwater management have been identified.

11. Land Use and Planning

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

a. Would the project physically divide an established community?

The proposed school project would not have an impact of physically dividing an established community. The proposed Alternative Education Campus and administrative offices would utilize a site that has previously been in use with development of similar form and intensity (i.e. the former Fresno County Juvenile Hall and government administrative offices). No aspects of the project have been identified as causing a physical division of the surrounding area.

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

As a preliminary note, when a school district seeks to develop educational facilities, the district is capable of exempting or overriding land use and zoning designations of a City or County in which it is located. However, developments that are not educational facilities (e.g. administrative offices) remain subject to the City's land use and zoning regulations. In this instance, the District would be able to exempt or override land use designations for the proposed Alternative Education Campus facilities, but the proposed administrative facilities would remain subject to applicable City of Fresno land use and zoning regulations.

The proposed alternative education campus and administrative offices are consistent with land use plans, policies, and regulations adopted for the project area. As discussed in Part A, Section 6 of this Initial Study, the project site includes land designated and zoned as Neighborhood Mixed Use plus some land designated and zoned for Residential use. The facilities and uses proposed as part of the project are compatible with these designations, except that administrative offices are not identified as a permissible use in Residential areas. However, the two parcels (1.01 acres) zoned and designated for Residential use are currently vacant, and the project does not propose any development or use on this area.

Additionally, the proposed Alternative Education Campus and administrative offices are consistent with the overarching goals and objectives of the City of Fresno General Plan and the Downtown Neighborhoods Community Plan. Both planning documents emphasize redevelopment of downtown Fresno, intensifying development along main corridors such as Ventura Avenue, promoting pedestrian and transit access – and the project would embody all of these things. Further, this Initial Study demonstrates that all potential impacts of the project are either less than significant or can be mitigated to a less than significant impact.

12. Mineral Resources

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				✓
b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?				✓

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?

The project would have no impacts on known mineral resources. The project site is located in a highly urbanized area and would not result in the loss of availability of a known mineral resource because no known resources exist on or near the proposed site. Likewise, the project would not result in the loss of availability of a locally important mineral resource recovery site because none exists on or near the site. (Fresno County General Plan Background Report (2000), City of Fresno General Plan DEIR (2014))

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?

This impact is addressed in Section 12(a) above.

13. Noise

This section is based on Noise Impact Analysis prepared for the project (included as Appendix 4 of this Initial Study).

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

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

Noise generated by the proposed project would occur during short-term construction and long-term operation. Noise-related impacts associated with short-term construction and long-term operations of the proposed project are discussed separately, as follows:

Short-Term Construction Noise Levels

Construction noise typically occurs intermittently and varies depending upon the nature or phase (e.g., demolition/land clearing, grading and excavation, erection) of construction. Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Although noise ranges were found to be similar for all construction phases, the initial site preparation phases, including demolition and grading/excavation activities, tend to involve the most equipment and result in the highest average-hourly noise levels.

Noise levels commonly associated with construction equipment are summarized in Table 7 of Appendix 4. As noted there, instantaneous noise levels (in dBA Lmax) generated by individual pieces of construction equipment typically range from approximately 80 dBA to 85 dBA Lmax at 50 feet (FTA 2006). Typical operating cycles may involve 2 minutes of full power, followed by 3 or 4 minutes at lower settings. Average-hourly noise levels for individual equipment generally range from approximately 73 to 82 dBA $L_{eq.}$ Based on typical off-road equipment usage rates and assuming multiple pieces of equipment operating simultaneously within a localized area, such as soil excavation activities, average-hourly noise levels could reach levels of approximately 80 dBA L_{eq} at roughly 100 feet.

The City of Fresno has not adopted noise standards that apply to short-term construction activities. However, based on screening noise criteria commonly recommended by federal agencies, construction activities would generally be considered to have a potentially significant impact if average-hourly daytime noise levels would exceed 80 dBA L_{eq} at noise-sensitive land uses, such as residential land uses (FTA 2006). Depending on the location and types of activities conducted (e.g., building demolition, soil excavation, grading), predicted noise levels at the nearest residences, which are located adjacent to and west of the project site, could potentially exceed 80 dBA L_{eq}. Furthermore, with regard to residential land uses, activities occurring during the more noise-sensitive evening and nighttime hours could result in increased levels of annoyance and potential sleep disruption. For these reasons, noise-generating construction activities would be considered to have a potentially significant short-term noise impact.

- **Mitigation Measure N-1**: Reduction of Construction-Generated Noise Levels

The following measures shall be implemented to reduce construction-generated noise levels. The term "construction" as used here shall refer broadly to pre-operational site preparation activities (e.g. excavation and grading) and includes all applicable activities involved in implementing the Removal Action Workplan.

a. Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the hours of 7:00 a.m. and 10:00 p.m. Construction activities shall be prohibited on Sundays and legal holidays.

b. Construction truck trips shall be scheduled, to the extent feasible, to occur during non-peak hours and truck haul routes shall be selected to minimize impacts to nearby residential dwellings.

c. Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.

d. Stationary construction equipment (e.g., portable power generators) should be located at the furthest distance possible from nearby residences. If deemed necessary, portable noise barriers shall be erected sufficient to shield nearby residences from direct line-of-sight of stationary construction equipment.

e. When not in use, all equipment shall be turned off and shall not be allowed to idle. Provide clear signage that posts this requirement for workers at the entrances to the site.

Level of Significance after Mitigation: Use of mufflers would reduce individual equipment noise levels by approximately 10 dBA. Implementation of the above mitigation measures would limit construction activities to the less noise-sensitive periods of the day. With implementation of the above mitigation measures, this impact would be considered less than significant.

Long-Term Operational Noise Levels

Potential long-term increases in noise associated with the proposed project would be primarily associated with the operation of building equipment, such as heating, ventilation, and air conditioning (HVAC) units, outdoor recreational activities, and vehicle use within onsite parking lots.

Stationary Equipment

The proposed project would not result in the introduction of any new major sources of stationary noise sources. Stationary noise sources would be predominantly associated with the operation of building mechanical equipment. Building mechanical equipment would be located within the structure, enclosed, or placed on rooftop areas away from direct public exposure. In addition, the operation of building mechanical equipment would be predominantly limited to the daytime hours of operations and not uncharacteristic of mechanical equipment operations associated with the existing buildings. As a result, significant increases in noise levels associated with onsite building mechanical equipment would not be projected to occur with project implementation. However, the type and location of onsite equipment to be included as part of the proposed project have not yet been identified. Depending on type and location of onsite equipment, predicted operational noise levels at nearby residential land uses could potentially exceed the City's exterior noise standards for non-transportation noise sources (refer to Table 3). As a result, noise generated by onsite equipment would be considered to have a potentially significant impact.

<u>Recreational Facilities</u>

The project would be anticipated to include the development of some onsite recreational-use facilities, such as playgrounds commonly associated with child preschools. Noise generated by small playgrounds typically includes elevated children's voices and occasional adult voices. Based on measurement data obtained from similar land uses, noise levels associated with small playgrounds can generate intermittent noise levels of approximately 55-60 dBA Leq at 50 feet. Noise levels associated with other recreational uses, such as ball fields with spectator areas, can generate higher noise levels.

The specific recreational uses to be included as part of the proposed project have not yet been identified. Depending on type and location of onsite recreational uses to be included, on-site recreational use could result in a significant increase in ambient noise levels at nearby residential land uses, which could exceed the exterior noise standard. Noise generated by the proposed playground would be considered to have a potentially significant impact.

<u>Vehicle Parking Areas</u>

The proposed project would include the use of on-site parking areas. The locations of any new on-site parking areas have not yet been identified. Based on noise measurements conducted for similar school uses, operational noise levels commonly associated with parking areas typically average approximately 45 dBA Leq, or less, and are often masked by vehicle traffic on area roadways. However, depending on size and location of onsite parking areas to be constructed, on-site parking areas could result in a significant increase in ambient noise levels at nearby residential land uses, which could exceed the City's exterior noise standards (refer to Table 3). Noise generated by the proposed parking areas would be considered to have a potentially significant impact.

<u>Roadway Traffic</u>

Predicted existing traffic noise levels, with and without implementation of proposed project, are summarized in Table 8 of Appendix 4. In comparison to existing traffic noise levels, the proposed project would result in a predicted increase in traffic noise levels of approximately 0.2 along Ventura Avenue to 4.6 dBA along Tenth Street. Predicted increases in future cumulative traffic noise levels along nearby roadways for proposed project are summarized in Table 9 of Appendix 4. In future years, the project's contribution to cumulative traffic noise levels would be anticipated to decline as increases in vehicle traffic due to surrounding development increases. Under future cumulative conditions, the proposed project would result in predicted increases in traffic noise levels of 0.1 to 0.2 along Ventura Avenue and 3.6 dBA along Tenth Street.

As noted earlier in this report, changes in ambient noise levels of approximately 3 dBA, or less, are typically not discernible to the human ear and would not be considered to result in a significant impact. Implementation of the proposed project would not result in a significant increase (i.e., 3 dBA, or greater) in existing or projected future traffic noise levels that would exceed the City's commonly applied exterior noise standard (i.e., 65 dBA CNEL) at the nearest noise-sensitive land uses. Project-generated increases in traffic noise levels would be considered to have a less-than-significant impact.

<u>Land Use Compatibility</u>

The City of Fresno General Plan Noise Element includes noise standards for determination of land use compatibility for new land uses. As previously discussed, the City's "normally acceptable" exterior noise standards for schools is 65 dBA CNEL/Ldn.

As noted earlier in this report, ambient noise levels in the project area are largely influenced by traffic noise emanating from Ventura Avenue. Under future cumulative conditions, with project-generated vehicle traffic included, the predicted 65 dBA CNEL/Ldn noise contours for Ventura Avenue would extend to 84 feet from the roadway centerline. The location of on-site structures has not yet been determined. As a result, it is conceivable that on-site structures could be located within the projected future 65 dBA CNEL contour of Ventura Avenue. Predicted exterior noise levels at onsite structures could, therefore, potentially exceed the City's "normally acceptable" exterior noise standard of 65 dBA CNEL/Ldn. In addition, depending on the location of onsite structures, predicted interior traffic noise levels could potentially exceed the commonly applied interior noise standard of 45 dBA CNEL/Ldn. This impact is considered potentially significant.

- **Mitigation Measure N-2:** Reduction of Long-term Operational Noise Impacts

  The following shall be implemented to reduce long-term operational noise impacts of the project:

  a. An acoustical analysis shall be prepared for the proposed project prior to final design. The acoustical analysis shall identify noise-reduction measures to be incorporated sufficient to achieve an exterior average-hourly noise-level of 50 dBA Leq, or less, at the property line of the nearest noise-sensitive land use for on-site building mechanical equipment and vehicle parking areas. Onsite recreational uses shall be evaluated in comparison to the City of Fresno's average-daily noise standard of 60 dBA CNEL. Noise-reduction measures to be incorporated may include, but are not limited to, the selection of alternative or quieter equipment and construction of noise barriers (i.e., walls).

  b. Noise-generating maintenance activities, such as landscape maintenance and waste-collection activities, shall be limited to between the hours of 7:00 a.m. to 10:00 p.m.

- **Mitigation Measure N-3**: Compatibility of Proposed School Uses with On-site Noise Levels

  Prior to final site design, an acoustical analysis shall be prepared for structures to be used for educational instruction purposes that are located within the projected future 65 dBA CNEL/Ldn noise contour of Ventura Avenue. The acoustical analysis shall include evaluation of predicted interior noise levels for occupied rooms. Noise-reduction measures shall be identified sufficient to achieve applicable exterior and interior noise standards (e.g., 65 dBA CNEL/Ldn and 45 dBA CNEL/Ldn, respectively). Based on the analysis prepared for this project, the projected future 65 dBA CNEL/Ldn noise contour of Ventura Avenue would extend 84 feet from the roadway centerline.

Level of Significance after Mitigation:

Implementation of Mitigation Measure N-2 would limit on-site maintenance activities to the daytime hours of operation. In addition, an acoustical analysis would also be required, prior to final site design, to further evaluate noise levels associated with on-site non-transportation noise sources and to incorporate additional mitigation sufficient to achieve applicable noise standards. With mitigation, noise impacts associated with on-site non-transportation noise sources would be considered less than significant.

Implementation of Mitigation Measure N-3 would require the preparation of an acoustical analysis, prior to final site design, to further evaluate the compatibility of proposed on-site uses with projected future noise levels. Additional mitigation measures would be identified sufficient to achieve applicable exterior and interior noise standards. With mitigation, predicted on-site noise levels at educational-use facilities would not exceed applicable noise standards. With mitigation, this impact would be considered less than significant.

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

Long-term operational activities associated with the proposed project would not involve the use of any equipment or processes that would result in potentially significant levels of ground vibration. Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities. Construction activities associated with the proposed improvements would likely require the use of various off-road equipment, such as tractors, concrete mixers, and haul trucks. The use of major groundborne vibration-generating construction equipment, such as pile drivers, would not be required for this project.

Groundborne vibration levels associated with the representative construction equipment are summarized in Table 10 of Appendix 4. As depicted there, ground vibration generated by construction equipment would be approximately 0.089 in/sec ppv, or less, at 25 feet. Predicted vibration levels at the nearest existing structures would not be anticipated to exceed commonly applied criteria for structural damage or human annoyance (i.e., 0.5 and 0.2 in/sec ppv, respectively). In addition, no fragile or historic structures have been identified in the project area. As a result, this impact would be considered less than significant.

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?

The proposed project is not located within the projected 60 dBA CNEL/Ldn noise contours of these airports (City of Fresno 2014). No private airstrips were identified within two miles of the project site. Implementation of the proposed project would not result in the exposure of sensitive receptors to aircraft noise levels nor would the proposed project affect airport operations.

14. Population and Housing

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Induce substantial unplanned population growth either in an area, directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			✓	
b. Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				✓

a. Would the project induce substantial unplanned population growth either in an area, directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Based on the following reasons, the project would not induce unplanned population growth:

- Many of the proposed functions of the alternative campus already exist at other locations in the District and the campus will consolidate these functions at this location. This also applies to the use of existing buildings for administrative functions. While development of the school campus and the administrative offices would add jobs at the project site, many of these jobs already exist in the District and are being relocated to the site. Additionally, the proposed Alternative Education Campus and administrative offices are consistent with land use plans, policies, and regulations adopted for the project area.
- The project does not include any new housing.
- The surrounding vicinity is an urbanized, fully built-out area are that already includes a mixture of residential and commercial development.
- The project does not require the extension of roads or other infrastructure such as water, sewer and drainage infrastructure.
- The project site is located along an existing major FAX bus line, and bike lanes and sidewalks exist at the northern boundary of the site, thus making the site readily accessible via alternative modes of transportation.

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

No impacts would occur, as the proposed school site does not contain any existing housing or population.

15. Public Services

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities or need for new or physically altered government 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?			✓	
(ii) Police Protection?			✓	
(iii) Schools?			✓	
(iv) Parks?			✓	
(v) Other public facilities?				✓

a. Would the project result in substantial adverse physical impacts associated with the provision of new or altered governmental facilities, need for new or 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 following public services: fire protection, police protection, schools, parks, and other public facilities?

The project would not result in the need for new or physically altered fire protection, police protection, parks, other public facilities in order to maintain acceptable service ratios, response times or other performance objectives. The project site is situated within an area of existing urban development where adequate City of Fresno facilities and services are already available. Therefore, the impact of the proposed project related to fire protection, police protection, parks, other public facilities would be less than significant. The project is a school, the impacts of which are addressed in other sections of this Initial Study and have been found to be less than significant with incorporation of the mitigation measures detailed in the other sections of this Initial Study.

16. Recreation

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			✓	
b. Include recreational facilities or require the			✓	

construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?				

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

The proposed project would not result in substantial physical deterioration of existing parks and/or recreational facilities. The project is not expected to substantially increase the demand for or use of existing park and recreation facilities, as the project would accommodate an existing population of Fresno Unified students and employees. Additionally, the proposed campus would include recreational facilities to serve students at the campus, alleviating potential demand placed on existing facilities. This impact is thus considered less than significant.

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

The proposed Alternative Education Campus would include some minor recreational facilities for physical education purposes. This Initial Study addresses impacts associated with the development of the facilities as part of the evaluation of impacts in Part E, Sections 1-21; none of the impacts identified in the Initial Study are specifically attributable to, or amplified by, the recreational facilities included in the project. The project would not require construction or expansion of recreational facilities elsewhere in the vicinity.

17. Transportation

The discussion of transportation and traffic impacts in this section primarily reflects information in the Traffic Impact Analysis (TIA) prepared for the project by JLB Traffic Engineering, Inc. (Initial Study Appendix 4). Table 17-1 provides definitions for traffic-related terms used in this section.

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?		✓		
b. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				✓
c. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?		✓		
d. Result in inadequate emergency access?			✓	

TABLE 17-1
Transportation/Traffic Definitions and Standards

Roadway Categories

- Expressways: Expressways provide for through traffic movement on continuous routes through a city. It generally connects with arterials, highways, freeways. Also, it connects a city with other cities. Expressways are generally four lane roadways, divided and undivided. Access to expressways is typically restricted to signalized intersections with arterial and collector streets. There are no expressways in the vicinity of this project.
- Arterials: Arterials are designed to move large volumes of traffic and are intended to provide a high level of mobility between freeways, expressways, other arterials, and collector roadways. Arterials also provide non-freeway/highway connections between major residential, employment, and activity centers. Unlike freeways, they are intended not only for motor vehicles, but also for bicycles and pedestrians. Arterial streets typically have more right-of-way and a higher degree of access control than collector roadways.
- Collectors: Collector streets provide for relatively short distance travel between and within neighborhoods. Collectors are not designed to handle long-distance through-traffic. Driveway access to collectors is less limited than on arterials. Speed limits on these streets are typically lower than those found on arterials.
- Local Streets: Local streets are designed to provide direct roadway access to abutting land uses and serve short distance trips within neighborhoods. Traffic volumes and speed limits on local streets are low, and these roadways have no more than two travel lanes.

Level of Service

Level of Service (LOS) is a measure of roadway performance based on a qualitative description of traffic flow from the perspective of motorists. The Highway Capacity Manual (HCM) developed by the Transportation Research Board defines the following six levels of service from LOS A to LOS F. These grades represent the perspective of drivers only and are an indication of the comfort and convenience associated with driving, as well as speed, travel time, traffic interruptions, and freedom to maneuver.

- Level of Service A: Free-flow operations. Drivers are almost completely unimpeded in their ability to maneuver within the traffic stream.
- Level of Service B: Free-flow speeds are maintained. The ability to maneuver within the traffic stream is only slightly restricted.
- Level of Service C: Traffic flow with speeds at or near free-flow speed. The freedom to maneuver within the traffic steam is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.
- Level of Service D: Speeds begin to decline slightly with increasing flows. Freedom to maneuver within the traffic stream is noticeably limited.
- Level of Service E: Operations at or near capacity. There are virtually no useable gaps within the traffic stream, leaving little room to maneuver.
- Level of Service F: Breakdown in vehicular flow. Vehicular demand exceeds capacity. (Fehr and Peers 2014)

AM Peak Hour/PM Peak Hour

For purposes of this Initial Study:

- AM Peak Hour (or morning peak hour) means the average vehicle trip ends versus dwelling units for residential units and students for elementary schools on a weekday (Tuesday, Wednesday or Thursday only), peak hour of adjacent street traffic, one hour between 7 and 9 a.m.
- PM Peak Hour (or evening peak hour) means the average vehicle trip ends versus dwelling units for residential units and students for elementary schools on a weekday (Tuesday, Wednesday or Thursday only), peak hour of adjacent street traffic, one hour between 2 and 4 p.m.

Vehicle Miles Traveled
Vehicle Miles Traveled (VMT) refers to the amount and distance of automobile travel attributable to a project. Calculating VMT simply involves the product of a number of trips and those trips' lengths. The first step in a VMT analysis is to establish the baseline average VMT, which requires the definition of a region. The OPR Technical Advisory states that existing VMT may be measured at the regional or city level. On the contrary, the Technical Advisory also notes that VMT analyses should not be truncated due to "jurisdictional or other boundaries."

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

Criteria of Significance

City of Fresno – Level of Service

The City of Fresno General Plan has established various degrees of acceptable LOS on its major streets, which are dependent on four (4) Traffic Impact Zones (TIZs) within the City of Fresno. The standard LOS threshold for TIZ I is LOS F, that for TIZ II is LOS E, that for TIZ III is LOS D, and that for TIZ IV is LOS E. Additionally, the General Plan Master EIR made findings of overriding consideration to allow a lower LOS threshold that that established by the underlying TIZ. For those cases in which a LOS criterion for a roadway segment differs from that of the underlying TIZ, such criteria are identified in the roadway description. In this case, all study facilities, except for the southern leg of the intersection of Cedar Avenue and Butler Avenue, fall within TIZ I, therefore LOS F is used to evaluate the potential significance of LOS impacts to intersections within TIZ I. Since the southern leg of the intersection of Cedar Avenue and Butler Avenue falls within TIZ II, LOS E is used to evaluate the potential significance of LOS impacts to this particular intersection.

(Note: As mentioned in the Traffic Impact Analysis, the County of Fresno and Caltrans each have independent measures for acceptable Level of Service, but the agencies' standards are not necessarily applicable based on locational factors. In this case, all study facilities fall within the City of Fresno, thus the City of Fresno LOS thresholds are utilized.)

City of Fresno Active Transportation Plan

The City of Fresno's Active Transportation Plan (ATP) is a comprehensive guide outlining the vision for active transportation in the City and a roadmap for achieving that vision. Active transportation is defined in the ATP as human-powered travel including walking, bicycling, and wheelchair use. The ATP strives to improve the accessibility and connectivity of the bicycle and pedestrian network in order to increase the number of persons that travel by active transportation and to provide walking and bicycling facilities equitably for all City residents. The following goals are set forth in the plan:

- Equitably improve the safety and perceived safety of walking and bicycling in Fresno
- Increase walking and bicycling trips in Fresno by creating user-friendly facilities
- Improve the geographic equity of access to walking and bicycling facilities in Fresno
- Fill key gaps in Fresno's walking and bicycling networks

To achieve these goals, the ATP proposes a long-term, comprehensive network of citywide bikeways, trails, and sidewalks that connect all parts of Fresno. Since build-out of this network will take many years to complete, the ATP also identifies a priority network of connected bikeways and priority pedestrian areas to focus the City's efforts in the near-term. These priority networks provide links to key destinations, support existing and future walking and biking activity areas, and equitably serve neighborhoods throughout the City. Additionally, the build-out must be consistent with requirements of the California Building Code and the Americans with Disabilities Act (ADA)[5].

[5] As described in the Fresno Active Transportation Plan, "The Americans with Disabilities Act Title III is legislation enacted in 1990 that provides thorough civil liberties protections to individuals with disabilities concerning employment, state and local government services, and access to public accommodations, transportation, and telecommunications. Title III of the Act requires places of public accommodation to be accessible

Senate Bill 743 – Transportation Impacts

Senate Bill (SB) 743 (Steinberg 2013) creates a path to revise the definition of transportation impacts according to CEQA. As the guidelines are proposed today, CEQA transportation impacts are determined using LOS of intersections and roadways, which is a measure of congestion. The intent of SB 743 is to align CEQA transportation study methodology with and promote the statewide goals and policies of reducing vehicle miles traveled (VMT) and greenhouse gases (GHG). Three objectives of SB 743 related to development are to reduce GHG, diversify land uses, and focus on creating a multimodal environment. It is hoped that this will spur infill development, particularly along transit corridors.

In December 2018, the California Natural Resources Agency certified and adopted the CEQA Guidelines update package, including the Guidelines section implementing SB 743 (section 15064.3). Concurrent with SB 743's implementation, the Governor's Office of Planning and Research (OPR) published its Technical Advisory on Evaluating Transportation Impacts in CEQA (hereafter referred to as "Technical Advisory"). The Technical Advisory acknowledges that lead agencies should set criteria and thresholds for VMT and transportation impacts. However, the Technical Advisory provides guidance to residential, office, and retail uses, citing these as the most common land uses. Beyond these three land uses, there is no guidance provided for any other land use type. The Technical Advisory also notes that land uses may have a less than significant impact if located within low VMT areas of a region. Screening maps are suggested for this determination.

Currently, Fresno COG and its member agencies, which include the City of Fresno, have begun the process to develop recommended criteria and thresholds that balance the direction from OPR and the goals of SB 743 with the vision of Fresno and economic development, access to goods and services, and overall quality of life. However, these regional recommended criteria are not anticipated to be completed until mid-2020. In this Initial Study, a qualitative threshold of significance is utilized in conjunction with applicable LOS thresholds to evaluate the potential transportation impacts of the project.

Existing Transportation Conditions

Roadway Network

Following are descriptions of existing roadways in the vicinity of the project site:

- *Orange Avenue* is an existing north-south two-lane undivided collector in the vicinity of the proposed Project. In this area, Orange Avenue exists as a two-lane undivided collector between Ventura Avenue and Jensen Avenue. The City of Fresno General Plan Circulation Element designates Orange Avenue as a two-lane collector between Ventura Avenue and Jensen Avenue.
- *Ninth Street* is an existing north-south two-lane undivided local roadway adjacent to the proposed Project. In this area, Ninth Street exists between Ventura Avenue and Lowe Avenue. The City of Fresno General Plan Circulation Element designates Ninth Street as a local roadway between Ventura Avenue and Lowe Avenue.
- *Tenth Street* is an existing north-south two-lane undivided local roadway adjacent to the proposed Project. In this area, Tenth Street exists as local roadway between Tulare Avenue and Butler Avenue. The City of Fresno General Plan Circulation Element designates Tenth Street as a local roadway between Tulare Avenue and Butler Avenue.
- *Cedar Avenue* is an existing north-south four-lane arterial in the vicinity of the proposed Project. In this area, Cedar Avenue exists as a four-lane divided arterial north of Ventura Avenue through the City of Fresno and a four-lane undivided arterial between Ventura Avenue and Jensen Avenue. The City of Fresno General Plan Circulation Element designates Cedar Avenue as a four-lane arterial north of Jensen Avenue.
- *Ventura Avenue* is an existing east-west four-lane divided arterial adjacent to the proposed Project. In this area, Ventura Avenue exists as a four-lane divided arterial east of Fig Avenue. Ventura Avenue

and usable to all people, including those with disabilities. While the letter of the law applies to 'public accommodations,' the spirit of the law applies not only to public agencies but also to all facilities serving the public, whether publicly or privately funded."

changes name to Kings Canyon Road east of Cedar Avenue. The City of Fresno General Plan Circulation Element designates Ventura Avenue as a four-lane arterial east of Fig Avenue.

- *Lane Avenue* is an existing east-west two-lane undivided local roadway in the vicinity of the proposed Project. In this area, Lane Avenue exists as a local roadway between Tenth Street and Chance Avenue. The City of Fresno General Plan Circulation Element designates Lane Avenue as a local roadway Tenth Street and Chance Avenue.
- *Butler Avenue* is an existing east-west two-lane collector in the vicinity of the proposed Project. In this area, Butler Avenue exists a four-lane collector between "N" Street and Orange Avenue, a two-lane undivided collector between Orange Avenue and Cedar Avenue, a two-lane collector divided by a two-way left-turn lane between Cedar Avenue and Peach Avenue, and a two-lane undivided scenic drive between Peach Avenue and Fowler Avenue. The City of Fresno General Plan Circulation Element designates Butler Avenue as a predominantly two-lane collector between "N" Street and Peach Avenue, a two-lane scenic drive between Peach Avenue and Fowler Avenue, and a two-lane connector east of Fowler Avenue.

Transit

Fresno Area Express (FAX) is the transit operator in the City of Fresno. At present, there are three (3) FAX transit routes that operate in the vicinity of the proposed project. These include FAX Route 1 Q Bus Rapid Transit (BRT), FAX Route 38 and FAX Route 26. Retention of the existing routes and expansion of future routes is dependent on transit ridership demand and available funding.

FAX Route 1 Q BRT runs on Ventura Avenue approximately 0.31 miles east of the proposed project. Its nearest stop to the Project is located along the south side of Kings Canyon Road approximately 180 feet east of Cedar Avenue. FAX Route 1 Q BRT operates at 10-minute intervals on weekdays starting at approximately 6:00 AM and ending at 9:00 AM, 15-minute intervals starting at approximately 9:00 AM and ending at approximately 2:35 PM, and 10-minute intervals starting at approximately 2:35 PM and ending at 7:00 PM. This route provides a direct connection to various destinations located along Blackstone Avenue and Ventura Avenue/Kings Canyon Road.

FAX Route 38 runs on Cedar Avenue approximately 0.29 miles east of the proposed Project. Its nearest stop to the Project is located along the east side of Cedar Avenue approximately 75 feet north of Kings Canyon Road. FAX Route 38 operates at 30-minute intervals on weekdays and weekends and provides a direct connection to River Park Shopping Center, Fresno State, Duncan Polytechnical High School, Cedar-Clinton Library, McLane High School, Roosevelt High School, Hinton Community Center, Edison High School, Kearney Palms Shopping Center, and Chukchansi Park.

FAX Route 26 runs on Butler Avenue approximately 0.48 miles southeast of the proposed project. Its nearest stop to the Project is located along the south side of Butler Avenue approximately 250 feet east of Cedar Avenue. FAX Route 26 operates at 30-minute intervals on weekdays and weekends and provides a direct connection to Bullard High School, Hamilton Elementary, Fresno High School, Tower District, Fairgrounds, Mosqueda Community Center, Fresno Pacific University, and Fresno Yosemite International Airport.

Bicycle and Pedestrian Facilities

Class II Bike Lanes currently exist in the vicinity of the proposed project site along Orange Avenue, Cedar Avenue and Ventura Avenue. The City of Fresno Active Transportation Plan recommends that Class II Bike Lanes be implemented on: 1) Orange Avenue south of Ventura Avenue, 2) Cedar Avenue and 3) Butler Avenue.

Walkways exist in the vicinity of the project site along Orange Avenue, Ninth Street, Tenth Street, Cedar Avenue, Ventura Avenue and Butler Avenue. The City of Fresno Active Transportation Plan recommends that walkways be implemented on: 1) Orange Avenue, 2) Ninth Street, 3) Tenth Street, 4) Cedar Avenue, and 5) Butler Avenue. Furthermore, the Active Transportation Plan recognizes that Ventura Avenue west of Cedar Avenue is an area with high pedestrian activity and that areas of Ventura Avenue west of Cedar Avenue, Cedar Avenue south of Ventura Avenue, and Butler Avenue are areas with high frequency of pedestrian collisions.

Study Facilities

The study focused on evaluating traffic conditions at the existing study intersections that may potentially be impacted by the proposed Project. New traffic counts were collected for the study intersections and segments in April and May 2017 while schools in the vicinity of the proposed Project were in session. The traffic counts for the existing study facilities are contained in Appendix C of the Traffic Impact Analysis (Initial Study Appendix 4). The existing turning movement volumes, intersection geometrics, and traffic controls are illustrated in Figure 2 of Initial Study Appendix 4.

Intersections

1. Orange Avenue / Ventura Avenue
2. Ninth Street / Ventura Avenue
3. Tenth Street / Ventura Avenue
4. Cedar Avenue / Ventura Avenue
5. Cedar Avenue / Lane Avenue
6. Cedar Avenue / Butler Avenue

Study Scenarios

Existing Traffic Conditions

This scenario evaluates the Existing Traffic Conditions based on existing traffic volumes and roadway conditions from traffic counts and field surveys conducted in March 2019.

Existing plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Project traffic conditions. The Existing plus Project traffic volumes were obtained by adding the Project Only Trips to the Existing Traffic Conditions scenario. The Project Only Trips to the study facilities were developed based on existing travel patterns, the Fresno COG Project Select Zones, the existing roadway network, engineering judgment, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the City of Fresno 2035 General Plan Circulation Element in the vicinity of the Project. The Fresno COG Models for the Project Select Zones are contained in Appendix C of the Traffic Impact Analysis (Initial Study Appendix 4).

Near Term plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Near Term plus Project Traffic Conditions. The Near Term plus Project traffic volumes were obtained by adding the Near Term related trips to the Existing plus Project Traffic Conditions scenario.

Cumulative Year 2035 No Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2035 No Project Traffic Conditions. The Cumulative Year 2035 No Project traffic volumes were obtained by subtracting Project Only Trips from the Cumulative Year 2035 plus Project traffic volumes.

Cumulative Year 2035 plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2035 plus Project Traffic Conditions. The Cumulative Year 2035 plus Project traffic volumes were obtained from the Fresno COG traffic model runs (Base Year 2019 and Cumulative Year 2035) and existing traffic counts. Under this scenario, the increment method, as recommended by the Model Steering Committee was utilized to determine the Cumulative Year 2035 plus Project traffic volumes. The Fresno COG models are contained in Appendix C. The Fresno COG Traffic Model runs are contained in Appendix C of the Traffic Impact Analysis (Initial Study Appendix 4).

Conclusions and Recommendations

The potential impacts of the proposed project were evaluated in accordance with the standards set forth by the level of service (LOS) policies of the City of Fresno. Impacts of each scenario are described below, as well as recommendations for reducing those impacts.

Existing Traffic Conditions

- Currently, all study intersections operate at an acceptable LOS during both the AM and PM peak hours.
- At present, all study intersections operate at an acceptable LOS during both peak periods.

Existing plus Project Traffic Conditions

- The project is estimated to generate a maximum of 2,459 daily trips, 580 AM peak hour trips and 221 PM peak hour trips.
- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the project is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 86.4 sec/veh (LOS F) during the AM peak period and 69.1 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five seconds would be considered a direct impact.
- To improve the LOS at this intersection, it is recommended that the following improvements be implemented at the Tenth Street / Ventura Avenue intersection:
    - Signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.
    - Include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg.
- As the project will be used to serve an expanding student population, it is likely that the project would not add VMT per capita, or service population to the surrounding area. Additionally, the project site is located near transit service and pedestrian and bicycle networks. Moreover, the project will provide transit passes to students and include bicycle parking.
- It is recommended that proposed project driveway(s) be placed in line with existing roadways connected to the east, or be offset by at least 125 feet from the roadways connecting to the east side of Tenth Street. By implementing this recommendation, the project driveway(s) will be located at points that minimize traffic operational impacts to the existing roadway network.
- It is recommended that the project retain the Class II bike lanes along its frontage to Ventura Avenue.
- It is recommended that the project retain the existing walkways that are in a good state and ADA compliant along its frontages to Ventura Avenue, Ninth Street, Lane Avenue, and Tenth Street. Any gaps shall be filled and the project shall reconstruct walkways where needed to conform to current ADA guidelines.
- It is recommended that the District work with the City of Fresno to implement a Safe Routes to School plan and seek grant funding to help build walkways where they are lacking within a one-half mile radius of the proposed project site.
- It is recommended that the project prepare a school signage and striping plan in the vicinity of the project, that these be reviewed and approved by the City of Fresno, and subsequently implemented prior to opening day of the school component of the project.
- Additionally, as future development takes place, the City should take into account the proposed school site and condition all new development proposals within a one-mile radius to conduct a Safe Routes to School evaluation from the residential project to the school site and require them to work on eliminating any barriers to the Safe Routes to School.

Near Term plus Project Traffic Conditions

- The total trip generation for Near Term Projects are estimated to be 1,130 daily trips, 96 AM peak hour trips and 78 PM peak hour trips.
- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the Project coupled with the Near Term Project is anticipated to increase the

average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 97.9 sec/veh (LOS F) during the AM peak period and 72.9 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five seconds would be considered a cumulative impact.

- To improve the LOS at this intersection, it is recommended that improvements from the Existing plus Project Traffic Conditions scenario be implemented at the Tenth Street / Ventura Avenue intersection.

Cumulative 2035 No Project Traffic Conditions

- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, background growth in traffic is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 27.8 sec/veh (LOS D) during the PM peak period to 60.3 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, it may want to consider changing the traffic controls of this intersection to improve traffic operations and LOS. One option for the City's consideration to improve LOS at this intersection is to signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.

Cumulative 2035 plus Project Traffic Conditions

- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the project coupled with background growth in traffic is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 269.3 sec/veh (LOS F) during the AM peak period and 359.0 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five seconds would be considered a cumulative impact.
- To improve the LOS at this intersection, it is recommended that improvements from the Existing plus Project Traffic Conditions scenario be implemented at the Tenth Street / Ventura Avenue intersection.

Queuing Analysis

The Traffic Impact Analysis included a Queuing Analysis (see Initial Study Appendix 4, pages 34-37), which compares the storage capacity of traffic lanes to existing and future traffic scenarios. Based on the Queuing Analysis, the report included recommendations to consider increasing turn lane storage lengths at the following intersections: 1) Orange Avenue / Ventura Avenue); 2) Cedar Avenue / Ventura Avenue; 3) Cedar Avenue / Butler Avenue. The report also recommends, however, that several of the movements be monitored prior to increasing the storage capacity due to existing transportation infrastructure conditions (see Initial Study Appendix 4 for more detailed information).

Project Pro-Rata Fair Share of Future Transportation Improvements

The project's fair share percentage impacts 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 17-2. Additional details regarding calculation of the project's fair share percentage impacts are presented in the Traffic Impact Analysis (Initial Study Appendix 4).

TABLE 17-2
Project's Fair Share of Future Roadway Improvements

Intersection	Existing Traffic Volumes (PM Peak)	Cumulative Year 2035 plus Project Traffic Volumes (PM Peak)	Project Only Trips (PM Peak)	Project Fair Share (%)
Tenth Street / Ventura Avenue	1,529	2,141	127	20.75

Project Fair Share = ((Project Only Trips) / (Cumulative Year 2035 plus Project Traffic Volumes – Existing Traffic Volumes)) x 100

The Traffic Impact Analysis recommended that the project contribute its equitable fair share as listed in Table 17-2 for 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 satisfy the project's traffic mitigation measures. This study does not provide construction costs for the recommended mitigation measures; therefore, if the recommended mitigation measures are implemented, it is recommended that the District work with the City of Fresno to develop the estimated construction cost.

Removal Action Workplan Evaluation

Prior to construction and operation of the proposed Alternative Education Campus, the project would generate trips related to the DTSC Removal Action Workplan. Approximately 6,600 cubic yards of contaminated soil will need to be removed from the site as part of the removal action. It is estimated that up to 500 truck trips will be required to transport this amount of soil to a disposal facility, which will require 25 trucks making two trips per day for 10 working days. If the soil is determined to be non-hazardous waste, it will likely be disposed of at the Waste Connections, Inc. Avenal Disposal Site[6]. If the soil is determined to be hazardous waste, it will likely be disposed of at the Clean Harbors Buttonwillow Landfill or at the Chemical Waste Management Disposal Site in Kettleman City[7]. The removal of the soil is planned to occur during the fall of 2019.

The Traffic Impact Analysis indicates that under the Existing Traffic Conditions scenario, all study intersections operate at an acceptable LOS. Given the limited number and duration of the truck trips, the removal action would not be considered significant in relation to potential degradation of the surrounding roadway network. However, it is noted that the removal action activities may coincide with the Big Fresno Fair (located approximately 0.4 miles east of the site), which is likely to result in a substantial temporary increase in traffic volume in the vicinity of the project area during the Fair's operation (scheduled this year from October 2 through 14). Since the existing PM peak hour traffic at Tenth Street and Ventura Avenue is operating at LOS D, it is recommended that the trucks not run during the period between 4 to 6 PM and that working days do not coincide with operation of the Big Fresno Fair.

Bicycle, Pedestrian, and Transit Evaluation

The Traffic Impact Analysis presented recommendations to ensure the functionality and safety of the circulation system for bicycle and pedestrian access to and from the project, which include:

- Retaining the Class II Bike Lane along the frontage to Ventura Avenue.
- Retaining the existing walkways that are in a good state and ADA compliant along its frontages to Ventura Avenue, Ninth Street, Lane Avenue and Tenth Street, plus filling any gaps and reconstructing walkways where needed to conform to current Americans With Disabilities Act (ADA) guidelines.
- Implementation of a Safe Routes to School plan and seeking grant funding to help build walkways where they are lacking within a one-mile radius of the proposed Project site.
- Preparation of a school signage and striping plan in the vicinity of the project, which should be reviewed and approved by the City of Fresno and subsequently implemented prior to opening day of the school component of the project.
- Inclusion of high visibility school crosswalks across the north, west and south legs of the Tenth Street / Ventura Avenue intersection, while prohibiting pedestrians across the east leg.

[6] Waste Connections, Inc. Avenal Disposal Site is located at 201 Hydril Road, Avenal, California, 93204 – approximately 62 miles from the project site.

[7] Clean Harbors Buttonwillow Landfill is located at 2500 West Lokern Road, Buttonwillow, California, 93206 – approximately 108 miles from the project site. Chemical Waste Management Disposal Site is located at 35251 Old Skyline Road, Kettleman City, California, 93239 – approximately 60 approximately miles from the project site.

These recommendations have been included as mitigation measures to ensure that the project preserves existing bike lanes and walkways in the project vicinity while also being functional and safe for users.

As discussed in Section 17(b), the project is located in a built-out urban area with existing walkways and bicycle lanes adjacent to the project site and is served by three FAX-operated transit lines (including a BRT line). Development and operation of the project is consistent with the overarching aims of increasing utilization of walking and bicycling facilities, increasing the access provided by this network, and providing a network that is safe and equitable. For these reasons, and with implementation of the recommended mitigation measures, the project would be consistent with applicable transportation programs, plans, ordinances and policies pertaining to bicycle and pedestrian transportation as well as transit.

The following measures shall be implemented to reduce potential impacts of the project regarding the transportation circulation system:

- **Mitigation Measure T-1:** Prior to operation of the project, the following improvements shall be implemented at the Tenth Street / Ventura Avenue intersection:
  a. Signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.
  b. Include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg.
- **Mitigation Measure T-2:** The District shall be responsible for contributing its proportionate share (20.75 percent, per Table 17-2) of the installation of improvements at the intersection of Tenth Street and Ventura Avenue identified in the Existing plus Project scenario.
- **Mitigation Measure T-3:** To ensure that future project driveways do not negatively impact traffic operations, proposed project driveways shall be placed in line with existing roadways connected to the east, or be offset by at least 125 feet from the roadways connecting to the east side of Tenth Street.
- **Mitigation Measure T-4:** The project shall retain the Class II Bike Lane along the frontage to Ventura Avenue.
- **Mitigation Measure T-5:** The project shall retain existing walkways that are in a good state and compliant with requirements of the Americans With Disabilities Act (ADA) along its frontages to Ventura Avenue, Ninth Street, Lane Avenue and Tenth Street. The District shall act to ensure that any gaps be filled and that the project reconstruct walkways where needed to conform to current California Building Code and ADA requirements.
- **Mitigation Measure T-6:** The District shall prepare a school signage and striping plan in the vicinity of the project and implement the plan prior to opening day of the school component of the project. Additionally, the District shall provide the plan to the City of Fresno for review and approval prior to its implementation.
- **Mitigation Measure T-7:** The District, working with the City of Fresno, shall seek to implement a Safe Routes to School plan for the project and seek grant funding to help build walkways where they are lacking within a one-mile radius of the proposed project site.
- **Mitigation Measure T-8:** During the project's removal action, in order to ensure an acceptable Level of Service is maintained at the intersection of Tenth Street and Ventura Avenue, no truck trips involving the transport of soil shall occur between the hours of 4:00 PM to 6:00 PM on weekdays. Additionally, no such truck trips shall occur during operation of the 2019 Big Fresno Fair (scheduled October 2 through 14, 2019).

Level of Significance After Mitigation: With implementation of the recommended mitigation measures, impacts of the project related to the transportation circulation system would be less than significant.

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

CEQA Guidelines section 15064.3 describes specific considerations for evaluating a project's transportation impacts and provides that, generally, vehicle miles traveled is the most appropriate measure of transportation impacts. 15064.3(b)(1) addresses land use projects as follows:

Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

The project is located in a built-out urban area, so it will not require the construction of new roadways. As the project will be used primarily to consolidate existing alternative school functions in the District at the project site, it is likely that the project would not add VMT per capita, or service population to the surrounding area. Additionally, the project site is located near transit service (including a BRT line) and pedestrian and bicycle networks. Moreover, the project will provide transit passes to students and include bicycle parking. Based on these factors, the project does not conflict with 15064.3(b).

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

As part of the Traffic Impact Analysis, a collision analysis was performed that involved a search and review of collision reports for the most recent three-year period (January 1, 2015 to December 31, 2017). In the three-year period, a total of six (6) collisions were reported within the influence zone of the existing study intersections.[8] The Traffic Impact Analysis determined that implementation of protective left-turn phasing at the signalized intersection of Cedar Avenue and Butler Avenue could reduce the number of broadside collisions associated with eastbound and westbound left-turn movements at this intersection. Therefore, it is recommended that the City of Fresno conduct further studies to determine if the implementation of protective left-turn phasing of the intersection of Cedar Avenue and Butler Avenue meets the City's criteria for protective left-turn phasing.

The Traffic Impact Analysis also includes a Safe Routes to Schools analysis[9], which identifies the most direct pedestrian paths to the project site for students residing in different parts of the surrounding vicinity and describes the conditions of those routes. Per the study, most of the areas are well-developed with walkways and intersection controls, but there are a few exceptions. Therefore, it is recommended that the District work with the City of Fresno to implement a Safe Routes to School plan and seek grant funding to help build walkways where they are lacking within a one-mile radius of the project site. It is also recommended that the project prepare a school signage and striping plan in the vicinity of the project, that these be reviewed and approved by the City of Fresno, and subsequently implemented prior to opening day of the school component of the project.

A site plan was not available at the time of this Initial Study; however, Fresno Unified will comply with all City of Fresno policies and standards pertaining to transportation access at the site. For example, any proposed access points should not be located within the functional area of a major street intersection (per Mitigation Measure T-3), and the District will consult with the City of Fresno to determine the final placement of driveways and their access type. Additionally, implementation of the mitigation measures identified in Section 17(a) would contribute to a further reduction in the potential for hazards. For these reasons, the project would result in a less than significant impact related to hazards due to roadway design features or incompatible uses.

Mitigation Measures: Implement Mitigation Measures T-1 through T-7.

Level of Significance after Mitigation: With implementation of the recommended mitigation measures, impacts of the project regarding transportation-related hazards would be less than significant.

[8] The collision analysis is based on data obtained using the Statewide Integrated Traffic Records System (SWITRS) and the Transportation Injury Mapping System (TIMS). Refer to Initial Study Appendix 4 for more detail regarding the collision analysis.

[9] As described by the US Department of Transportation, Safe Routes to School (SRTS) is an approach that promotes walking and bicycling to school through infrastructure improvements, enforcement, tools, safety education, and incentives to encourage walking and bicycling to school. https://www.transportation.gov/mission/health/Safe-Routes-to-School-Programs

d. Would the project result in inadequate emergency access?

Fresno Unified will work with the City of Fresno and responsible emergency services agencies to ensure adequate emergency access exists for the proposed project, and the District will follow objectives and policies of the City of Fresno General Plan that will support implementation and provide adequate emergency access. As mentioned in Section 17(c), the roadways associated with the project will be designed according to applicable governmental agency design standards. Emergency access may be hindered during periods of construction and the removal action, but alternative routes would be available. Therefore, this impact would be less than significant.

18. Tribal Cultural Resources

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in the Public Resource Code § 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 the Public Resources Code § 5020.1(k)?			v	
(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 § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American Tribe?		✓		

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:

- **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**
- **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.**

In accordance with AB 52, potentially affected tribes were formally notified of this project and were given the opportunity to request consultation on the project. No request for consultation was received nor were any other comments provided by the tribes in response to a Request for Preliminary Comment that was mailed to them. At this time, the District has no information or evidence that Tribal Cultural Resources exist in relation to the site or will be affected by the project. However, it is possible that subsurface resources could exist and be disturbed by project construction activities. Therefore, the following mitigation measure has be incorporated into the project:

Mitigation Measure TC-1: If subsurface tribal cultural resources are discovered during excavation and/or construction activities, construction shall stop in the immediate vicinity of the find and a qualified tribal cultural resources professional shall be consulted to determine whether the resources require further study. If the resources are determined to be significant, mitigation measures shall be identified by the cultural resources professional and recommended to the District. If human remains are discovered, the procedures of Mitigation Measure CR-3 shall also apply.

19. Utilities and Service Systems

Would the project:	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects?		✓		
b. Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?			✓	
c. Result in determination by the wastewater treatment provider, which serves or may serve the project, that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			✓	
d. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?			✓	
e. Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?			✓	

Would the project:

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

The impact of the proposed project on the above items would be less than significant. The reasons for this conclusion are as follows:

Water and Wastewater

The project site is within the City of Fresno and would receive water supply and wastewater collection and treatment services from the City's Department of Public Utilities for the project. Details of the project were distributed to the Department of Public Utilities for review and comment.

Regarding water supply infrastructure, the Department of Public Utilities commented that the existing water distribution system serving the project was constructed in years 1934 and 1951 respectively and would not be adequate to support the proposed development. The department's comment letter recommends that the development shall construct 1) a 12-inch replacement water main in East Ventura Boulevard from South Tenth Street west across the project frontage, and 2) an 8-inch replacement water main in South Tenth Street between East Ventura Boulevard and East Lane Avenue. Additionally, the comment letter recommends that development include an additional 12-inch replacement water main in Ventura Boulevard between South Cedar Avenue and South Tenth Street. Installation of the recommended water supply infrastructure improvements has been included as a Mitigation Measure below. Further, the project would be developed in a manner compliant with the Department of Public Utilities standards, specifications, and policies.

As discussed below in Section 19(c), the Department of Public Utilities has determined that adequate wastewater treatment services will 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 which is compliant with the Department of Public Utilities standards, specifications, and policies.

Mitigation Measure US-1: Water Supply Infrastructure Improvements

The project shall include the following water supply infrastructure improvements**,** installed in a manner compliant with City of Fresno standards, specifications, and policies:

a. Construction of a 12-inch replacement water main in East Ventura Boulevard from South Tenth Street west across the project frontage
b. Construction of an 8-inch replacement water main in South Tenth Street between East Ventura Boulevard and East Lane Avenue.
c. Construction of a 12-inch replacement water main in Ventura Boulevard between South Cedar Avenue and South Tenth Street.

Level of Significance After Mitigation: With implementation of the recommended mitigation measure, potential impacts of the project related to water supply infrastructure would be less than significant.

Storm Drainage

The Fresno Metropolitan Flood Control District (FMFCD) provides storm water drainage services to the proposed project area. The project site is located in Basin "II2". As the area has been urbanized for many years, existing drainage infrastructure is in place at the project site.

The volume of storm water runoff from the proposed education campus and administrative offices would not substantially differ from the existing conditions at the project site. In addition, the District must comply with FMFCD requirements in designing and constructing any necessary storm drainage facilities. For these reasons, the project's impact on the storm drain system would be less than significant.

Electric Power, Natural Gas, and Telecommunications

The project site is located in an urbanized area with existing electrical and natural gas service utilities in place as well as telecommunications facilities such as cellular towers and broadband internet connections. Development of the project will be subject to compliance with applicable rules, regulations, and policies regarding connections to these utilities. As such, any impacts that would occur related to relocation or construction of electrical, natural gas, or telecommunications facilities would be less than significant.

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

The City of Fresno's 2015 Urban Water Management Plan includes a Water Supply Reliability Assessment, which evaluates the City's anticipated water supplies and water demands in normal year, single dry year, and multiple dry year scenarios. According to the UWMP, the City's water supplies are projected to meet its water demands under all three scenarios through 2040. (For reference, see 2015 UWMP Chapter 7)

As discussed in Section 10, Hydrology and Water Quality, the project's demand for water is not expected to substantially differ from the demand projected from the uses planned on the site in the City's General Plan, on which assumptions and projections of the UWMP are based. Additionally, the City of Fresno's Department of Public Utilities reviewed the project and provided comments regarding upgrades to water supply infrastructure at the project site, but the department's comments did not indicate any concerns regarding the adequacy and available of its water supplies to serve the project.

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's Department of Public Utilities has reviewed the proposed project and determined that adequate wastewater treatment services will 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 which is compliant with the Department of Public Utilities standards, specifications, and policies. Sanitary sewer service 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.

d. Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impar the attainment of solid waste reduction goals?

Non-recyclable solid waste collected within the City of Fresno is generally taken to the American Avenue Landfill, located approximately six miles southwest of the City of Kerman. The American Avenue Landfill is owned and operated by Fresno County and began operations in 1992 for both public and commercial solid waste haulers. As described in the City of Fresno General Plan Master EIR, the American Avenue Landfill 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 (CalRecycle, 2014). 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 (CalRecycle, 2014). 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 (CalRecycle, 2014).

Based on the above information, the impact of the proposed education campus and administrative offices in relation to landfill capacity would be less than significant.

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

The District operates its existing schools and would operate the proposed project in compliance with applicable statutes and regulation related to solid waste. Therefore, no impact would occur.

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20. Wildfire

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

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

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

No impacts related to wildfire would result from the project. The project site is located within a highly urbanized area of the City of Fresno and is not within a State Responsibility Area (SRA) or any area classified as high-risk for wildfire.

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?

This impact is addressed in Section 20(a).

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?

This impact is addressed in Section 20(a).

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?

This impact is addressed in Section 20(a).

21. Mandatory Findings of Significance

	Potentially Significant Impact	Less Than Significant Impact with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?		✓		
b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)			✓	
c. Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?		✓		

a. Does the proposed school project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?

Based on the information in Part E, Sections 5 and 18, the project could have potentially significant effects on cultural resources and tribal cultural resources, but these effects would be less than significant with the incorporation of the mitigation measures provided. As discussed in Part E, Section 4, potential impacts to biological resources would be less than significant with mitigation.

b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means 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)

Based on the information in Part E, Sections 1 through 20, the proposed project would not have any impacts that would be individually limited but cumulatively considerable.

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

Based on the information in Part E, Sections 3 and 13, the proposed school project could potentially have substantial adverse effects on human beings with respect to air quality and noise. However, mitigation measures have been incorporated in the project that would reduce the impacts to insignificance.

F. Mitigation Monitoring and Reporting Program

1. Purpose

The District has prepared this Mitigation Monitoring and Reporting Program to comply with Section 15097 of the State CEQA Guidelines. The purpose for the Mitigation Monitoring and Reporting Program is to ensure implementation of the mitigation measures identified in this Initial Study.

2. Lead Agency

Fresno Unified School District will undertake the project and is the Lead Agency for the project. The District is responsible for the implementation of all mitigation measures identified in this Initial Study.

3. Mitigation Monitoring and Reporting Coordinator

The Chief Operations Officer, or his/her designee shall act as the Project Mitigation Reporting Coordinator ("Coordinator").

4. Monitoring and Reporting Procedures for Design-, Site Clearing-, and Construction Mitigation Measures

a. The Coordinator shall provide a copy of all project design-, site clearing- and construction-related mitigation measures to the project engineer and contractor for incorporation in the project plans, construction specifications, permits, and contracts, as appropriate.

b. Prior to award of bid, the Coordinator shall determine that all project design-, site clearing- and construction-related mitigation measures have been incorporated in the project plans, construction specifications, permits, and contracts, as appropriate.

c. During construction, the Coordinator, through the construction management team, shall inspect the project area regularly to ensure all work complies with the mitigation measures. If a discrepancy is not resolved within a reasonable time, the Coordinator may order work to cease until the discrepancy is resolved.

d. Prior to the District accepting the project improvements, the Coordinator shall certify that the project incorporates all project design and construction-related mitigation measures.

5. Monitoring and Reporting Procedures for Operational- and Maintenance-Related Mitigation Measures

Before the project becomes operational, the Coordinator shall determine that the project operational plans and procedures incorporate all operations-related mitigation measures.

G. Names of Persons Who Prepared or Participated in the Initial Study

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H. Sources Consulted

Following are the documents and other sources consulted in preparing this Initial Study:

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Appendix 1

Air Quality & Greenhouse Gas Impact Analysis

AIR QUALITY & GREENHOUSE GAS IMPACT ANALYSIS

FOR

VENTURA ALTERNATIVE EDUCATION CAMPUS PROJECT

FRESNO UNIFIED SCHOOL DISTRICT
FRESNO, CA

JUNE 2019

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Appendix A: Emissions Modeling & Documentation

LIST OF COMMON TERMS & ACRONYMS

AAM	Annual Arithmetic Mean
AHERA	Asbestos Hazard Emergency Response Act
ASHAA	Asbestos School Hazard Abatement Act
ASHARA	Asbestos School Hazard Abatement and Reauthorization Act
ATCM	Airborne Toxic Control Measure
CAAQS	California Ambient Air Quality Standards
ARB	California Air Resources Board
CCAA	California Clean Air Act
CCAR	California Climate Action Registry
CEQA	California Environmental Quality Act
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DPM	Diesel-Exhaust Particulate Matter or Diesel-Exhaust PM
DRRP	Diesel Risk Reduction Plan
FCAA	Federal Clean Air Act
GHG	Greenhouse Gases
HAP	Hazardous Air Pollutant
IPCC	Intergovernmental Panel on Climate Change
LOS	Level of Service
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NESHAPs	National Emission Standards for HAPs
NO_x	Oxides of Nitrogen
O_3	Ozone
Pb	Lead
PM	Particulate Matter
PM_{10}	Particulate Matter (less than 10 µm)
$PM_{2.5}$	Particulate Matter (less than 2.5 µm)
ppb	Parts per Billion
ppm	Parts per Million
ROG	Reactive Organic Gases
SIP	State Implementation Plan
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	Sulfur Dioxide
SRTS	Safe Routes to School
TAC	Toxic Air Contaminant
TSCA	Toxic Substances Control Act
$\mu g/m^3$	Micrograms per cubic meter
U.S. EPA	United State Environmental Protection Agency

INTRODUCTION

This report describes the existing environment in the project vicinity and identifies potential air quality and greenhouse gas impacts associated with the proposed project. Project impacts are evaluated relative to applicable thresholds of significance. Mitigation measures have been identified for significant impacts.

PROPOSED PROJECT

The proposed project includes the acquisition of a 12.65-acre project site located on the south side Ventura Avenue between Ninth Street and Tenth Street within the City of Fresno (See Figures 1 and 2). The northern portion of the site previously housed the former Fresno County Juvenile Hall and Court, and the southern portion of the site housed County offices. The existing site includes nine buildings (total of 182,005 square feet), a fenced athletic/recreation yard, asphalt-paved parking areas, a vacant unpaved area at the southwest portion of the site, and landscaping.

The project entails the demolition of six existing buildings at the site (total of 139,805 square feet), predominately the Juvenile Hall and Juvenile Court buildings located on the northern portion of the property. The project also includes the development and operation of a new alternative education campus, as well as operation of District-level administrative offices in existing office buildings, which would function separately from the proposed campus..

The proposed alternative education campus includes construction of eight new buildings (67,850 square feet) within the northern portion of the site. The proposed facilities and programs at the campus include a career technical education program (CTE), a continuation school, independent study, Educational Resource Center (ERC), E-Learn academy, a health building, a cafeteria/student union building, an early learning center, hardcourt recreation areas, and parking areas. The entire campus is anticipated to include 44 classrooms.

The alternative education campus would serve up to 1,180 students in grades 9-12 and include an early learning center which is expected to serve 60 pre-K students. Not all students would be on the site at one time as student instruction would be provided through a combination of conventional classroom settings and alternative settings where students spend less time physically present at the campus (e.g. independent study, E-Learn). The campus would have up to 103 employees, including administrators, faculty, and support staff. The maximum number of students and employees on the campus at one time is estimated to be 930. Most of the activity on the campus would take place during the day with some limited evening activities.

The proposed administrative offices would utilize three existing buildings (total of 42,200 square feet) located in the southern portion of the project site. The buildings would house up to 165 employees and operate year-round.

The project is expected to be completed in three phases, with the initial phase consisting of the property acquisition followed shortly by the demolition of the six existing buildings. This initial phase will begin in early 2019.

The second phase of the project will focus on the reuse of the three remaining buildings located on the southern portion of the property for District administrative offices. The administrative offices would tentatively begin operations in late 2019.

The final phase of the project would entail the construction of the alternative education campus. This phase of the project is dependent on yet-to-be-identified funding, therefore the timeline is much less predictable; it may possibly begin in the next 3 to 10 years.

Figure 1
Project Site Location

Source: OPR 2018

Figure 2
Project Site Location

Source: OPR 2018

AIR QUALITY

EXISTING SETTING

The project is located within the San Joaquin Valley Air Basin (SJVAB). The SJVAB is within the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). Air quality in the SJVAB is influenced by a variety of factors, including topography, local and regional meteorology. Factors affecting regional and local air quality are discussed below.

TOPOGRAPHY, METEOROLOGY, AND POLLUTANT DISPERSION

The dispersion of air pollution in an area is determined by such natural factors as topography, meteorology, and climate, coupled with atmospheric stability conditions and the presence of inversions. The factors affecting the dispersion of air pollution with respect to the SJVAB are discussed below.

Topography

The SJVAB occupies the southern half of the Central Valley. The SJVAB is open to the north, and is surrounded by mountain ranges on all other sides. The Coast Ranges, which have an average elevation of 3,000 feet, are along on the western boundary of the SJVAB, while the Sierra Nevada Mountains (8,000 to 14,000 feet in elevation) are along the eastern border. The San Emigdio Mountains, which are part of the Coast Ranges, and the Tehachapi Mountains, which are part of the Sierra Nevada, form the southern boundary, and have an elevation of 6,000 to 8,000 feet. The SJVAB is mostly flat with a downward gradient in terrain to the northwest.

Meteorology and Climate

The SJVAB has an inland Mediterranean climate that is strongly influenced by the presence of mountain ranges. The mountain ranges to the west and south induce winter storms from the Pacific Ocean to release precipitation on the western slopes producing a partial rain shadow over the valley. In addition, the mountain ranges block the free circulation of air to the east, trapping stable air in the valley for extended periods during the cooler half of the year.
Winter in the SJVAB is characterized as mild and fairly humid, while the summer is typically hot, dry, and cloudless. The climate is a result of the topography and the strength and location of a semi permanent, subtropical high-pressure cell. During the summer months, the Pacific high-pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind flow. Upwelling of cold ocean water from below to the surface as a result of the northwesterly flow produces a band of cold water off the California coast. In winter, the Pacific high-pressure cell weakens and shifts southward, resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms.

The annual temperature, humidity, precipitation, and wind patterns reflect the topography of the SJVAB and the strength and location of the semi permanent, subtropical high-pressure cell. Summer temperatures that often exceed 100 degrees Fahrenheit (°F) and clear sky conditions are favorable to ozone formation. Most of the precipitation in the valley occurs as rainfall during winter storms. The winds and unstable atmospheric conditions associated with the passage of winter storms result in periods of low air pollution and excellent visibility. However, between winter storms, high pressure and light winds lead to the creation of low-level temperature inversions and stable atmospheric conditions, which can result in higher pollutant concentrations. The orientation of the wind flow pattern in the SJVAB is parallel to the valley and mountain ranges. Summer wind conditions promote the transport of ozone and precursors from the San Francisco Bay Area through the Carquinez Strait, a gap in the Coast Ranges, and low-mountain passes such as Altamont Pass and Pacheco Pass. During the summer, predominant wind direction is from the northwest. During the winter, the predominant wind direction is from the southeast. Calm conditions are also predominant during the winter (ARB 1992).

The climate is semi-arid, with an annual normal precipitation of approximately 11 inches. Temperatures in the project area range from an average minimum of approximately 38°F, in January, to an average maximum of 98°F, in July (WRCC 2018).

<u>Atmospheric Stability and Inversions</u>

Stability describes the resistance of the atmosphere to vertical motion. The stability of the atmosphere is dependent on the vertical distribution of temperature with height. Stability categories range from "Extremely Unstable" (Class A), through Neutral (Class D), to "Stable" (Class F). Unstable conditions often occur during daytime hours when solar heating warms the lower atmospheric layers sufficiently. Under Class A stability conditions, large fluctuations in horizontal wind direction occur coupled with large vertical mixing depths. Under Class B stability conditions, wind direction fluctuations and the vertical mixing depth are less pronounced because of a decrease in the amount of solar heating. Under Class C stability conditions, solar heating is weak along with horizontal and vertical fluctuations because of a combination of thermal and mechanical turbulence. Under Class D stability conditions, vertical motions are primarily generated by mechanical turbulence. Under Class E and Class F stability conditions, air pollution emitted into the atmosphere travels downwind with poor dispersion. The dispersive power of the atmosphere decreases with progression through the categories from A to F.

With respect to the SJVAB, Classes D through F are predominant during the late fall and winter because of cool temperatures and entrapment of cold air near the surface. March and August are transition months with equally occurring percentages of Class F and Class A. During the spring months of April and May and the summer months of June and July, Class A is predominant. The fall months of September, October, and November have comparable percentages of Class A and Class F.

An inversion is a layer of warmer air over a layer of cooler air. Inversions influence the mixing depth of the atmosphere, which is the vertical depth available for diluting air pollution near the ground, thus significantly affecting air quality conditions. The SJVAB experiences both surface-based and elevated inversions. The shallow surface-based inversions are present in the morning but are often broken by daytime heating of the air layers near the ground. The deep elevated inversions occur less frequently than the surface-based inversions but generally result in more severe stagnation. The surface-based inversions occur more frequently in the fall, and the stronger elevated inversions usually occur during December and January.

AIR POLLUTANTS OF CONCERN

<u>Criteria Air Pollutants</u>

For the protection of public health and welfare, the Federal Clean Air Act (FCAA) required that the United States Environmental Protection Agency (U.S. EPA) establish National Ambient Air Quality Standards (NAAQS) for various pollutants. These pollutants are referred to as "criteria" pollutants because the U.S. EPA publishes criteria documents to justify the choice of standards. These standards define the maximum amount of an air pollutant that can be present in ambient air. An ambient air quality standard is generally specified as a concentration averaged over a specific time period, such as one hour, eight hours, 24 hours, or one year. The different averaging times and concentrations are meant to protect against different exposure effects. Standards established for the protection of human health are referred to as primary standards; whereas, standards established for the prevention of environmental and property damage are called secondary standards. The FCAA allows states to adopt additional or more health-protective standards. The air quality regulatory framework and ambient air quality standards are discussed in greater detail later in this report.

The following provides a summary discussion of the primary and secondary criteria air pollutants of primary concern. In general, primary pollutants are directly emitted into the atmosphere, and secondary pollutants are formed by chemical reactions in the atmosphere.

Ozone (O_3) is a reactive gas consisting of three atoms of oxygen. In the troposphere, it is a product of the photochemical process involving the sun's energy. It is a secondary pollutant that is formed when NO_X and volatile organic compounds (VOC) react in the presence of sunlight. Ozone at the earth's surface causes numerous adverse health effects and is a criteria pollutant. It is a major component of smog. In the stratosphere, ozone exists naturally and shields Earth from harmful incoming ultraviolet radiation.

High concentrations of ground level ozone can adversely affect the human respiratory system and aggravate cardiovascular disease and many respiratory ailments. Ozone also damages natural ecosystems such as forests and foothill communities, agricultural crops, and some man-made materials, such as rubber, paint, and plastics.

Reactive Organic Gas (ROG) is a reactive chemical gas, composed of hydrocarbon compounds that may contribute to the formation of smog by their involvement in atmospheric chemical reactions. No separate health standards exist for ROG as a group. Because some compounds that make up ROG are also toxic, like the carcinogen benzene, they are often evaluated as part of a toxic risk assessment. Total Organic Gases (TOGs) includes all of the ROGs, in addition to low reactivity organic compounds like methane and acetone. ROGs and VOC are subsets of TOG.

Volatile Organic Compounds (VOC) are hydrocarbon compounds that exist in the ambient air. VOCs contribute to the formation of smog and may also be toxic. VOC emissions are a major precursor to the formation of ozone. VOCs often have an odor, and some examples include gasoline, alcohol, and the solvents used in paints.

Oxides of Nitrogen (NO_X) are a family of gaseous nitrogen compounds and is a precursor to the formation of ozone and particulate matter. The major component of NO_X, nitrogen dioxide (NO_2), is a reddish-brown gas that is toxic at high concentrations. NO_X results primarily from the combustion of fossil fuels under high temperature and pressure. On-road and off-road motor vehicles and fuel combustion are the major sources of this air pollutant.

Particulate Matter (PM), also known as particle pollution, is a complex mixture of extremely small particles and liquid droplets. Particle pollution is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. U.S. EPA is concerned about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. U.S. EPA groups particle pollution into three categories based on their size and where they are deposited:

- "Inhalable coarse particles ($PM_{2.5}$- PM_{10})," such as those found near roadways and dusty industries, are between 2.5 and 10 micrometers in diameter. $PM_{2.5\text{-}10}$ is deposited in the thoracic region of the lungs.
- "Fine particles ($PM_{2.5}$)," such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller. These particles can be directly emitted from sources such as forest fires, or they can form when gases emitted from power plants, industries and automobiles react in the air. They penetrate deeply into the thoracic and alveolar regions of the lungs.
- "Ultrafine particles (UFP)," are very small particles less than 0.1 micrometers in diameter largely resulting from the combustion of fossils fuels, meat, wood and other hydrocarbons. While UFP mass is a small portion of $PM_{2.5}$, its high surface area, deep lung penetration, and transfer into the bloodstream can result in disproportionate health impacts relative to their mass.

PM_{10}, $PM_{2.5}$, and UFP include primary pollutants (emitted directly to the atmosphere) as well as secondary pollutants (formed in the atmosphere by chemical reactions among precursors). Generally speaking, $PM_{2.5}$ and UFP are emitted by combustion sources like vehicles, power generation, industrial processes, and wood burning, while PM_{10} sources include these same sources plus roads and farming activities. Fugitive windblown dust and other area sources also represent a source of airborne dust.

Numerous scientific studies have linked both long- and short-term particle pollution exposure to a variety of health problems. Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis and even premature death. Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and also acute (short-term) bronchitis, and may also increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short term exposures, although they may experience temporary minor irritation when particle levels are elevated.

Carbon Monoxide (CO) is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels and is emitted directly into the air (unlike ozone). The main source of CO is on-road motor vehicles. Other CO sources include other mobile sources, miscellaneous processes, and fuel combustion from stationary sources. Because of the local nature of CO problems, the California Air Resources Board (ARB) and U.S. EPA designate urban areas as CO nonattainment areas instead of the entire basin as with ozone and PM_{10}. Motor vehicles are by far the largest source of CO emissions. Emissions from motor vehicles have been declining since 1985, despite increases in vehicle miles traveled, with the introduction of new automotive emission controls and fleet turnover.

Sulfur Dioxide (SO_2) is a colorless, irritating gas with a "rotten egg" smell formed primarily by the combustion of sulfur-containing fossil fuels. However, like airborne NO_X, suspended SO_X particles contribute to the poor visibility. These SO_X particles can also combine with other pollutants to form $PM_{2.5}$. The prevalence of low-sulfur fuel use has minimized problems from this pollutant.

Lead (Pb) is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. The health effects of lead poisoning include loss of appetite, weakness, apathy, and miscarriage. Lead can also cause lesions of the neuromuscular system, circulatory system, brain, and gastrointestinal tract. Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels. The use of leaded fuel has been mostly phased out, with the result that ambient concentrations of lead have dropped dramatically.

Hydrogen Sulfide (H_2S) is associated with geothermal activity, oil and gas production, refining, sewage treatment plants, and confined animal feeding operations. Hydrogen sulfide is extremely hazardous in high concentrations; especially in enclosed spaces (800 ppm can cause death). OSHA regulates workplace exposure to H_2S.

Other Pollutants

The State of California has established air quality standards for some pollutants not addressed by Federal standards. The ARB has established State standards for hydrogen sulfide, sulfates, vinyl chloride, and visibility reducing particles. The following section summarizes these pollutants and provides a description of the pollutants' physical properties, health and other effects, sources, and the extent of the problems.

Sulfates (SO_4^{2-}) are the fully oxidized ionic form of sulfur. Sulfates occur in combination with metal and/or hydrogen ions. In California, emissions of sulfur compounds occur primarily from the combustion of petroleum-derived fuels (e.g., gasoline and diesel fuel) that contain sulfur. This sulfur is oxidized to SO_2 during the combustion process and subsequently converted to sulfate compounds in the atmosphere. The conversion of SO_2 to sulfates takes place comparatively rapidly and completely in urban areas of California due to regional meteorological features.

The ARB sulfates standard is designed to prevent aggravation of respiratory symptoms. Effects of sulfate exposure at levels above the standard include a decrease in ventilator function, aggravation of asthmatic symptoms, and an increased risk of cardio-pulmonary disease. Sulfates are particularly effective in degrading visibility, and, due to the fact that they are usually acidic, can harm ecosystems and damage materials and property.

Visibility Reducing Particles: Are a mixture of suspended particulate matter consisting of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. The standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Vinyl Chloride (C_2H_3Cl or VCM) is a colorless gas that does not occur naturally. It is formed when other substances such as trichloroethane, trichloroethylene, and tetrachloro-ethylene are broken down. Vinyl chloride is used to make polyvinyl chloride (PVC) which is used to make a variety of plastic products, including pipes, wire and cable coatings, and packaging materials.

Odors

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

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

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word strong to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Neither the state nor the federal governments have adopted rules or regulations for the control of odor sources. The SJVAPCD does not have an individual rule or regulation that specifically addresses odors; however, odors would be subject to SJVAPCD *Rule 4102, Nuisance*. Any actions related to odors would be based on citizen complaints to local governments and the SJVAPCD.

Toxic Air Contaminants

Toxic air contaminants (TACs) are air pollutants that may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air, but due to their high toxicity, they may pose a threat to public health even at very low concentrations. Because there is no threshold level below which adverse health impacts are not expected to occur, TACs differ from criteria pollutants for which acceptable levels of exposure can be determined and for which state and federal governments have set ambient air quality standards. TACs, therefore, are not considered "criteria pollutants" under either the FCAA or the California Clean Air Act (CCAA), and are thus not subject to National or California ambient air quality standards (NAAQS and CAAQS, respectively). Instead, the U.S. EPA and the ARB regulate Hazardous Air Pollutants (HAPs) and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology to limit emissions. In conjunction with SJVAPCD rules, these federal and state statutes and regulations establish the regulatory framework for TACs. At the national levels, the U.S. EPA has established National Emission Standards for HAPs (NESHAPs), in accordance with the requirements of the FCAA and subsequent amendments. These are technology-based source-specific regulations that limit allowable emissions of HAPs.

Within California, TACs are regulated primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. The following provides a summary of the primary TACs of concern within the State of California and related health effects:

Diesel Particulate Matter (DPM) was identified as a TAC by the ARB in August 1998. DPM is emitted from both mobile and stationary sources. In California, on-road diesel-fueled vehicles contribute approximately 40% of the statewide total, with an additional 57 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources, contributing about 3 percent of emissions, include shipyards, warehouses, heavy equipment repair yards, and oil and gas production operations. Emissions from these sources are from diesel-fueled internal combustion engines. Stationary sources that report DPM emissions also include heavy construction, manufacturers of asphalt paving materials and blocks, and diesel-fueled electrical generation facilities (ARB 2013).

In October 2000, the ARB issued a report entitled: "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles", which is commonly referred to as the Diesel Risk Reduction Plan (DRRP). The DRRP provides a mechanism for combating the DPM problem. The goal of the DRRP is to reduce concentrations of DPM by 85 percent by the year 2020, in comparison to year 2000 baseline emissions. The key elements of the DRRP are to clean up existing engines through engine retrofit emission control devices, to adopt stringent standards for new diesel engines, and to lower the sulfur content of diesel fuel to protect new, and very effective, advanced technology emission control devices on diesel engines. When fully implemented, the DRPP will significantly reduce emissions from both old and new diesel fueled motor vehicles and from stationary sources that burn diesel fuel. In addition to these strategies, the ARB continues to promote the use of alternative fuels and electrification. As a result of these actions, DPM concentrations and associated health risks in future years are projected to decline (ARB 2013, ARB 2000).

Exposure to DPM can have immediate health effects. DPM can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, Exposure to DPM also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. The elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. Because children's lungs and respiratory systems are still developing, they are also more susceptible than healthy adults to fine particles. Exposure to fine particles is associated with increased frequency of childhood illnesses and can also reduce lung function in children. In California, DPM has been identified as a carcinogen.

Acetaldehyde is a federal hazardous air pollutant. The ARB identified acetaldehyde as a TAC in April 1993. Acetaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Sources of acetaldehyde include emissions from combustion processes such as exhaust from mobile sources and fuel combustion from stationary internal combustion engines, boilers, and process heaters. A majority of the statewide acetaldehyde emissions can be attributed to mobile sources, including on-road motor vehicles, construction and mining equipment, aircraft, recreational boats, and agricultural equipment. Area sources of emissions include the burning of wood in residential fireplaces and wood stoves. The primary stationary sources of acetaldehyde are from fuel combustion from the petroleum industry (ARB 2013).

Acute exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic intoxication of acetaldehyde resemble those of alcoholism. The U.S. EPA has classified acetaldehyde as a probable human carcinogen. In California, acetaldehyde was classified on April 1, 1988, as a chemical known to the state to cause cancer (U.S. EPA 2014; ARB 2013).

Benzene is highly carcinogenic and occurs throughout California. The ARB identified benzene as a TAC in January 1985. A majority of benzene emitted in California (roughly 88 percent) comes from motor vehicles, including evaporative leakage and unburned fuel exhaust. These sources include on-road motor vehicles, recreational boats, off-road recreational vehicles, and lawn and garden equipment. Benzene is also formed as a partial combustion product of larger aromatic fuel components. To a lesser extent, industry-related stationary sources are also sources of benzene emissions. The primary stationary sources of reported benzene emissions are crude petroleum and natural gas mining, petroleum refining, and electric generation that involves the use of petroleum products. The primary area sources include residential combustion of various types such as cooking and water heating (ARB 2013).

Acute inhalation exposure of humans to benzene may cause drowsiness, dizziness, headaches, as well as eye, skin, and respiratory tract irritation, and, at high levels, unconsciousness. Chronic inhalation exposure has caused various disorders in the blood, including reduced numbers of red blood cells and aplastic anemia, in occupational settings. Reproductive effects have been reported for women exposed by inhalation to high levels, and adverse effects on the developing fetus have been observed in animal tests. Increased incidences of leukemia (cancer of the tissues that form white blood cells) have been observed in humans occupationally exposed to benzene. The U.S. EPA has classified benzene as known human carcinogen for all routes of exposure (U.S. EPA 2014).

1,3-butadiene was identified by the ARB as a TAC in 1992. Most of the emissions of 1,3-butadiene are from incomplete combustion of gasoline and diesel fuels. Mobile sources account for a majority of the total statewide emissions. Additional sources include agricultural waste burning, open burning associated with forest management, petroleum refining, manufacturing of synthetics and man-made materials, and oil and gas extraction. The primary natural sources of 1,3-butadiene emissions are wildfires (ARB 2013).

Acute exposure to 1,3-butadiene by inhalation in humans results in irritation of the eyes, nasal passages, throat, and lungs. Epidemiological studies have reported a possible association between 1,3-butadiene exposure and cardiovascular diseases. Epidemiological studies of workers in rubber plants have shown an association between 1,3-butadiene exposure and increased incidence of leukemia. Animal studies have reported tumors at various sites from 1,3-butadiene exposure. In California, 1,3-butadiene has been identified as a carcinogen.

Carbon Tetrachloride was identified by the ARB as a TAC in 1987 under California's TAC program (ARB 2013). The primary stationary sources reporting emissions of carbon tetrachloride include chemical and allied product manufacturers and petroleum refineries. In the past, carbon tetrachloride was used for dry cleaning and as a grain-fumigant. Usage for these purposes is no longer allowed in the United States. Carbon tetrachloride has not been registered for pesticidal use in California since 1987. Also, the use of carbon tetrachloride in products to be used indoors has been discontinued in the United States. The statewide emissions of carbon tetrachloride are small (about 1.96 tons per year), and background concentrations account for most of the health risk (ARB 2013).

The primary effects of carbon tetrachloride in humans are on the liver, kidneys, and central nervous system. Human symptoms of acute inhalation and oral exposures to carbon tetrachloride include headache, weakness, lethargy, nausea, and vomiting. Acute exposures to higher levels and chronic (long-term) inhalation or oral exposure to carbon tetrachloride produces liver and kidney damage in humans. Human data on the carcinogenic effects of carbon tetrachloride are limited. Studies in animals have shown that ingestion of carbon tetrachloride increases the risk of liver cancer. In California, carbon tetrachloride has been identified as a carcinogen.

Hexavalent chromium was identified as a TAC in 1986. Sources of Hexavalent chromium include industrial metal finishing processes, such as chrome plating and chromic acid anodizing, and firebrick lining of glass furnaces. Other sources include mobile sources, including gasoline motor vehicles, trains, and ships (ARB 2013).

The respiratory tract is the major target organ for hexavalent chromium toxicity, for acute and chronic inhalation exposures. Shortness of breath, coughing, and wheezing were reported from a case of acute exposure to hexavalent chromium, while perforations and ulcerations of the septum, bronchitis, decreased pulmonary function, pneumonia, and other respiratory effects have been noted from chronic exposure. Human studies have clearly established that inhaled hexavalent chromium is a human carcinogen, resulting in an increased risk of lung cancer. In California, hexavalent chromium has been identified as a carcinogen.

Para-Dichlorobenzene was identified by the ARB as a TAC in April 1993. The primary area-wide sources that have reported emissions of para-dichlorobenzene include consumer products such as non-aerosol insect repellants and solid/gel air fresheners. These sources contribute nearly all of the statewide para-dichlorobenzene emissions (ARB 2013).

Acute exposure to paradichlorobenzene via inhalation results in irritation to the eyes, skin, and throat in humans. In addition, long-term inhalation exposure may affect the liver, skin, and central nervous system in humans. The U.S. EPA has classified para-dichlorobenzene as a possible human carcinogen.

Formaldehyde was identified by the ARB as a TAC in 1992. Formaldehyde is both directly emitted into the atmosphere and formed in the atmosphere as a result of photochemical oxidation. Photochemical oxidation is the largest source of formaldehyde concentrations in California ambient air. Directly emitted formaldehyde is a product of incomplete combustion. One of the primary sources of directly-emitted formaldehyde is vehicular exhaust. Formaldehyde is also used in resins, can be found in many consumer products as an antimicrobial agent, and is also used in fumigants and soil disinfectants. The primary area sources of formaldehyde emissions include wood burning in residential fireplaces and wood stoves (ARB 2013).

Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute and chronic inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. Formaldehyde is classified as a probable human carcinogen.

Methylene Chloride was identified by the ARB as a TAC in 1987. Methylene chloride is used as a solvent, a blowing and cleaning agent in the manufacture of polyurethane foam and plastic fabrication, and as a solvent in paint stripping operations. Paint removers account for the largest use of methylene chloride in California, where methylene chloride is the main ingredient in many paint stripping formulations. Plastic product manufacturers, manufacturers of synthetics, and aircraft and parts manufacturers are stationary sources reporting emissions of methylene chloride (ARB 2013).

The acute effects of methylene chloride inhalation in humans consist mainly of nervous system effects including decreased visual, auditory, and motor functions, but these effects are reversible once exposure ceases. The effects of chronic exposure to methylene chloride suggest that the central nervous system is a potential target in humans and animals. Human data are inconclusive regarding methylene chloride and cancer. Animal studies have shown increases in liver and lung cancer and benign mammary gland tumors following the inhalation of methylene chloride. In California, methylene chloride has been identified as a carcinogen.

Perchloroethylene was identified by the ARB as a TAC in 1991. Perchloroethylene is used as a solvent, primarily in dry cleaning operations. Perchloroethylene is also used in degreasing operations, paints and coatings, adhesives, aerosols, specialty chemical production, printing inks, silicones, rug shampoos, and laboratory solvents. In California, the stationary sources that have reported emissions of perchloroethylene are dry cleaning plants, aircraft part and equipment manufacturers, and fabricated metal product manufacturers. The primary area sources include consumer products such as automotive brake cleaners and tire sealants and inflators (ARB 2013).

Acute inhalation exposure to perchloroethylene vapors can result in irritation of the upper respiratory tract and eyes, kidney dysfunction, and at lower concentrations, neurological effects, such as reversible mood and behavioral changes, impairment of coordination, dizziness, headaches sleepiness, and unconsciousness. Chronic inhalation exposure can result in neurological effects, including sensory symptoms such as headaches, impairments in cognitive and motor neurobehavioral functioning, and color vision decrements. Cardiac arrhythmia, liver damage, and possible kidney damage may also occur. In California, perchloroethylene has been identified as a carcinogen.

ASBESTOS

Asbestos is a term used for several types of naturally-occurring fibrous minerals found in many parts of California. The most common type of asbestos is chrysotile, but other types are also found in California. Serpentine rock often contains chrysotile asbestos. Serpentine rock, and its parent material, ultramafic rock, is abundant in the Sierra foothills, the Klamath Mountains, and Coast Ranges. The project site, however, is not located in an area of known ultramafic rock.

Asbestos is commonly found in ultramafic rock, including serpentine, and near fault zones. The amount of asbestos that is typically present in these rocks range from less than 1 percent up to about 25 percent, and sometimes more. Asbestos is released from ultramafic and serpentine rock when it is broken or crushed. This can happen when cars drive over unpaved roads or driveways which are surfaced with these rocks, when land is graded for building purposes, or at quarrying operations. It is also released naturally through weathering and erosion. Once released from the rock, asbestos can become airborne and may stay in the air for long periods of time.

Additional sources of asbestos include building materials and other manmade materials. The most common sources are heat-resistant insulators, cement, furnace or pipe coverings, inert filler material, fireproof gloves and clothing, and brake linings. Asbestos has been used in the United States since the early 1900's; however, asbestos is no longer allowed as a constituent in most home products and materials. Many older buildings, schools, and homes still have asbestos containing products.

Naturally-occurring asbestos was identified by ARB as a TAC in 1986. The ARB has adopted two statewide control measures which prohibits the use of serpentine or ultramafic rock for unpaved surfacing and controls dust emissions from construction, grading, and surface mining in areas with these rocks. Various other laws have also been adopted, including laws related to the control of asbestos-containing materials during the renovation and demolition of buildings.

All types of asbestos are hazardous and may cause lung disease and cancer. Health risks to people are dependent upon their exposure to asbestos. The longer a person is exposed to asbestos and the greater the intensity of the exposure, the greater the chances for a health problem. Asbestos-related disease, such as lung cancer, may not occur for decades after breathing asbestos fibers. Cigarette smoking increases the risk of lung cancer from asbestos exposure.

VALLEY FEVER

Valley fever is an infection caused by the fungus Coccidioides. The scientific name for valley fever is “coccidioidomycosis,” and it’s also sometimes called “desert rheumatism.” The term “valley fever” usually refers to Coccidioides infection in the lungs, but the infection can spread to other parts of the body in severe cases.

Coccidioides spores circulate in the air after contaminated soil and dust are disturbed by humans, animals, or the weather. The spores are too small to see without a microscope. When people breathe in the spores, they are at risk for developing valley fever. After the spores enter the lungs, the person’s body temperature allows the spores to change shape and grow into spherules. When the spherules get large enough, they break open and release smaller pieces (called endospores) which can then potentially spread within the lungs or to other organs and grow into new spherules. In extremely rare cases, the fungal spores can enter the skin through a cut, wound, or splinter and cause a skin infection.

Symptoms of valley fever may appear between 1 and 3 weeks after exposure. Symptoms commonly include fatigue, coughing, fever, shortness of breath, headaches, night sweats, muscle aches and joint pain, and rashes on the upper body or legs.

Approximately 5 to 10 percent of people who get valley fever will develop serious or long-term problems in their lungs. In an even smaller percent of people (about 1 percent), the infection spreads from the lungs to other parts of the body, such as the central nervous system (brain and spinal cord), skin, or bones and joints. Certain groups of people may be at higher risk for developing the severe forms of valley fever, such as people who have weakened immune systems. The fungus that causes valley fever, Coccidioides, can't spread from the lungs between people or between people and animals. However, in extremely rare instances, a wound infection with Coccidioides can spread valley fever to someone else, or the infection can be spread through an organ transplant with an infected organ.

For many people, the symptoms of valley fever will go away within a few months without any treatment. Healthcare providers choose to prescribe antifungal medication for some people to try to reduce the severity of symptoms or prevent the infection from getting worse. Antifungal medication is typically given to people who are at higher risk for developing severe valley fever. The treatment typically occurs over a period of roughly 3 to 6 months. In some instances, longer treatment may be required. If valley fever develops into meningitis life-long antifungal treatment is typically necessary.

Scientists continue to study how weather and climate patterns affect the habitat of the fungus that causes valley fever. Coccidioides is thought to grow best in soil after heavy rainfall and then disperse into the air most effectively during hot, dry conditions. For example, hot and dry weather conditions have been shown to correlate with an increase in the number of valley fever cases in Arizona and in California. The ways in which climate change may be affecting the number of valley fever infections, as well as the geographic range of Coccidioides, isn't known yet, but is a subject for further research (CDC 2016).

REGULATORY FRAMEWORK

Air quality within the SJVAB is regulated by several jurisdictions including the U.S. EPA, ARB, and the SJVAPCD. Each of these jurisdictions develops rules, regulations, and policies to attain the goals or directives imposed upon them through legislation. Although U.S. EPA regulations may not be superseded, both state and local regulations may be more stringent.

FEDERAL

U.S. Environmental Protection Agency

At the federal level, the U.S. EPA has been charged with implementing national air quality programs. The U.S. EPA's air quality mandates are drawn primarily from the FCAA, which was signed into law in 1970. Congress substantially amended the FCAA in 1977 and again in 1990.

Federal Clean Air Act

The FCAA required the U.S. EPA to establish National Ambient Air Quality Standards (NAAQS), and also set deadlines for their attainment. Two types of NAAQS have been established: primary standards, which protect public health, and secondary standards, which protect public welfare from non-health-related adverse effects, such as visibility restrictions. NAAQS are summarized in Table 2.

The FCAA also required each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The FCAA Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. The U.S. EPA has responsibility to review all state SIPs to determine conformance with the mandates of the FCAA, and the amendments thereof, and determine if implementation will achieve air quality goals. If the U.S. EPA determines a SIP to be inadequate, a Federal Implementation Plan (FIP) may be prepared for the nonattainment area that imposes additional control measures.

Table 1
Summary of Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards (Primary)
Ozone (O_3)	1-hour	0.09 ppm	–
	8-hour	0.070 ppm	0.070 ppm
Particulate Matter (PM_{10})	AAM	20 µg/m³	–
	24-hour	50 µg/m³	150 µg/m³
Fine Particulate Matter ($PM_{2.5}$)	AAM	12 µg/m³	12 µg/m³
	24-hour	No Standard	35 µg/m³
Carbon Monoxide (CO)	1-hour	20 ppm	35 ppm
	8-hour	9 ppm	9 ppm
	8-hour (Lake Tahoe)	6 ppm	–
Nitrogen Dioxide (NO_2)	AAM	0.030 ppm	53 ppb
	1-hour	0.18 ppm	100 ppb
Sulfur Dioxide (SO_2)	AAM	–	0.03 ppm
	24-hour	0.04 ppm	0.14 ppm
	3-hour	–	–
	1-hour	0.25 ppm	75 ppb
Lead	30-day Average	1.5 µg/m³	–
	Calendar Quarter	–	1.5 µg/m³
	Rolling 3-Month Average	–	0.15 µg/m³
Sulfates	24-hour	25 µg/m³	No Federal Standards
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m³)	
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m³)	
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient: 0.23/kilometer-visibility of 10 miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70%.	
** For more information on standards visit : https://ww3.arb.ca.gov/research/aaqs/aaqs2.pdf Source: ARB 2019a*			

Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) first authorized the U.S. EPA to regulate asbestos in schools and Public and Commercial buildings under Title II of the law, which is also known as the Asbestos Hazard Emergency Response Act (AHERA). AHERA requires Local Education Agencies (LEAs) to inspect their schools for ACBM and prepare management plans to reduce the asbestos hazard. The Act also established a program for the training and accreditation of individuals performing certain types of asbestos work.

Asbestos School Hazard Abatement and Reauthorization Act

The Asbestos School Hazard Abatement and Reauthorization Act (ASHARA) reauthorized AHERA and made some minor changes in the Act. It also reauthorized the Asbestos School Hazard Abatement Act.

Asbestos School Hazard Abatement Act

The Asbestos School Hazard Abatement Act (ASHAA) of 1984 provided loans and grants to help financially needy public and private schools correct serious asbestos hazards. This program was funded from 1985 until 1993. There have been no funds appropriated since that date.

National Emission Standards for Hazardous Air Pollutants

Pursuant to the FCAA of 1970, the U.S. EPA established the National Emission Standards for Hazardous Air Pollutants. These are technology-based source-specific regulations that limit allowable emissions of HAPs.

STATE

California Air Resources Board

The ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act of 1988. Other ARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control districts and air quality management districts, establishing California Ambient Air Quality Standards (CAAQS), which in many cases are more stringent than the NAAQS, and setting emissions standards for new motor vehicles. The CAAQS are summarized in Table 2. The emission standards established for motor vehicles differ depending on various factors including the model year, and the type of vehicle, fuel and engine used.

California Clean Air Act

The CCAA requires that all air districts in the state endeavor to achieve and maintain CAAQS for Ozone, CO, SO_2, and NO_2 by the earliest practical date. The CCAA specifies that districts focus particular attention on reducing the emissions from transportation and area-wide emission sources, and the act provides districts with authority to regulate indirect sources. Each district plan is required to either (1) achieve a five percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each non-attainment pollutant or its precursors, or (2) to provide for implementation of all feasible measures to reduce emissions. Any planning effort for air quality attainment would thus need to consider both state and federal planning requirements.

California Assembly Bill 170

Assembly Bill 170, Reyes (AB 170), was adopted by state lawmakers in 2003 creating Government Code Section 65302.1 which requires cities and counties in the San Joaquin Valley to amend their general plans to include data and analysis, comprehensive goals, policies and feasible implementation strategies designed to improve air quality.

Assembly Bills 1807 & 2588 - Toxic Air Contaminants

Within California, TACs are regulated primarily through AB 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics Hot Spots Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB designates a substance as a TAC. Existing sources of TACs that are subject to the Air Toxics Hot Spots Information and Assessment Act are required to: (1) prepare a toxic emissions inventory; (2) prepare a risk assessment if emissions are significant; (3) notify the public of significant risk levels; and (4) prepare and implement risk reduction measures.

Regulations Related to Schools

The State of California has adopted various regulations and programs intended to reduce exposure of children to air pollutant concentrations, including the following:

Toxic Emissions Near Schools Program (AB 3205/SB 352)

Assembly Bill (AB) 3205 (Health and Safety Code Sections 42301.6–42301.9) addresses stationary sources of TACs near schools. It also requires public notice to the parents or guardians of children enrolled in any school located within one-quarter mile of the source and to each address within a 1,000-foot radius of a TAC source. Senate Bill (SB) 352 (Education Code Section 17213, Public Resources Code Section 21151.8) expands previous requirements to review sources of TACs near school sites. SB 352 directs school districts to include in the school site analysis any emissions sources, including, but not limited to, freeways and other busy traffic corridors, large agricultural operations, and rail yards within one-quarter mile of a school site. SB 352 requires that any school site located within 500 feet of the edge of the closest travel lane of a freeway or other busy traffic corridor be reviewed for potential health risks.

California Air Resources Board's Truck and Bus Regulation

This regulation requires fleets that operate in California to reduce diesel truck and bus emissions by retrofitting or replacing existing engines. Amendments were adopted in December 2010 to provide more time for fleets to comply. The amended regulation required installation of PM retrofits beginning January 1, 2012 and replacement of older trucks starting January 1, 2015. By January 1, 2023, nearly all vehicles would need to have 2010 model year engines or equivalent.

The regulation applies to nearly all privately and federally owned diesel fueled trucks and buses and privately and publicly owned school buses with a gross vehicle weight rating greater than 14,000 pounds. The regulation has provisions to provide extra credit for PM filters installed prior to July 2011, has delayed requirements for fleets with 3 or fewer vehicles, provisions for agricultural vehicles and other situations.

Lower-Emission School Bus Program 2007

Proposition 1B, which was approved by the voters on November 7th, 2006, enacts the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006. This bond act authorizes $200 million for replacing and retrofitting school buses. The primary goal of the ARB's Lower-Emission School Bus Program is to reduce school children's exposure to both cancer-causing and smog-forming pollution. The program provides grant funding for new, safer school buses and to put air pollution control equipment (i.e., retrofit devices) on buses that are already on the road.

Airborne Toxic Control Measure to Limit School Bus Idling at Schools

ARB has approved an airborne toxic control measure (ATCM) that limits school bus idling and idling at or near schools to only when necessary for safety or operational concerns. The ATCM requires a driver of a school bus or vehicle, transit bus, or other commercial motor vehicle to manually turn off the bus or vehicle engine upon arriving at a school and to restart no more than 30 seconds before departing. A driver of a school bus or vehicle is subject to the same requirement when operating within 100 feet of a school and is prohibited from idling more than five minutes at each stop beyond schools, such as parking or maintenance facilities, school bus stops, or school activity destinations. A driver of a transit bus or other commercial motor vehicle is prohibited from idling more than five minutes at each stop within 100 feet of a school. Idling necessary for health, safety, or operational concerns is exempt from these restrictions. In addition, the ATCM requires a motor carrier of an affected bus or vehicle to ensure that drivers are informed of the idling requirements, track complaints and enforcement actions, and keep records of these driver education and tracking activities. This ATCM became effective in July 2003.

San Joaquin Valley Air Pollution Control District

The SJVAPCD is the agency primarily responsible for ensuring that NAAQS and CAAQS are not exceeded and that air quality conditions are maintained in the SJVAB, within which the proposed project is located. Responsibilities of the SJVAPCD include, but are not limited to, preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution and responding to citizen complaints, monitoring ambient air quality and meteorological conditions, and implementing programs and regulations required by the FCAA and the CCAA. The SJVAPCD Rules and Regulations that are applicable to the proposed project include, but are not limited to, the following:

- *Regulation VIII (Fugitive Dust Prohibitions). Regulation VIII (Rules 8011-8081).* This regulation is a series of rules designed to reduce particulate emissions generated by human activity, including construction and demolition activities, carryout and trackout, paved and unpaved roads, bulk material handling and storage, unpaved vehicle/traffic areas, open space areas, etc.
- *Rule 4002 (National Emissions Standards for Hazardous Air Pollutants).* This rule may apply to projects in which portions of an existing building would be renovated, partially demolished or removed. With regard to asbestos, the NESHAP specifies work practices to be followed during renovation, demolition or other abatement activities when friable asbestos is involved. Prior to demolition activity, an asbestos survey of the existing structure may be required to identify the presence of any asbestos containing building materials (ACBM). Removal of identified ACBM must be removed by a certified asbestos contractor in accordance with CAL-OSHA requirements.
- *Rule 4102 (Nuisance).* Applies to any source operation that emits or may emit air contaminants or other materials.
- *Rule 4103 (Open Burning).* This rule regulates the use of open burning and specifies the types of materials that may be open burned. Section 5.1 of this rule prohibits the burning of trees and other vegetative (non-agricultural) material whenever the land is being developed for non-agricultural purposes.
- *Rule 4601 (Architectural Coatings).* Limits volatile organic compounds from architectural coatings.
- *Rule 4641 (Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations).* This rule applies to the manufacture and use of cutback, slow cure, and emulsified asphalt during paving and maintenance operations.
- *Rule 9510 (Indirect Source Review - ISR).* Requires developers of larger residential, commercial, recreational, and industrial projects to reduce smog-forming and particulate emissions from their projects' baselines. If project emissions still exceed the minimum baseline reductions, a project's developer will be required to mitigate the difference by paying an off-site fee to the District, which would then be used to fund clean-air projects. For projects subject to this rule, the ISR rule requires developers to mitigate and/or offset emissions sufficient to achieve: (1) 20-percent reduction of construction equipment exhaust NOx; (2) 45-percent reduction of construction equipment exhaust PM_{10}; (3) 33-percent reduction of operational NOx over 10 years; and (4) 50-percent reduction of operational PM_{10} over 10 years. SJVAPCD ISR applications must be filed "no later than applying for a final discretionary approval with a public agency."

Regulatory Attainment Designations

Under the CCAA, ARB is required to designate areas of the state as attainment, nonattainment, or unclassified with respect to applicable standards. An "attainment" designation for an area signifies that pollutant concentrations did not violate the applicable standard in that area. A "nonattainment" designation indicates that a pollutant concentration violated the applicable standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. Depending on the frequency and severity of pollutants exceeding applicable standards, the nonattainment designation can be further classified as serious nonattainment, severe nonattainment, or extreme nonattainment, with extreme nonattainment being the most severe of the classifications. An "unclassified" designation signifies that the data does not support either an attainment or nonattainment designation. The CCAA divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The U.S. EPA designates areas for ozone, CO, and NO_2 as "does not meet the primary standards," "cannot be classified," or "better than national standards." For SO_2, areas are designated as "does not meet the primary standards," "does not meet the secondary standards," "cannot be classified," or "better than national standards." However, ARB terminology of attainment, nonattainment, and unclassified is more frequently used. The U.S. EPA uses the same sub-categories for nonattainment status: serious, severe, and extreme. In 1991, U.S. EPA assigned new nonattainment designations to areas that had previously been classified as Group I, II, or III for PM_{10} based on the likelihood that they would violate national PM_{10} standards. All other areas are designated "unclassified."

The state and national attainment status designations pertaining to the SJVAB are summarized in Table 2. The SJVAB is currently designated as a nonattainment area with respect to the state PM_{10} standard, ozone, and $PM_{2.5}$ standards. The SJVAB is designated nonattainment for the national 8-hour ozone and $PM_{2.5}$ standards. On September 25, 2008, the U.S. EPA redesignated the San Joaquin Valley to attainment for the PM_{10} NAAQS and approved the PM_{10} Maintenance Plan (SJVAPCD 2019).

Table 2
SJVAB Attainment Status Designations

Pollutant	National Designation	State Designation
Ozone, 1 hour	No Standard	Nonattainment/Severe
Ozone, 8 hour	Nonattainment/Extreme	Nonattainment
PM_{10}	Attainment	Nonattainment
$PM_{2.5}$	Nonattainment	Nonattainment
Carbon Monoxide	Attainment/Unclassified	Attainment/Unclassified
Nitrogen dioxide	Attainment/Unclassified	Attainment
Sulfur dioxide	Attainment/Unclassified	Attainment
Lead (particulate)	No Designation/Classification	Attainment
Hydrogen sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility-reducing particulates	No Federal Standard	Unclassified
Vinyl Chloride	No Federal Standard	Attainment

For more information visit website url: https://www.valleyair.org/aqinfo/attainment.htm.
Source: SJVAPCD 2019

AMBIENT AIR QUALITY

Air pollutant concentrations are measured at several monitoring stations in Fresno County. The Fresno-Drummond Street Monitoring Station is the closest representative monitoring site to the proposed project site with sufficient data to meet U.S. EPA and/or ARB criteria for quality assurance. This monitoring station monitors ambient concentrations of ozone, nitrogen dioxide, and PM_{10}. Ambient $PM_{2.5}$ monitoring data was obtained from the Fresno-Garland Monitoring Station. Ambient monitoring data was obtained for the last three years of available measurement data (i.e., 2015 through 2017) and are summarized in Table 3. As depicted, the state and national ozone, national $PM_{2.5}$, and state PM_{10} standards were exceeded on numerous occasions during the past 3 years.

Table 3
Summary of Ambient Air Quality Monitoring Data[1]

	2015	2016	2017
Ozone			
Maximum concentration (1-hour/8-hour average)	0.135/0.110	0.117/0.093	0.125/0.103
Number of days state/national 1-hour standard exceeded	12/1	13/0	8/1
Number of days state/national 8-hour standard exceeded	41/39	60/57	31/29
Nitrogen Dioxide (NO_2)			
Maximum concentration (1-hour average)	56.0	58.6	64.7
Annual average	11	NA	NA
Number of days state/federal standard exceeded	0	0	0
Suspended Particulate Matter (PM_{10})			
Maximum concentration (state/national)	116.7/120.7	86.3/88.3	120.5/115.6
Number of days state standard exceeded (measured/calculated[2])	13/80.3	17/98.9	17/111.6
Number of days national standard exceeded (measured/calculated[2])	0/0	0/0	0/0
Suspended Particulate Matter ($PM_{2.5}$)			
Maximum concentration (state/national)	75.2	52.7	86.0
Annual Average (state/national)	14.5	13.6	14.3
Number of days national standard exceeded	20	16	31

ppm = parts per million by volume, μg/m³ = micrograms per cubic meter, NA=Not Available

1 *Ambient ozone, NO_2, and PM_{10} data was obtained from the Fresno-Drummond Street Monitoring Station. Ambient $PM_{2.5}$ data was obtained from the Fresno-Garland Monitoring Station.*

2 *Measured days are those days that an actual measurement was greater than the standard. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day.*

Source: ARB 2019b

SENSITIVE RECEPTORS

One of the most important reasons for air quality standards is the protection of those members of the population who are most sensitive to the adverse health effects of air pollution, termed "sensitive receptors." The term sensitive receptors refer to specific population groups, as well as the land uses where individuals would reside for long periods. Commonly identified sensitive population groups are children, the elderly, the acutely ill, and the chronically ill. Commonly identified sensitive land uses would include facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Residential dwellings, schools, parks, playgrounds, childcare centers, convalescent homes, and hospitals are examples of sensitive land uses.

Sensitive land uses located in the vicinity of the proposed project site consist predominantly of residential land uses. The nearest residential land uses are located to the west, east, and south of the project site. Nearby residential land uses are depicted in Figure 1.

IMPACTS & MITIGATION MEASURES

METHODOLOGY

Short-term Impacts

Short-term construction emissions associated with the proposed project were calculated using the CalEEMod computer program. Emissions were quantified for demolition, removal action workplan (RAW) for contaminated soils/grading, asphalt paving, facility construction, and application of architectural coatings. Detailed construction information, including construction schedules and equipment requirements, have not been identified for the proposed project. Default construction phases and equipment assumptions contained in the CalEEMod model were, therefore, relied upon for the calculation of construction-generated emissions. Two excavators were included in the modeling for RAW activities, based on information derived from the RAW report prepared for this project. The export of contaminated soil is estimated to require approximately 500 truckloads. To be conservative, construction of the project was assumed to begin in 2019 and extend through year 2020. Due to anticipated reductions in future fleet-average emission rates, emissions for post-year 2020 conditions would be less. Modeling assumptions and output files are included in Appendix A of this report.

Long-term Impacts

Long-term operational emissions of criteria air pollutants associated with the proposed project were calculated using the CalEEMod computer program. Modeling was conducted based on traffic data derived, in part, from the *traffic analysis prepared for the proposed project* (JLB 2018). Mobile source emissions were conservatively based on the default fleet distribution assumptions contained in the model. All other modeling assumptions were based on the default parameters contained in the CalEEMod computer model. Modeling assumptions and output files are included in Appendix A of this report. Localized concentrations of TACs were evaluated based on the Air Toxics Health Risk Assessment (ATHRA) prepared for this project (AECOM 2019). Localized concentrations of other pollutants, including fugitive dust, mobile-source CO, and odors were qualitatively assessed. As previously noted, an estimated date of project construction and opening date are dependent, in part, on yet-to-be-identified funding. To be conservative, operation of the project was assumed to begin in 2020. Due to anticipated reductions in future fleet-average mobile-source and energy emission rates, emissions for post-year 2020 operational conditions would be less.

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the CEQA Guidelines Initial Study Checklist, a project would be considered to have a significant impact to climate change if it would:

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

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.

c) Expose sensitive receptors to substantial pollutant concentrations.

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

To assist local jurisdictions in the evaluation of air quality impacts, the SJVAPCD has published the Guide for Assessing and Mitigating Air Quality Impacts (SJVAPCD 2015). This guidance document includes recommended thresholds of significance to be used for the evaluation of short-term construction, long-term operational, odor, toxic air contaminant, and cumulative air quality impacts. Accordingly, the SJVAPCD-recommended thresholds of significance are used to determine whether implementation of the proposed project would result in a significant air quality impact. The thresholds of significance are summarized below.

- Short-term Emissions—Construction impacts associated with the proposed project would be considered significant if project-generated emissions would exceed 100 tons per year (TPY) of CO, 10 TPY of ROG or NO_X, 27 TPY of SO_X, or 15 TPY of PM_{10} or $PM_{2.5}$.
- Long-term Emissions—Operational impacts associated with the proposed project would be considered significant if project generated emissions would exceed 100 TPY of CO, 10 TPY of ROG or NO_X, 27 TPY of SO_X, or 15 TPY of PM_{10} or $PM_{2.5}$.
- Conflict with or Obstruct Implementation of Applicable Air Quality Plan—Due to the region's non-attainment status for ozone, $PM_{2.5}$, and PM_{10}, if project-generated emissions of ozone precursor pollutants (i.e., ROG and NO_x) or PM would exceed the SJVAPCD's significance thresholds, then the project would be considered to conflict with the attainment plans.

- Local Mobile-Source CO Concentrations—Local mobile source impacts associated with the proposed project would be considered significant if the project contributes to CO concentrations at receptor locations in excess of the CAAQS (i.e., 9.0 ppm for 8 hours or 20 ppm for 1 hour).
- Exposure to toxic air contaminants (TAC) would be considered significant if the probability of contracting cancer for the Maximally Exposed Individual (i.e., maximum individual risk) would exceed 20 in 1 million or would result in a Hazard Index greater than 1.
- Odor impacts associated with the proposed project would be considered significant if the project has the potential to frequently expose members of the public to objectionable odors.

In addition to the above thresholds, the SJVAPCD also recommends the use of daily emissions thresholds for the evaluation of project impacts on localized ambient air quality conditions. Accordingly, the proposed project would also be considered to result in a significant contribution to localized ambient air quality if on-site emissions or ROG, NO_X, PM_{10}, $PM_{2.5}$, CO, or SO_2 associated with either short-term construction or long-term operational activities would exceed a daily average of 100 pounds per day (lbs/day) for each of the pollutants evaluated (SJVAPCD 2015).

PROJECT IMPACTS

Impact AQ-A.	***Would the project conflict with or obstruct implementation of the applicable air quality plan?***

In accordance with SJVAPCD-recommended methodology for the assessment of air quality impacts, projects that result in significant air quality impacts at the project level are also considered to have a significant cumulative air quality impact. As noted in Impact AQ-B, short-term construction and long-term operational emissions would not exceed applicable thresholds. In addition, the proposed project's contribution to localized concentrations of emissions, including emissions of CO, TACs, and odors, are considered less than significant. However, as noted in Impact AQ-C, the proposed project could result in a significant contribution to localized PM concentrations for which the SJVAB is currently designated non-attainment. For this reason, implementation of the proposed project could conflict with air quality attainment or maintenance planning efforts. This impact would be considered ***potentially significant***.

Mitigation Measure: Implement Mitigation Measure AQ-1 (refer to Impact AQ-C).

Significance after Mitigation: With implementation of Mitigation Measure AQ-1 this impact would be considered less than significant.

Impact AQ-B.	***Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?***

The proposed project is located in the City of Fresno, which is within the SJVAB. The SJVAB is designated nonattainment for the national 8-hour ozone and $PM_{2.5}$ standards. On September 25, 2008, the U.S. EPA redesignated the San Joaquin Valley to attainment for the PM_{10} NAAQS and approved the PM_{10} Maintenance Plan (SJVAPCD 2019). Potential air quality impacts associated with the proposed project could potentially occur during project construction or operational phases. Short-term construction and long-term air quality impacts associated with the proposed project are discussed, as follows:

Short-term Construction Emissions

Short-term increases in emissions would occur during the construction process. Construction-generated emissions are of temporary duration, lasting only as long as construction activities occur, but have the potential to represent a significant air quality impact. The construction of the proposed project would result in the temporary generation of emissions associated with site grading and excavation, paving, motor vehicle exhaust associated with construction equipment, and worker trips; as well as, the movement of construction equipment on unpaved surfaces. Short-term construction emissions would result in increased emissions of ozone-precursor pollutants (i.e., ROG and NO_X) and emissions of PM. Emissions of ozone-precursors would result from the operation of on-road and off-road motorized vehicles and equipment. Emissions of airborne PM are largely dependent on the amount of ground disturbance associated with site grading and excavation activities and can result in increased concentrations of PM that can adversely affect nearby sensitive land uses. Estimated construction-generated annual emissions associated with the proposed project alternatives are summarized in Table 4.

Table 4
Annual Construction Emissions

Construction Phase	Uncontrolled Maximum Annual Emissions (TPY) [1]					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction Year 1						
Demolition	0.04	0.45	0.24	0.00	0.09	0.03
RAW & Grading	0.02	0.23	0.11	0.00	0.05	0.03
Building Construction	0.11	0.96	0.76	0.00	0.09	0.06
Total:	0.16	1.64	1.11	0.00	0.23	0.11
Construction Year 2						
Building Construction	0.23	2.04	1.70	0.00	0.20	0.12
Paving	0.02	0.14	0.15	0.00	0.01	0.01
Architectural Coating	0.22	0.10	0.15	0.00	0.02	0.01
Total:	0.47	2.28	2.00	0.01	0.23	0.14
Maximum Annual Emissions:	0.47	2.28	2.00	0.01	0.23	0.14
Significance Thresholds:	*10*	*10*	*None*	*None*	*15*	*15*
Exceeds Thresholds/Significant Impact?:	*No*	*No*	*No*	*No*	*No*	*No*

1. Based on CalEEMod computer modeling. Totals may not sum due to rounding. Does not include emission control measures. Construction start date has not yet been identified. To be conservative, emissions modeling assumes construction could begin in 2019. Future year emissions would be less.
Refer to Appendix A for modeling results and assumptions.

As noted in Table 4, construction of the proposed project would generate maximum uncontrolled annual emissions of approximately 0.47 tons/year of ROG, 2.28 tons/year of NO_x, 2.00 tons/year of CO, 0.01 tons/year of SO_2, 0.01 tons/year of PM_{10}, and 0.23 tons/year of $PM_{2.5}$. Estimated construction-generated emissions would not exceed the SJVAPCD's significance thresholds of 10 tons/year of ROG, 10 tons/year of NO_x, or 15 tons/year PM_{10}.

Estimated average-daily on-site construction emissions are summarized in Table 5. As noted in Table 5, construction of the proposed project would generate maximum uncontrolled on-site emissions of approximately 7.76 lbs/day of ROG, 35.78 lbs/day of NO_x, 32.92 lbs/day of CO, 8.72 lbs/day of PM_{10}, and 4.84 lbs/day of $PM_{2.5}$. The highest average-daily emissions would generally occur during the demolition of the existing structures, and RAW excavation and grading activities. Emissions of SO_2 would be negligible (e.g., less than 0.1 tons/year). Average-daily on-site construction emissions would not exceed the SJVAPCD's recommended localized ambient air quality significance thresholds of 100 lbs/day for each of the criteria air pollutants evaluated.

Short-term construction of the proposed project would not result in a significant impact to regional or local air quality conditions. Furthermore, it is important to note that project construction, including RAW excavation and grading activities, would be required to comply with SJVPACD Regulation VIII (Fugitive PM_{10} Prohibitions). Mandatory compliance with SJVAPCD Regulation VIII would further reduce emissions of fugitive dust from the project site and minimize the project's potential to adversely affect nearby sensitive receptors. With compliance with SJVAPCD Regulation VIII, emissions of PM would be reduced by approximately 50 percent, or more. Given that project-generated emissions would not exceed applicable SJVAPCD significance thresholds, this impact would be considered ***less than significant***.

Table 5
Daily On-Site Construction Emissions

Construction Phase	Uncontrolled Daily Emissions (lbs/day) [1]					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Demolition	3.51	35.78	22.06	0.04	8.68	2.71
RAW & Grading	2.84	31.03	19.56	0.04	8.72	4.85
Building Construction – Year 1	2.51	22.38	18.22	0.03	1.37	1.29
Building Construction – Year 2	2.07	18.72	16.44	0.03	0.76	0.69
Paving	2.01	14.07	14.65	0.02	0.11	0.11
Architectural Coating	3.68	1.68	1.83	0.00	0.11	0.11
Maximum Daily On-site Emissions:	7.76	35.78	32.92	0.05	8.72	4.84
Significance Thresholds:	*100*	*100*	*100*	*100*	*100*	*100*
Exceeds Thresholds/Significant Impact?:	*No*	*No*	*No*	*No*	*No*	*No*

1. Based on CalEEMod computer modeling. Totals may not sum due to rounding. Does not include emission control measures, including dust control per Regulation VIII.
2. Average daily on-site emissions are based on total on-site emissions divided by the total number of construction days.
3. Maximum daily on-site emissions assumes building construction, paving, and architectural coating application could potentially occur simultaneously.
Refer to Appendix A for modeling results and assumptions.

Long-term Operational Emissions

Estimated annual operational emissions for the proposed project are summarized in Table 6. As depicted, the proposed project would result in operational emissions of approximately 0.7 tons/year of ROG, 4.3 tons/year of NO_X, 3.3 tons/year of CO, 0.8 tons/year of PM_{10}, and 0.3 tons/year of $PM_{2.5}$ during the initial year of operation. Emissions of SO_2 would be negligible (i.e., less than 0.1 tons/year). Operational emissions would be projected to decline in future years, with improvements in fuel-consumption emissions standards. Operational emissions would not exceed SJVAPCD's mass-emissions significance thresholds.

Estimated average-daily on-site operational emissions are also summarized in Table 7. Average-daily on-site operational emissions would be largely associated with area sources (e.g., landscape maintenance activities and use of consumer products) and the use of natural-gas fired appliances. Average-daily on-site emissions of ROG would total approximately 6 lbs/day. Average-daily on-site emissions of other pollutants would be negligible (i.e., less than 0.1 lbs/day). Average-daily on-site emissions would not exceed the SJVAPCD's recommended localized ambient air quality significance thresholds of 100 lbs/day for each of the criteria air pollutants evaluated.

Long-term operation of the proposed project would not result in a significant impact to regional or local air quality conditions. It is important to note that estimated operational emissions are conservatively based on the default vehicle fleet distribution assumptions contained in the model, which include contributions from medium and heavy-duty trucks. Mobile sources associated with schools typically consist largely to light-duty vehicles and buses. As a result, actual mobile source emissions would likely be less than estimated. This impact is considered ***less than significant***.

Table 6
Long-term Operational Emissions (Unmitigated)

Season	Uncontrolled Annual Emissions (tons/year)[1]					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Area Source	0.30	0.00	0.00	0.00	0.00	0.00
Energy Use	0.01	0.08	0.07	0.00	0.00	0.00
Mobile Source[2]	0.53	6.27	5.00	0.02	1.33	0.38
Total:	0.84	6.35	5.07	0.02	1.33	0.38
Significance Thresholds (tons):	*10*	*10*	*None*	*None*	*15*	*None*
Exceeds Thresholds/Significant Impact?:	*No*	*No*	*--*	*--*	*No*	*--*
Average Daily On-site Emissions (lbs)[3]:	*6.0*	*Negligible*				
Significance Thresholds (lbs):	*100*	*100*	*100*	*100*	*100*	*100*
Exceeds Thresholds/Significant Impact?:	*No*	*No*	*No*	*No*	*No*	*No*

1. Emissions were calculated using the CalEEMod computer program. Does not include implementation of emissions control measures.
2. Fleet distribution data for the project is not available. Mobile source emissions are conservatively based on default vehicle fleet distribution for Fresno County, which includes all vehicle types/classifications, including medium and heavy-duty vehicles. Actual emissions would likely be lower.
3. Based on calculated annual operational emissions from area sources and an average of 200 operational days annually.
Totals may not sum due to rounding.
Refer to Appendix A for modeling assumptions and results.

Impact AQ-C. Would the project expose sensitive receptors to substantial pollutant concentrations?

Sensitive land uses located in the vicinity of the proposed project site consist predominantly of residential land uses. The nearest residential land uses are located adjacent to the western boundary of the project site. Residential land uses are also located to the south and east of the project site (refer to Figure 1). Long-term operational and short-term construction activities and emission sources that could adversely impact these nearest sensitive receptors are discussed, as follows:

Long-term Operation

Localized Mobile-Source CO Emissions

Carbon monoxide is the primary criteria air pollutant of local concern associated with the proposed project. Under specific meteorological and operational conditions, such as near areas of heavily congested vehicle traffic, CO concentrations may reach unhealthy levels. If inhaled, CO can be adsorbed easily by the blood stream and can inhibit oxygen delivery to the body, which can cause significant health effects ranging from slight headaches to death. The most serious effects are felt by individuals susceptible to oxygen deficiencies, including people with anemia and those suffering from chronic lung or heart disease.

Mobile-source emissions of CO are a direct function of traffic volume, speed, and delay. Transport of CO is extremely limited because it disperses rapidly with distance from the source under normal meteorological conditions. For this reason, modeling of mobile-source CO concentrations is typically recommended for sensitive land uses located near signalized roadway intersections that are projected to operate at unacceptable levels of service (i.e., LOS E or F). Localized CO concentrations associated with the proposed project would be considered less-than-significant impact if: (1) traffic generated by the proposed project would not result in deterioration of a signalized intersection to a LOS of E or F; or (2) the project would not contribute additional traffic to a signalized intersection that already operates at LOS of E or F.

Signalized intersections in the project area include the intersections of Orange Avenue/Ventura Avenue, Cedar Avenue/Ventura Avenue and Cedar Avenue/Butler Avenue. With implementation of the proposed traffic improvements, these intersections are projected to operate at LOS D, or better, for existing-plus-project, near-term, and future cumulative conditions (JBL 2019). In comparison to the CO screening criteria, implementation of the proposed project would not result in or contribute to unacceptable levels of service (i.e., LOS E, or worse) at nearby signalized intersections. As a result, the proposed project would not be anticipated to contribute substantially to localized CO concentrations that would exceed applicable standards. For this reason, this impact would be considered ***less than significant***.

Toxic Air Contaminants

An air toxics health risk assessment (ATHRA) was prepared for the proposed project site by AECOM in April 2019. The ATHRA included an analysis of all identified sources located within one-quarter mile of the project site. Based on the HRA prepared, the following emission sources were identified and included in the analysis:

- Chevron gasoline station, 4161 E. Ventura Avenue
- Sinclair gasoline station, 4202 E. Kings Canyon Road
- Rosy's Mexican Restaurant, 4244 E. Kings Canyon Road
- Me-n-Ed's Pizzeria, 4072 E. Ventura Avenue
- Lola's Ricos Tacos, 4066 E. Ventura Avenue
- Fosters Freeze, 3858 E. Ventura Avenue
- Tacos Tijuana, 3838 E. Ventura Avenue
- Castillo's Mexican Food, 3659 E. Ventura Avenue
- Family Dollar, 4077 E. Ventura Avenue
- Golden Work Finish, 3951 E. Ventura Avenue
- City of Fresno Water Division, 3905 E. Mono Avenue

Source categories included in the ATHRA included on-site and off-site truck travel, on-site truck idling, transportation refrigeration units, commercial cooking emissions, gasoline storage and dispensing, stationary emergency engine usage, coating and miscellaneous material usage. Predicted onsite health risks for onsite students and staff are summarized in Table 7. Based on the analysis conducted, predicted cancer risk and non-cancer hazard index for onsite student and staff exposures were determined to not exceed the SJVAPCD's significance thresholds. In addition, implementation of the proposed project would not result in the long-term operation of any major onsite stationary sources of TACs, nor would project implementation result in a significant increase in diesel-fueled vehicles traveling along area roadways. For these reasons, long-term exposure to TACs would be considered ***less than significant***.

Table 7
Summary of Health Risk Assessment Results for the Proposed Elementary School Site

Receptor	Predicted Risk	Risk Threshold	Exceeds Threshold?
Student			
Cancer Risk	7.23E-06	1.00E-05	No
Chronic Hazard Index	1.11E-02	1.0	No
Acute Hazard Index	5.96E-03	1.0	No
Staff			
Cancer Risk	5.49E-07	1.00E-05	No
Chronic Hazard Index	1.11E-02	1.0	No
Acute Hazard Index	5.96E-03	1.0	No
Source: AECOM 2019			

Short-term Construction

Naturally Occurring Asbestos

Naturally-occurring asbestos, which was identified by ARB as a TAC in 1986, is located in many parts of California and is commonly associated with ultramafic rock. The project site is not located near any areas that are likely to contain ultramafic rock (DOC 2000). As a result, risk of exposure to asbestos during the construction process would be considered ***less than significant***.

Diesel-Exhaust Emissions

Implementation of the proposed project would result in the generation of DPM emissions during construction associated with the use of off-road diesel equipment for site grading and excavation, paving and other construction activities. Health-related risks associated with diesel-exhaust emissions are primarily associated with long-term exposure and associated risk of contracting cancer. For residential land uses, the calculation of cancer risk associated with exposure of to TACs are typically calculated based on a 25 to 30-year period of exposure. The use of diesel-powered construction equipment, however, would be temporary and episodic and would occur over a relatively large area. Assuming that construction activities involving the use of diesel-fueled equipment would occur over an approximate 18-month period, project-related construction activities would constitute less than six percent of the typical exposure period. As a result, exposure to construction-generated DPM would not be anticipated to exceed applicable thresholds (i.e., incremental increase in cancer risk of 20 in one million). In addition, implementation of Mitigation Measure AQ-1 would result in further reductions of on-site DPM emissions. For these reasons, this impact would be considered ***less than significant***.

Localized PM Concentrations

The proposed project will require the excavation and removal of contaminated soils at the project site. Excavation activities would likely require the use of excavators, front-end loaders, and various other types of off-road equipment. A Removal Action Workplan (RAW) has been prepared for the proposed project, which identifies various measures to be implemented to control airborne emissions generated during RAW activities, including the preparation of a dust control plan. The dust control plan will include requirements for the monitoring of airborne contaminants during the RAW activities to ensure that localized concentrations at nearby receptors would not exceed applicable ambient air quality standards.

Fugitive dust emissions would also be associated with other construction-related activities, including building demolition, material handling, and vehicle travel on unpaved and paved surfaces. On-site off-road equipment and trucks would also result in short-term emissions of diesel-exhaust PM, which could contribute to elevated localized concentration at nearby receptors. Uncontrolled emissions of fugitive dust may also contribute to increased occurrences of Valley Fever and potential increases in nuisance impacts to nearby receptors. For these reasons, localized uncontrolled concentrations of construction-generated PM, particularly activities not specifically addressed in the RAW, would be considered to have a ***potentially-significant*** impact.

Mitigation Measure AQ-1: The following measures shall be implemented to reduce potential expose of nearby sensitive receptors to localized concentrations of construction-generated PM:

1. On-road diesel vehicles shall comply with Section 2485 of Title 13 of the California Code of Regulations. This regulation limits idling from diesel-fueled commercial motor vehicles with gross vehicular weight ratings of more than 10,000 pounds and licensed for operation on highways. It applies to California and non-California based vehicles. In general, the regulation specifies that drivers of said vehicles:
    a. Shall not idle the vehicle's primary diesel engine for greater than 5 minutes at any location, except as noted in Subsection (d) of the regulation; and,
    b. Shall not operate a diesel-fueled auxiliary power system to power a heater, air conditioner, or any ancillary equipment on that vehicle during sleeping or resting in a sleeper berth for greater

than 5.0 minutes at any location when within 1,000 feet of a restricted area, except as noted in Subsection (d) of the regulation.

2. Off-road diesel equipment shall comply with the 5 minute idling restriction identified in Section 2449(d)(2) of the California Air Resources Board's In-Use off-Road Diesel regulation. The specific requirements and exceptions in the regulations can be reviewed at the following web sites: www.arb.ca.gov/msprog/truck-idling/2485.pdf and ww.arb.ca.gov/regact/2007/ordiesl07/frooal.pdf.
3. Signs shall be posted at the project site construction entrance to remind drivers and operators of the state's 5 minute idling limit.
4. To the extent available, replace fossil-fueled equipment with alternatively-fueled (e.g., natural gas) or electrically-driven equivalents.
5. Construction truck trips shall be scheduled, to the extent feasible, to occur during non-peak hours and truck haul routes shall be selected to minimize impacts to nearby residential dwellings.
6. The burning of vegetative material shall be prohibited.
7. The proposed project shall comply with SJVAPCD Regulation VIII for the control of fugitive dust emissions. Regulation VIII can be obtained on the SJVAPCD's website at website URL: https://www.valleyair.org/rules/1ruleslist.htm. At a minimum, the following measures shall be implemented:
   a. All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.
   b. All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
   c. All land clearing, grubbing, scraping, excavation, land leveling, grading, cut & fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
   d. With the demolition of buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition.
   e. When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.
   f. All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions.) (Use of blower devices is expressly forbidden.)
   g. Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
   h. On-road vehicle speeds on unpaved surfaces of the project site shall be limited to 15 mph.
   i. Sandbags or other erosion control measures shall be installed sufficient to prevent silt runoff to public roadways from sites with a slope greater than one percent.
   j. Excavation and grading activities shall be suspended when winds exceed 20 mph (Regardless of wind speed, an owner/operator must comply with Regulation VIII's 20 percent opacity limitation).
8. The above measures for the control of construction-generated emissions shall be included on site grading and construction plans.

Impact AQ-D. Would the project result in other emissions (such as those leading to odors) affecting a substantial number of people?

Other emissions potentially associated with the proposed project would be predominantly associated to the generation of odors during project construction. The occurrence and severity of odor impacts depends on numerous factors, including: the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. While offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and regulatory agencies.

Construction of the proposed project would involve the use of a variety of gasoline or diesel-powered equipment that would emit exhaust fumes. Exhaust fumes, particularly diesel-exhaust, may be considered objectionable by some people. In addition, pavement coatings and architectural coatings used during project construction would also emit temporary odors. However, construction-generated emissions would occur intermittently throughout the workday and would dissipate rapidly within increasing distance from the source. As a result, short-term construction activities would not expose a substantial number of people to frequent odorous emissions. In addition, no major sources of odors have been identified in the project area. This impact would be considered ***less than significant***.

GREENHOUSE GASES AND CLIMATE CHANGE

EXISTING SETTING

To fully understand global climate change, it is important to recognize the naturally occurring "greenhouse effect" and to define the greenhouse gases (GHGs) that contribute to this phenomenon. Various gases in the earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Primary GHGs attributed to global climate change, are discussed, as follows:

- **Carbon Dioxide**. Carbon dioxide (CO_2) is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere (U.S. EPA 2018).

- **Methane**. Methane (CH_4) is a colorless, odorless gas that is not flammable under most circumstances. CH_4 is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (enteric fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years (U.S. EPA 2018).

- **Nitrous Oxide**. Nitrous oxide (N_2O) is a clear, colorless gas with a slightly sweet odor. N_2O is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 114 years (U.S. EPA 2018).

- **Hydrofluorocarbons.** Hydrofluorocarbons (HFCs) are man-made chemicals, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The only significant emissions of HFCs before 1990 were of the chemical HFC-23, which is generated as a byproduct of the production of HCFC-22 (or Freon 22, used in air conditioning applications). The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 270 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes of less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, has an atmospheric life of 14 years) (U.S. EPA 2018).

- **Perfluorocarbons.** Perfluorocarbons (PFCs) are colorless, highly dense, chemically inert, and nontoxic. There are seven PFC gases: perfluoromethane (CF_4), perfluoroethane (C_2F_6), perfluoropropane (C_3F_8), perfluorobutane (C_4F_{10}), perfluorocyclobutane (C_4F_8), perfluoropentane (C_5F_{12}), and perfluorohexane (C_6F_{14}). Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere in the past; however, the largest current source is aluminum production, which releases CF_4 and C_2F_6 as byproducts. The estimated atmospheric lifetimes for PFCs ranges from 2,600 to 50,000 years (U.S. EPA 2018).

- **Nitrogen Trifluoride**. Nitrogen trifluoride (NF_3) is an inorganic, colorless, odorless, toxic, nonflammable gas used as an etchant in microelectronics. Nitrogen trifluoride is predominantly employed in the cleaning of the plasma-enhanced chemical vapor deposition chambers in the production of liquid crystal displays and silicon-based thin film solar cells. It has a global warming potential of 16,100 carbon dioxide equivalents (CO_2e). While NF_3 may have a lower global warming potential than other chemical etchants, it is still a potent GHG. In 2009, NF_3 was listed by California as a high global warming potential GHG to be listed and regulated under Assembly Bill (AB) 32 (Section 38505 Health and Safety Code).

- **Sulfur Hexafluoride**. Sulfur hexafluoride (SF_6) is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF_6 is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF_6 produced worldwide. Leaks of SF_6 occur from aging equipment and during equipment maintenance and servicing. SF_6 has an atmospheric life of 3,200 years (U.S. EPA 2018).

- **Black Carbon**. Black carbon is the strongest light-absorbing component of particulate matter (PM) emitted from burning fuels such as coal, diesel, and biomass. Black carbon contributes to climate change both directly by absorbing sunlight and indirectly by depositing on snow and by interacting with clouds and affecting cloud formation. Black carbon is considered a short-lived species, which can vary spatially and, consequently, it is very difficult to quantify associated global-warming potentials. The main sources of black carbon in California are wildfires, off-road vehicles (locomotives, marine vessels, tractors, excavators, dozers, etc.), on-road vehicles (cars, trucks, and buses), fireplaces, agricultural waste burning, and prescribed burning (planned burns of forest or wildlands) (CCAC 2018, U.S. EPA 2018).

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Often, estimates of GHG emissions are presented in CO_2e, which weight each gas by its global warming potential (GWP). Expressing GHG emissions in CO_2e takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted. Table 8 provides a summary of the GWP for GHG emissions of typical concern with regard to community development projects, based on a 100-year time horizon. As indicated, Methane traps over 25 times more heat per molecule than CO_2, and N_2O absorbs roughly 298 times more heat per molecule than CO_2. Additional GHG with high GWP include Nitrogen trifluoride, Sulfur hexafluoride, Perfluorocarbons, and black carbon.

Table 8
Global Warming Potential for Greenhouse Gases

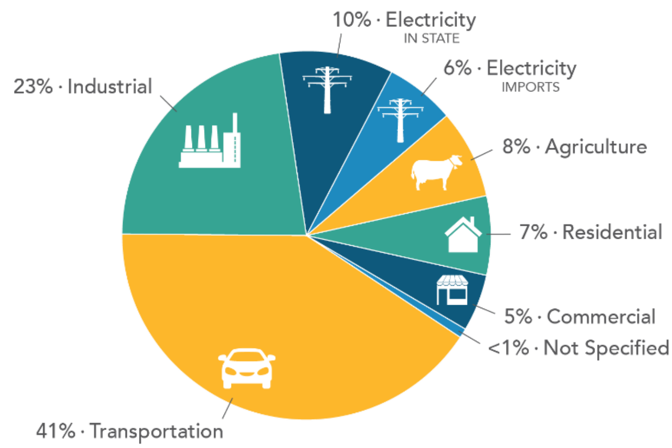
Greenhouse Gas	Global Warming Potential (100-year)
Carbon Dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous Dioxide (N_2O)	298
**Based on IPCC GWP values for 100-year time horizon Source: IPCC 2007*	

SOURCES OF GHG EMISSIONS

On a global scale, GHG emissions are predominantly associated with activities related to energy production; changes in land use, such as deforestation and land clearing; industrial sources; agricultural activities; transportation; waste and wastewater generation; and commercial and residential land uses. World-wide, energy production including the burning of coal, natural gas, and oil for electricity and heat are typically considered the largest single sources of global GHG emissions.

In 2016, GHG emissions within California totaled 429.4 million metric tons of carbon dioxide equivalents (MMTCO_2e). Within California, the transportation sector is the largest contributor, accounting for roughly 41 percent of the total state-wide GHG emissions. Emissions associated with the industrial sector are the second largest contributor, totaling approximately 23 percent. Emissions from in-state electricity generation, imported electricity, agriculture, residential, and commercial uses constitute the remaining major sources on GHG emissions. In comparison to the year 2014 emissions inventory, overall GHG emissions in California decreased by 12 MMTCO2e. The State of California GHG emissions inventory for year 2016, by main economic sector, is depicted in Figure 3 (ARB 2019c).

Figure 3
State of California Greenhouse Gases Emissions Inventory by Main Economic Sector



Emissions inventory is categorized based on main economic sector. "Not Specified" includes sources that could not be attributed to an individual sector, such as evaporative losses and emissions from use of ozone-depleting substances.
Source: ARB 2019c

Short-Lived Climate Pollutants

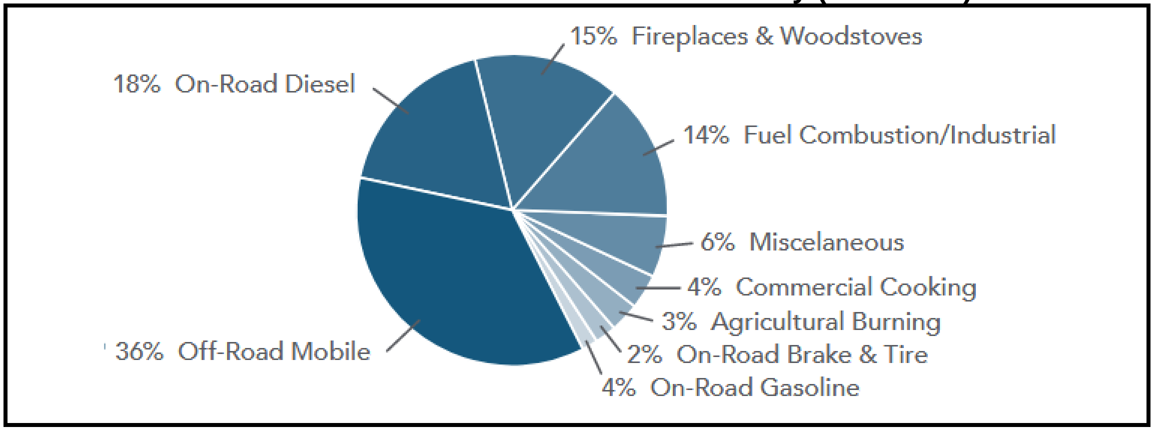
Short-lived climate pollutants (SLCPs), such as black carbon, fluorinated gases, and methane also have a dramatic effect on climate change. Though short lived, these pollutants create a warming influence on the climate that is many times more potent than that of carbon dioxide.

As part of the ARB's efforts to address SLCPs, the ARB has developed a statewide emission inventory for black carbon. The black carbon inventory will help support implementation of the SLCP Strategy, but it is not part of the State's GHG Inventory that tracks progress towards the State's climate targets. The most recent inventory for year 2013 conditions is depicted in Figure 4. As depicted, off-road mobile sources account for a majority of black carbon emissions totaling roughly 36 percent of the inventory. Other major anthropogenic sources of black carbon include on-road transportation, residential wood burning, fuel combustion, and industrial processes (ARB 2017).

EFFECTS OF GLOBAL CLIMATE CHANGE

There are uncertainties as to exactly what the climate changes will be in various local areas of the earth. There are also uncertainties associated with the magnitude and timing of other consequences of a warmer planet: sea level rise, spread of certain diseases out of their usual geographic range, the effect on agricultural production, water supply, sustainability of ecosystems, increased strength and frequency of storms, extreme heat events, increased air pollution episodes, and the consequence of these effects on the economy.

Figure 4
California Black Carbon Emissions Inventory (Year 2013)



Source: ARB 2017

Within California, climate changes would likely alter the ecological characteristics of many ecosystems throughout the state. Such alterations would likely include increases in surface temperatures and changes in the form, timing, and intensity of precipitation. For instance, historical records are depicting an increasing trend toward earlier snowmelt in the Sierra Nevada. This snowpack is a principal supply of water for the state, providing roughly 50 percent of state's annual runoff. If this trend continues, some areas of the state may experience an increased danger of floods during the winter months and possible exhaustion of the snowpack during spring and summer months. An earlier snowmelt would also impact the State's energy resources. Currently, approximately 20 percent of California's electricity comes from hydropower. An early exhaustion of the Sierra snowpack, may force electricity producers to switch to more costly or non-renewable forms of electricity generation during spring and summer months. A changing climate may also impact agricultural crop yields, coastal structures, and biodiversity. As a result, resultant changes in climate will likely have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry (ARB 2017).

REGULATORY FRAMEWORK

FEDERAL

Executive Order 13514

Executive Order 13514 is focused on reducing GHGs internally in federal agency missions, programs, and operations. In addition, the executive order directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

On April 2, 2007, in Massachusetts v. U.S. EPA, 549 U.S. 497 (2007), the Supreme Court found that GHGs are air pollutants covered by the FCAA and that the U.S. EPA has the authority to regulate GHG. The Court held that the U.S. EPA Administrator must determine whether or not emissions of GHGs from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator found that the current and projected concentrations of the six key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.

- Cause or Contribute Finding: The Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the U.S. EPA's Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles, which was published on September 15, 2009. On May 7, 2010 the final Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards was published in the Federal Register.

U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations. These steps were outlined by President Obama in a Presidential Memorandum on May 21, 2010.

The final combined U.S. EPA and NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile (the equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO_2 level solely through fuel economy improvements). Together, these standards will cut GHG emissions by an estimated 960 MMT and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016). On August 28, 2012, U.S. EPA and NHTSA issued their joint rule to extend this national program of coordinated GHG and fuel economy standards to model years 2017 through 2025 passenger vehicles.

STATE

Assembly Bill 1493

AB 1493 (Pavley) of 2002 (Health and Safety Code Sections 42823 and 43018.5) requires the ARB to develop and adopt the nation's first GHG emission standards for automobiles. These standards are also known as Pavley I. The California Legislature declared in AB 1493 that global warming is a matter of increasing concern for public health and the environment. It cites several risks that California faces from climate change, including a reduction in the state's water supply; an increase in air pollution caused by higher temperatures; harm to agriculture; an increase in wildfires; damage to the coastline; and economic losses caused by higher food, water, energy, and insurance prices. The bill also states that technological solutions to reduce GHG emissions would stimulate California's economy and provide jobs. In 2004, the State of California submitted a request for a waiver from federal clean air regulations, as the State is authorized to do under the FCAA, to allow the State to require reduced tailpipe emissions of CO_2. In late 2007, the U.S. EPA denied California's waiver request and declined to promulgate adequate federal regulations limiting GHG emissions. In early 2008, the State brought suit against the U.S. EPA related to this denial.

In January 2009, President Obama instructed the U.S. EPA to reconsider the Bush Administration's denial of California's and 13 other states' requests to implement global warming pollution standards for cars and trucks. In June 2009, the U.S. EPA granted California's waiver request, enabling the State to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

In 2009, President Obama announced a national policy aimed at both increasing fuel economy and reducing GHG pollution for all new cars and trucks sold in the US. The new standards would cover model years 2012 to 2016 and would raise passenger vehicle fuel economy to a fleet average of 35.5 miles per gallon by 2016. When the national program takes effect, California has committed to allowing automakers who show compliance with the national program to also be deemed in compliance with state requirements. California is committed to further strengthening these standards beginning in 2017 to obtain a 45 percent GHG reduction from the 2020 model year vehicles.

Executive Order No. S-3-05

Executive Order S-3-05 (State of California) proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the secretary of CalEPA created a Climate Action Team made up of members from various state agencies and commissions. The Climate Action Team released its first report in March 2006 and continues to release periodic reports on progress. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

Assembly Bill 32 - California Global Warming Solutions Act of 2006

AB 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599) requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases that are regulated by AB 32 include CO_2, CH_4, N_2O, HFCs, PFCs, NF_3, and SF_6. The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

Climate Change Scoping Plan

In October 2008, ARB published its *Climate Change Proposed Scoping Plan*, which is the State's plan to achieve GHG reductions in California required by AB 32. This initial Scoping Plan contained the main strategies to be implemented in order to achieve the target emission levels identified in AB 32. The Scoping Plan included ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations were associated with improving emissions standards for light-duty vehicles, implementing the Low Carbon Fuel Standard program, implementation of energy efficiency measures in buildings and appliances, and the widespread development of combined heat and power systems, and developing a renewable portfolio standard for electricity production.

The Scoping Plan states that land use planning and urban growth decisions will play important roles in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. ARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emissions sectors. With regard to land use planning, the Scoping Plan expects approximately 5.0 MMT CO_2e will be achieved associated with implementation of Senate Bill 375, which is discussed further below.

The initial Scoping Plan was first approved by ARB on December 11, 2008 and is updated every five years. The first update of the Scoping Plan was approved by the ARB on May 22, 2014, which looked past 2020 to set mid-term goals (2030-2035) on the road to reaching the 2050 goals., The most recent update released by ARB is the *2017 Climate Change Scoping Plan*, which was released In November 2017. The *2017 Climate Change Scoping Plan* incorporates strategies for achieving the 2030 GHG-reduction target established in SB 32 and EO B-30-15.

Senate Bill 1078 and Governor's Order S-14-08 (California Renewables Portfolio Standards)

Senate Bill 1078 (Public Utilities Code Sections 387, 390.1, 399.25 and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum 20 percent of their supply from renewable sources by 2017. This Senate Bill will affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive Order S-14-08, which set the Renewables Portfolio Standard target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target. Executive Order S-14-08 was later superseded by Executive Order S-21-09 on September 15, 2009. Executive Order S-21-09 directed the ARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. Statute SB X1-2 superceded this Executive Order in 2011, which obligated all California electricity providers, including investor-owned utilities and publicly owned utilities, to obtain at least 33 percent of their energy from renewable electrical generation facilities by 2020.

ARB is required by current law, AB 32 of 2006, to regulate sources of GHGs to meet a state goal of reducing GHG emissions to 1990 levels by 2020 and an 80 percent reduction of 1990 levels by 2050. The California Energy Commissions and California Public Utilities Commission serve in advisory roles to help ARB develop the regulations to administer the 33 percent by 2020 requirement. ARB is also authorized to increase the target and accelerate and expand the time frame.

Mandatory Reporting of GHG Emissions

The California Global Warming Solutions Act (AB 32, 2006) requires the reporting of GHGs by major sources to the ARB. Major sources required to report GHG emissions include industrial facilities, suppliers of transportation fuels, natural gas, natural gas liquids, liquefied petroleum gas, and carbon dioxide, operators of petroleum and natural gas systems, and electricity retail providers and marketers.

Cap-and-Trade Regulation

The cap-and-trade regulation is a key element in California's climate plan. It sets a statewide limit on sources responsible for 85 percent of California's GHG emissions and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The cap-and-trade rules came into effect on January 1, 2013, and apply to large electric power plants and large industrial plants. In 2015, fuel distributors, including distributors of heating and transportation fuels, also became subject to the cap-and-trade rules. At that stage, the program will encompass around 360 businesses throughout California and nearly 85 percent of the state's total GHG emissions.

Under the cap-and-trade regulation, companies must hold enough emission allowances to cover their emissions and are free to buy and sell allowances on the open market. California held its first auction of GHG allowances on November 14, 2012. California's GHG cap-and-trade system is projected to reduce GHG emissions to 1990 levels by the year 2020 and would achieve an approximate 80 percent reduction from 1990 levels by 2050.

Senate Bill 32

SB 32 was signed by Governor Brown on September 8, 2016. SB 32 effectively extends California's GHG emission-reduction goals from year 2020 to year 2030. This new emission-reduction target of 40 percent below 1990 levels by 2030 is intended to promote further GHG-reductions in support of the State's ultimate goal of reducing GHG emissions by 80 percent below 1990 levels by 2050. SB 32 also directs the ARB to update the Climate Change Scoping Plan to address this interim 2030 emission-reduction target.

Senate Bill 375

SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will address land use allocation in that MPOs regional transportation plan. ARB, in consultation with MPOs, establishes regional reduction targets for GHGs emitted by passenger cars and light trucks for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, funding for transportation projects may be withheld.

California Building Code

The California Building Code (CBC) contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The California Building Code is adopted every three years by the Building Standards Commission (BSC). In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBC standards apply statewide; however, a local jurisdiction may amend a CBC standard if it makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

Green Building Standards

In essence, green buildings standards are indistinguishable from any other building standards. Both standards are contained in the California Building Code and regulate the construction of new buildings and improvements. The only practical distinction between the two is that whereas the focus of traditional building standards has been protecting public health and safety, the focus of green building standards is to improve environmental performance.

AB 32, which mandates the reduction of GHG emissions in California to 1990 levels by 2020, increased the urgency around the adoption of green building standards. In its scoping plan for the implementation of AB 32, ARB identified energy use as the second largest contributor to California's GHG emissions, constituting roughly 25 percent of all such emissions. In recommending a green building strategy as one element of the scoping plan, ARB estimated that green building standards would reduce GHG emissions by approximately 26 MMT of CO_2e by 2020. The green buildings standards were most recently updated in 2016.

Senate Bill 97

Senate Bill 97 (SB 97) was enacted in 2007. SB 97 required OPR to develop, and the Natural Resources Agency to adopt, amendments to the CEQA Guidelines addressing the analysis and mitigation of GHG emissions. Those CEQA Guidelines amendments clarified several points, including the following:

- Lead agencies must analyze the GHG emissions of proposed projects and must reach a conclusion regarding the significance of those emissions.
- When a project's GHG emissions may be significant, lead agencies must consider a range of potential mitigation measures to reduce those emissions.
- Lead agencies must analyze potentially significant impacts associated with placing projects in hazardous locations, including locations potentially affected by climate change.
- Lead agencies may significantly streamline the analysis of GHGs on a project level by using a programmatic GHG emissions reduction plan meeting certain criteria.
- CEQA mandates analysis of a proposed project's potential energy use (including transportation-related energy), sources of energy supply and ways to reduce energy demand, including through the use of efficient transportation alternatives.

Short-Lived Climate Pollutant Reduction Strategy

In March 2017, the ARB adopted the *Short-Lived Climate Pollutant Reduction Strategy* (*SLCP Strategy*) establishing a path to decrease GHG emissions and displace fossil-based natural gas use. Strategies include avoiding landfill methane emissions by reducing the disposal of organics through edible food recovery, composting, in-vessel digestion, and other processes; and recovering methane from wastewater treatment facilities, and manure methane at dairies, and using the methane as a renewable source of natural gas to fuel vehicles or generate electricity. The *SLCP Strategy* also identifies steps to reduce natural gas leaks from oil and gas wells, pipelines, valves, and pumps to improve safety, avoid energy losses, and reduce methane emissions associated with natural gas use. Lastly, the *SLCP Strategy* also identifies measures that can reduce hydrofluorocarbon (HFC) emissions at national and international levels, in addition to State-level action that includes an incentive program to encourage the use of low-Global Warming Potential (GWP) refrigerants, and limitations on the use of high-GWP refrigerants in new refrigeration and air-conditioning equipment (ARB 2017).

SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT

SJVAPCD Climate Change Action Plan

On August 21, 2008, the SJVAPCD Governing Board approved the SJVAPCD's *Climate Change Action Plan* with the following goals and actions:

Goals:

- Assist local land-use agencies with California Environmental Quality Act (CEQA) issues relative to projects with GHG emissions increases.
- Assist Valley businesses in complying with mandates of AB 32.
- Ensure that climate protection measures do not cause increase in toxic or criteria pollutants that adversely impact public health or environmental justice communities.

Actions:

- Authorize the Air Pollution Control Officer to develop GHG significance threshold(s) or other mechanisms to address CEQA projects with GHG emissions increases. Begin the requisite public process, including public workshops, and develop recommendations for Governing Board consideration in the spring of 2009.
- Authorize the Air Pollution Control Officer to develop necessary regulations and instruments for establishment and administration of the San Joaquin Valley Carbon Exchange Bank for voluntary GHG reductions created in the Valley. Begin the requisite public process, including public workshops, and develop recommendations for Governing Board consideration in spring 2009.
- Authorize the Air Pollution Control Officer to enhance the SJVAPCD's existing criteria pollutant emissions inventory reporting system to allow businesses subject to AB32 emission reporting requirements to submit simultaneous streamlined reports to the SJVAPCD and the state of California with minimal duplication.
- Authorize the Air Pollution Control Officer to develop and administer voluntary GHG emission reduction agreements to mitigate proposed GHG increases from new projects.
- Direct the Air Pollution Control Officer to support climate protection measures that reduce GHG emissions as well as toxic and criteria pollutants. Oppose measures that result in a significant increase in toxic or criteria pollutant emissions in already impacted area.

SJVAPCD CEQA Greenhouse Gas Guidance.

On December 17, 2009, the SJVAPCD Governing Board adopted "Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA" and the policy, "District Policy—Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency." The SJVAPCD concluded that the existing science is inadequate to support quantification of the impacts that project specific greenhouse gas emissions have on global climatic change. The SJVAPCD found the effects of project-specific emissions to be cumulative, and without mitigation, that their incremental contribution to global climatic change could be considered cumulatively considerable. The SJVAPCD found that this cumulative impact is best addressed by requiring all projects to reduce their greenhouse gas emissions, whether through project design elements or mitigation.

The SJVAPCD's approach is intended to streamline the process of determining if project-specific greenhouse gas emissions would have a significant effect. Projects exempt from the requirements of CEQA, and projects complying with an approved plan or mitigation program would be determined to have a less than significant cumulative impact. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources and have a certified final CEQA document.

Best performance standards (BPS) would be established according to performance-based determinations. Projects complying with BPS would not require specific quantification of greenhouse gas emissions and would be determined to have a less than significant cumulative impact for greenhouse gas emissions. Projects not complying with BPS would require quantification of greenhouse gas emissions and demonstration that greenhouse gas emissions have been reduced or mitigated by 29 percent, as targeted by ARB's AB 32 Scoping Plan. Furthermore, quantification of greenhouse gas emissions would be required for all projects for which the lead agency has determined that an Environmental Impact Report is required, regardless of whether the project incorporates Best Performance Standards.

For stationary source permitting projects, best performance standards are "the most stringent of the identified alternatives for control of greenhouse gas emissions, including type of equipment, design of equipment and operational and maintenance practices, which are achieved-in-practice for the identified service, operation, or emissions unit class." For development projects, best performance standards are "any combination of identified greenhouse gas emission reduction measures, including project design elements and land use decisions that reduce project specific greenhouse gas emission reductions by at least 29 percent compared with business as usual." The SJVAPCD proposes to create a list of all approved Best Performance Standards to help in the determination as to whether a proposed project has reduced its GHG emissions by 29 percent.

IMPACTS & MITIGATION MEASURES

METHODOLOGY

Short-term Impacts

Short-term construction emissions associated with the proposed project were calculated using the CalEEMod computer program. Modeling includes emissions generated during site preparation/grading, asphalt paving, facility construction, and application of architectural coatings. Detailed construction information, including construction schedules and equipment requirements, has not been identified for the proposed project. Default construction phases and equipment assumptions contained in the CalEEMod model were, therefore, relied upon for the calculation of construction-generated emissions. To be conservative, construction was assumed to begin in 2018 and occur over an approximate As previously noted, an estimated date of project construction has not yet been identified. However, the District estimates that the school could be constructed within approximately five years. To be conservative, construction of the project was assumed to begin in 2018. Due to anticipated reductions in future fleet-average emission rates, emissions for post-year 2018 conditions would be less. Modeling assumptions and output files are included in Appendix A of this report.

Long-term Impacts

Long-term operational GHG emissions associated with the proposed project were calculated using the CalEEMod computer program. Modeling was conducted based on traffic data derived, in part, from the traffic analysis prepared for the proposed project (JLB 2018). Mobile-source emissions were conservatively based on the default fleet distribution assumptions contained in the model. All other modeling assumptions were based on the default parameters contained in the CalEEMod computer model. As previously noted, an estimated date of project construction and opening have not yet been identified. However, the District estimates that the school could be constructed within approximately five years. To be conservative, initial operation of the project was assumed to begin in 2020. Due to anticipated reductions in future fleet-average mobile-source and energy emission rates, emissions for post-year 2020 operational conditions would be less. Modeling assumptions and output files are included in Appendix A of this report.

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the CEQA Guidelines Initial Study Checklist, a project would be considered to have a significant impact to climate change if it would:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or,

b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

San Joaquin Valley Air Pollution Control District

In accordance with the SJVAPCD's *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects Under CEQA* (SJVAPCD 2009), a project would be considered to have a less than significant impact on climate change if it would comply with at least one of the following criteria:

- Comply with an approved GHG emission reduction plan or GHG mitigation program which avoids or substantially reduces GHG emissions within the geographic area in which the project is located. Such plans or programs must be specified in law or approved by the lead agency with jurisdiction over the affected resource and supported by a CEQA compliant environmental review document adopted by the lead agency, or
- Implement approved best performance standards, or
- Quantify project GHG emissions and reduce those emissions by at least 29 percent compared to "business as usual" (BAU).

The SJVAPCD has not yet adopted best performance standards for development projects. In addition, although the City of Fresno has adopted a GHG-reduction plan for emissions generated by activities under the control or influence of the City, the City's GHG-reduction plan does not specifically address the development of schools for which the FUSD is the lead agency. The quantification of project-generated GHG emissions in comparison to BAU conditions to determine consistency with AB 32's reduction goals is considered appropriate in some instances. However, based on the California Supreme Court's decision in *Center for Biological Diversity v. California Department of Fish and Wildlife and Newhall Land and Farming (2015) 224 Cal.App.4th 1105 (CBD vs. CDFW;* also known as the *"Newhall Ranch case")*, substantial evidence would need to be provided to document that project-level reductions in comparison to a BAU approach would be consistent with achieving AB 32's overall statewide reduction goal. Given that AB 32's statewide goal includes reductions that are not necessarily related to an individual development project, the use of this approach may be difficult to support given the lack of substantial evidence to adequately demonstrate a link between the data contained in the AB 32 Scoping Plan and individual development projects. Alternatively, the Court identified potential options for evaluating GHG impacts for individual development projects, which included the use of GHG efficiency metrics. In general, GHG efficiency metrics can be used to assess the GHG efficiency of an individual project based on a per capita basis or on a service population basis.

A GHG efficiency threshold based on service population can be calculated by dividing the GHG emissions inventory goal (allowable emissions), by the estimated service population of the individual project. For most development projects, service population is traditionally defined as the sum of the number of jobs and the number of residents provided by a project. However, this traditional definition of service population may not be applicable to all projects, depending on the end use. For instance, with regard to schools, the student and employee population is the primary generator of GHG emissions with a majority of the school's emissions being associated with student vehicle trips. Therefore, the calculated GHG efficiency of the proposed project was expanded to include the proposed student and employee population. GHG efficiency for the proposed project was calculated for years 2020 and 2030 to be consistent with state GHG-reduction target years. The methodology used for quantification of the target efficiency threshold applied to the proposed project is summarized in Table 9. Project-generated GHG emissions that would exceed the efficiency threshold of 4.9 $MTCO_2e$ per service population ($MTCO_2e$/SP/year) in year 2020 or 2.6

$MTCO_2e$/SP/year in 2030 would be considered to have a potentially significant impact on the environment that could conflict with GHG-reduction planning efforts. To be conservative, construction-generated GHG emissions were amortized based on an estimated 30-year project life and included in annual operational GHG emissions estimates.

Table 9
Project-Level GHG Efficiency Threshold Calculation

	2020	2030
Land Use Sectors GHG Emissions Target[1]	287,000,000	168,000,000
Population[2]	40,619,346	44,085,600
Employment[3]	18,195,720	20,908,816
Service Population	58,815,066	64,994,416
GHG Efficiency Threshold ($MTCO_2e$/SP/yr)	4.9	2.6

Based on AB 32 Scoping Plan's land use inventory sectors for years 2020 and 2030; Includes transportation sources.

1. *California Air Resources Board. California 1990 Greenhouse Gas Emissions Level and 2020 Limit — by Sector and Activity (Land Use-driven sectors only) MMT CO2e - (based upon IPCC Fourth Assessment Report Global Warming Potentials)*
2. *California Department of Finance Demographic Research Unit Report P-2 "State and County Population Projections by Race/Ethnicity and Age (5-year groups)" 2010 through 2060 (as of July 1). Published 12/15/2014*
3. *California Department of Finance Employment Development Department. Industry Employment Projections Labor Market Information Division 2010-2020 (Published 5/23/2012) and 2012-2022 (Published 9/19/2014)*

PROJECT IMPACTS

Impact GHG-A. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? and

Implementation of the proposed project would contribute to increases of GHG emissions that are associated with global climate change. Short-term and long-term GHG emissions associated with the development of the proposed project are discussed in greater detail, as follows:

Short-term Greenhouse Gas Emissions

Short-term annual GHG emissions are summarized in Table 10. Based on the modeling conducted, annual emissions of GHGs associated with construction of the proposed project would total approximately 654.6 $MTCO_2e$. There would also be a small amount of GHG emissions from waste generated during construction; however, this amount is speculative. Actual emissions would vary, depending on various factors including construction schedules, equipment required, and activities conducted. Assuming an average project life of 30 years, amortized construction-generated GHG emissions would total approximately 21.8 $MTCO_2e$/yr. Amortized construction-generated GHG emissions were included in the operational GHG emissions inventory for the evaluation of project-generated GHG emissions (refer to Table 11).

Table 10
Short-Term Construction GHG Emissions

Construction Year	Total GHG Emissions ($MTCO_2e$)
Year 1	251.6
Year 2	403.0
Total:	654.6
Amortized Construction Emissions:	21.8

Based on CalEEMod computer modeling. Assumes a 30-year project life. Refer to Appendix A for modeling results and assumptions.

Long-term Greenhouse Gas Emissions

Estimated long-term increases in GHG emissions associated with the proposed project are summarized in Table 11. Based on the modeling conducted, operational GHG emissions would total approximately 2,431.7 $MTCO_2e$/year in 2020 and approximately 2,401.1 $MTCO_2e$/year in 2030. With the inclusion of amortized construction emissions, operational GHG emissions would total approximately 2,453.5 $MTCO_2e$/year in 2020 and approximately 2,422.9 $MTCO_2e$/year in 2030. Based on these estimates and assuming an on-site population of 887 students and 103 employees, the calculated GHG efficiency for the proposed project would be 2.48 $MTCO_2e$/SP/yr in 2020 and 2.45 $MTCO_2e$/SP/yr in 2030. The GHG efficiency for the proposed project would not exceed the thresholds of 4.9 $MTCO_2e$/SP/yr in 2020 or 2.6 $MTCO_2e$/SP/yr in 2030.

Table 11
Long-term Operational GHG Emissions

Emissions Source	GHG Emissions ($MTCO_2e$ per year) [1]	
	Year 2020	Year 2030
Energy Use	204.4	175.8
Mobile Sources[2]	2,196.1	2,195.8
Waste Generation[3]	22.2	22.2
Water Use[4]	9.0	7.3
Total Project Operational Emissions:	2,431.7	2,401.1
Amortized Construction Emissions:	21.8	21.8
Net Increase:	2,453.5	2,422.9
Project GHG Efficiency ($MTCO_2e$/SP/yr)[5]:	2.48	2.45
GHG Efficiency Threshold ($MTCO_2e$/SP/yr):	4.9	2.6
Exceeds Threshold/Significant Impact?	No	No

1. Project-generated emissions were quantified using the CalEEMod computer program.
2. Fleet distribution data for the project is not available. Mobile source emissions are conservatively based on default vehicle fleet distribution for Fresno County, which includes all vehicle types/classificaations, including medium and heavy-duty vehicles. Actual emissions would likely be lower. Assumes no net increase in vehicle trips for relocation of school district staff to existing on-site office buildings.
3. Based on state-wide waste diversion rate of 50 percent for 2020 and target diversion of 75% for 2030.
4. Includes installation of low-flow water fixtures and water-efficient irrigation systems, per California's 2015 water-efficiency standards.
5. Based on a combined student and employee population of 990 individuals (OPR 2019).
Refer to Appendix A for modeling results and assumptions.

Based on the modeling conducted, the calculated GHG efficiency for the proposed project would be 2.5 $MTCO_2e$/SP/yr in 2020 and 2030. As depicted in Table 11, operational GHG emissions associated with the proposed project would be predominantly associated with mobile sources. It is important to note that mobile-source emissions were conservatively calculated, based on the default fleet-distribution assumptions contained in the model, which includes medium and heavy-duty vehicles. Mobile sources associated with schools typically consist largely to light-duty vehicles and buses. As a result, actual mobile-source emissions would be less. Nonetheless, because the GHG efficiency for the proposed project would not exceed the efficiency thresholds of 4.9 $MTCO_2e$/SP/yr in 2020 or 2.6 $MTCO_2e$/SP/yr in 2030, this impact would be considered ***less than significant***.

Impact GHG-B. Would the project conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

As noted in Impact GHG-A, the proposed project would not result in increased GHG emissions that would conflict with AB 32 GHG-reduction targets. The proposed project would be designed to meet current building energy-efficiency standards, which includes measures to reduce overall energy use, water use, and waste generation. The project would also be designed to promote the use of alternative means of transportation, such as bicycle use, and to provide improved pedestrian access that would link the project site to nearby land uses. These improvements would help to further reduce the project's GHG emissions and would also help to reduce community-wide GHG emissions. For these reasons, the proposed project would not conflict with local or state GHG-reduction planning efforts. This impact would be considered ***less than significant***.

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APPENDIX A

EMISSIONS MODELING & DOCUMENTATION

EMISSIONS SUMMARY - ANNUAL CONSTRUCTION

UNMITIGATED EMISSIONS (TONS)

					PM10			**PM2.5**			
CONSTRUCTION YR 1	**ROG**	**NOX**	**CO**	**SOX**	**FUG**	**EXH**	**TOT**	**FUG**	**EXH**	**TOT**	**CO2E**
DEMOLITION											
ONSITE	0.0351	0.3578	0.2206	3.90E-04	0.0688	0.018	0.0868	0.0104	0.0167	0.0271	34.8672
OFFSITE	3.46E-03	0.0963	0.0175	2.70E-04	6.64E-03	3.80E-04	7.02E-03	1.81E-03	3.70E-04	2.18E-03	25.6315
TOTAL	0.03856	0.4541	0.2381	0.00066	0.07544	0.01838	0.09382	0.01221	0.01707	0.02928	60.4987
RAW&GRADING											
ONSITE	0.0142	0.1552	0.0978	1.70E-04	0.036	7.63E-03	0.0436	0.0172	7.02E-03	0.0242	15.7633
OFFSITE	2.51E-03	0.0756	0.0124	2.10E-04	4.87E-03	2.90E-04	5.17E-03	1.34E-03	2.80E-04	1.62E-03	19.8438
TOTAL	0.01671	0.2308	0.1102	0.00038	0.04087	0.00792	0.04877	0.01854	0.0073	0.02582	35.6071
BUILDING CONSTRUCTION											
ONSITE	0.0815	0.7272	0.5922	9.30E-04	0	0.0445	0.0445	0	0.0418	0.0418	81.6049
OFFSITE	0.027	0.2321	0.1664	7.90E-04	0.0439	1.81E-03	0.0457	0.0119	1.72E-03	0.0136	73.8355
TOTAL	0.1085	0.9593	0.7586	0.00172	0.0439	0.04631	0.0902	0.0119	0.04352	0.0554	155.4404
					PM10			**PM2.5**			
CONSTRUCTION YR 2	**ROG**	**NOX**	**CO**	**SOX**	**FUG**	**EXH**	**TOT**	**FUG**	**EXH**	**TOT**	**CO2E**
BUILDING CONSTRUCTION											
ONSITE	0.1707	1.5445	1.3563	2.17E-03	0	0.0899	0.0899	0	0.0846	0.0846	187.5832
OFFSITE	0.0558	0.4953	0.3434	1.81E-03	0.1023	2.99E-03	0.1053	0.0278	2.84E-03	0.0306	169.2369
TOTAL	0.2265	2.0398	1.6997	0.00398	0.1023	0.09289	0.1952	0.0278	0.08744	0.1152	356.8201
PAVING											
ONSITE	0.0201	0.1407	0.1465	2.30E-04		7.53E-03	7.53E-03		6.93E-03	6.93E-03	20.1902
OFFSITE	6.50E-04	4.10E-04	4.17E-03	1.00E-05	1.20E-03	1.00E-05	1.21E-03	3.20E-04	1.00E-05	3.30E-04	1.0386
TOTAL	0.02075	0.14111	0.15067	0.00024	0.0012	0.00754	0.00874	0.00032	0.00694	0.00726	21.2288
ARCH COATING											
ONSITE	0.217	0.0994	0.1081	1.80E-04		6.55E-03	6.55E-03		6.55E-03	6.55E-03	15.0934
OFFSITE	6.11E-03	3.88E-03	0.0394	1.10E-04	0.0113	7.00E-05	0.0114	3.01E-03	7.00E-05	3.08E-03	9.8044
TOTAL	0.22311	0.10328	0.1475	0.00029	0.0113	0.00662	0.01795	0.00301	0.00662	0.00963	24.8978
TOTAL ANNUAL EMISSIONS											
CONST YR 1	**0.16377**	**1.6442**	**1.1069**	**0.00276**	**0.16021**	**0.07261**	**0.23279**	**0.04265**	**0.06789**	**0.1105**	**251.5462**
CONST YR 2	**0.47036**	**2.28419**	**1.99787**	**0.00451**	**0.1148**	**0.10705**	**0.22189**	**0.03113**	**0.101**	**0.13209**	**402.9467**
TOTAL ALL CONST YRS	**0.63413**	**3.92839**	**3.10477**	**0.00727**	**0.27501**	**0.17966**	**0.45468**	**0.07378**	**0.16889**	**0.24259**	**654.4929**

EMISSIONS SUMMARY - AVERAGE DAILY CONSTRUCTION

UNMITIGATED ONSITE EMISSIONS (LBS)

		CONST					PM10			PM2.5		
CONSTRUCTION YR 1		**DAYS**	**ROG**	**NOX**	**CO**	**SOX**	**FUG**	**EXH**	**TOT**	**FUG**	**EXH**	**TOT**
DEMOLITION		20										
	ONSITE		3.51	35.78	22.06	0.039	6.88	1.8	8.68	1.04	1.67	2.71
	OFFSITE											
	TOTAL											
RAW&GRADING		10										
	ONSITE		2.84	31.04	19.56	0.034	7.2	1.526	8.72	3.44	1.404	4.84
	OFFSITE											
	TOTAL											
BUILDING CONSTRUCTION		65										
	ONSITE		2.507692	22.37538	18.22154	0.028615	0	1.369231	1.369231	0	1.286154	1.286154
	OFFSITE											
	TOTAL											

		CONST					PM10			PM2.5		
CONSTRUCTION YR 2		**DAYS**	**ROG**	**NOX**	**CO**	**SOX**	**FUG**	**EXH**	**TOT**	**FUG**	**EXH**	**TOT**
BUILDING CONSTRUCTION		165										
	ONSITE		2.069091	18.72121	16.44	0.026303	0	1.089697	1.089697	0	1.025455	1.025455
	OFFSITE											
	TOTAL											
PAVING		20										
	ONSITE		2.01	14.07	14.65	0.023	0	0.753	0.753	0	0.693	0.693
	OFFSITE											
	TOTAL											
ARCH COATING		118										
	ONSITE		3.677966	1.684746	1.832203	0.003051	0	0.111017	0.111017	0	0.111017	0.111017
	OFFSITE											
	TOTAL											
	TOTAL BLDG CONST, PAVING, COATING		7.757057	34.47596	32.9222	0.052354	0	1.953714	1.953714	0	1.829471	1.829471
	MAX. ON-SITE EMISSIONS		**7.757057**	**35.78**	**32.9222**	**0.052354**	**0**	**1.953714**	**8.72**	**0**	**1.829471**	**4.84**

EMISSIONS SUMMARY - ANNUAL AVG. DAILY ON-SITE OPERATIONAL

	ON-SITE EMISSIONS (TONS/YR)									
					PM10			PM2.5		
	ROG	NOX	CO	SOX	FUG	EXH	TOT	FUG	EXH	TOT
ARCH COATINGS	0.02									
CONSUMER PRODUCTS	0.2791									
LANDSCAPE MAINTENANCE	0.00006	0.00001	0.00067							
NATURAL GAS USE	0.29916	0.00001	0.00067	0.0005	0	0.00635	0.00635	0	0.00635	0.00635
TOTAL ANNUAL EMISSIONS	0.59832	0.00002	0.00134	0.0005	0	0.00635	0.00635	0	0.00635	0.00635
OPERATIONAL DAYS	200									
AVG. DAILY EMISSIONS	**5.9832**	**0.0002**	**0.0134**	**0.005**	**0**	**0.0635**	**0.0635**	**0**	**0.0635**	**0.0635**

FUSD Ventura Alt Ed Campus

Fresno County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	2.40	1000sqft	0.06	2,400.00	0
High School	65.45	1000sqft	1.50	65,450.00	0
Parking Lot	5.00	Acre	5.00	217,800.00	0
User Defined Educational	0.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	488.3	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Includes RPS adjustment.

Land Use - Includes 2400sf child care facility, 65450sf high school, 5 ac paved. District offices will occupy existing office buildings.

Construction Phase - Based on model defaults. RAW excavation based on information provided. Arch coating based on building const period, excluding initial approx. four-month framing period.

Off-road Equipment - Off-road equipment based on model defaults.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Based on model defaults. Assumes an additional grader for RAW excavation (2 total).

Grading - Assumes 10,000 cy exported during RAW (500 truckloads).

Demolition - 139805 sf demolished

Trips and VMT - Based on model defaults. Includes 500 truckloads for RAW export.

Architectural Coating - Assumes 50 g/L for interior/exterior paint.

Vehicle Trips - Based on trip gen from the traffic analysis.

Road Dust - Based on model defaults.

Area Coating - Assumes 50 g/L for interior/exterior paints.

Energy Use -

Construction Off-road Equipment Mitigation - Assumes T3 for modeling purposes. Mitigation includes 50%CE for watering vehicle travel surfaces, 61%CE for graded surfaces, 15mph onsite speed limit.

Mobile Commute Mitigation -

Energy Mitigation - Assumes minimum 16% reduction for use of high-efficiency lighting.

Water Mitigation - Includes use of low-flow water fixtures and water-efficient irrigation systems.

Waste Mitigation - Assumes 50% diversion rate based on current statewide averages.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	50.00
tblArchitecturalCoating	EF_Residential_Exterior	150.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	150.00	50.00

tblAreaCoating	Area_EF_Nonresidential_Exterior	150	50
tblAreaCoating	Area_EF_Nonresidential_Interior	150	50
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
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tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	118.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	PhaseEndDate	10/7/2020	8/12/2020
tblConstructionPhase	PhaseEndDate	9/25/2019	9/11/2019
tblConstructionPhase	PhaseStartDate	9/10/2020	3/1/2020
tblGrading	AcresOfGrading	5.00	10.00
tblGrading	MaterialExported	0.00	10,000.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	641.35	488.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblTripsAndVMT	HaulingTripNumber	1,250.00	500.00
tblTripsAndVMT	WorkerTripNumber	18.00	15.00
tblVehicleTrips	WD_TR	74.06	47.08
tblVehicleTrips	WD_TR	12.89	25.65
tblVehicleTrips	WD_TR	0.00	14.37

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1638	1.6442	1.1067	2.7600e-003	0.1601	0.0726	0.2327	0.0427	0.0679	0.1106						251.5462
2020	0.4703	2.2840	1.9978	4.5000e-003	0.1148	0.1071	0.2219	0.0311	0.1009	0.1320						402.9467
Maximum	**0.4703**	**2.2840**	**1.9978**	**4.5000e-003**	**0.1601**	**0.1071**	**0.2327**	**0.0427**	**0.1009**	**0.1320**						**402.9467**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0708	1.1662	1.1689	2.7600e-003	0.0962	0.0467	0.1430	0.0258	0.0465	0.0724						251.5460
2020	0.3352	1.8378	2.1068	4.5000e-003	0.1148	0.0875	0.2023	0.0311	0.0874	0.1185						402.9464
Maximum	**0.3352**	**1.8378**	**2.1068**	**4.5000e-003**	**0.1148**	**0.0875**	**0.2023**	**0.0311**	**0.0874**	**0.1185**						**402.9464**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**35.97**	**23.53**	**-5.51**	**0.00**	**23.25**	**25.27**	**24.04**	**22.85**	**20.71**	**21.36**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**8-1-2019**	**10-31-2019**	1.1346	0.7484
2	**11-1-2019**	**1-31-2020**	0.9879	0.7309
3	**2-1-2020**	**4-30-2020**	1.0264	0.8093
4	**5-1-2020**	**7-31-2020**	1.1059	0.8787
5	**8-1-2020**	**9-30-2020**	0.3061	0.2408
		Highest	1.1346	0.8787

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2994	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003
Energy	9.1900e-003	0.0835	0.0702	5.0000e-004		6.3500e-003	6.3500e-003		6.3500e-003	6.3500e-003						214.3491
Mobile	0.5318	6.2683	5.0034	0.0235	1.2998	0.0275	1.3274	0.3505	0.0261	0.3766						2,196.0688
Waste						0.0000	0.0000		0.0000	0.0000						44.3609
Water						0.0000	0.0000		0.0000	0.0000						10.3939
Total	**0.8403**	**6.3518**	**5.0742**	**0.0240**	**1.2998**	**0.0339**	**1.3337**	**0.3505**	**0.0325**	**0.3829**						**2,465.1742**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2994	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003
Energy	9.1900e-003	0.0835	0.0702	5.0000e-004		6.3500e-003	6.3500e-003		6.3500e-003	6.3500e-003						204.4170
Mobile	0.5318	6.2683	5.0034	0.0235	1.2998	0.0275	1.3274	0.3505	0.0261	0.3766						2,196.0688
Waste						0.0000	0.0000		0.0000	0.0000						22.1805
Water						0.0000	0.0000		0.0000	0.0000						8.9484
Total	**0.8403**	**6.3518**	**5.0742**	**0.0240**	**1.2998**	**0.0339**	**1.3337**	**0.3505**	**0.0325**	**0.3829**						**2,431.6161**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.36**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	8/1/2019	8/28/2019	5	20	
2	RAW & Site Grading	Grading	8/29/2019	9/11/2019	5	10	
3	Building Construction	Building Construction	9/26/2019	8/12/2020	5	230	
4	Paving	Paving	8/13/2020	9/9/2020	5	20	
5	Architectural Coating	Architectural Coating	3/1/2020	8/12/2020	5	118	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 101,775; Non-Residential Outdoor: 33,925; Striped Parking Area: 13,068 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
RAW & Site Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
RAW & Site Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
RAW & Site Grading	Graders	1	8.00	187	0.41
RAW & Site Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	24.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	120.00	47.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	15.00	0.00	636.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
RAW & Site Grading	7	15.00	0.00	500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0688	0.0000	0.0688	0.0104	0.0000	0.0104						0.0000
Off-Road	0.0351	0.3578	0.2206	3.9000e-004		0.0180	0.0180		0.0167	0.0167						34.8672
Total	**0.0351**	**0.3578**	**0.2206**	**3.9000e-004**	**0.0688**	**0.0180**	**0.0868**	**0.0104**	**0.0167**	**0.0271**						**34.8672**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.7500e-003	0.0959	0.0128	2.6000e-004	5.4400e-003	3.7000e-004	5.8100e-003	1.4900e-003	3.6000e-004	1.8500e-003						24.5595
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	7.1000e-004	4.7000e-004	4.6700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.0720
Total	**3.4600e-003**	**0.0963**	**0.0175**	**2.7000e-004**	**6.6400e-003**	**3.8000e-004**	**7.0200e-003**	**1.8100e-003**	**3.7000e-004**	**2.1800e-003**						**25.6315**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0268	0.0000	0.0268	4.0600e-003	0.0000	4.0600e-003						0.0000
Off-Road	0.0101	0.1845	0.2428	3.9000e-004		8.6900e-003	8.6900e-003		8.6300e-003	8.6300e-003						34.8671
Total	**0.0101**	**0.1845**	**0.2428**	**3.9000e-004**	**0.0268**	**8.6900e-003**	**0.0355**	**4.0600e-003**	**8.6300e-003**	**0.0127**						**34.8671**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.7500e-003	0.0959	0.0128	2.6000e-004	5.4400e-003	3.7000e-004	5.8100e-003	1.4900e-003	3.6000e-004	1.8500e-003						24.5595
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	7.1000e-004	4.7000e-004	4.6700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.0720
Total	**3.4600e-003**	**0.0963**	**0.0175**	**2.7000e-004**	**6.6400e-003**	**3.8000e-004**	**7.0200e-003**	**1.8100e-003**	**3.7000e-004**	**2.1800e-003**						**25.6315**

3.3 RAW & Site Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0360	0.0000	0.0360	0.0172	0.0000	0.0172						0.0000
Off-Road	0.0142	0.1552	0.0978	1.7000e-004		7.6300e-003	7.6300e-003		7.0200e-003	7.0200e-003						15.7633
Total	**0.0142**	**0.1552**	**0.0978**	**1.7000e-004**	**0.0360**	**7.6300e-003**	**0.0436**	**0.0172**	**7.0200e-003**	**0.0242**						**15.7633**

3.3 RAW & Site Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.1600e-003	0.0754	0.0101	2.0000e-004	4.2700e-003	2.9000e-004	4.5700e-003	1.1800e-003	2.8000e-004	1.4600e-003						19.3078
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.5000e-004	2.3000e-004	2.3400e-003	1.0000e-005	6.0000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004						0.5360
Total	**2.5100e-003**	**0.0756**	**0.0124**	**2.1000e-004**	**4.8700e-003**	**2.9000e-004**	**5.1700e-003**	**1.3400e-003**	**2.8000e-004**	**1.6200e-003**						**19.8438**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0140	0.0000	0.0140	6.7100e-003	0.0000	6.7100e-003						0.0000
Off-Road	4.5300e-003	0.0869	0.1132	1.7000e-004		4.3900e-003	4.3900e-003		4.3700e-003	4.3700e-003						15.7632
Total	**4.5300e-003**	**0.0869**	**0.1132**	**1.7000e-004**	**0.0140**	**4.3900e-003**	**0.0184**	**6.7100e-003**	**4.3700e-003**	**0.0111**						**15.7632**

3.3 RAW & Site Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.1600e-003	0.0754	0.0101	2.0000e-004	4.2700e-003	2.9000e-004	4.5700e-003	1.1800e-003	2.8000e-004	1.4600e-003						19.3078
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.5000e-004	2.3000e-004	2.3400e-003	1.0000e-005	6.0000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004						0.5360
Total	**2.5100e-003**	**0.0756**	**0.0124**	**2.1000e-004**	**4.8700e-003**	**2.9000e-004**	**5.1700e-003**	**1.3400e-003**	**2.8000e-004**	**1.6200e-003**						**19.8438**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0815	0.7272	0.5922	9.3000e-004		0.0445	0.0445		0.0418	0.0418						81.6049
Total	**0.0815**	**0.7272**	**0.5922**	**9.3000e-004**		**0.0445**	**0.0445**		**0.0418**	**0.0418**						**81.6049**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	7.4600e-003	0.2192	0.0374	4.6000e-004	0.0108	1.5900e-003	0.0123	3.1000e-003	1.5200e-003	4.6300e-003						44.2485
Worker	0.0196	0.0129	0.1290	3.3000e-004	0.0331	2.2000e-004	0.0333	8.8000e-003	2.0000e-004	9.0000e-003						29.5871
Total	**0.0270**	**0.2321**	**0.1664**	**7.9000e-004**	**0.0439**	**1.8100e-003**	**0.0457**	**0.0119**	**1.7200e-003**	**0.0136**						**73.8355**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0233	0.4908	0.6166	9.3000e-004		0.0312	0.0312		0.0312	0.0312						81.6048
Total	**0.0233**	**0.4908**	**0.6166**	**9.3000e-004**		**0.0312**	**0.0312**		**0.0312**	**0.0312**						**81.6048**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	7.4600e-003	0.2192	0.0374	4.6000e-004	0.0108	1.5900e-003	0.0123	3.1000e-003	1.5200e-003	4.6300e-003						44.2485
Worker	0.0196	0.0129	0.1290	3.3000e-004	0.0331	2.2000e-004	0.0333	8.8000e-003	2.0000e-004	9.0000e-003						29.5871
Total	**0.0270**	**0.2321**	**0.1664**	**7.9000e-004**	**0.0439**	**1.8100e-003**	**0.0457**	**0.0119**	**1.7200e-003**	**0.0136**						**73.8355**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1707	1.5445	1.3563	2.1700e-003		0.0899	0.0899		0.0846	0.0846						187.5832
Total	**0.1707**	**1.5445**	**1.3563**	**2.1700e-003**		**0.0899**	**0.0899**		**0.0846**	**0.0846**						**187.5832**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0141	0.4688	0.0749	1.0700e-003	0.0251	2.4900e-003	0.0276	7.2400e-003	2.3800e-003	9.6200e-003						102.3509
Worker	0.0417	0.0265	0.2685	7.4000e-004	0.0772	5.0000e-004	0.0777	0.0205	4.6000e-004	0.0210						66.8861
Total	**0.0558**	**0.4953**	**0.3434**	**1.8100e-003**	**0.1023**	**2.9900e-003**	**0.1053**	**0.0278**	**2.8400e-003**	**0.0306**						**169.2369**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0543	1.1452	1.4388	2.1700e-003		0.0727	0.0727		0.0727	0.0727						187.5830
Total	**0.0543**	**1.1452**	**1.4388**	**2.1700e-003**		**0.0727**	**0.0727**		**0.0727**	**0.0727**						**187.5830**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0141	0.4688	0.0749	1.0700e-003	0.0251	2.4900e-003	0.0276	7.2400e-003	2.3800e-003	9.6200e-003						102.3509
Worker	0.0417	0.0265	0.2685	7.4000e-004	0.0772	5.0000e-004	0.0777	0.0205	4.6000e-004	0.0210						66.8861
Total	**0.0558**	**0.4953**	**0.3434**	**1.8100e-003**	**0.1023**	**2.9900e-003**	**0.1053**	**0.0278**	**2.8400e-003**	**0.0306**						**169.2369**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0136	0.1407	0.1465	2.3000e-004		7.5300e-003	7.5300e-003		6.9300e-003	6.9300e-003						20.1902
Paving	6.5500e-003					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.0201**	**0.1407**	**0.1465**	**2.3000e-004**		**7.5300e-003**	**7.5300e-003**		**6.9300e-003**	**6.9300e-003**						**20.1902**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	6.5000e-004	4.1000e-004	4.1700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.0386
Total	**6.5000e-004**	**4.1000e-004**	**4.1700e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**						**1.0386**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.6100e-003	0.1130	0.1730	2.3000e-004		6.0900e-003	6.0900e-003		6.0900e-003	6.0900e-003						20.1901
Paving	6.5500e-003					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.0122**	**0.1130**	**0.1730**	**2.3000e-004**		**6.0900e-003**	**6.0900e-003**		**6.0900e-003**	**6.0900e-003**						**20.1901**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	6.5000e-004	4.1000e-004	4.1700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.0386
Total	**6.5000e-004**	**4.1000e-004**	**4.1700e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**						**1.0386**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2027					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0143	0.0994	0.1081	1.8000e-004		6.5500e-003	6.5500e-003		6.5500e-003	6.5500e-003						15.0934
Total	**0.2170**	**0.0994**	**0.1081**	**1.8000e-004**		**6.5500e-003**	**6.5500e-003**		**6.5500e-003**	**6.5500e-003**						**15.0934**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	6.1100e-003	3.8800e-003	0.0394	1.1000e-004	0.0113	7.0000e-005	0.0114	3.0100e-003	7.0000e-005	3.0800e-003						9.8044
Total	**6.1100e-003**	**3.8800e-003**	**0.0394**	**1.1000e-004**	**0.0113**	**7.0000e-005**	**0.0114**	**3.0100e-003**	**7.0000e-005**	**3.0800e-003**						**9.8044**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2027					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	3.5100e-003	0.0801	0.1081	1.8000e-004		5.6100e-003	5.6100e-003		5.6100e-003	5.6100e-003						15.0933
Total	**0.2062**	**0.0801**	**0.1081**	**1.8000e-004**		**5.6100e-003**	**5.6100e-003**		**5.6100e-003**	**5.6100e-003**						**15.0933**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	6.1100e-003	3.8800e-003	0.0394	1.1000e-004	0.0113	7.0000e-005	0.0114	3.0100e-003	7.0000e-005	3.0800e-003						9.8044
Total	**6.1100e-003**	**3.8800e-003**	**0.0394**	**1.1000e-004**	**0.0113**	**7.0000e-005**	**0.0114**	**3.0100e-003**	**7.0000e-005**	**3.0800e-003**						**9.8044**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.5318	6.2683	5.0034	0.0235	1.2998	0.0275	1.3274	0.3505	0.0261	0.3766						2,196.068 8
Unmitigated	0.5318	6.2683	5.0034	0.0235	1.2998	0.0275	1.3274	0.3505	0.0261	0.3766						2,196.068 8

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Day-Care Center	112.99	14.90	13.99	99,906	99,906
High School	1,678.99	286.02	117.16	3,290,698	3,290,698
Parking Lot	0.00	0.00	0.00		
User Defined Educational	0.00	0.00	0.00		
Total	1,791.98	300.92	131.15	3,390,604	3,390,604

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Day-Care Center	9.50	7.30	7.30	12.70	82.30	5.00	28	58	14
High School	9.50	7.30	7.30	77.80	17.20	5.00	75	19	6
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
User Defined Educational	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Day-Care Center	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
High School	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
Parking Lot	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
User Defined Educational	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000						112.9600
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000						122.8922
NaturalGas Mitigated	9.1900e-003	0.0835	0.0702	5.0000e-004		6.3500e-003	6.3500e-003		6.3500e-003	6.3500e-003						91.4569
NaturalGas Unmitigated	9.1900e-003	0.0835	0.0702	5.0000e-004		6.3500e-003	6.3500e-003		6.3500e-003	6.3500e-003						91.4569

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Day-Care Center	60264	3.2000e-004	2.9500e-003	2.4800e-003	2.0000e-005		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004						3.2350
High School	1.64345e+006	8.8600e-003	0.0806	0.0677	4.8000e-004		6.1200e-003	6.1200e-003		6.1200e-003	6.1200e-003						88.2219
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
User Defined Educational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Total		**9.1800e-003**	**0.0835**	**0.0702**	**5.0000e-004**		**6.3400e-003**	**6.3400e-003**		**6.3400e-003**	**6.3400e-003**						**91.4569**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Day-Care Center	60264	3.2000e-004	2.9500e-003	2.4800e-003	2.0000e-005		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004						3.2350
High School	1.64345e+006	8.8600e-003	0.0806	0.0677	4.8000e-004		6.1200e-003	6.1200e-003		6.1200e-003	6.1200e-003						88.2219
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
User Defined Educational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Total		**9.1800e-003**	**0.0835**	**0.0702**	**5.0000e-004**		**6.3400e-003**	**6.3400e-003**		**6.3400e-003**	**6.3400e-003**						**91.4569**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Day-Care Center	16848				3.7472
High School	459459				102.1903
Parking Lot	76230				16.9547
User Defined Educational	0				0.0000
Total					**122.8922**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Day-Care Center	15699.8				3.4919
High School	428148				95.2263
Parking Lot	64033.2				14.2419
User Defined Educational	0				0.0000
Total					**112.9600**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2994	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003
Unmitigated	0.2994	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0203					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.2791					0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	6.0000e-005	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003
Total	**0.2994**	**1.0000e-005**	**6.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**						**1.3900e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0203					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.2791					0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	6.0000e-005	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003
Total	**0.2994**	**1.0000e-005**	**6.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**						**1.3900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				8.9484
Unmitigated				10.3939

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Day-Care Center	0.102935 / 0.26469				0.4700
High School	2.17324 / 5.58834				9.9239
Parking Lot	0 / 0				0.0000
User Defined Educational	0 / 0				0.0000
Total					**10.3939**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Day-Care Center	0.082348 / 0.248544				0.4047
High School	1.73859 / 5.24745				8.5438
Parking Lot	0 / 0				0.0000
User Defined Educational	0 / 0				0.0000
Total					**8.9484**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				22.1805
Unmitigated				44.3609

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Day-Care Center	3.12				1.5691
High School	85.09				42.7919
Parking Lot	0				0.0000
User Defined Educational	0				0.0000
Total					**44.3609**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Day-Care Center	1.56				0.7845
High School	42.545				21.3960
Parking Lot	0				0.0000
User Defined Educational	0				0.0000
Total					**22.1805**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

FUSD Ventura Alt Ed Campus
Fresno County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	2.40	1000sqft	0.06	2,400.00	0
High School	65.45	1000sqft	1.50	65,450.00	0
Parking Lot	5.00	Acre	5.00	217,800.00	0
User Defined Educational	0.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 45

Climate Zone 3 **Operational Year** 2030

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 364.4 **CH4 Intensity (lb/MWhr)** 0.016 **N2O Intensity (lb/MWhr)** 0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Includes RPS adjustment.

Land Use - Includes 2400sf child care facility, 65450sf high school, 5 ac paved. District offices will occupy existing office buildings.

Construction Phase - Based on model defaults. RAW excavation based on information provided. Arch coating based on building const period, excluding initial approx. four-month framing period.

Off-road Equipment - Off-road equipment based on model defaults.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Based on model defaults. Assumes an additional grader for RAW excavation (2 total).

Grading - Assumes 10,000 cy exported during RAW (500 truckloads).

Demolition - 139805 sf demolished

Trips and VMT - Based on model defaults. Includes 500 truckloads for RAW export.

Architectural Coating - Assumes 50 g/L for interior/exterior paint.

Vehicle Trips - Based on trip gen from the traffic analysis.

Road Dust - Based on model defaults.

Area Coating - Assumes 50 g/L for interior/exterior paints.

Energy Use -

Construction Off-road Equipment Mitigation - Assumes T3 for modeling purposes. Mitigation includes 50%CE for watering vehicle travel surfaces, 61%CE for graded surfaces, 15mph onsite speed limit.

Mobile Commute Mitigation -

Energy Mitigation - Assumes minimum 16% reduction for use of high-efficiency lighting.

Water Mitigation - Includes use of low-flow water fixtures and water-efficient irrigation systems.

Waste Mitigation - Assumes 50% diversion rate based on current statewide averages.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	50.00
tblArchitecturalCoating	EF_Residential_Exterior	150.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	150.00	50.00

tblAreaCoating	Area_EF_Nonresidential_Exterior	150	50
tblAreaCoating	Area_EF_Nonresidential_Interior	150	50
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	118.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	PhaseEndDate	10/7/2020	8/12/2020
tblConstructionPhase	PhaseEndDate	9/25/2019	9/11/2019
tblConstructionPhase	PhaseStartDate	9/10/2020	3/1/2020
tblFleetMix	HHD	0.13	0.12
tblFleetMix	HHD	0.13	0.12
tblFleetMix	HHD	0.13	0.12
tblFleetMix	HHD	0.13	0.12
tblFleetMix	LDA	0.52	0.48
tblFleetMix	LDA	0.52	0.48
tblFleetMix	LDA	0.52	0.48
tblFleetMix	LDA	0.52	0.48
tblFleetMix	LDT1	0.03	0.03
tblFleetMix	LDT1	0.03	0.03
tblFleetMix	LDT1	0.03	0.03
tblFleetMix	LDT1	0.03	0.03
tblFleetMix	LDT2	0.18	0.17
tblFleetMix	LDT2	0.18	0.17
tblFleetMix	LDT2	0.18	0.17
tblFleetMix	LDT2	0.18	0.17
tblFleetMix	LHD1	9.7000e-003	0.02
tblFleetMix	LHD1	9.7000e-003	0.02
tblFleetMix	LHD1	9.7000e-003	0.02
tblFleetMix	LHD1	9.7000e-003	0.02

tblFleetMix	LHD2	3.4040e-003	4.9970e-003
tblFleetMix	LHD2	3.4040e-003	4.9970e-003
tblFleetMix	LHD2	3.4040e-003	4.9970e-003
tblFleetMix	LHD2	3.4040e-003	4.9970e-003
tblFleetMix	MCY	4.5630e-003	5.2610e-003
tblFleetMix	MCY	4.5630e-003	5.2610e-003
tblFleetMix	MCY	4.5630e-003	5.2610e-003
tblFleetMix	MCY	4.5630e-003	5.2610e-003
tblFleetMix	MDV	0.09	0.13
tblFleetMix	MDV	0.09	0.13
tblFleetMix	MDV	0.09	0.13
tblFleetMix	MDV	0.09	0.13
tblFleetMix	MH	4.3600e-004	6.6700e-004
tblFleetMix	MH	4.3600e-004	6.6700e-004
tblFleetMix	MH	4.3600e-004	6.6700e-004
tblFleetMix	MH	4.3600e-004	6.6700e-004
tblFleetMix	MHD	0.03	0.03
tblFleetMix	MHD	0.03	0.03
tblFleetMix	MHD	0.03	0.03
tblFleetMix	MHD	0.03	0.03
tblFleetMix	OBUS	2.3060e-003	2.3690e-003
tblFleetMix	OBUS	2.3060e-003	2.3690e-003
tblFleetMix	OBUS	2.3060e-003	2.3690e-003
tblFleetMix	OBUS	2.3060e-003	2.3690e-003
tblFleetMix	SBUS	9.9800e-004	1.1150e-003
tblFleetMix	SBUS	9.9800e-004	1.1150e-003
tblFleetMix	SBUS	9.9800e-004	1.1150e-003

tblFleetMix	SBUS	9.9800e-004	1.1150e-003
tblFleetMix	UBUS	1.1850e-003	1.6750e-003
tblFleetMix	UBUS	1.1850e-003	1.6750e-003
tblFleetMix	UBUS	1.1850e-003	1.6750e-003
tblFleetMix	UBUS	1.1850e-003	1.6750e-003
tblGrading	AcresOfGrading	5.00	10.00
tblGrading	MaterialExported	0.00	10,000.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.016
tblProjectCharacteristics	CO2IntensityFactor	641.35	364.4
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	HaulingTripNumber	1,250.00	500.00
tblTripsAndVMT	WorkerTripNumber	18.00	15.00
tblVehicleEF	HHD	1.89	2.96
tblVehicleEF	HHD	8.2550e-003	0.01
tblVehicleEF	HHD	0.06	0.11
tblVehicleEF	HHD	1.73	3.27
tblVehicleEF	HHD	0.51	0.66
tblVehicleEF	HHD	0.51	0.71
tblVehicleEF	HHD	5,107.42	5,898.79
tblVehicleEF	HHD	1,465.23	1,601.10
tblVehicleEF	HHD	1.58	2.13
tblVehicleEF	HHD	14.43	25.61
tblVehicleEF	HHD	1.47	4.06
tblVehicleEF	HHD	20.67	20.63
tblVehicleEF	HHD	2.4110e-003	0.03
tblVehicleEF	HHD	0.06	0.06

tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.4990e-003	0.02
tblVehicleEF	HHD	1.6000e-005	2.0000e-005
tblVehicleEF	HHD	2.3070e-003	0.03
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.9170e-003	8.9030e-003
tblVehicleEF	HHD	5.2610e-003	0.02
tblVehicleEF	HHD	1.4000e-005	1.8000e-005
tblVehicleEF	HHD	2.1000e-005	3.3000e-005
tblVehicleEF	HHD	6.7900e-004	1.2650e-003
tblVehicleEF	HHD	0.46	0.87
tblVehicleEF	HHD	1.1000e-005	1.7000e-005
tblVehicleEF	HHD	0.08	0.14
tblVehicleEF	HHD	5.5000e-005	9.6000e-005
tblVehicleEF	HHD	9.2740e-003	0.02
tblVehicleEF	HHD	0.05	0.06
tblVehicleEF	HHD	0.01	0.02
tblVehicleEF	HHD	2.4000e-005	3.3000e-005
tblVehicleEF	HHD	2.1000e-005	3.3000e-005
tblVehicleEF	HHD	6.7900e-004	1.2650e-003
tblVehicleEF	HHD	0.53	0.99
tblVehicleEF	HHD	1.1000e-005	1.7000e-005
tblVehicleEF	HHD	0.09	0.16
tblVehicleEF	HHD	5.5000e-005	9.6000e-005
tblVehicleEF	HHD	0.01	0.02
tblVehicleEF	HHD	1.78	2.79
tblVehicleEF	HHD	8.2600e-003	0.01

tblVehicleEF	HHD	0.05	0.11
tblVehicleEF	HHD	1.26	2.39
tblVehicleEF	HHD	0.51	0.66
tblVehicleEF	HHD	0.47	0.66
tblVehicleEF	HHD	5,410.86	6,245.05
tblVehicleEF	HHD	1,465.23	1,601.10
tblVehicleEF	HHD	1.58	2.13
tblVehicleEF	HHD	14.89	26.42
tblVehicleEF	HHD	1.40	3.86
tblVehicleEF	HHD	20.66	20.63
tblVehicleEF	HHD	2.0330e-003	0.02
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.4990e-003	0.02
tblVehicleEF	HHD	1.6000e-005	2.0000e-005
tblVehicleEF	HHD	1.9450e-003	0.02
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.9170e-003	8.9030e-003
tblVehicleEF	HHD	5.2610e-003	0.02
tblVehicleEF	HHD	1.4000e-005	1.8000e-005
tblVehicleEF	HHD	4.7000e-005	7.6000e-005
tblVehicleEF	HHD	7.6400e-004	1.4520e-003
tblVehicleEF	HHD	0.44	0.82
tblVehicleEF	HHD	2.2000e-005	3.8000e-005
tblVehicleEF	HHD	0.08	0.14
tblVehicleEF	HHD	5.4000e-005	9.7000e-005
tblVehicleEF	HHD	8.7610e-003	0.02

tblVehicleEF	HHD	0.05	0.06
tblVehicleEF	HHD	0.01	0.02
tblVehicleEF	HHD	2.3000e-005	3.2000e-005
tblVehicleEF	HHD	4.7000e-005	7.6000e-005
tblVehicleEF	HHD	7.6400e-004	1.4520e-003
tblVehicleEF	HHD	0.50	0.94
tblVehicleEF	HHD	2.2000e-005	3.8000e-005
tblVehicleEF	HHD	0.09	0.16
tblVehicleEF	HHD	5.4000e-005	9.7000e-005
tblVehicleEF	HHD	9.5920e-003	0.02
tblVehicleEF	HHD	2.04	3.19
tblVehicleEF	HHD	8.2490e-003	0.01
tblVehicleEF	HHD	0.06	0.12
tblVehicleEF	HHD	2.38	4.50
tblVehicleEF	HHD	0.51	0.65
tblVehicleEF	HHD	0.55	0.77
tblVehicleEF	HHD	4,688.39	5,420.63
tblVehicleEF	HHD	1,465.23	1,601.10
tblVehicleEF	HHD	1.58	2.13
tblVehicleEF	HHD	13.79	24.49
tblVehicleEF	HHD	1.50	4.13
tblVehicleEF	HHD	20.67	20.64
tblVehicleEF	HHD	2.9340e-003	0.03
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.04	0.04
tblVehicleEF	HHD	5.4990e-003	0.02
tblVehicleEF	HHD	1.6000e-005	2.0000e-005

tblVehicleEF	HHD	2.8070e-003	0.03
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.9170e-003	8.9030e-003
tblVehicleEF	HHD	5.2610e-003	0.02
tblVehicleEF	HHD	1.4000e-005	1.8000e-005
tblVehicleEF	HHD	7.0000e-006	1.0000e-005
tblVehicleEF	HHD	6.7100e-004	1.3050e-003
tblVehicleEF	HHD	0.50	0.94
tblVehicleEF	HHD	5.0000e-006	7.0000e-006
tblVehicleEF	HHD	0.08	0.14
tblVehicleEF	HHD	6.1000e-005	1.0500e-004
tblVehicleEF	HHD	9.8710e-003	0.02
tblVehicleEF	HHD	0.04	0.05
tblVehicleEF	HHD	0.01	0.02
tblVehicleEF	HHD	2.5000e-005	3.4000e-005
tblVehicleEF	HHD	7.0000e-006	1.0000e-005
tblVehicleEF	HHD	6.7100e-004	1.3050e-003
tblVehicleEF	HHD	0.57	1.07
tblVehicleEF	HHD	5.0000e-006	7.0000e-006
tblVehicleEF	HHD	0.09	0.16
tblVehicleEF	HHD	6.1000e-005	1.0500e-004
tblVehicleEF	HHD	0.01	0.03
tblVehicleEF	LDA	1.8140e-003	4.3510e-003
tblVehicleEF	LDA	2.0960e-003	7.5130e-003
tblVehicleEF	LDA	0.33	0.59
tblVehicleEF	LDA	0.63	1.51
tblVehicleEF	LDA	184.63	268.73

tblVehicleEF	LDA	42.76	61.89
tblVehicleEF	LDA	0.02	0.06
tblVehicleEF	LDA	0.03	0.10
tblVehicleEF	LDA	1.0970e-003	1.5800e-003
tblVehicleEF	LDA	1.8750e-003	2.3410e-003
tblVehicleEF	LDA	1.0090e-003	1.4560e-003
tblVehicleEF	LDA	1.7240e-003	2.1520e-003
tblVehicleEF	LDA	0.03	0.06
tblVehicleEF	LDA	0.06	0.13
tblVehicleEF	LDA	0.02	0.04
tblVehicleEF	LDA	4.5380e-003	0.01
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.03	0.10
tblVehicleEF	LDA	1.8470e-003	2.6910e-003
tblVehicleEF	LDA	4.3800e-004	6.4500e-004
tblVehicleEF	LDA	0.03	0.06
tblVehicleEF	LDA	0.06	0.13
tblVehicleEF	LDA	0.02	0.04
tblVehicleEF	LDA	6.6040e-003	0.02
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.03	0.11
tblVehicleEF	LDA	2.0950e-003	5.0340e-003
tblVehicleEF	LDA	1.7300e-003	6.2060e-003
tblVehicleEF	LDA	0.41	0.74
tblVehicleEF	LDA	0.52	1.26
tblVehicleEF	LDA	203.16	295.91
tblVehicleEF	LDA	42.76	61.89

tblVehicleEF	LDA	0.02	0.05
tblVehicleEF	LDA	0.03	0.09
tblVehicleEF	LDA	1.0970e-003	1.5800e-003
tblVehicleEF	LDA	1.8750e-003	2.3410e-003
tblVehicleEF	LDA	1.0090e-003	1.4560e-003
tblVehicleEF	LDA	1.7240e-003	2.1520e-003
tblVehicleEF	LDA	0.06	0.14
tblVehicleEF	LDA	0.07	0.16
tblVehicleEF	LDA	0.05	0.10
tblVehicleEF	LDA	5.2310e-003	0.01
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.02	0.08
tblVehicleEF	LDA	2.0340e-003	2.9650e-003
tblVehicleEF	LDA	4.3600e-004	6.4000e-004
tblVehicleEF	LDA	0.06	0.14
tblVehicleEF	LDA	0.07	0.16
tblVehicleEF	LDA	0.05	0.10
tblVehicleEF	LDA	7.6160e-003	0.02
tblVehicleEF	LDA	0.03	0.04
tblVehicleEF	LDA	0.03	0.09
tblVehicleEF	LDA	1.6920e-003	4.0730e-003
tblVehicleEF	LDA	2.4740e-003	8.9090e-003
tblVehicleEF	LDA	0.30	0.54
tblVehicleEF	LDA	0.77	1.85
tblVehicleEF	LDA	177.19	257.81
tblVehicleEF	LDA	42.76	61.89
tblVehicleEF	LDA	0.03	0.06

tblVehicleEF	LDA	0.03	0.11
tblVehicleEF	LDA	1.0970e-003	1.5800e-003
tblVehicleEF	LDA	1.8750e-003	2.3410e-003
tblVehicleEF	LDA	1.0090e-003	1.4560e-003
tblVehicleEF	LDA	1.7240e-003	2.1520e-003
tblVehicleEF	LDA	8.1230e-003	0.02
tblVehicleEF	LDA	0.06	0.13
tblVehicleEF	LDA	7.5990e-003	0.02
tblVehicleEF	LDA	4.2350e-003	0.01
tblVehicleEF	LDA	0.03	0.05
tblVehicleEF	LDA	0.03	0.12
tblVehicleEF	LDA	1.7730e-003	2.5810e-003
tblVehicleEF	LDA	4.4000e-004	6.5100e-004
tblVehicleEF	LDA	8.1230e-003	0.02
tblVehicleEF	LDA	0.06	0.13
tblVehicleEF	LDA	7.5990e-003	0.02
tblVehicleEF	LDA	6.1630e-003	0.01
tblVehicleEF	LDA	0.03	0.05
tblVehicleEF	LDA	0.04	0.13
tblVehicleEF	LDT1	4.1560e-003	0.01
tblVehicleEF	LDT1	7.0020e-003	0.02
tblVehicleEF	LDT1	0.60	1.66
tblVehicleEF	LDT1	1.54	4.56
tblVehicleEF	LDT1	239.93	330.29
tblVehicleEF	LDT1	56.61	75.49
tblVehicleEF	LDT1	0.06	0.18
tblVehicleEF	LDT1	0.08	0.26

tblVehicleEF	LDT1	1.4480e-003	2.7610e-003
tblVehicleEF	LDT1	2.4690e-003	4.2630e-003
tblVehicleEF	LDT1	1.3310e-003	2.5440e-003
tblVehicleEF	LDT1	2.2700e-003	3.9210e-003
tblVehicleEF	LDT1	0.11	0.24
tblVehicleEF	LDT1	0.19	0.43
tblVehicleEF	LDT1	0.08	0.16
tblVehicleEF	LDT1	0.01	0.03
tblVehicleEF	LDT1	0.13	0.26
tblVehicleEF	LDT1	0.09	0.32
tblVehicleEF	LDT1	2.4050e-003	3.3240e-003
tblVehicleEF	LDT1	5.9200e-004	8.3600e-004
tblVehicleEF	LDT1	0.11	0.24
tblVehicleEF	LDT1	0.19	0.43
tblVehicleEF	LDT1	0.08	0.16
tblVehicleEF	LDT1	0.02	0.05
tblVehicleEF	LDT1	0.13	0.26
tblVehicleEF	LDT1	0.10	0.35
tblVehicleEF	LDT1	4.7610e-003	0.02
tblVehicleEF	LDT1	5.7770e-003	0.02
tblVehicleEF	LDT1	0.74	2.02
tblVehicleEF	LDT1	1.27	3.78
tblVehicleEF	LDT1	263.32	361.85
tblVehicleEF	LDT1	56.61	75.49
tblVehicleEF	LDT1	0.05	0.16
tblVehicleEF	LDT1	0.08	0.24
tblVehicleEF	LDT1	1.4480e-003	2.7610e-003

tblVehicleEF	LDT1	2.4690e-003	4.2630e-003
tblVehicleEF	LDT1	1.3310e-003	2.5440e-003
tblVehicleEF	LDT1	2.2700e-003	3.9210e-003
tblVehicleEF	LDT1	0.26	0.57
tblVehicleEF	LDT1	0.24	0.55
tblVehicleEF	LDT1	0.16	0.35
tblVehicleEF	LDT1	0.01	0.04
tblVehicleEF	LDT1	0.12	0.26
tblVehicleEF	LDT1	0.08	0.27
tblVehicleEF	LDT1	2.6400e-003	3.6450e-003
tblVehicleEF	LDT1	5.8800e-004	8.2200e-004
tblVehicleEF	LDT1	0.26	0.57
tblVehicleEF	LDT1	0.24	0.55
tblVehicleEF	LDT1	0.16	0.35
tblVehicleEF	LDT1	0.02	0.06
tblVehicleEF	LDT1	0.12	0.26
tblVehicleEF	LDT1	0.09	0.29
tblVehicleEF	LDT1	3.8930e-003	0.01
tblVehicleEF	LDT1	8.2830e-003	0.03
tblVehicleEF	LDT1	0.55	1.55
tblVehicleEF	LDT1	1.88	5.62
tblVehicleEF	LDT1	230.53	317.61
tblVehicleEF	LDT1	56.61	75.49
tblVehicleEF	LDT1	0.06	0.20
tblVehicleEF	LDT1	0.09	0.29
tblVehicleEF	LDT1	1.4480e-003	2.7610e-003
tblVehicleEF	LDT1	2.4690e-003	4.2630e-003

tblVehicleEF	LDT1	1.3310e-003	2.5440e-003
tblVehicleEF	LDT1	2.2700e-003	3.9210e-003
tblVehicleEF	LDT1	0.03	0.07
tblVehicleEF	LDT1	0.19	0.43
tblVehicleEF	LDT1	0.03	0.05
tblVehicleEF	LDT1	9.6440e-003	0.03
tblVehicleEF	LDT1	0.15	0.32
tblVehicleEF	LDT1	0.11	0.39
tblVehicleEF	LDT1	2.3100e-003	3.1960e-003
tblVehicleEF	LDT1	5.9800e-004	8.5500e-004
tblVehicleEF	LDT1	0.03	0.07
tblVehicleEF	LDT1	0.19	0.43
tblVehicleEF	LDT1	0.03	0.05
tblVehicleEF	LDT1	0.01	0.05
tblVehicleEF	LDT1	0.15	0.32
tblVehicleEF	LDT1	0.12	0.42
tblVehicleEF	LDT2	3.1170e-003	6.9890e-003
tblVehicleEF	LDT2	3.7840e-003	0.01
tblVehicleEF	LDT2	0.51	0.89
tblVehicleEF	LDT2	0.99	2.27
tblVehicleEF	LDT2	272.29	375.67
tblVehicleEF	LDT2	63.09	86.28
tblVehicleEF	LDT2	0.04	0.11
tblVehicleEF	LDT2	0.06	0.20
tblVehicleEF	LDT2	1.2780e-003	1.5950e-003
tblVehicleEF	LDT2	2.1240e-003	2.4140e-003
tblVehicleEF	LDT2	1.1760e-003	1.4670e-003

tblVehicleEF	LDT2	1.9530e-003	2.2190e-003
tblVehicleEF	LDT2	0.05	0.09
tblVehicleEF	LDT2	0.09	0.17
tblVehicleEF	LDT2	0.04	0.07
tblVehicleEF	LDT2	7.7350e-003	0.02
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.05	0.15
tblVehicleEF	LDT2	2.7260e-003	3.7640e-003
tblVehicleEF	LDT2	6.4700e-004	9.0200e-004
tblVehicleEF	LDT2	0.05	0.09
tblVehicleEF	LDT2	0.09	0.17
tblVehicleEF	LDT2	0.04	0.07
tblVehicleEF	LDT2	0.01	0.03
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.06	0.17
tblVehicleEF	LDT2	3.5870e-003	8.0510e-003
tblVehicleEF	LDT2	3.1440e-003	9.4610e-003
tblVehicleEF	LDT2	0.63	1.10
tblVehicleEF	LDT2	0.83	1.89
tblVehicleEF	LDT2	298.95	412.53
tblVehicleEF	LDT2	63.09	86.28
tblVehicleEF	LDT2	0.04	0.10
tblVehicleEF	LDT2	0.06	0.18
tblVehicleEF	LDT2	1.2780e-003	1.5950e-003
tblVehicleEF	LDT2	2.1240e-003	2.4140e-003
tblVehicleEF	LDT2	1.1760e-003	1.4670e-003
tblVehicleEF	LDT2	1.9530e-003	2.2190e-003

tblVehicleEF	LDT2	0.12	0.21
tblVehicleEF	LDT2	0.11	0.21
tblVehicleEF	LDT2	0.09	0.15
tblVehicleEF	LDT2	8.8980e-003	0.02
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.04	0.13
tblVehicleEF	LDT2	2.9940e-003	4.1360e-003
tblVehicleEF	LDT2	6.4400e-004	8.9500e-004
tblVehicleEF	LDT2	0.12	0.21
tblVehicleEF	LDT2	0.11	0.21
tblVehicleEF	LDT2	0.09	0.15
tblVehicleEF	LDT2	0.01	0.03
tblVehicleEF	LDT2	0.06	0.09
tblVehicleEF	LDT2	0.05	0.14
tblVehicleEF	LDT2	2.9120e-003	6.5610e-003
tblVehicleEF	LDT2	4.4460e-003	0.01
tblVehicleEF	LDT2	0.46	0.82
tblVehicleEF	LDT2	1.19	2.78
tblVehicleEF	LDT2	261.58	360.87
tblVehicleEF	LDT2	63.09	86.28
tblVehicleEF	LDT2	0.05	0.12
tblVehicleEF	LDT2	0.07	0.22
tblVehicleEF	LDT2	1.2780e-003	1.5950e-003
tblVehicleEF	LDT2	2.1240e-003	2.4140e-003
tblVehicleEF	LDT2	1.1760e-003	1.4670e-003
tblVehicleEF	LDT2	1.9530e-003	2.2190e-003
tblVehicleEF	LDT2	0.02	0.03

tblVehicleEF	LDT2	0.09	0.17
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	7.2260e-003	0.02
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.06	0.18
tblVehicleEF	LDT2	2.6180e-003	3.6150e-003
tblVehicleEF	LDT2	6.5000e-004	9.1100e-004
tblVehicleEF	LDT2	0.02	0.03
tblVehicleEF	LDT2	0.09	0.17
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	0.07	0.11
tblVehicleEF	LDT2	0.07	0.20
tblVehicleEF	LHD1	4.0010e-003	5.4410e-003
tblVehicleEF	LHD1	0.01	0.03
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	0.13	0.14
tblVehicleEF	LHD1	0.74	1.48
tblVehicleEF	LHD1	1.64	2.81
tblVehicleEF	LHD1	9.18	9.35
tblVehicleEF	LHD1	654.24	705.59
tblVehicleEF	LHD1	26.41	30.27
tblVehicleEF	LHD1	0.08	0.09
tblVehicleEF	LHD1	1.09	2.24
tblVehicleEF	LHD1	0.72	1.02
tblVehicleEF	LHD1	9.2800e-004	1.0490e-003
tblVehicleEF	LHD1	0.01	0.01

tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	6.1500e-004	9.8100e-004
tblVehicleEF	LHD1	8.8800e-004	1.0040e-003
tblVehicleEF	LHD1	2.5950e-003	2.5340e-003
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	5.6600e-004	9.0300e-004
tblVehicleEF	LHD1	2.8860e-003	3.9680e-003
tblVehicleEF	LHD1	0.09	0.10
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	1.3090e-003	1.6320e-003
tblVehicleEF	LHD1	0.11	0.16
tblVehicleEF	LHD1	0.29	0.31
tblVehicleEF	LHD1	0.15	0.28
tblVehicleEF	LHD1	9.1000e-005	9.3000e-005
tblVehicleEF	LHD1	6.3940e-003	6.9250e-003
tblVehicleEF	LHD1	2.9400e-004	3.5600e-004
tblVehicleEF	LHD1	2.8860e-003	3.9680e-003
tblVehicleEF	LHD1	0.09	0.10
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.3090e-003	1.6320e-003
tblVehicleEF	LHD1	0.13	0.20
tblVehicleEF	LHD1	0.29	0.31
tblVehicleEF	LHD1	0.16	0.31
tblVehicleEF	LHD1	4.0010e-003	5.4410e-003
tblVehicleEF	LHD1	0.01	0.03
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	0.13	0.14

tblVehicleEF	LHD1	0.75	1.52
tblVehicleEF	LHD1	1.52	2.61
tblVehicleEF	LHD1	9.18	9.35
tblVehicleEF	LHD1	654.24	705.59
tblVehicleEF	LHD1	26.41	30.27
tblVehicleEF	LHD1	0.08	0.09
tblVehicleEF	LHD1	1.03	2.12
tblVehicleEF	LHD1	0.68	0.96
tblVehicleEF	LHD1	9.2800e-004	1.0490e-003
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	6.1500e-004	9.8100e-004
tblVehicleEF	LHD1	8.8800e-004	1.0040e-003
tblVehicleEF	LHD1	2.5950e-003	2.5340e-003
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	5.6600e-004	9.0300e-004
tblVehicleEF	LHD1	6.5410e-003	9.1960e-003
tblVehicleEF	LHD1	0.10	0.13
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	2.7190e-003	3.5890e-003
tblVehicleEF	LHD1	0.11	0.17
tblVehicleEF	LHD1	0.29	0.31
tblVehicleEF	LHD1	0.14	0.27
tblVehicleEF	LHD1	9.1000e-005	9.3000e-005
tblVehicleEF	LHD1	6.3940e-003	6.9250e-003
tblVehicleEF	LHD1	2.9200e-004	3.5200e-004
tblVehicleEF	LHD1	6.5410e-003	9.1960e-003

tblVehicleEF	LHD1	0.10	0.13
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	2.7190e-003	3.5890e-003
tblVehicleEF	LHD1	0.13	0.21
tblVehicleEF	LHD1	0.29	0.31
tblVehicleEF	LHD1	0.16	0.29
tblVehicleEF	LHD1	4.0010e-003	5.4410e-003
tblVehicleEF	LHD1	9.8380e-003	0.02
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	0.13	0.14
tblVehicleEF	LHD1	0.73	1.45
tblVehicleEF	LHD1	1.78	3.07
tblVehicleEF	LHD1	9.18	9.35
tblVehicleEF	LHD1	654.24	705.59
tblVehicleEF	LHD1	26.41	30.27
tblVehicleEF	LHD1	0.08	0.09
tblVehicleEF	LHD1	1.11	2.29
tblVehicleEF	LHD1	0.77	1.09
tblVehicleEF	LHD1	9.2800e-004	1.0490e-003
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	6.1500e-004	9.8100e-004
tblVehicleEF	LHD1	8.8800e-004	1.0040e-003
tblVehicleEF	LHD1	2.5950e-003	2.5340e-003
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	5.6600e-004	9.0300e-004
tblVehicleEF	LHD1	9.0700e-004	1.1450e-003

tblVehicleEF	LHD1	0.09	0.11
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	5.6800e-004	6.5800e-004
tblVehicleEF	LHD1	0.11	0.16
tblVehicleEF	LHD1	0.32	0.34
tblVehicleEF	LHD1	0.16	0.30
tblVehicleEF	LHD1	9.1000e-005	9.3000e-005
tblVehicleEF	LHD1	6.3940e-003	6.9240e-003
tblVehicleEF	LHD1	2.9700e-004	3.6000e-004
tblVehicleEF	LHD1	9.0700e-004	1.1450e-003
tblVehicleEF	LHD1	0.09	0.11
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	5.6800e-004	6.5800e-004
tblVehicleEF	LHD1	0.13	0.20
tblVehicleEF	LHD1	0.32	0.34
tblVehicleEF	LHD1	0.18	0.33
tblVehicleEF	LHD2	2.7040e-003	4.0850e-003
tblVehicleEF	LHD2	5.7490e-003	0.01
tblVehicleEF	LHD2	4.1190e-003	0.01
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.49	0.84
tblVehicleEF	LHD2	0.91	1.49
tblVehicleEF	LHD2	13.79	14.33
tblVehicleEF	LHD2	681.69	742.00
tblVehicleEF	LHD2	22.30	25.95
tblVehicleEF	LHD2	0.08	0.12
tblVehicleEF	LHD2	0.42	1.84

tblVehicleEF	LHD2	0.33	0.65
tblVehicleEF	LHD2	1.0840e-003	1.3140e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.5600e-004	4.7300e-004
tblVehicleEF	LHD2	1.0370e-003	1.2570e-003
tblVehicleEF	LHD2	2.7050e-003	2.6680e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.2800e-004	4.3500e-004
tblVehicleEF	LHD2	9.9300e-004	1.8440e-003
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	4.9200e-004	7.9800e-004
tblVehicleEF	LHD2	0.10	0.14
tblVehicleEF	LHD2	0.06	0.12
tblVehicleEF	LHD2	0.06	0.15
tblVehicleEF	LHD2	1.3400e-004	1.4000e-004
tblVehicleEF	LHD2	6.6240e-003	7.2250e-003
tblVehicleEF	LHD2	2.3900e-004	2.8700e-004
tblVehicleEF	LHD2	9.9300e-004	1.8440e-003
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	4.9200e-004	7.9800e-004
tblVehicleEF	LHD2	0.11	0.16
tblVehicleEF	LHD2	0.06	0.12
tblVehicleEF	LHD2	0.06	0.16
tblVehicleEF	LHD2	2.7040e-003	4.0850e-003

tblVehicleEF	LHD2	5.7910e-003	0.01
tblVehicleEF	LHD2	3.9480e-003	0.01
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.50	0.85
tblVehicleEF	LHD2	0.85	1.39
tblVehicleEF	LHD2	13.79	14.33
tblVehicleEF	LHD2	681.69	742.00
tblVehicleEF	LHD2	22.30	25.95
tblVehicleEF	LHD2	0.08	0.12
tblVehicleEF	LHD2	0.39	1.75
tblVehicleEF	LHD2	0.32	0.62
tblVehicleEF	LHD2	1.0840e-003	1.3140e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.5600e-004	4.7300e-004
tblVehicleEF	LHD2	1.0370e-003	1.2570e-003
tblVehicleEF	LHD2	2.7050e-003	2.6680e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.2800e-004	4.3500e-004
tblVehicleEF	LHD2	2.2340e-003	4.2480e-003
tblVehicleEF	LHD2	0.03	0.06
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	1.0090e-003	1.7360e-003
tblVehicleEF	LHD2	0.10	0.14
tblVehicleEF	LHD2	0.06	0.12
tblVehicleEF	LHD2	0.05	0.14
tblVehicleEF	LHD2	1.3400e-004	1.4000e-004

tblVehicleEF	LHD2	6.6240e-003	7.2250e-003
tblVehicleEF	LHD2	2.3800e-004	2.8500e-004
tblVehicleEF	LHD2	2.2340e-003	4.2480e-003
tblVehicleEF	LHD2	0.03	0.06
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	1.0090e-003	1.7360e-003
tblVehicleEF	LHD2	0.11	0.16
tblVehicleEF	LHD2	0.06	0.12
tblVehicleEF	LHD2	0.06	0.16
tblVehicleEF	LHD2	2.7040e-003	4.0850e-003
tblVehicleEF	LHD2	5.7040e-003	0.01
tblVehicleEF	LHD2	4.3110e-003	0.01
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.49	0.84
tblVehicleEF	LHD2	0.99	1.62
tblVehicleEF	LHD2	13.79	14.33
tblVehicleEF	LHD2	681.69	742.00
tblVehicleEF	LHD2	22.30	25.95
tblVehicleEF	LHD2	0.08	0.12
tblVehicleEF	LHD2	0.42	1.88
tblVehicleEF	LHD2	0.35	0.70
tblVehicleEF	LHD2	1.0840e-003	1.3140e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.5600e-004	4.7300e-004
tblVehicleEF	LHD2	1.0370e-003	1.2570e-003
tblVehicleEF	LHD2	2.7050e-003	2.6680e-003

tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.2800e-004	4.3500e-004
tblVehicleEF	LHD2	3.2200e-004	5.5000e-004
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	2.1500e-004	3.2700e-004
tblVehicleEF	LHD2	0.10	0.14
tblVehicleEF	LHD2	0.06	0.13
tblVehicleEF	LHD2	0.06	0.16
tblVehicleEF	LHD2	1.3400e-004	1.4000e-004
tblVehicleEF	LHD2	6.6240e-003	7.2250e-003
tblVehicleEF	LHD2	2.4000e-004	2.9000e-004
tblVehicleEF	LHD2	3.2200e-004	5.5000e-004
tblVehicleEF	LHD2	0.03	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	2.1500e-004	3.2700e-004
tblVehicleEF	LHD2	0.11	0.16
tblVehicleEF	LHD2	0.06	0.13
tblVehicleEF	LHD2	0.06	0.17
tblVehicleEF	MCY	0.43	0.40
tblVehicleEF	MCY	0.15	0.17
tblVehicleEF	MCY	18.83	22.73
tblVehicleEF	MCY	10.19	9.98
tblVehicleEF	MCY	168.95	163.41
tblVehicleEF	MCY	44.41	48.59
tblVehicleEF	MCY	1.15	1.19
tblVehicleEF	MCY	0.31	0.32

tblVehicleEF	MCY	1.9730e-003	1.7080e-003
tblVehicleEF	MCY	3.0090e-003	4.0620e-003
tblVehicleEF	MCY	1.8410e-003	1.6040e-003
tblVehicleEF	MCY	2.8180e-003	3.8470e-003
tblVehicleEF	MCY	1.61	1.65
tblVehicleEF	MCY	0.88	1.02
tblVehicleEF	MCY	0.84	0.91
tblVehicleEF	MCY	2.09	2.29
tblVehicleEF	MCY	0.44	0.64
tblVehicleEF	MCY	2.11	2.26
tblVehicleEF	MCY	2.0580e-003	2.0690e-003
tblVehicleEF	MCY	6.7300e-004	7.1600e-004
tblVehicleEF	MCY	1.61	1.65
tblVehicleEF	MCY	0.88	1.02
tblVehicleEF	MCY	0.84	0.91
tblVehicleEF	MCY	2.60	2.77
tblVehicleEF	MCY	0.44	0.64
tblVehicleEF	MCY	2.30	2.46
tblVehicleEF	MCY	0.43	0.39
tblVehicleEF	MCY	0.13	0.14
tblVehicleEF	MCY	19.15	23.07
tblVehicleEF	MCY	9.11	9.18
tblVehicleEF	MCY	168.95	163.41
tblVehicleEF	MCY	44.41	48.59
tblVehicleEF	MCY	1.00	1.03
tblVehicleEF	MCY	0.29	0.29
tblVehicleEF	MCY	1.9730e-003	1.7080e-003

tblVehicleEF	MCY	3.0090e-003	4.0620e-003
tblVehicleEF	MCY	1.8410e-003	1.6040e-003
tblVehicleEF	MCY	2.8180e-003	3.8470e-003
tblVehicleEF	MCY	3.91	4.06
tblVehicleEF	MCY	1.42	1.54
tblVehicleEF	MCY	2.17	2.35
tblVehicleEF	MCY	2.05	2.22
tblVehicleEF	MCY	0.43	0.62
tblVehicleEF	MCY	1.81	1.91
tblVehicleEF	MCY	2.0620e-003	2.0720e-003
tblVehicleEF	MCY	6.4600e-004	6.9200e-004
tblVehicleEF	MCY	3.91	4.06
tblVehicleEF	MCY	1.42	1.54
tblVehicleEF	MCY	2.17	2.35
tblVehicleEF	MCY	2.55	2.68
tblVehicleEF	MCY	0.43	0.62
tblVehicleEF	MCY	1.97	2.08
tblVehicleEF	MCY	0.45	0.42
tblVehicleEF	MCY	0.18	0.20
tblVehicleEF	MCY	20.13	24.56
tblVehicleEF	MCY	11.91	11.53
tblVehicleEF	MCY	168.95	163.41
tblVehicleEF	MCY	44.41	48.59
tblVehicleEF	MCY	1.25	1.30
tblVehicleEF	MCY	0.34	0.34
tblVehicleEF	MCY	1.9730e-003	1.7080e-003
tblVehicleEF	MCY	3.0090e-003	4.0620e-003

tblVehicleEF	MCY	1.8410e-003	1.6040e-003
tblVehicleEF	MCY	2.8180e-003	3.8470e-003
tblVehicleEF	MCY	0.38	0.38
tblVehicleEF	MCY	0.85	1.05
tblVehicleEF	MCY	0.21	0.23
tblVehicleEF	MCY	2.17	2.43
tblVehicleEF	MCY	0.52	0.74
tblVehicleEF	MCY	2.51	2.73
tblVehicleEF	MCY	2.0820e-003	2.1020e-003
tblVehicleEF	MCY	7.1300e-004	7.5500e-004
tblVehicleEF	MCY	0.38	0.38
tblVehicleEF	MCY	0.85	1.05
tblVehicleEF	MCY	0.21	0.23
tblVehicleEF	MCY	2.70	2.93
tblVehicleEF	MCY	0.52	0.74
tblVehicleEF	MCY	2.73	2.97
tblVehicleEF	MDV	5.3630e-003	0.01
tblVehicleEF	MDV	9.0350e-003	0.02
tblVehicleEF	MDV	0.70	1.62
tblVehicleEF	MDV	1.79	4.21
tblVehicleEF	MDV	376.25	515.99
tblVehicleEF	MDV	87.78	116.39
tblVehicleEF	MDV	0.08	0.21
tblVehicleEF	MDV	0.14	0.39
tblVehicleEF	MDV	1.3010e-003	1.6840e-003
tblVehicleEF	MDV	2.1180e-003	2.5830e-003
tblVehicleEF	MDV	1.1980e-003	1.5550e-003

tblVehicleEF	MDV	1.9480e-003	2.3790e-003
tblVehicleEF	MDV	0.10	0.12
tblVehicleEF	MDV	0.17	0.24
tblVehicleEF	MDV	0.08	0.10
tblVehicleEF	MDV	0.01	0.04
tblVehicleEF	MDV	0.11	0.14
tblVehicleEF	MDV	0.12	0.34
tblVehicleEF	MDV	3.7640e-003	5.1750e-003
tblVehicleEF	MDV	9.0800e-004	1.2390e-003
tblVehicleEF	MDV	0.10	0.12
tblVehicleEF	MDV	0.17	0.24
tblVehicleEF	MDV	0.08	0.10
tblVehicleEF	MDV	0.02	0.06
tblVehicleEF	MDV	0.11	0.14
tblVehicleEF	MDV	0.13	0.37
tblVehicleEF	MDV	6.1650e-003	0.02
tblVehicleEF	MDV	7.4720e-003	0.02
tblVehicleEF	MDV	0.87	1.98
tblVehicleEF	MDV	1.50	3.53
tblVehicleEF	MDV	412.07	565.23
tblVehicleEF	MDV	87.78	116.39
tblVehicleEF	MDV	0.07	0.20
tblVehicleEF	MDV	0.13	0.37
tblVehicleEF	MDV	1.3010e-003	1.6840e-003
tblVehicleEF	MDV	2.1180e-003	2.5830e-003
tblVehicleEF	MDV	1.1980e-003	1.5550e-003
tblVehicleEF	MDV	1.9480e-003	2.3790e-003

tblVehicleEF	MDV	0.23	0.28
tblVehicleEF	MDV	0.20	0.28
tblVehicleEF	MDV	0.17	0.20
tblVehicleEF	MDV	0.02	0.05
tblVehicleEF	MDV	0.11	0.13
tblVehicleEF	MDV	0.10	0.28
tblVehicleEF	MDV	4.1240e-003	5.6720e-003
tblVehicleEF	MDV	9.0300e-004	1.2260e-003
tblVehicleEF	MDV	0.23	0.28
tblVehicleEF	MDV	0.20	0.28
tblVehicleEF	MDV	0.17	0.20
tblVehicleEF	MDV	0.02	0.06
tblVehicleEF	MDV	0.11	0.13
tblVehicleEF	MDV	0.11	0.30
tblVehicleEF	MDV	5.0120e-003	0.01
tblVehicleEF	MDV	0.01	0.03
tblVehicleEF	MDV	0.64	1.52
tblVehicleEF	MDV	2.17	5.12
tblVehicleEF	MDV	361.86	496.21
tblVehicleEF	MDV	87.78	116.39
tblVehicleEF	MDV	0.08	0.23
tblVehicleEF	MDV	0.15	0.44
tblVehicleEF	MDV	1.3010e-003	1.6840e-003
tblVehicleEF	MDV	2.1180e-003	2.5830e-003
tblVehicleEF	MDV	1.1980e-003	1.5550e-003
tblVehicleEF	MDV	1.9480e-003	2.3790e-003
tblVehicleEF	MDV	0.03	0.04

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tblVehicleEF	MDV	0.17	0.24
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.01	0.04
tblVehicleEF	MDV	0.13	0.16
tblVehicleEF	MDV	0.14	0.40
tblVehicleEF	MDV	3.6190e-003	4.9760e-003
tblVehicleEF	MDV	9.1500e-004	1.2550e-003
tblVehicleEF	MDV	0.03	0.04
tblVehicleEF	MDV	0.17	0.24
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.02	0.05
tblVehicleEF	MDV	0.13	0.16
tblVehicleEF	MDV	0.16	0.44
tblVehicleEF	MH	0.01	0.05
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	0.61	3.83
tblVehicleEF	MH	3.93	7.32
tblVehicleEF	MH	1,190.86	1,232.21
tblVehicleEF	MH	55.97	59.12
tblVehicleEF	MH	1.07	2.10
tblVehicleEF	MH	0.67	0.99
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.04
tblVehicleEF	MH	8.7200e-004	1.4730e-003
tblVehicleEF	MH	3.2330e-003	3.2450e-003
tblVehicleEF	MH	0.02	0.04
tblVehicleEF	MH	8.0200e-004	1.3610e-003

tblVehicleEF	MH	0.87	1.78
tblVehicleEF	MH	0.05	0.10
tblVehicleEF	MH	0.25	0.45
tblVehicleEF	MH	0.05	0.17
tblVehicleEF	MH	0.01	0.03
tblVehicleEF	MH	0.23	0.44
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.2800e-004	7.1900e-004
tblVehicleEF	MH	0.87	1.78
tblVehicleEF	MH	0.05	0.10
tblVehicleEF	MH	0.25	0.45
tblVehicleEF	MH	0.06	0.23
tblVehicleEF	MH	0.01	0.03
tblVehicleEF	MH	0.26	0.48
tblVehicleEF	MH	0.01	0.05
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	0.63	3.98
tblVehicleEF	MH	3.57	6.63
tblVehicleEF	MH	1,190.86	1,232.21
tblVehicleEF	MH	55.97	59.12
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tblVehicleEF	MH	0.63	0.93
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.04
tblVehicleEF	MH	8.7200e-004	1.4730e-003
tblVehicleEF	MH	3.2330e-003	3.2450e-003
tblVehicleEF	MH	0.02	0.04

tblVehicleEF	MH	8.0200e-004	1.3610e-003
tblVehicleEF	MH	1.99	4.16
tblVehicleEF	MH	0.06	0.12
tblVehicleEF	MH	0.52	1.02
tblVehicleEF	MH	0.05	0.17
tblVehicleEF	MH	0.01	0.03
tblVehicleEF	MH	0.22	0.41
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.2200e-004	7.0800e-004
tblVehicleEF	MH	1.99	4.16
tblVehicleEF	MH	0.06	0.12
tblVehicleEF	MH	0.52	1.02
tblVehicleEF	MH	0.06	0.24
tblVehicleEF	MH	0.01	0.03
tblVehicleEF	MH	0.24	0.44
tblVehicleEF	MH	0.01	0.05
tblVehicleEF	MH	0.02	0.04
tblVehicleEF	MH	0.60	3.72
tblVehicleEF	MH	4.36	8.22
tblVehicleEF	MH	1,190.86	1,232.21
tblVehicleEF	MH	55.97	59.12
tblVehicleEF	MH	1.11	2.17
tblVehicleEF	MH	0.72	1.06
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.04
tblVehicleEF	MH	8.7200e-004	1.4730e-003
tblVehicleEF	MH	3.2330e-003	3.2450e-003

tblVehicleEF	MH	0.02	0.04
tblVehicleEF	MH	8.0200e-004	1.3610e-003
tblVehicleEF	MH	0.26	0.48
tblVehicleEF	MH	0.05	0.12
tblVehicleEF	MH	0.13	0.22
tblVehicleEF	MH	0.05	0.16
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	0.25	0.47
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.3500e-004	7.3500e-004
tblVehicleEF	MH	0.26	0.48
tblVehicleEF	MH	0.05	0.12
tblVehicleEF	MH	0.13	0.22
tblVehicleEF	MH	0.06	0.22
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	0.27	0.52
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tblVehicleEF	MHD	2.3520e-003	8.8450e-003
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tblVehicleEF	MHD	1,169.08	1,213.16
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tblVehicleEF	MHD	1.17	2.52

tblVehicleEF	MHD	16.73	16.04
tblVehicleEF	MHD	7.5000e-005	0.01
tblVehicleEF	MHD	3.1600e-003	0.05
tblVehicleEF	MHD	3.1800e-004	6.4700e-004
tblVehicleEF	MHD	7.2000e-005	0.01
tblVehicleEF	MHD	3.0210e-003	0.05
tblVehicleEF	MHD	2.9200e-004	5.9500e-004
tblVehicleEF	MHD	4.4200e-004	1.4030e-003
tblVehicleEF	MHD	0.01	0.04
tblVehicleEF	MHD	0.01	0.05
tblVehicleEF	MHD	2.1100e-004	5.6100e-004
tblVehicleEF	MHD	0.04	0.14
tblVehicleEF	MHD	5.0660e-003	0.01
tblVehicleEF	MHD	0.09	0.26
tblVehicleEF	MHD	2.0260e-003	2.0340e-003
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.5500e-004	3.7200e-004
tblVehicleEF	MHD	4.4200e-004	1.4030e-003
tblVehicleEF	MHD	0.01	0.04
tblVehicleEF	MHD	0.02	0.06
tblVehicleEF	MHD	2.1100e-004	5.6100e-004
tblVehicleEF	MHD	0.05	0.16
tblVehicleEF	MHD	5.0660e-003	0.01
tblVehicleEF	MHD	0.10	0.28
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	2.3610e-003	8.9450e-003
tblVehicleEF	MHD	0.03	0.07

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tblVehicleEF	MHD	0.25	0.58
tblVehicleEF	MHD	1.40	4.09
tblVehicleEF	MHD	224.45	225.31
tblVehicleEF	MHD	1,169.08	1,213.16
tblVehicleEF	MHD	22.87	29.48
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tblVehicleEF	MHD	1.11	2.39
tblVehicleEF	MHD	16.71	16.01
tblVehicleEF	MHD	6.3000e-005	9.0550e-003
tblVehicleEF	MHD	3.1600e-003	0.05
tblVehicleEF	MHD	3.1800e-004	6.4700e-004
tblVehicleEF	MHD	6.0000e-005	8.6630e-003
tblVehicleEF	MHD	3.0210e-003	0.05
tblVehicleEF	MHD	2.9200e-004	5.9500e-004
tblVehicleEF	MHD	1.0060e-003	3.3430e-003
tblVehicleEF	MHD	0.02	0.05
tblVehicleEF	MHD	0.01	0.05
tblVehicleEF	MHD	4.4600e-004	1.3130e-003
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tblVehicleEF	MHD	5.0490e-003	0.01
tblVehicleEF	MHD	0.09	0.25
tblVehicleEF	MHD	2.1460e-003	2.1550e-003
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.5300e-004	3.6700e-004
tblVehicleEF	MHD	1.0060e-003	3.3430e-003
tblVehicleEF	MHD	0.02	0.05

tblVehicleEF	MHD	0.02	0.05
tblVehicleEF	MHD	4.4600e-004	1.3130e-003
tblVehicleEF	MHD	0.05	0.16
tblVehicleEF	MHD	5.0490e-003	0.01
tblVehicleEF	MHD	0.10	0.27
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	2.3410e-003	8.7400e-003
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tblVehicleEF	MHD	0.23	0.57
tblVehicleEF	MHD	0.25	0.57
tblVehicleEF	MHD	1.65	4.84
tblVehicleEF	MHD	194.51	195.25
tblVehicleEF	MHD	1,169.08	1,213.16
tblVehicleEF	MHD	22.87	29.48
tblVehicleEF	MHD	0.55	1.42
tblVehicleEF	MHD	1.19	2.56
tblVehicleEF	MHD	16.74	16.09
tblVehicleEF	MHD	9.1000e-005	0.01
tblVehicleEF	MHD	3.1600e-003	0.05
tblVehicleEF	MHD	3.1800e-004	6.4700e-004
tblVehicleEF	MHD	8.7000e-005	0.01
tblVehicleEF	MHD	3.0210e-003	0.05
tblVehicleEF	MHD	2.9200e-004	5.9500e-004
tblVehicleEF	MHD	1.3700e-004	3.6800e-004
tblVehicleEF	MHD	0.01	0.04
tblVehicleEF	MHD	0.01	0.05
tblVehicleEF	MHD	8.9000e-005	2.0400e-004

tblVehicleEF	MHD	0.04	0.14
tblVehicleEF	MHD	5.6390e-003	0.01
tblVehicleEF	MHD	0.10	0.28
tblVehicleEF	MHD	1.8610e-003	1.8690e-003
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	2.5700e-004	3.7900e-004
tblVehicleEF	MHD	1.3700e-004	3.6800e-004
tblVehicleEF	MHD	0.01	0.04
tblVehicleEF	MHD	0.02	0.06
tblVehicleEF	MHD	8.9000e-005	2.0400e-004
tblVehicleEF	MHD	0.05	0.16
tblVehicleEF	MHD	5.6390e-003	0.01
tblVehicleEF	MHD	0.11	0.30
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	4.5930e-003	0.02
tblVehicleEF	OBUS	0.02	0.04
tblVehicleEF	OBUS	0.25	0.32
tblVehicleEF	OBUS	0.37	1.04
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tblVehicleEF	OBUS	210.41	174.61
tblVehicleEF	OBUS	1,308.07	1,363.34
tblVehicleEF	OBUS	59.87	65.25
tblVehicleEF	OBUS	0.50	1.12
tblVehicleEF	OBUS	1.09	2.79
tblVehicleEF	OBUS	4.38	4.04
tblVehicleEF	OBUS	4.6000e-005	5.2900e-004
tblVehicleEF	OBUS	3.2550e-003	0.01

tblVehicleEF	OBUS	8.5500e-004	8.5200e-004
tblVehicleEF	OBUS	4.4000e-005	5.0600e-004
tblVehicleEF	OBUS	3.0980e-003	0.01
tblVehicleEF	OBUS	7.8600e-004	7.8300e-004
tblVehicleEF	OBUS	1.9970e-003	2.9240e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.04	0.05
tblVehicleEF	OBUS	6.7700e-004	9.1600e-004
tblVehicleEF	OBUS	0.05	0.11
tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	0.27	0.47
tblVehicleEF	OBUS	2.0180e-003	1.6770e-003
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.7500e-004	7.8800e-004
tblVehicleEF	OBUS	1.9970e-003	2.9240e-003
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	6.7700e-004	9.1600e-004
tblVehicleEF	OBUS	0.06	0.14
tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	0.30	0.52
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	4.6710e-003	0.02
tblVehicleEF	OBUS	0.02	0.04
tblVehicleEF	OBUS	0.24	0.29
tblVehicleEF	OBUS	0.38	1.07
tblVehicleEF	OBUS	3.93	7.00

tblVehicleEF	OBUS	222.03	184.04
tblVehicleEF	OBUS	1,308.07	1,363.34
tblVehicleEF	OBUS	59.87	65.25
tblVehicleEF	OBUS	0.52	1.15
tblVehicleEF	OBUS	1.03	2.64
tblVehicleEF	OBUS	4.34	3.96
tblVehicleEF	OBUS	3.9000e-005	4.4600e-004
tblVehicleEF	OBUS	3.2550e-003	0.01
tblVehicleEF	OBUS	8.5500e-004	8.5200e-004
tblVehicleEF	OBUS	3.7000e-005	4.2700e-004
tblVehicleEF	OBUS	3.0980e-003	0.01
tblVehicleEF	OBUS	7.8600e-004	7.8300e-004
tblVehicleEF	OBUS	4.4950e-003	6.7570e-003
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tblVehicleEF	OBUS	0.04	0.05
tblVehicleEF	OBUS	1.3960e-003	1.9960e-003
tblVehicleEF	OBUS	0.05	0.11
tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	0.25	0.44
tblVehicleEF	OBUS	2.1290e-003	1.7670e-003
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tblVehicleEF	OBUS	6.6800e-004	7.7600e-004
tblVehicleEF	OBUS	4.4950e-003	6.7570e-003
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tblVehicleEF	OBUS	0.05	0.06
tblVehicleEF	OBUS	1.3960e-003	1.9960e-003
tblVehicleEF	OBUS	0.06	0.14

tblVehicleEF	OBUS	0.03	0.04
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tblVehicleEF	OBUS	4.5060e-003	0.02
tblVehicleEF	OBUS	0.03	0.04
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tblVehicleEF	OBUS	194.35	161.60
tblVehicleEF	OBUS	1,308.07	1,363.34
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tblVehicleEF	OBUS	5.6000e-005	6.4400e-004
tblVehicleEF	OBUS	3.2550e-003	0.01
tblVehicleEF	OBUS	8.5500e-004	8.5200e-004
tblVehicleEF	OBUS	5.4000e-005	6.1600e-004
tblVehicleEF	OBUS	3.0980e-003	0.01
tblVehicleEF	OBUS	7.8600e-004	7.8300e-004
tblVehicleEF	OBUS	6.5600e-004	8.7100e-004
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tblVehicleEF	OBUS	0.04	0.05
tblVehicleEF	OBUS	3.5400e-004	4.4800e-004
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tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	0.29	0.51

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tblVehicleEF	OBUS	6.5600e-004	8.7100e-004
tblVehicleEF	OBUS	0.02	0.03
tblVehicleEF	OBUS	0.05	0.07
tblVehicleEF	OBUS	3.5400e-004	4.4800e-004
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tblVehicleEF	OBUS	0.03	0.04
tblVehicleEF	OBUS	0.32	0.56
tblVehicleEF	SBUS	0.82	0.87
tblVehicleEF	SBUS	5.5010e-003	0.01
tblVehicleEF	SBUS	0.06	0.09
tblVehicleEF	SBUS	4.35	3.94
tblVehicleEF	SBUS	0.39	0.85
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tblVehicleEF	SBUS	1,265.58	1,369.86
tblVehicleEF	SBUS	1,137.86	1,188.59
tblVehicleEF	SBUS	28.65	23.47
tblVehicleEF	SBUS	6.89	14.90
tblVehicleEF	SBUS	2.31	5.99
tblVehicleEF	SBUS	16.20	17.31
tblVehicleEF	SBUS	3.5800e-003	0.02
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.03
tblVehicleEF	SBUS	4.7200e-004	4.1100e-004
tblVehicleEF	SBUS	3.4250e-003	0.02

tblVehicleEF	SBUS	2.7940e-003	2.8270e-003
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tblVehicleEF	SBUS	4.3400e-004	3.7800e-004
tblVehicleEF	SBUS	2.7520e-003	3.2380e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.52	0.47
tblVehicleEF	SBUS	9.7100e-004	9.2100e-004
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tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.01
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tblVehicleEF	SBUS	28.65	23.47
tblVehicleEF	SBUS	7.11	15.38
tblVehicleEF	SBUS	2.19	5.69
tblVehicleEF	SBUS	16.18	17.28
tblVehicleEF	SBUS	3.0180e-003	0.01
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tblVehicleEF	SBUS	0.01	0.03
tblVehicleEF	SBUS	4.7200e-004	4.1100e-004
tblVehicleEF	SBUS	2.8870e-003	0.01
tblVehicleEF	SBUS	2.7940e-003	2.8270e-003
tblVehicleEF	SBUS	0.01	0.03
tblVehicleEF	SBUS	4.3400e-004	3.7800e-004
tblVehicleEF	SBUS	6.1260e-003	7.4420e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.51	0.47
tblVehicleEF	SBUS	1.9510e-003	2.0250e-003
tblVehicleEF	SBUS	0.08	0.14
tblVehicleEF	SBUS	6.5940e-003	0.01
tblVehicleEF	SBUS	0.14	0.19
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	3.2500e-004	2.8800e-004
tblVehicleEF	SBUS	6.1260e-003	7.4420e-003
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.74	0.66
tblVehicleEF	SBUS	1.9510e-003	2.0250e-003

tblVehicleEF	SBUS	0.09	0.16
tblVehicleEF	SBUS	6.5940e-003	0.01
tblVehicleEF	SBUS	0.15	0.20
tblVehicleEF	SBUS	0.82	0.87
tblVehicleEF	SBUS	5.4290e-003	0.01
tblVehicleEF	SBUS	0.07	0.11
tblVehicleEF	SBUS	4.48	4.20
tblVehicleEF	SBUS	0.38	0.83
tblVehicleEF	SBUS	4.46	6.14
tblVehicleEF	SBUS	1,173.34	1,266.97
tblVehicleEF	SBUS	1,137.86	1,188.59
tblVehicleEF	SBUS	28.65	23.47
tblVehicleEF	SBUS	6.58	14.24
tblVehicleEF	SBUS	2.35	6.11
tblVehicleEF	SBUS	16.21	17.34
tblVehicleEF	SBUS	4.3560e-003	0.02
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.03
tblVehicleEF	SBUS	4.7200e-004	4.1100e-004
tblVehicleEF	SBUS	4.1670e-003	0.02
tblVehicleEF	SBUS	2.7940e-003	2.8270e-003
tblVehicleEF	SBUS	0.01	0.03
tblVehicleEF	SBUS	4.3400e-004	3.7800e-004
tblVehicleEF	SBUS	9.4100e-004	9.3700e-004
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.52	0.48
tblVehicleEF	SBUS	5.2100e-004	4.5400e-004

tblVehicleEF	SBUS	0.08	0.13
tblVehicleEF	SBUS	9.5180e-003	0.02
tblVehicleEF	SBUS	0.21	0.28
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	3.6300e-004	3.4000e-004
tblVehicleEF	SBUS	9.4100e-004	9.3700e-004
tblVehicleEF	SBUS	0.02	0.02
tblVehicleEF	SBUS	0.74	0.67
tblVehicleEF	SBUS	5.2100e-004	4.5400e-004
tblVehicleEF	SBUS	0.09	0.16
tblVehicleEF	SBUS	9.5180e-003	0.02
tblVehicleEF	SBUS	0.23	0.30
tblVehicleEF	UBUS	1.19	2.05
tblVehicleEF	UBUS	0.06	0.07
tblVehicleEF	UBUS	5.41	8.78
tblVehicleEF	UBUS	8.96	10.27
tblVehicleEF	UBUS	1,825.34	1,981.19
tblVehicleEF	UBUS	139.10	125.24
tblVehicleEF	UBUS	3.46	8.97
tblVehicleEF	UBUS	12.59	14.01
tblVehicleEF	UBUS	0.51	0.55
tblVehicleEF	UBUS	0.05	0.14
tblVehicleEF	UBUS	1.3470e-003	8.4600e-004
tblVehicleEF	UBUS	0.22	0.24
tblVehicleEF	UBUS	0.05	0.14
tblVehicleEF	UBUS	1.2380e-003	7.7800e-004

tblVehicleEF	UBUS	5.9980e-003	6.5800e-003
tblVehicleEF	UBUS	0.07	0.08
tblVehicleEF	UBUS	2.7120e-003	2.8920e-003
tblVehicleEF	UBUS	0.27	0.71
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.82	0.89
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	1.5560e-003	1.4410e-003
tblVehicleEF	UBUS	5.9980e-003	6.5800e-003
tblVehicleEF	UBUS	0.07	0.08
tblVehicleEF	UBUS	2.7120e-003	2.8920e-003
tblVehicleEF	UBUS	1.49	2.85
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.90	0.97
tblVehicleEF	UBUS	1.19	2.05
tblVehicleEF	UBUS	0.05	0.06
tblVehicleEF	UBUS	5.43	8.83
tblVehicleEF	UBUS	7.28	8.29
tblVehicleEF	UBUS	1,825.34	1,981.19
tblVehicleEF	UBUS	139.10	125.24
tblVehicleEF	UBUS	3.27	8.51
tblVehicleEF	UBUS	12.50	13.91
tblVehicleEF	UBUS	0.51	0.55
tblVehicleEF	UBUS	0.05	0.14
tblVehicleEF	UBUS	1.3470e-003	8.4600e-004
tblVehicleEF	UBUS	0.22	0.24
tblVehicleEF	UBUS	0.05	0.14

tblVehicleEF	UBUS	1.2380e-003	7.7800e-004
tblVehicleEF	UBUS	0.01	0.02
tblVehicleEF	UBUS	0.09	0.11
tblVehicleEF	UBUS	5.6790e-003	6.2720e-003
tblVehicleEF	UBUS	0.27	0.72
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.73	0.78
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	1.5270e-003	1.4060e-003
tblVehicleEF	UBUS	0.01	0.02
tblVehicleEF	UBUS	0.09	0.11
tblVehicleEF	UBUS	5.6790e-003	6.2720e-003
tblVehicleEF	UBUS	1.49	2.86
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	0.80	0.86
tblVehicleEF	UBUS	1.19	2.05
tblVehicleEF	UBUS	0.07	0.07
tblVehicleEF	UBUS	5.39	8.73
tblVehicleEF	UBUS	10.94	12.62
tblVehicleEF	UBUS	1,825.34	1,981.19
tblVehicleEF	UBUS	139.10	125.24
tblVehicleEF	UBUS	3.53	9.15
tblVehicleEF	UBUS	12.70	14.13
tblVehicleEF	UBUS	0.51	0.55
tblVehicleEF	UBUS	0.05	0.14
tblVehicleEF	UBUS	1.3470e-003	8.4600e-004
tblVehicleEF	UBUS	0.22	0.24

tblVehicleEF	UBUS	0.05	0.14
tblVehicleEF	UBUS	1.2380e-003	7.7800e-004
tblVehicleEF	UBUS	2.0250e-003	2.1400e-003
tblVehicleEF	UBUS	0.06	0.08
tblVehicleEF	UBUS	1.3940e-003	1.4110e-003
tblVehicleEF	UBUS	0.26	0.71
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	0.93	1.00
tblVehicleEF	UBUS	0.01	0.01
tblVehicleEF	UBUS	1.5910e-003	1.4810e-003
tblVehicleEF	UBUS	2.0250e-003	2.1400e-003
tblVehicleEF	UBUS	0.06	0.08
tblVehicleEF	UBUS	1.3940e-003	1.4110e-003
tblVehicleEF	UBUS	1.49	2.84
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.01	1.10
tblVehicleTrips	WD_TR	74.06	47.08
tblVehicleTrips	WD_TR	12.89	25.65
tblVehicleTrips	WD_TR	0.00	14.37

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.1638	1.6442	1.1067	2.7600e-003	0.1601	0.0726	0.2327	0.0427	0.0679	0.1106						251.5462
2020	0.4703	2.2840	1.9978	4.5000e-003	0.1148	0.1071	0.2219	0.0311	0.1009	0.1320						402.9467
Maximum	**0.4703**	**2.2840**	**1.9978**	**4.5000e-003**	**0.1601**	**0.1071**	**0.2327**	**0.0427**	**0.1009**	**0.1320**						**402.9467**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0708	1.1662	1.1689	2.7600e-003	0.0962	0.0467	0.1430	0.0258	0.0465	0.0724						251.5460
2020	0.3352	1.8378	2.1068	4.5000e-003	0.1148	0.0875	0.2023	0.0311	0.0874	0.1185						402.9464
Maximum	**0.3352**	**1.8378**	**2.1068**	**4.5000e-003**	**0.1148**	**0.0875**	**0.2023**	**0.0311**	**0.0874**	**0.1185**						**402.9464**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**35.97**	**23.53**	**-5.51**	**0.00**	**23.25**	**25.27**	**24.04**	**22.85**	**20.71**	**21.36**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	8-1-2019	10-31-2019	1.1346	0.7484
2	11-1-2019	1-31-2020	0.9879	0.7309
3	2-1-2020	4-30-2020	1.0264	0.8093
4	5-1-2020	7-31-2020	1.1059	0.8787
5	8-1-2020	9-30-2020	0.3061	0.2408
		Highest	1.1346	0.8787

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2994	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003
Energy	9.1900e-003	0.0835	0.0702	5.0000e-004		6.3500e-003	6.3500e-003		6.3500e-003	6.3500e-003						183.1842
Mobile	0.5317	6.2676	5.0029	0.0235	1.2997	0.0275	1.3272	0.3504	0.0261	0.3765						2,195.8325
Waste						0.0000	0.0000		0.0000	0.0000						44.3609
Water						0.0000	0.0000		0.0000	0.0000						8.5438
Total	**0.8403**	**6.3511**	**5.0737**	**0.0240**	**1.2997**	**0.0339**	**1.3336**	**0.3504**	**0.0325**	**0.3829**						**2,431.9228**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2994	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003
Energy	9.1900e-003	0.0835	0.0702	5.0000e-004		6.3500e-003	6.3500e-003		6.3500e-003	6.3500e-003						175.7708
Mobile	0.5317	6.2676	5.0029	0.0235	1.2997	0.0275	1.3272	0.3504	0.0261	0.3765						2,195.8325
Waste						0.0000	0.0000		0.0000	0.0000						22.1805
Water						0.0000	0.0000		0.0000	0.0000						7.3077
Total	**0.8403**	**6.3511**	**5.0737**	**0.0240**	**1.2997**	**0.0339**	**1.3336**	**0.3504**	**0.0325**	**0.3829**						**2,401.0929**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.27**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	8/1/2019	8/28/2019	5	20	
2	RAW & Site Grading	Grading	8/29/2019	9/11/2019	5	10	
3	Building Construction	Building Construction	9/26/2019	8/12/2020	5	230	
4	Paving	Paving	8/13/2020	9/9/2020	5	20	
5	Architectural Coating	Architectural Coating	3/1/2020	8/12/2020	5	118	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 101,775; Non-Residential Outdoor: 33,925; Striped Parking Area: 13,068 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
RAW & Site Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
RAW & Site Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
RAW & Site Grading	Graders	1	8.00	187	0.41
RAW & Site Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	24.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	120.00	47.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	15.00	0.00	636.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
RAW & Site Grading	7	15.00	0.00	500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0688	0.0000	0.0688	0.0104	0.0000	0.0104						0.0000
Off-Road	0.0351	0.3578	0.2206	3.9000e-004		0.0180	0.0180		0.0167	0.0167						34.8672
Total	**0.0351**	**0.3578**	**0.2206**	**3.9000e-004**	**0.0688**	**0.0180**	**0.0868**	**0.0104**	**0.0167**	**0.0271**						**34.8672**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.7500e-003	0.0959	0.0128	2.6000e-004	5.4400e-003	3.7000e-004	5.8100e-003	1.4900e-003	3.6000e-004	1.8500e-003						24.5595
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	7.1000e-004	4.7000e-004	4.6700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.0720
Total	**3.4600e-003**	**0.0963**	**0.0175**	**2.7000e-004**	**6.6400e-003**	**3.8000e-004**	**7.0200e-003**	**1.8100e-003**	**3.7000e-004**	**2.1800e-003**						**25.6315**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0268	0.0000	0.0268	4.0600e-003	0.0000	4.0600e-003						0.0000
Off-Road	0.0101	0.1845	0.2428	3.9000e-004		8.6900e-003	8.6900e-003		8.6300e-003	8.6300e-003						34.8671
Total	**0.0101**	**0.1845**	**0.2428**	**3.9000e-004**	**0.0268**	**8.6900e-003**	**0.0355**	**4.0600e-003**	**8.6300e-003**	**0.0127**						**34.8671**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.7500e-003	0.0959	0.0128	2.6000e-004	5.4400e-003	3.7000e-004	5.8100e-003	1.4900e-003	3.6000e-004	1.8500e-003						24.5595
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	7.1000e-004	4.7000e-004	4.6700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.0720
Total	**3.4600e-003**	**0.0963**	**0.0175**	**2.7000e-004**	**6.6400e-003**	**3.8000e-004**	**7.0200e-003**	**1.8100e-003**	**3.7000e-004**	**2.1800e-003**						**25.6315**

3.3 RAW & Site Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0360	0.0000	0.0360	0.0172	0.0000	0.0172						0.0000
Off-Road	0.0142	0.1552	0.0978	1.7000e-004		7.6300e-003	7.6300e-003		7.0200e-003	7.0200e-003						15.7633
Total	**0.0142**	**0.1552**	**0.0978**	**1.7000e-004**	**0.0360**	**7.6300e-003**	**0.0436**	**0.0172**	**7.0200e-003**	**0.0242**						**15.7633**

3.3 RAW & Site Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.1600e-003	0.0754	0.0101	2.0000e-004	4.2700e-003	2.9000e-004	4.5700e-003	1.1800e-003	2.8000e-004	1.4600e-003						19.3078
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.5000e-004	2.3000e-004	2.3400e-003	1.0000e-005	6.0000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004						0.5360
Total	**2.5100e-003**	**0.0756**	**0.0124**	**2.1000e-004**	**4.8700e-003**	**2.9000e-004**	**5.1700e-003**	**1.3400e-003**	**2.8000e-004**	**1.6200e-003**						**19.8438**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0140	0.0000	0.0140	6.7100e-003	0.0000	6.7100e-003						0.0000
Off-Road	4.5300e-003	0.0869	0.1132	1.7000e-004		4.3900e-003	4.3900e-003		4.3700e-003	4.3700e-003						15.7632
Total	**4.5300e-003**	**0.0869**	**0.1132**	**1.7000e-004**	**0.0140**	**4.3900e-003**	**0.0184**	**6.7100e-003**	**4.3700e-003**	**0.0111**						**15.7632**

3.3 RAW & Site Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.1600e-003	0.0754	0.0101	2.0000e-004	4.2700e-003	2.9000e-004	4.5700e-003	1.1800e-003	2.8000e-004	1.4600e-003						19.3078
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.5000e-004	2.3000e-004	2.3400e-003	1.0000e-005	6.0000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004						0.5360
Total	**2.5100e-003**	**0.0756**	**0.0124**	**2.1000e-004**	**4.8700e-003**	**2.9000e-004**	**5.1700e-003**	**1.3400e-003**	**2.8000e-004**	**1.6200e-003**						**19.8438**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0815	0.7272	0.5922	9.3000e-004		0.0445	0.0445		0.0418	0.0418						81.6049
Total	**0.0815**	**0.7272**	**0.5922**	**9.3000e-004**		**0.0445**	**0.0445**		**0.0418**	**0.0418**						**81.6049**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	7.4600e-003	0.2192	0.0374	4.6000e-004	0.0108	1.5900e-003	0.0123	3.1000e-003	1.5200e-003	4.6300e-003						44.2485
Worker	0.0196	0.0129	0.1290	3.3000e-004	0.0331	2.2000e-004	0.0333	8.8000e-003	2.0000e-004	9.0000e-003						29.5871
Total	**0.0270**	**0.2321**	**0.1664**	**7.9000e-004**	**0.0439**	**1.8100e-003**	**0.0457**	**0.0119**	**1.7200e-003**	**0.0136**						**73.8355**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0233	0.4908	0.6166	9.3000e-004		0.0312	0.0312		0.0312	0.0312						81.6048
Total	**0.0233**	**0.4908**	**0.6166**	**9.3000e-004**		**0.0312**	**0.0312**		**0.0312**	**0.0312**						**81.6048**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	7.4600e-003	0.2192	0.0374	4.6000e-004	0.0108	1.5900e-003	0.0123	3.1000e-003	1.5200e-003	4.6300e-003						44.2485
Worker	0.0196	0.0129	0.1290	3.3000e-004	0.0331	2.2000e-004	0.0333	8.8000e-003	2.0000e-004	9.0000e-003						29.5871
Total	**0.0270**	**0.2321**	**0.1664**	**7.9000e-004**	**0.0439**	**1.8100e-003**	**0.0457**	**0.0119**	**1.7200e-003**	**0.0136**						**73.8355**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1707	1.5445	1.3563	2.1700e-003		0.0899	0.0899		0.0846	0.0846						187.5832
Total	**0.1707**	**1.5445**	**1.3563**	**2.1700e-003**		**0.0899**	**0.0899**		**0.0846**	**0.0846**						**187.5832**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0141	0.4688	0.0749	1.0700e-003	0.0251	2.4900e-003	0.0276	7.2400e-003	2.3800e-003	9.6200e-003						102.3509
Worker	0.0417	0.0265	0.2685	7.4000e-004	0.0772	5.0000e-004	0.0777	0.0205	4.6000e-004	0.0210						66.8861
Total	**0.0558**	**0.4953**	**0.3434**	**1.8100e-003**	**0.1023**	**2.9900e-003**	**0.1053**	**0.0278**	**2.8400e-003**	**0.0306**						**169.2369**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0543	1.1452	1.4388	2.1700e-003		0.0727	0.0727		0.0727	0.0727						187.5830
Total	**0.0543**	**1.1452**	**1.4388**	**2.1700e-003**		**0.0727**	**0.0727**		**0.0727**	**0.0727**						**187.5830**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0141	0.4688	0.0749	1.0700e-003	0.0251	2.4900e-003	0.0276	7.2400e-003	2.3800e-003	9.6200e-003						102.3509
Worker	0.0417	0.0265	0.2685	7.4000e-004	0.0772	5.0000e-004	0.0777	0.0205	4.6000e-004	0.0210						66.8861
Total	**0.0558**	**0.4953**	**0.3434**	**1.8100e-003**	**0.1023**	**2.9900e-003**	**0.1053**	**0.0278**	**2.8400e-003**	**0.0306**						**169.2369**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0136	0.1407	0.1465	2.3000e-004		7.5300e-003	7.5300e-003		6.9300e-003	6.9300e-003						20.1902
Paving	6.5500e-003					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.0201**	**0.1407**	**0.1465**	**2.3000e-004**		**7.5300e-003**	**7.5300e-003**		**6.9300e-003**	**6.9300e-003**						**20.1902**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	6.5000e-004	4.1000e-004	4.1700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.0386
Total	**6.5000e-004**	**4.1000e-004**	**4.1700e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**						**1.0386**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.6100e-003	0.1130	0.1730	2.3000e-004		6.0900e-003	6.0900e-003		6.0900e-003	6.0900e-003						20.1901
Paving	6.5500e-003					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.0122**	**0.1130**	**0.1730**	**2.3000e-004**		**6.0900e-003**	**6.0900e-003**		**6.0900e-003**	**6.0900e-003**						**20.1901**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	6.5000e-004	4.1000e-004	4.1700e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004						1.0386
Total	**6.5000e-004**	**4.1000e-004**	**4.1700e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**						**1.0386**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2027					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0143	0.0994	0.1081	1.8000e-004		6.5500e-003	6.5500e-003		6.5500e-003	6.5500e-003						15.0934
Total	**0.2170**	**0.0994**	**0.1081**	**1.8000e-004**		**6.5500e-003**	**6.5500e-003**		**6.5500e-003**	**6.5500e-003**						**15.0934**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	6.1100e-003	3.8800e-003	0.0394	1.1000e-004	0.0113	7.0000e-005	0.0114	3.0100e-003	7.0000e-005	3.0800e-003						9.8044
Total	**6.1100e-003**	**3.8800e-003**	**0.0394**	**1.1000e-004**	**0.0113**	**7.0000e-005**	**0.0114**	**3.0100e-003**	**7.0000e-005**	**3.0800e-003**						**9.8044**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2027					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	3.5100e-003	0.0801	0.1081	1.8000e-004		5.6100e-003	5.6100e-003		5.6100e-003	5.6100e-003						15.0933
Total	**0.2062**	**0.0801**	**0.1081**	**1.8000e-004**		**5.6100e-003**	**5.6100e-003**		**5.6100e-003**	**5.6100e-003**						**15.0933**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	6.1100e-003	3.8800e-003	0.0394	1.1000e-004	0.0113	7.0000e-005	0.0114	3.0100e-003	7.0000e-005	3.0800e-003						9.8044
Total	**6.1100e-003**	**3.8800e-003**	**0.0394**	**1.1000e-004**	**0.0113**	**7.0000e-005**	**0.0114**	**3.0100e-003**	**7.0000e-005**	**3.0800e-003**						**9.8044**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Mitigated	0.5317	6.2676	5.0029	0.0235	1.2997	0.0275	1.3272	0.3504	0.0261	0.3765						2,195.8325
Unmitigated	0.5317	6.2676	5.0029	0.0235	1.2997	0.0275	1.3272	0.3504	0.0261	0.3765						2,195.8325

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Day-Care Center	112.99	14.90	13.99	99,906	99,906
High School	1,678.79	286.02	117.16	3,290,331	3,290,331
Parking Lot	0.00	0.00	0.00		
User Defined Educational	0.00	0.00	0.00		
Total	1,791.78	300.92	131.15	3,390,237	3,390,237

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Day-Care Center	9.50	7.30	7.30	12.70	82.30	5.00	28	58	14
High School	9.50	7.30	7.30	77.80	17.20	5.00	75	19	6
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
User Defined Educational	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Day-Care Center	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
High School	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
Parking Lot	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
User Defined Educational	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000						84.3139
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000						91.7273
NaturalGas Mitigated	9.1900e-003	0.0835	0.0702	5.0000e-004		6.3500e-003	6.3500e-003		6.3500e-003	6.3500e-003						91.4569
NaturalGas Unmitigated	9.1900e-003	0.0835	0.0702	5.0000e-004		6.3500e-003	6.3500e-003		6.3500e-003	6.3500e-003						91.4569

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Day-Care Center	60264	3.2000e-004	2.9500e-003	2.4800e-003	2.0000e-005		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004						3.2350
High School	1.64345e+006	8.8600e-003	0.0806	0.0677	4.8000e-004		6.1200e-003	6.1200e-003		6.1200e-003	6.1200e-003						88.2219
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
User Defined Educational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Total		**9.1800e-003**	**0.0835**	**0.0702**	**5.0000e-004**		**6.3400e-003**	**6.3400e-003**		**6.3400e-003**	**6.3400e-003**						**91.4569**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Day-Care Center	60264	3.2000e-004	2.9500e-003	2.4800e-003	2.0000e-005		2.2000e-004	2.2000e-004		2.2000e-004	2.2000e-004						3.2350
High School	1.64345e+006	8.8600e-003	0.0806	0.0677	4.8000e-004		6.1200e-003	6.1200e-003		6.1200e-003	6.1200e-003						88.2219
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
User Defined Educational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Total		**9.1800e-003**	**0.0835**	**0.0702**	**5.0000e-004**		**6.3400e-003**	**6.3400e-003**		**6.3400e-003**	**6.3400e-003**						**91.4569**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Day-Care Center	16848				2.7970
High School	459459				76.2753
Parking Lot	76230				12.6550
User Defined Educational	0				0.0000
Total					**91.7273**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Day-Care Center	15699.8				2.6064
High School	428148				71.0773
Parking Lot	64033.2				10.6302
User Defined Educational	0				0.0000
Total					**84.3139**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2994	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003
Unmitigated	0.2994	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0203					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.2791					0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	6.0000e-005	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003
Total	**0.2994**	**1.0000e-005**	**6.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**						**1.3900e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0203					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.2791					0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	6.0000e-005	1.0000e-005	6.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000						1.3900e-003
Total	**0.2994**	**1.0000e-005**	**6.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**						**1.3900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				7.3077
Unmitigated				8.5438

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Day-Care Center	0.102935 / 0.26469				0.3864
High School	2.17324 / 5.58834				8.1574
Parking Lot	0 / 0				0.0000
User Defined Educational	0 / 0				0.0000
Total					**8.5438**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Day-Care Center	0.082348 / 0.248544				0.3305
High School	1.73859 / 5.24745				6.9772
Parking Lot	0 / 0				0.0000
User Defined Educational	0 / 0				0.0000
Total					**7.3077**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				22.1805
Unmitigated				44.3609

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Day-Care Center	3.12				1.5691
High School	85.09				42.7919
Parking Lot	0				0.0000
User Defined Educational	0				0.0000
Total					**44.3609**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Day-Care Center	1.56				0.7845
High School	42.545				21.3960
Parking Lot	0				0.0000
User Defined Educational	0				0.0000
Total					**22.1805**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

FUSD Ventura Alt Ed Campus

Fresno County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	2.40	1000sqft	0.06	2,400.00	0
High School	65.45	1000sqft	1.50	65,450.00	0
Parking Lot	5.00	Acre	5.00	217,800.00	0
User Defined Educational	0.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	488.3	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Includes RPS adjustment.

Land Use - Includes 2400sf child care facility, 65450sf high school, 5 ac paved. District offices will occupy existing office buildings.

Construction Phase - Based on model defaults. RAW excavation based on information provided. Arch coating based on building const period, excluding initial approx. four-month framing period.

Off-road Equipment - Off-road equipment based on model defaults.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Based on model defaults. Assumes an additional grader for RAW excavation (2 total).

Grading - Assumes 10,000 cy exported during RAW (500 truckloads).

Demolition - 139805 sf demolished

Trips and VMT - Based on model defaults. Includes 500 truckloads for RAW export.

Architectural Coating - Assumes 50 g/L for interior/exterior paint.

Vehicle Trips - Based on trip gen from the traffic analysis.

Road Dust - Based on model defaults.

Area Coating - Assumes 50 g/L for interior/exterior paints.

Energy Use -

Construction Off-road Equipment Mitigation - Assumes T3 for modeling purposes. Mitigation includes 50%CE for watering vehicle travel surfaces, 61%CE for graded surfaces, 15mph onsite speed limit.

Mobile Commute Mitigation -

Energy Mitigation - Assumes minimum 16% reduction for use of high-efficiency lighting.

Water Mitigation - Includes use of low-flow water fixtures and water-efficient irrigation systems.

Waste Mitigation - Assumes 50% diversion rate based on current statewide averages.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	50.00
tblArchitecturalCoating	EF_Residential_Exterior	150.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	150.00	50.00

tblAreaCoating	Area_EF_Nonresidential_Exterior	150	50
tblAreaCoating	Area_EF_Nonresidential_Interior	150	50
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	118.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	PhaseEndDate	10/7/2020	8/12/2020
tblConstructionPhase	PhaseEndDate	9/25/2019	9/11/2019
tblConstructionPhase	PhaseStartDate	9/10/2020	3/1/2020
tblGrading	AcresOfGrading	5.00	10.00
tblGrading	MaterialExported	0.00	10,000.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	641.35	488.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblTripsAndVMT	HaulingTripNumber	1,250.00	500.00
tblTripsAndVMT	WorkerTripNumber	18.00	15.00
tblVehicleTrips	WD_TR	74.06	47.08
tblVehicleTrips	WD_TR	12.89	25.65
tblVehicleTrips	WD_TR	0.00	14.37

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	3.8654	45.7730	23.8094	0.0769	8.1942	1.8326	9.7798	3.7146	1.7057	5.1754						7,899.2886
2020	6.6773	26.9814	24.1717	0.0555	1.5014	1.2660	2.7674	0.4055	1.1974	1.6028						5,475.8827
Maximum	**6.6773**	**45.7730**	**24.1717**	**0.0769**	**8.1942**	**1.8326**	**9.7798**	**3.7146**	**1.7057**	**5.1754**						**7,899.2886**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.5327	32.1297	26.0303	0.0769	3.8049	0.9556	4.7421	1.6150	0.9532	2.5456						7,899.2886
2020	5.0486	21.6946	25.1980	0.0555	1.5014	1.0367	2.5381	0.4055	1.0348	1.4402						5,475.8827
Maximum	**5.0486**	**32.1297**	**26.0303**	**0.0769**	**3.8049**	**1.0367**	**4.7421**	**1.6150**	**1.0348**	**2.5456**						**7,899.2886**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**37.57**	**26.02**	**-6.77**	**0.00**	**45.27**	**35.70**	**41.98**	**50.96**	**31.52**	**41.20**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.6409	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170
Energy	0.0503	0.4576	0.3844	2.7500e-003		0.0348	0.0348		0.0348	0.0348						552.4054
Mobile	4.6192	45.3671	39.6689	0.1819	9.7932	0.2003	9.9935	2.6343	0.1900	2.8243						18,685.1594
Total	**6.3104**	**45.8248**	**40.0607**	**0.1846**	**9.7932**	**0.2351**	**10.0284**	**2.6343**	**0.2248**	**2.8591**						**19,237.5818**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.6409	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170
Energy	0.0503	0.4576	0.3844	2.7500e-003		0.0348	0.0348		0.0348	0.0348						552.4054
Mobile	4.6192	45.3671	39.6689	0.1819	9.7932	0.2003	9.9935	2.6343	0.1900	2.8243						18,685.1594
Total	**6.3104**	**45.8248**	**40.0607**	**0.1846**	**9.7932**	**0.2351**	**10.0284**	**2.6343**	**0.2248**	**2.8591**						**19,237.5818**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	8/1/2019	8/28/2019	5	20	
2	RAW & Site Grading	Grading	8/29/2019	9/11/2019	5	10	
3	Building Construction	Building Construction	9/26/2019	8/12/2020	5	230	
4	Paving	Paving	8/13/2020	9/9/2020	5	20	
5	Architectural Coating	Architectural Coating	3/1/2020	8/12/2020	5	118	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 101,775; Non-Residential Outdoor: 33,925; Striped Parking Area: 13,068 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
RAW & Site Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
RAW & Site Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
RAW & Site Grading	Graders	1	8.00	187	0.41
RAW & Site Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	24.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	120.00	47.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	15.00	0.00	636.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
RAW & Site Grading	7	15.00	0.00	500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.8809	0.0000	6.8809	1.0418	0.0000	1.0418						0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697						3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**6.8809**	**1.7949**	**8.6758**	**1.0418**	**1.6697**	**2.7115**						**3,843.4451**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2714	9.3490	1.2098	0.0260	0.5567	0.0369	0.5936	0.1526	0.0353	0.1880						2,731.298 7
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0807	0.0434	0.5395	1.3000e-003	0.1232	7.9000e-004	0.1240	0.0327	7.3000e-004	0.0334						129.5893
Total	**0.3521**	**9.3925**	**1.7493**	**0.0273**	**0.6799**	**0.0377**	**0.7177**	**0.1853**	**0.0360**	**0.2214**						**2,860.888 0**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.6835	0.0000	2.6835	0.4063	0.0000	0.4063						0.0000
Off-Road	1.0048	18.4481	24.2810	0.0388		0.8692	0.8692		0.8630	0.8630						3,843.445 1
Total	**1.0048**	**18.4481**	**24.2810**	**0.0388**	**2.6835**	**0.8692**	**3.5527**	**0.4063**	**0.8630**	**1.2693**						**3,843.445 1**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2714	9.3490	1.2098	0.0260	0.5567	0.0369	0.5936	0.1526	0.0353	0.1880						2,731.2987
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0807	0.0434	0.5395	1.3000e-003	0.1232	7.9000e-004	0.1240	0.0327	7.3000e-004	0.0334						129.5893
Total	**0.3521**	**9.3925**	**1.7493**	**0.0273**	**0.6799**	**0.0377**	**0.7177**	**0.1853**	**0.0360**	**0.2214**						**2,860.8880**

3.3 RAW & Site Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1957	0.0000	7.1957	3.4419	0.0000	3.4419						0.0000
Off-Road	2.8412	31.0299	19.5566	0.0348		1.5267	1.5267		1.4046	1.4046						3,475.2046
Total	**2.8412**	**31.0299**	**19.5566**	**0.0348**	**7.1957**	**1.5267**	**8.7224**	**3.4419**	**1.4046**	**4.8464**						**3,475.2046**

3.3 RAW & Site Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4267	14.6998	1.9022	0.0408	0.8753	0.0580	0.9334	0.2400	0.0555	0.2955						4,294.494 8
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0807	0.0434	0.5395	1.3000e-003	0.1232	7.9000e-004	0.1240	0.0327	7.3000e-004	0.0334						129.5893
Total	**0.5074**	**14.7432**	**2.4417**	**0.0421**	**0.9986**	**0.0588**	**1.0574**	**0.2727**	**0.0563**	**0.3290**						**4,424.084 1**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8063	0.0000	2.8063	1.3423	0.0000	1.3423						0.0000
Off-Road	0.9069	17.3865	22.6467	0.0348		0.8784	0.8784		0.8743	0.8743						3,475.204 6
Total	**0.9069**	**17.3865**	**22.6467**	**0.0348**	**2.8063**	**0.8784**	**3.6848**	**1.3423**	**0.8743**	**2.2166**						**3,475.204 6**

3.3 RAW & Site Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4267	14.6998	1.9022	0.0408	0.8753	0.0580	0.9334	0.2400	0.0555	0.2955						4,294.4948
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0807	0.0434	0.5395	1.3000e-003	0.1232	7.9000e-004	0.1240	0.0327	7.3000e-004	0.0334						129.5893
Total	**0.5074**	**14.7432**	**2.4417**	**0.0421**	**0.9986**	**0.0588**	**1.0574**	**0.2727**	**0.0563**	**0.3290**						**4,424.0841**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127						2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**						**2,607.3635**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.2134	6.2562	1.0081	0.0136	0.3185	0.0457	0.3642	0.0917	0.0438	0.1354						1,432.226 9
Worker	0.6454	0.3473	4.3161	0.0104	0.9858	6.3600e-003	0.9921	0.2615	5.8600e-003	0.2673						1,036.714 3
Total	**0.8588**	**6.6034**	**5.3241**	**0.0240**	**1.3042**	**0.0521**	**1.3563**	**0.3532**	**0.0496**	**0.4028**						**2,468.941 2**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,607.363 5
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,607.363 5**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.2134	6.2562	1.0081	0.0136	0.3185	0.0457	0.3642	0.0917	0.0438	0.1354						1,432.226 9
Worker	0.6454	0.3473	4.3161	0.0104	0.9858	6.3600e-003	0.9921	0.2615	5.8600e-003	0.2673						1,036.714 3
Total	**0.8588**	**6.6034**	**5.3241**	**0.0240**	**1.3042**	**0.0521**	**1.3563**	**0.3532**	**0.0496**	**0.4028**						**2,468.941 2**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503						2,568.634 5
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**						**2,568.634 5**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1729	5.7442	0.8610	0.0135	0.3185	0.0306	0.3491	0.0917	0.0293	0.1210						1,419.8900
Worker	0.5894	0.3061	3.8590	0.0101	0.9858	6.1700e-003	0.9919	0.2615	5.6800e-003	0.2672						1,004.4711
Total	**0.7623**	**6.0503**	**4.7200**	**0.0236**	**1.3042**	**0.0368**	**1.3410**	**0.3532**	**0.0350**	**0.3881**						**2,424.3612**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,568.6345
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,568.6345**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1729	5.7442	0.8610	0.0135	0.3185	0.0306	0.3491	0.0917	0.0293	0.1210						1,419.890 0
Worker	0.5894	0.3061	3.8590	0.0101	0.9858	6.1700e-003	0.9919	0.2615	5.6800e-003	0.2672						1,004.471 1
Total	**0.7623**	**6.0503**	**4.7200**	**0.0236**	**1.3042**	**0.0368**	**1.3410**	**0.3532**	**0.0350**	**0.3881**						**2,424.361 2**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926						2,225.584 1
Paving	0.6550					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**2.0116**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**						**2,225.584 1**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0737	0.0383	0.4824	1.2600e-003	0.1232	7.7000e-004	0.1240	0.0327	7.1000e-004	0.0334						125.5589
Total	**0.0737**	**0.0383**	**0.4824**	**1.2600e-003**	**0.1232**	**7.7000e-004**	**0.1240**	**0.0327**	**7.1000e-004**	**0.0334**						**125.5589**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5609	11.2952	17.2957	0.0228		0.6093	0.6093		0.6093	0.6093						2,225.5841
Paving	0.6550					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**1.2159**	**11.2952**	**17.2957**	**0.0228**		**0.6093**	**0.6093**		**0.6093**	**0.6093**						**2,225.5841**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0737	0.0383	0.4824	1.2600e-003	0.1232	7.7000e-004	0.1240	0.0327	7.1000e-004	0.0334						125.5589
Total	**0.0737**	**0.0383**	**0.4824**	**1.2600e-003**	**0.1232**	**7.7000e-004**	**0.1240**	**0.0327**	**7.1000e-004**	**0.0334**						**125.5589**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.4351					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109						281.9928
Total	**3.6773**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.1179	0.0612	0.7718	2.0200e-003	0.1972	1.2300e-003	0.1984	0.0523	1.1400e-003	0.0534						200.8942
Total	**0.1179**	**0.0612**	**0.7718**	**2.0200e-003**	**0.1972**	**1.2300e-003**	**0.1984**	**0.0523**	**1.1400e-003**	**0.0534**						**200.8942**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.4351					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9928
Total	**3.4945**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.1179	0.0612	0.7718	2.0200e-003	0.1972	1.2300e-003	0.1984	0.0523	1.1400e-003	0.0534						200.8942
Total	**0.1179**	**0.0612**	**0.7718**	**2.0200e-003**	**0.1972**	**1.2300e-003**	**0.1984**	**0.0523**	**1.1400e-003**	**0.0534**						**200.8942**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	4.6192	45.3671	39.6689	0.1819	9.7932	0.2003	9.9935	2.6343	0.1900	2.8243						18,685.15 94
Unmitigated	4.6192	45.3671	39.6689	0.1819	9.7932	0.2003	9.9935	2.6343	0.1900	2.8243						18,685.15 94

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Day-Care Center	112.99	14.90	13.99	99,906	99,906
High School	1,678.99	286.02	117.16	3,290,698	3,290,698
Parking Lot	0.00	0.00	0.00		
User Defined Educational	0.00	0.00	0.00		
Total	1,791.98	300.92	131.15	3,390,604	3,390,604

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Day-Care Center	9.50	7.30	7.30	12.70	82.30	5.00	28	58	14
High School	9.50	7.30	7.30	77.80	17.20	5.00	75	19	6
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
User Defined Educational	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Day-Care Center	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
High School	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
Parking Lot	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
User Defined Educational	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0503	0.4576	0.3844	2.7500e-003		0.0348	0.0348		0.0348	0.0348						552.4054
NaturalGas Unmitigated	0.0503	0.4576	0.3844	2.7500e-003		0.0348	0.0348		0.0348	0.0348						552.4054

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Day-Care Center	165.107	1.7800e-003	0.0162	0.0136	1.0000e-004		1.2300e-003	1.2300e-003		1.2300e-003	1.2300e-003						19.5398
High School	4502.6	0.0486	0.4414	0.3708	2.6500e-003		0.0336	0.0336		0.0336	0.0336						532.8657
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
User Defined Educational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Total		**0.0503**	**0.4576**	**0.3844**	**2.7500e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**						**552.4054**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Day-Care Center	0.165107	1.7800e-003	0.0162	0.0136	1.0000e-004		1.2300e-003	1.2300e-003		1.2300e-003	1.2300e-003						19.5398
High School	4.5026	0.0486	0.4414	0.3708	2.6500e-003		0.0336	0.0336		0.0336	0.0336						532.8657
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
User Defined Educational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Total		**0.0503**	**0.4576**	**0.3844**	**2.7500e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**						**552.4054**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.6409	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170
Unmitigated	1.6409	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1111					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	1.5291					0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	7.0000e-004	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170
Total	**1.6409**	**7.0000e-005**	**7.4900e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**						**0.0170**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1111					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	1.5291					0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	7.0000e-004	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170
Total	**1.6409**	**7.0000e-005**	**7.4900e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**						**0.0170**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

FUSD Ventura Alt Ed Campus

Fresno County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Day-Care Center	2.40	1000sqft	0.06	2,400.00	0
High School	65.45	1000sqft	1.50	65,450.00	0
Parking Lot	5.00	Acre	5.00	217,800.00	0
User Defined Educational	0.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	488.3	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Includes RPS adjustment.

Land Use - Includes 2400sf child care facility, 65450sf high school, 5 ac paved. District offices will occupy existing office buildings.

Construction Phase - Based on model defaults. RAW excavation based on information provided. Arch coating based on building const period, excluding initial approx. four-month framing period.

Off-road Equipment - Off-road equipment based on model defaults.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Based on model defaults. Assumes an additional grader for RAW excavation (2 total).

Grading - Assumes 10,000 cy exported during RAW (500 truckloads).

Demolition - 139805 sf demolished

Trips and VMT - Based on model defaults. Includes 500 truckloads for RAW export.

Architectural Coating - Assumes 50 g/L for interior/exterior paint.

Vehicle Trips - Based on trip gen from the traffic analysis.

Road Dust - Based on model defaults.

Area Coating - Assumes 50 g/L for interior/exterior paints.

Energy Use -

Construction Off-road Equipment Mitigation - Assumes T3 for modeling purposes. Mitigation includes 50%CE for watering vehicle travel surfaces, 61%CE for graded surfaces, 15mph onsite speed limit.

Mobile Commute Mitigation -

Energy Mitigation - Assumes minimum 16% reduction for use of high-efficiency lighting.

Water Mitigation - Includes use of low-flow water fixtures and water-efficient irrigation systems.

Waste Mitigation - Assumes 50% diversion rate based on current statewide averages.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	50.00
tblArchitecturalCoating	EF_Residential_Exterior	150.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	150.00	50.00

tblAreaCoating	Area_EF_Nonresidential_Exterior	150	50
tblAreaCoating	Area_EF_Nonresidential_Interior	150	50
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	118.00
tblConstructionPhase	NumDays	20.00	10.00
tblConstructionPhase	PhaseEndDate	10/7/2020	8/12/2020
tblConstructionPhase	PhaseEndDate	9/25/2019	9/11/2019
tblConstructionPhase	PhaseStartDate	9/10/2020	3/1/2020
tblGrading	AcresOfGrading	5.00	10.00
tblGrading	MaterialExported	0.00	10,000.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	641.35	488.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblTripsAndVMT	HaulingTripNumber	1,250.00	500.00
tblTripsAndVMT	WorkerTripNumber	18.00	15.00
tblVehicleTrips	WD_TR	74.06	47.08
tblVehicleTrips	WD_TR	12.89	25.65
tblVehicleTrips	WD_TR	0.00	14.37

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	3.8686	46.2012	23.8962	0.0759	8.1942	1.8334	9.7810	3.7146	1.7065	5.1765						7,793.149 9
2020	6.6339	27.1122	23.6473	0.0536	1.5014	1.2667	2.7681	0.4055	1.1980	1.6035						5,283.181 4
Maximum	**6.6339**	**46.2012**	**23.8962**	**0.0759**	**8.1942**	**1.8334**	**9.7810**	**3.7146**	**1.7065**	**5.1765**						**7,793.149 9**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	1.4946	32.5579	26.1171	0.0759	3.8049	0.9565	4.7434	1.6150	0.9540	2.5468						7,793.149 9
2020	5.0052	21.8254	24.6736	0.0536	1.5014	1.0373	2.5387	0.4055	1.0354	1.4408						5,283.181 4
Maximum	**5.0052**	**32.5579**	**26.1171**	**0.0759**	**3.8049**	**1.0373**	**4.7434**	**1.6150**	**1.0354**	**2.5468**						**7,793.149 9**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**38.11**	**25.82**	**-6.83**	**0.00**	**45.27**	**35.69**	**41.97**	**50.96**	**31.51**	**41.19**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.6409	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170
Energy	0.0503	0.4576	0.3844	2.7500e-003		0.0348	0.0348		0.0348	0.0348						552.4054
Mobile	3.7189	46.1219	37.9676	0.1678	9.7932	0.2050	9.9982	2.6343	0.1945	2.8288						17,262.0695
Total	**5.4102**	**46.5795**	**38.3595**	**0.1705**	**9.7932**	**0.2398**	**10.0330**	**2.6343**	**0.2293**	**2.8636**						**17,814.4919**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.6409	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170
Energy	0.0503	0.4576	0.3844	2.7500e-003		0.0348	0.0348		0.0348	0.0348						552.4054
Mobile	3.7189	46.1219	37.9676	0.1678	9.7932	0.2050	9.9982	2.6343	0.1945	2.8288						17,262.0695
Total	**5.4102**	**46.5795**	**38.3595**	**0.1705**	**9.7932**	**0.2398**	**10.0330**	**2.6343**	**0.2293**	**2.8636**						**17,814.4919**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	8/1/2019	8/28/2019	5	20	
2	RAW & Site Grading	Grading	8/29/2019	9/11/2019	5	10	
3	Building Construction	Building Construction	9/26/2019	8/12/2020	5	230	
4	Paving	Paving	8/13/2020	9/9/2020	5	20	
5	Architectural Coating	Architectural Coating	3/1/2020	8/12/2020	5	118	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 5

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 101,775; Non-Residential Outdoor: 33,925; Striped Parking Area: 13,068 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	158	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
RAW & Site Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
RAW & Site Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
RAW & Site Grading	Graders	1	8.00	187	0.41
RAW & Site Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	24.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	120.00	47.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	15.00	0.00	636.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
RAW & Site Grading	7	15.00	0.00	500.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.8809	0.0000	6.8809	1.0418	0.0000	1.0418						0.0000
Off-Road	3.5134	35.7830	22.0600	0.0388		1.7949	1.7949		1.6697	1.6697						3,843.4451
Total	**3.5134**	**35.7830**	**22.0600**	**0.0388**	**6.8809**	**1.7949**	**8.6758**	**1.0418**	**1.6697**	**2.7115**						**3,843.4451**

3.2 Demolition - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2804	9.6165	1.3744	0.0254	0.5567	0.0377	0.5944	0.1526	0.0361	0.1887						2,673.9755
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0748	0.0511	0.4618	1.1400e-003	0.1232	7.9000e-004	0.1240	0.0327	7.3000e-004	0.0334						113.5814
Total	**0.3553**	**9.6676**	**1.8362**	**0.0266**	**0.6799**	**0.0385**	**0.7184**	**0.1853**	**0.0368**	**0.2221**						**2,787.5568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.6835	0.0000	2.6835	0.4063	0.0000	0.4063						0.0000
Off-Road	1.0048	18.4481	24.2810	0.0388		0.8692	0.8692		0.8630	0.8630						3,843.4451
Total	**1.0048**	**18.4481**	**24.2810**	**0.0388**	**2.6835**	**0.8692**	**3.5527**	**0.4063**	**0.8630**	**1.2693**						**3,843.4451**

3.2 Demolition - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2804	9.6165	1.3744	0.0254	0.5567	0.0377	0.5944	0.1526	0.0361	0.1887						2,673.975 5
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0748	0.0511	0.4618	1.1400e-003	0.1232	7.9000e-004	0.1240	0.0327	7.3000e-004	0.0334						113.5814
Total	**0.3553**	**9.6676**	**1.8362**	**0.0266**	**0.6799**	**0.0385**	**0.7184**	**0.1853**	**0.0368**	**0.2221**						**2,787.556 8**

3.3 RAW & Site Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.1957	0.0000	7.1957	3.4419	0.0000	3.4419						0.0000
Off-Road	2.8412	31.0299	19.5566	0.0348		1.5267	1.5267		1.4046	1.4046						3,475.204 6
Total	**2.8412**	**31.0299**	**19.5566**	**0.0348**	**7.1957**	**1.5267**	**8.7224**	**3.4419**	**1.4046**	**4.8464**						**3,475.204 6**

3.3 RAW & Site Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4409	15.1203	2.1610	0.0400	0.8753	0.0593	0.9346	0.2400	0.0567	0.2967						4,204.364 0
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0748	0.0511	0.4618	1.1400e-003	0.1232	7.9000e-004	0.1240	0.0327	7.3000e-004	0.0334						113.5814
Total	**0.5157**	**15.1714**	**2.6228**	**0.0411**	**0.9986**	**0.0601**	**1.0586**	**0.2727**	**0.0574**	**0.3301**						**4,317.945 3**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.8063	0.0000	2.8063	1.3423	0.0000	1.3423						0.0000
Off-Road	0.9069	17.3865	22.6467	0.0348		0.8784	0.8784		0.8743	0.8743						3,475.204 6
Total	**0.9069**	**17.3865**	**22.6467**	**0.0348**	**2.8063**	**0.8784**	**3.6848**	**1.3423**	**0.8743**	**2.2166**						**3,475.204 6**

3.3 RAW & Site Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.4409	15.1203	2.1610	0.0400	0.8753	0.0593	0.9346	0.2400	0.0567	0.2967						4,204.3640
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0748	0.0511	0.4618	1.1400e-003	0.1232	7.9000e-004	0.1240	0.0327	7.3000e-004	0.0334						113.5814
Total	**0.5157**	**15.1714**	**2.6228**	**0.0411**	**0.9986**	**0.0601**	**1.0586**	**0.2727**	**0.0574**	**0.3301**						**4,317.9453**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3612	21.0788	17.1638	0.0269		1.2899	1.2899		1.2127	1.2127						2,607.3635
Total	**2.3612**	**21.0788**	**17.1638**	**0.0269**		**1.2899**	**1.2899**		**1.2127**	**1.2127**						**2,607.3635**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.2220	6.3446	1.1876	0.0132	0.3185	0.0466	0.3650	0.0917	0.0446	0.1363						1,388.3297
Worker	0.5987	0.4087	3.6943	9.1200e-003	0.9858	6.3600e-003	0.9921	0.2615	5.8600e-003	0.2673						908.6509
Total	**0.8207**	**6.7533**	**4.8818**	**0.0223**	**1.3042**	**0.0529**	**1.3572**	**0.3532**	**0.0504**	**0.4036**						**2,296.9806**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,607.3635
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,607.3635**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.2220	6.3446	1.1876	0.0132	0.3185	0.0466	0.3650	0.0917	0.0446	0.1363						1,388.3297
Worker	0.5987	0.4087	3.6943	9.1200e-003	0.9858	6.3600e-003	0.9921	0.2615	5.8600e-003	0.2673						908.6509
Total	**0.8207**	**6.7533**	**4.8818**	**0.0223**	**1.3042**	**0.0529**	**1.3572**	**0.3532**	**0.0504**	**0.4036**						**2,296.9806**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503						2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**						**2,568.6345**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1807	5.8105	1.0233	0.0131	0.3185	0.0313	0.3497	0.0917	0.0299	0.1216						1,376.164 3
Worker	0.5467	0.3599	3.2868	8.8300e-003	0.9858	6.1700e-003	0.9919	0.2615	5.6800e-003	0.2672						880.3248
Total	**0.7274**	**6.1704**	**4.3101**	**0.0219**	**1.3042**	**0.0374**	**1.3417**	**0.3532**	**0.0356**	**0.3888**						**2,256.489 1**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,568.634 5
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,568.634 5**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1807	5.8105	1.0233	0.0131	0.3185	0.0313	0.3497	0.0917	0.0299	0.1216						1,376.1643
Worker	0.5467	0.3599	3.2868	8.8300e-003	0.9858	6.1700e-003	0.9919	0.2615	5.6800e-003	0.2672						880.3248
Total	**0.7274**	**6.1704**	**4.3101**	**0.0219**	**1.3042**	**0.0374**	**1.3417**	**0.3532**	**0.0356**	**0.3888**						**2,256.4891**

3.5 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3566	14.0656	14.6521	0.0228		0.7528	0.7528		0.6926	0.6926						2,225.5841
Paving	0.6550					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**2.0116**	**14.0656**	**14.6521**	**0.0228**		**0.7528**	**0.7528**		**0.6926**	**0.6926**						**2,225.5841**

3.5 Paving - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0683	0.0450	0.4108	1.1000e-003	0.1232	7.7000e-004	0.1240	0.0327	7.1000e-004	0.0334						110.0406
Total	**0.0683**	**0.0450**	**0.4108**	**1.1000e-003**	**0.1232**	**7.7000e-004**	**0.1240**	**0.0327**	**7.1000e-004**	**0.0334**						**110.0406**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5609	11.2952	17.2957	0.0228		0.6093	0.6093		0.6093	0.6093						2,225.5841
Paving	0.6550					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**1.2159**	**11.2952**	**17.2957**	**0.0228**		**0.6093**	**0.6093**		**0.6093**	**0.6093**						**2,225.5841**

3.5 Paving - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0683	0.0450	0.4108	1.1000e-003	0.1232	7.7000e-004	0.1240	0.0327	7.1000e-004	0.0334						110.0406
Total	**0.0683**	**0.0450**	**0.4108**	**1.1000e-003**	**0.1232**	**7.7000e-004**	**0.1240**	**0.0327**	**7.1000e-004**	**0.0334**						**110.0406**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.4351					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109						281.9928
Total	**3.6773**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.1094	0.0720	0.6574	1.7700e-003	0.1972	1.2300e-003	0.1984	0.0523	1.1400e-003	0.0534						176.0650
Total	**0.1094**	**0.0720**	**0.6574**	**1.7700e-003**	**0.1972**	**1.2300e-003**	**0.1984**	**0.0523**	**1.1400e-003**	**0.0534**						**176.0650**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	3.4351					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9928
Total	**3.4945**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.1094	0.0720	0.6574	1.7700e-003	0.1972	1.2300e-003	0.1984	0.0523	1.1400e-003	0.0534						176.0650
Total	**0.1094**	**0.0720**	**0.6574**	**1.7700e-003**	**0.1972**	**1.2300e-003**	**0.1984**	**0.0523**	**1.1400e-003**	**0.0534**						**176.0650**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	lb/day										lb/day					
Mitigated	3.7189	46.1219	37.9676	0.1678	9.7932	0.2050	9.9982	2.6343	0.1945	2.8288						17,262.0695
Unmitigated	3.7189	46.1219	37.9676	0.1678	9.7932	0.2050	9.9982	2.6343	0.1945	2.8288						17,262.0695

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Day-Care Center	112.99	14.90	13.99	99,906	99,906
High School	1,678.99	286.02	117.16	3,290,698	3,290,698
Parking Lot	0.00	0.00	0.00		
User Defined Educational	0.00	0.00	0.00		
Total	1,791.98	300.92	131.15	3,390,604	3,390,604

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Day-Care Center	9.50	7.30	7.30	12.70	82.30	5.00	28	58	14
High School	9.50	7.30	7.30	77.80	17.20	5.00	75	19	6
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
User Defined Educational	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Day-Care Center	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
High School	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
Parking Lot	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667
User Defined Educational	0.481390	0.032808	0.168621	0.127212	0.018382	0.004997	0.032622	0.122881	0.002369	0.001675	0.005261	0.001115	0.000667

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0503	0.4576	0.3844	2.7500e-003		0.0348	0.0348		0.0348	0.0348						552.4054
NaturalGas Unmitigated	0.0503	0.4576	0.3844	2.7500e-003		0.0348	0.0348		0.0348	0.0348						552.4054

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Day-Care Center	165.107	1.7800e-003	0.0162	0.0136	1.0000e-004		1.2300e-003	1.2300e-003		1.2300e-003	1.2300e-003						19.5398
High School	4502.6	0.0486	0.4414	0.3708	2.6500e-003		0.0336	0.0336		0.0336	0.0336						532.8657
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
User Defined Educational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Total		**0.0503**	**0.4576**	**0.3844**	**2.7500e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**						**552.4054**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Day-Care Center	0.165107	1.7800e-003	0.0162	0.0136	1.0000e-004		1.2300e-003	1.2300e-003		1.2300e-003	1.2300e-003						19.5398
High School	4.5026	0.0486	0.4414	0.3708	2.6500e-003		0.0336	0.0336		0.0336	0.0336						532.8657
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
User Defined Educational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Total		**0.0503**	**0.4576**	**0.3844**	**2.7500e-003**		**0.0348**	**0.0348**		**0.0348**	**0.0348**						**552.4054**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.6409	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170
Unmitigated	1.6409	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1111					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	1.5291					0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	7.0000e-004	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170
Total	**1.6409**	**7.0000e-005**	**7.4900e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**						**0.0170**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1111					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	1.5291					0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	7.0000e-004	7.0000e-005	7.4900e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.0170
Total	**1.6409**	**7.0000e-005**	**7.4900e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**						**0.0170**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix 2

Historic Architectural Survey Report

Historic Architectural Survey Report (HASR) for the

Ventura Alternative Education Campus and Administrative Office Project

Prepared by: Karana Hattersley-Drayton, M.A.
Architectural Historian

Prepared for: Scott Odell, AICP
Odell Planning and Research Inc.
49346 Road 426 Suite 2
Oakhurst, CA 93644

July 1, 2019

Summary of Findings

The Fresno Unified School District (District) proposes to undertake the Ventura Alternative Education Campus and Administrative Office Project. The proposed Project includes the acquisition of a 12.65-acre site located east of downtown on the south side of Ventura Avenue between Ninth Street and Tenth Street within the City of Fresno. The northern portion of the site previously housed the former Fresno County Juvenile Hall and Court, and the southern portion of the site housed County offices. The project site includes ten buildings for a total of 182,005 square feet, a fenced athletic/recreation yard, parking areas and a vacant unpaved parcel on the southwest corner.

The project entails the demolition of six existing buildings including the post 1957 buildings associated with the Juvenile Hall and the Juvenile Court. Four existing buildings on the southern portion of the site will be preserved in place and adaptively reused. The project also includes the development and operation of a new alternative education campus, as well as operation of District-level administrative offices in existing office buildings, which would function separately from the proposed campus (Request for Preliminary Comment, FUSD 17 October 2018).

This report documents the efforts to identify historic properties that may be affected directly or indirectly by the proposed project pursuant to 36 CFR 800.4 (d) (1). The report also fulfills California Environmental Quality Act (CEQA) requirements that mandate public agencies determine whether a project will have a significant impact on important historical resources. A substantial adverse change in the significant qualities of a historical resource is considered a significant impact. As defined by CEQA, in part, a "historical resource" is a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR) [14 California Code of Regulations (CCR) 15064.5 (a)(3)].

A Cultural Resources Record Search (18-509) was submitted by ODELL Planning and Research with the California Historical Resources Information System (CHRIS) to CSU Bakersfield. The December 14, 2018 response noted that there were no known cultural resource studies within the project area. However the CHRIS Coordinator, Celeste M. Thomson, recommended that any structures 45 years or older be recorded and evaluated for historical significance by a qualified, professional consultant (CHRIS 18-509 14 December 2019).

Demolition of the existing buildings on the northern section of the campus was underway by the time fieldwork for this report was initiated. Karana Hattersley-Drayton, who meets the Secretary of the Interior's Professional Qualifications as an architectural historian and historian, was retained by the FUSD on 17 June 2019. A ceremony with local officials to "kick off" the project and begin demolition of the Juvenile Hall buildings (dubbed by the media the "Hall of Shame") was held on Friday, June 21st.

The report thus documents resources prior to demolition as well as resources slated for adaptive reuse. Of the six buildings slated for demolition, none meet the threshold for listing on the National Register of Historic Places, the California Register of Historical Resources or Fresno's Local Register of Historic Resources. Of the four buildings slated for adaptive reuse, two buildings (Map reference #5, the former Old Peoples Home Recreation Hall/1940) and the original school building for the Fresno County Orphanage (Map reference #9/circa 1910) are eligible for listing on Fresno's Local Register and thus should be treated as historical resources pursuant to CEQA (see Figure 1, Project Site Map).

The two historical resources were built at least 30 years apart and are part of a campus that has changed dramatically over the last 100 years. FUSD proposes to adaptively reuse both buildings as part of the new Alternative Education campus. As such, the proposed project will not create a substantial adverse change to the buildings or to their setting.

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<u>Project Description</u>

The Fresno Unified School District (District) proposes to undertake the Ventura Alternative Education Campus and Administrative Office Project. The proposed Project includes the acquisition of a 12.65-acre site located east of downtown on the south side of Ventura Avenue between Ninth Street and Tenth Street within the City of Fresno. The northern portion of the site previously housed the former Fresno County Juvenile Hall and Court, and the southern portion of the site housed County offices. The project site includes ten buildings for a total of 182,005 square feet, a fenced athletic/recreation yard, parking areas and a vacant unpaved parcel on the southwest corner. The project also includes the development and operation of a new alternative education campus, as well as operation of District-level administrative offices in existing office buildings, which would function separately from the proposed campus (Request for Preliminary Comment, FUSD 17 October 2018).

The project includes the demolition of six existing post 1957 buildings associated with the Juvenile Hall and the Juvenile Court. The six buildings are Map reference #1 (unspecified 2-story addition to the Juvenile Court/1969), Map reference #2 (addition to the Juvenile Court by 1970), Map reference #3 (Juvenile Hall 1957), Map reference #4 (Fresno County Youth Center including the Wakefield School/1967), and two metal sided modular office buildings (Map reference #6 and 7) which were constructed (circa 1969 and post 1970).

Four existing buildings on the southern portion of the site will be preserved in place and adaptively reused. The two non-historic era buildings include the 1978 Probation Building (Map reference #8) and a Fresno County Computer Services Center (Map reference #10) constructed in 1974. The two buildings evaluated as eligible for listing on Fresno's Local Register of Historic Resources and which are thus considered historical resources for the purposes of CEQA are the circa 1910 masonry brick building originally used as a school building for the Fresno County Orphanage (Map reference #9) and the 1940 former County of Fresno's Old Peoples' Home Recreation Hall designed by Franklin and Kump in 1940 (Map reference #5).

Regulatory Context

The California Environmental Quality Act (1970) requires consideration of project impacts on archaeological or historical sites deemed to be "historical resources." A substantial adverse change in the significant qualities of a historical resource is considered a significant impact. For the purposes of CEQA, a "historical resource" is a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR). Historical resources may include, but are not limited to:

> *A resource included in a local register of historical resources… or identified in an historical resource survey meeting the requirements section 5024.1(g) of the Public Resources Code…*
>
> *Any object, building, structure, site, area, place, record or manuscript which a lead agency determines to be historically significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. . .[14 California Code of Regulations (CCR) 15064.5(a)(3)].*

Research Methods

Ms. Hattersley-Drayton conducted on-line and archival research and made site visits on June 11, 20, and 25 2019 to photograph and record the buildings on the project site. On June 20th and again on June 25th she met with Rick Andreasen, Project Manager, Facilities Management and Planning for the FUSD. The June 25th meeting included the review of original architectural plans for several of the buildings on the campus. Ms. Drayton reviewed Sanborn fire insurance maps for the project area from 1898 to 1970 (thanks to archaeologist Sarah Johnston for preparing details of these maps for this report). A video prepared for the Centennial of the County of Fresno Probation Department (circa 2009) was useful in documenting the early history of the department and the site. Joy Thompson, Probation Department Division Director, graciously responded to requests for research help. Drayton met with Scott Odell (Principal) and Associate Planner Daniel Brannick of Odell Planning and Research, Inc. on 27 June 2019 to discuss the project. Mr. Brannick created screen shots of two photos from the 2009 Probation Department video as well as a jpeg of the overall site map.

Overview

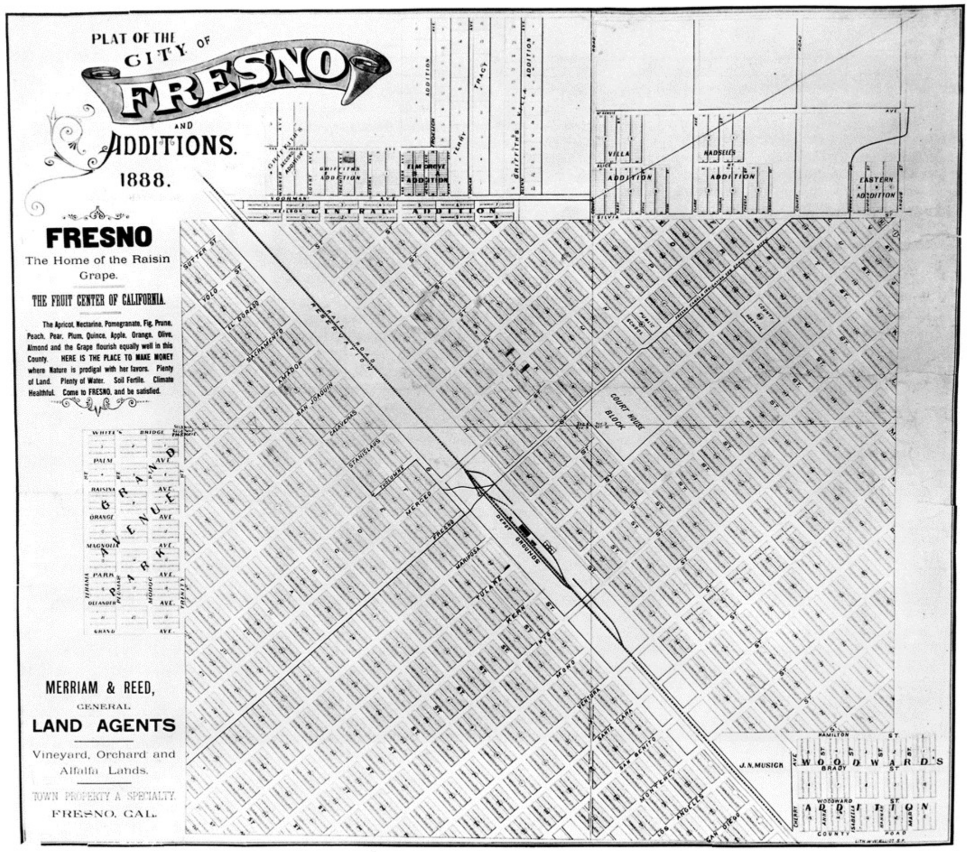
Early History and Development of Fresno

The Yokuts were the first residents of the Fresno area, with small tribes occupying the floodplains of the Big Dry Creek and Little Dry Creek (Gayton 1948:153; Latta 1997:163). Although there were no missions established in the Valley, there were small Mexican era settlements including Pueblo de las Junta, located at the confluence of the San Joaquin River and the Fresno Slough (Hoover 1990: 86). The Spanish and Mexican influence is indicated through place names such as “Fresno,” which means “ash tree” and which was first applied to the Fresno River (Hoover et al 1990:85). Following the Gold Rush of 1849, miners were drawn to the southern gold fields, and cattle ranchers and dryland farmers moved into the area. Three momentous changes occurred in the 1870s, which dramatically affected settlement patterns and history: the construction of the Central Pacific Railroad, the introduction of agricultural colonies and the concomitant development of a labyrinth of canals to bring water to these colonies.

In 1870 the Central Pacific Railroad began its diagonal push down the San Joaquin Valley. New towns were surveyed along the corridor---several were planned by the railroad itself---and earlier villages situated away from the tracks often vanished overnight. In 1872 the railroad reached what is now Fresno. The Contract and Finance Company, a subsidiary of the Central Pacific Railroad, bought 4,480 acres in a desolate area where Dry Creek drained into the plains. Surveyor Edward H. Mix laid out the new town in blocks 320 feet by 400 feet, with 20 foot alleys, lots 25×150 feet fronting on 80-foot wide streets parallel to and on both sides of the tracks (Clough 1984:121). The gridiron plan was filed in 1873 and was remarkably rigid, broken only by the space reserved for a future courthouse and the broad swaths through the center of town for the tracks, depot and yards (Reps 1979:187).

Fresno’s location was uninviting at best, with barren sand plains in all directions. The nearest substantial supplies of water were the San Joaquin River, 10 miles to the north (Reps 1979:187) and the Kings River further south. Fresno grew slowly but in 1874 it was able to wrestle the county seat away from the former mining town of Millerton (Hoover 1990:88).

1888 Map Fresno
(Rep 1979:190)



The population of Fresno in 1875 was 600, with a third of the residents Chinese who lived west of the tracks. In 1878, a new resident, R.W. Riggs described the community as “not much of a town, a handful of houses in a desert of sand” (Reps 1979:187). Fresno’s population was 1,112 in 1880 and 3,464 in 1885. “Yet the town remained a collection of buildings on the prairie rather than a full-fledged city. There was no police force, sewer system or truly efficient fire department, and cattle were still roaming the dusty streets that became winter lakes” (Clough 1984:141).

The 1880s, however, were prosperous years and the desert was turned into profitable farmland with the introduction of irrigation and agricultural colonies. The model for the system that ultimately served throughout the San Joaquin Valley was the Central California Colony, established in 1875 three miles south of Fresno. The Colony was the “brainchild” of Bernard Marks, a German immigrant who approached William S. Chapman, one of the wealthiest landowners in California, with his vision of 20-acre family owned farms sharing a secured source of water. Marks saw the potential for farming in the desert-like environment of San Joaquin Valley if irrigation could be guaranteed (Panter 1994:2). He surveyed six sections of land owned by Chapman and investor William Martin and subdivided the land into 192 20-acre parcels. Three laterals from the Kings River and Fresno Canal were extended into the tracts and water rights were sold to the prospective farmers. Twenty-three miles of roads were laid out and bordered with trees (Panter 1994; Rehart and Patterson 1988:7). Many of the earliest settlers were former miners as well as Scandinavian immigrants: Danes, Swedes and Norwegians (Rehart and Patterson 1988:8). By 1903 there were 48 separate colonies or tracts in Fresno County representing approximately 71,080 acres (Panter 1994:9). These colonies helped to break up the vast estates and initiated what agricultural historian Donald Pisani has termed "the horticultural small-farm phase" of California agriculture (Datel 1999:97).

Fresno was incorporated in 1885. With incorporation, street grades and town lot numbers were established (Clough 1984:319). In November 1887, 1,100 deeds were filed at the county courthouse and the last of the original railroad lots in Fresno were sold. By 1890 the population of Fresno was over 10,000, and land outside of the original town site was subdivided into streets and lots (Reps 1979:191). The first streetcars were introduced in 1892, and this greater mobility allowed for the construction of a variety of streetcar suburbs (Bulbulian 2001:38; Clough 1984:319). Van Ness Boulevard, for example, was developed to link Fresno and the San Joaquin River. Van Ness led to the prestigious Fig Garden residential area (<u>Fresno Bee</u> 25 May 1985).

The “west” side of the Southern Pacific tracks quickly became “Chinatown,” where Chinese, as well as disreputable whites, were forced to settle. The 1898 Sanborn Map shows a remarkably dense in-fill of saloons, lodging houses, lottery and gambling parlors between G, Mariposa, F and Kern Streets. A Chinese theatre is noted on China Alley and a Joss House faced G Street (1898 Sanborn Map of Fresno).

In addition to Chinese and Scandinavian farmers, other early ethnic groups in the Fresno area included Germans from Russia, Japanese and Armenians. The first Armenians arrived in 1881 and eventually settled in an area between the Santa Fe and Southern Pacific tracks appropriately called “Armenian Town” (Bulbulian 2001:37-38). African-Americans were also present early on and organized an African Methodist Church in 1882 (Clough 1984:137).

The raisin industry developed in the 1870s, after the scorching heat of 1875 dried grapes on the vine (Hoover 1990:91). Martin Theodore Kearney who left employment with the Central California Colony and eventually became one of the wealthiest landowners in the area served as the President of the first California Raisin Growers Association from 1898 to 1904. The Sun-Maid Raisin Cooperative was founded in 1911 and became one of the most successful in America. Fresno became the principal-packing center for the raisin grape industry with numerous packinghouses in the city. Other crops such as figs and stone fruits helped to diversify the local economy and Fresno became the market town for a large portion of the San Joaquin Valley (Reps 1979:192). It is now a city of 500,000 and the center of the richest agricultural county in the United States (Haslam 1993:194).

The Development of Fresno’s Downtown

The 1887 boom in agriculture and land values brought prosperity to Fresno. In 1889 alone, buildings with an estimated value of 1 million dollars were erected along Mariposa Street in the heart of “downtown”. The Depression of 1893 had little effect on Fresno, probably due to its agricultural base. The architectural style of most of the hotels and business blocks was “high Victorian” with construction of brick, iron and glass with French Renaissance inspired mansard roofs, towers and gable dormer windows topped with decorative finials.

Courthouse Square,
Mariposa and K (Van Ness) c1910

Beginning in the early 20th century the City's downtown was completely transformed: the elegant "Victorian" style blocks and hotels were demolished or in the case of smaller buildings were eventually refaced with a "modern" storefront. What emerged was a more "rational" Classic Revival city, one influenced by the latest trends in architectural design emanating from American cities such as New York, Chicago and San Francisco as well as Paris, France (Powell 1983:2; Powell 2008:52).

The building boom in downtown Fresno was halted when the Depression hit in 1929. In the 1960s Redevelopment permanently altered the downtown landscape with the demolition of numerous buildings, including the Carnegie-financed library and original City Hall. Both of these buildings were replaced by parking lots.

Expansion of the City

Beginning in the 1880s subdivisions were added north and west of Fresno's original railroad town. Although the "parent grid" of the city was parallel to the Central Pacific tracks, these new subdivisions were laid out to line up with the surrounding agricultural sections with streets oriented north-south and east-west. Settlement north of the railroad town was facilitated by the development of street car lines, in particular the Forthcamp Avenue Line (1902) along what is now Fulton Street.

Expansion also occurred on the east side of town. In 1902 local entrepreneur Albert Graves Wishon purchased and improved Recreation Park which was located near the present day University Medical Center at Cedar Avenue and Ventura Avenue. In order to increase visitation to the park he needed a double track street car line but the business owners along Ventura were opposed as they feared a second track would hurt business due to the additional noise and potential danger to foot traffic. Wishon then struck a deal with the Pacific Improvement Company, which owned a 190-acre alfalfa field immediately east of downtown Fresno and north of Ventura. The agreement specified that the Fresno Traction Company was to lay a double track from downtown to First Street, then from First to Recreation Park by way of Mariposa Street. Mariposa was renamed "Huntington Boulevard" (Garcia 2003:8-9).

The Sunnyside and Recreation Line adopted the new route down Huntington Boulevard and service began after 1907 (Hamm 1979:55-56).

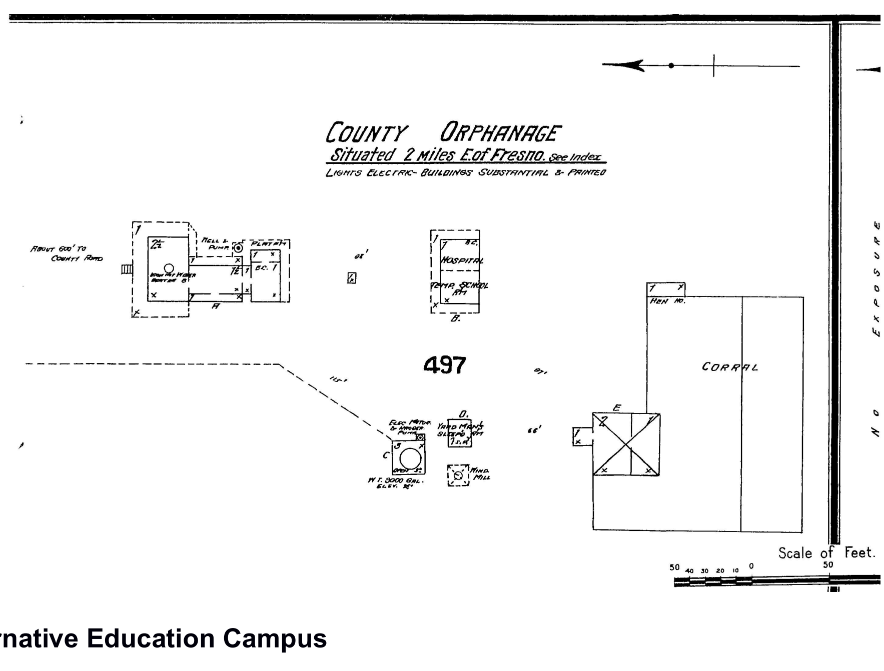
As with other streetcar suburbs around the United States, the land adjacent to the line became increasingly desirable for residential use; in fact the option for a subdivision was clearly part of Wishon's vision (Garcia 2003:10). The “Alta Vista Tract” was mapped by William Stranahan for the Pacific Improvement Corporation, a subsidiary of the Southern Pacific Railroad Company, and officially platted in 1911 (AVRP 1991:1). The tract was annexed to the City on January 23, 1912 and extended from First Street on the west to Twelfth Street (now Cedar Avenue) on the east, the north side of Balch and the south side of Platt Avenue east of fifth and both sides of Platt to Twelfth Street.

Wishon purchased the first parcels in the subdivision in 1912, a day after the official annexation and he completed a beautiful Arts and Crafts inspired residence. He envisioned an upscale, exclusive community which included racial and building covenants. By 1920 the Alta Vista Tract included 267 homes and Huntington Boulevard in particular became the preferred location for Fresno's leading citizens. With the Sunnyside and Recreation Line streetcar in place, commuting to businesses downtown was easy and efficient.

Site History 10th Street and Ventura Avenue (APN: 470-021-01T)

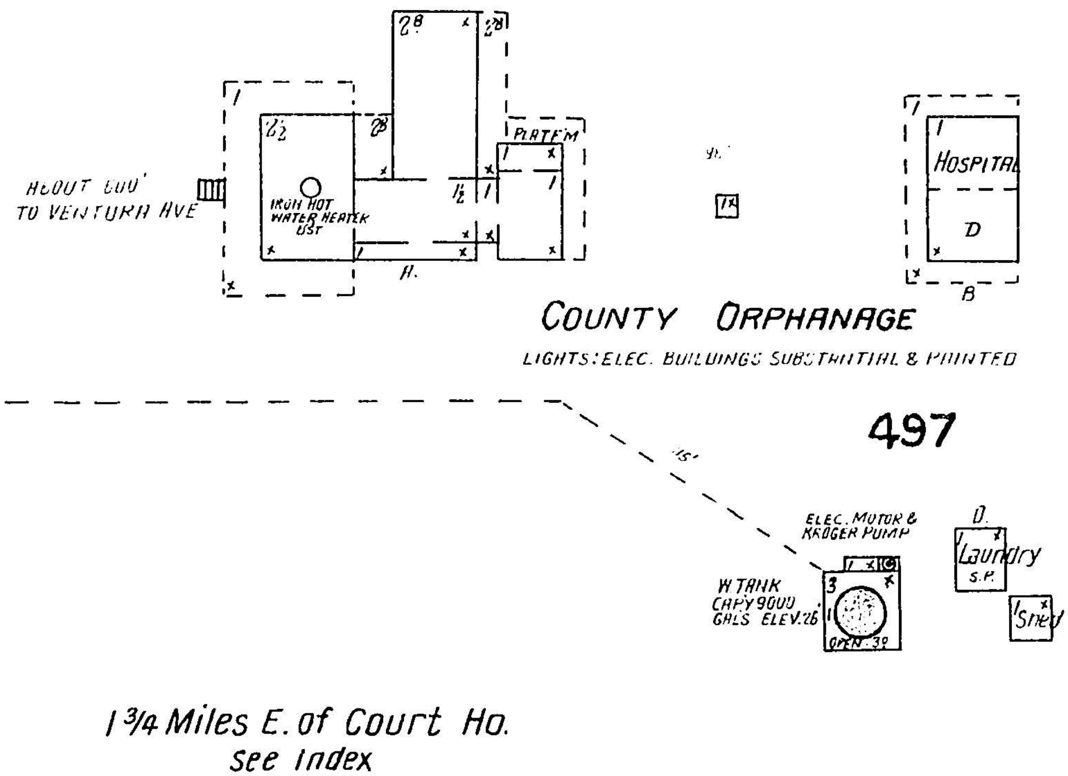
At the end of the 19th century Fresno's population was 14,000 (Sanborn Insurance Map 1898). With the City's growth came the need for both recreational facilities and social services of which several were east of downtown. The County Fairgrounds and its racetrack were located along Ventura Avenue in its current location. Recreation Park, with a dance hall, seating pavilion, merry-go-round, monkey house and two refreshment stands was on the northeast corner of Ventura Avenue and what is now Cedar Avenue. On the west side of Cedar across from the park was the County Hospital and Alms House (Sanborn Map 1898).

Nearby at 10th and Ventura was the Fresno County Orphanage. Circa 1892 Mary Donlevy founded the Orphanage which was first located at 1429 N Street between Fresno and Merced (Rehart 1996:125; Clough 1986:366-368). Within a few years a larger facility was needed and in February 1897 the County purchased 10 acres from George A. Norse at Ventura and Tenth. The purchase price of $8,000 included a "tank and tank house, windmill and tower, steam engine and boiler, stable and carriage house, shed and engine house" (Clough 1986:367). Curiously, no mention was made of a farmhouse or residence which would have been on the parcel as evidenced by the tankhouse and windmill, outbuildings which typically served to supply water for domestic purposes. The 1898 Sanborn map clearly indicates a 1 story building south of the orphanage that was used as both a hospital and "temporary" school. The building had a porch wrapping three sides and may have well been the farmhouse.



1898 Sanborn Map:64

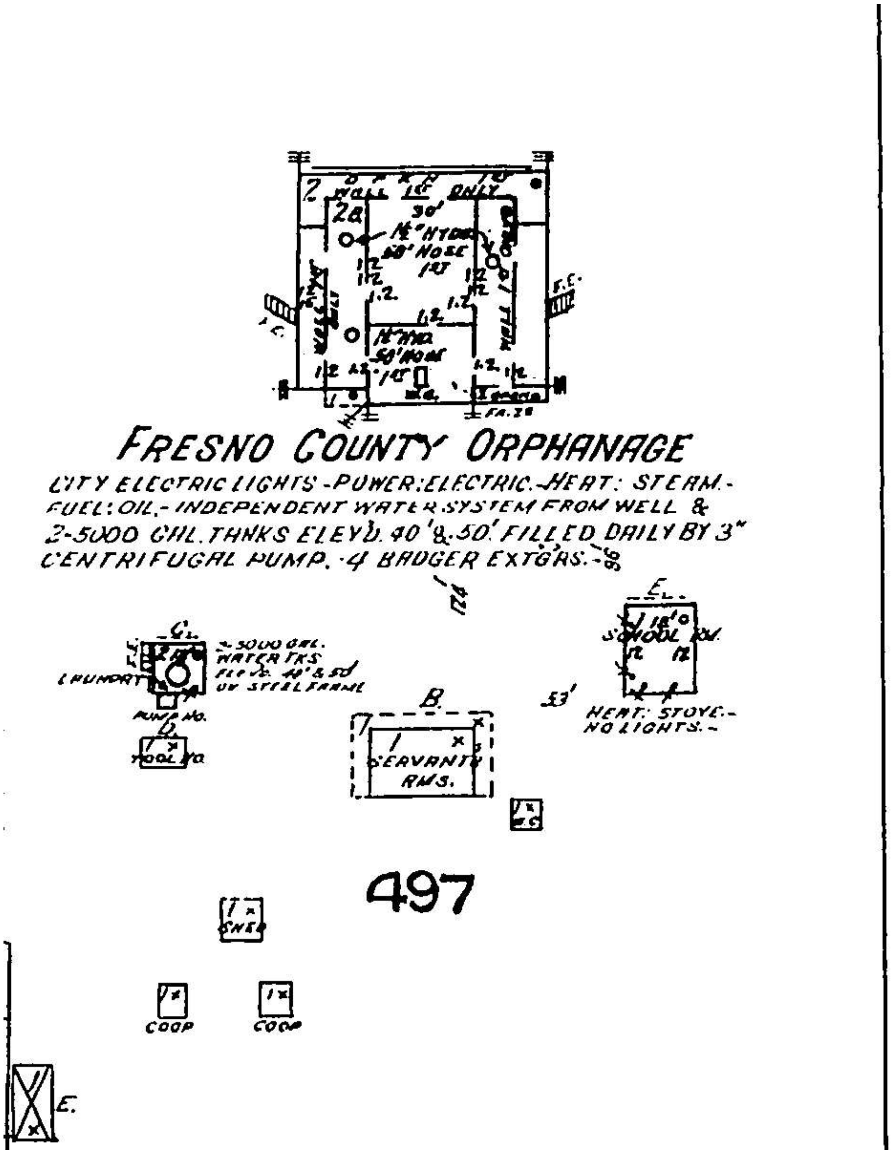
In 1899 the orphanage expanded at a cost of $3,000 by remodeling a barn on the property for living quarters (Clough 1986:367). By 1906 the orphanage building had been expanded to include a two story addition on the east elevation. The one story building south of the orphanage was now both a hospital and a residence (Sanborn Map 1906).



1906 Sanborn:99

The Orphanage burned on May 24, 1908. All 53 children were saved and were housed temporarily in a tent at the fairgrounds. A new Mission Revival style building was completed on November 6th 1908 (Clough 1986:367)

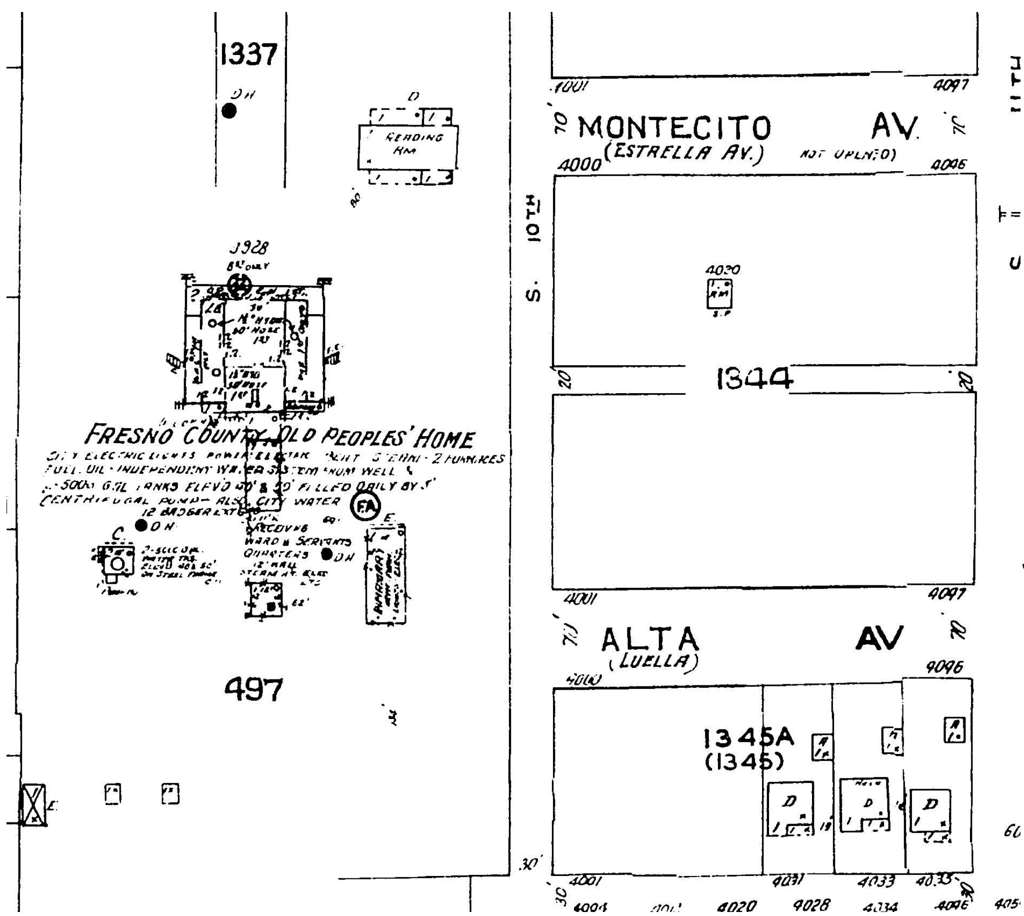
Postcard c1922, San Joaquin Valley Library System



1918-1919 Sanborn Map:54

The 1918-1919 Sanborn Map indicates that the main orphanage building was reached by a long drive that ran north to south down the parcel. Several small ancillary structures were located behind (south) of the orphanage including a school building that remains on site and was later expanded (Map reference # 9). Also on site was the 1 story house now used for servants, the tankhouse, a one story stables and three chicken coops. The blocks immediately east of the parcel were within the city limits but had not been developed. The Orphanage closed in 1918 and in 1922 the buildings were adapted for the Fresno County Old People's Home (Clough 1986:368).

The 1948 Sanborn map depicts the main building, now the Fresno County Old People's Home, still reached by a long drive with the former orphanage school (Map reference #9) now doubled in length. Unfortunately how the building was used cannot be deciphered from the map. Also depicted northeast of the Home was a rectangular "reading room" sited perpendicularly to the main building and close to S. 10th Street. This is building #5 on the project map and was designed by architects Franklin and Kump in 1940 as a Recreation Hall, complete with stage, dressing room and small library (Franklin and Kump plans, on file FUSD). The tankhouse was apparently still on site. Further east of the parcel several blocks were developed with small residences although curiously the blocks immediately adjacent to the parcel were still largely vacant although the street names had been changed.



1948 Sanborn:54

Fresno County Juvenile Hall and Probation Department:

In 1909 the County had founded a Probation Department. H.A. Sessions was the first Chief Probation Officer who served for several years without pay. He built and ran a parental home for wayward children which allowed them to live in a more comfortable setting rather than in the basement of the County Courthouse where they had been housed. The beautiful 2-story shingled residence (although with bars on the windows) was located near the County Hospital (County Probation Department video circa 2009).

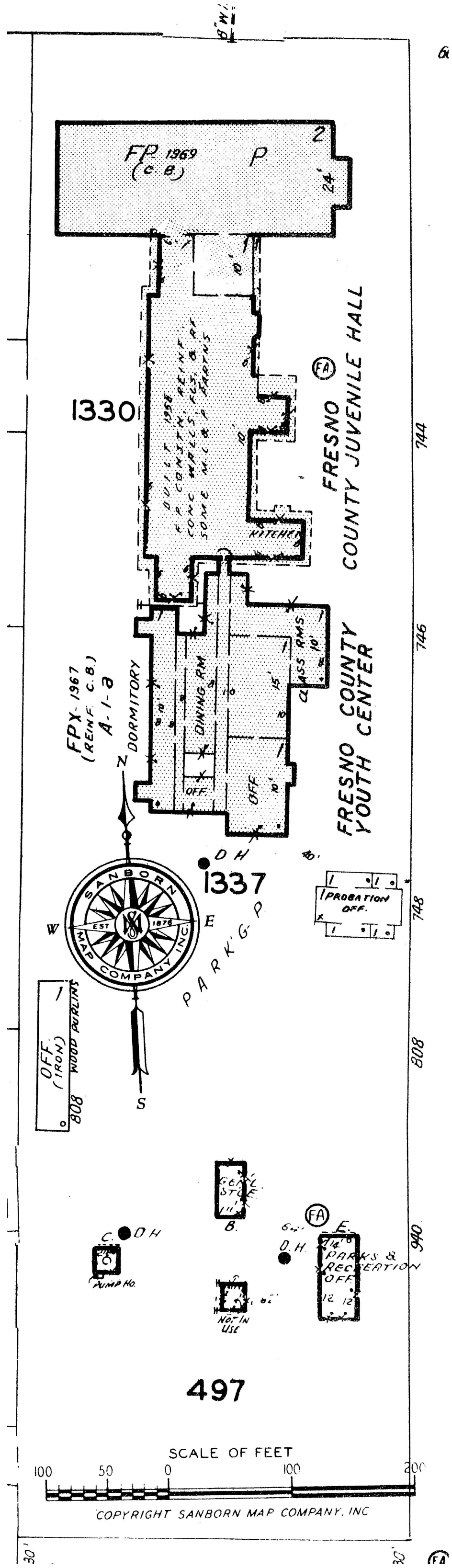
In the 1950s the County secured the parcel at 10th and Ventura, now vacated as the Fresno County Old Peoples' Home, and made plans for a new Juvenile Hall facility. Construction began in 1956 and a Mid-Century Modern building was completed in 1957 (Map reference #3). (The 1963 Sanborn map has a 1958 date for the building). The cost was $438,000 and the building had a capacity for approximately 50 children. L.B. Stagner was by this time the Chief Probation Office and under his direction the staff at the facility grew to 130 (County Probation Department video circa 2009).

The former reading room at the Old Peoples' Home now served as the Probation Office (Map reference #5) and the Orphanage school house (map reference #9) now functioned as a City Parks and Recreation Office. Three other small buildings near the Parks office included the former tankhouse, a “general store” and an outbuilding “not in use” (1963 Sanborn Map).

By 1964 the former Orphanage school building was used as the Boys Field Supervision Building (County Probation video circa 2009). (Note the dormer with hipped roof on the facade).

In 1967 Juvenile Hall was expanded to include the Fresno County Youth Center which included a dormitory, office, classroom, dining room and the Wakefield School (Map reference #4). In the 1970s an annex was added for girls (County Probation Video 2009). The 1970 Sanborn also depicts the 2 story addition (Map reference #1, 1969) facing Ventura Avenue. This addition at the north end of the parcel had no designated function on the map. Also new on the site was an “iron” clad office, one of the modular buildings noted as Map reference #6. It is unclear when a second modular building (Map reference #7) was added. The Probation Office and former schoolhouse also were on site, although the terraces on the sides of the former Recreation Hall (Probation Office/Map reference #5) were now filled in. The former tankhouse, “general store” and an outbuilding “not in use” were also depicted as they were in 1963.

Other post 1970 changes to the campus included a Juvenile Courts Building (Map reference #2), a purpose-built Probation Building in 1978 (Map reference #8) and a Fresno County Computer Services Center (Map reference # 10) constructed in 1974. In 2007 a new Juvenile Justice Campus was constructed on American Avenue and inmates were moved in convoys. The facilities at 10th and Ventura closed in 2009.



1968-1970 Sanborn Map:54

Findings and Conclusions

The proposed project includes demolition or adaptive reuse of ten buildings. Of the six buildings slated for demolition, none were found to be eligible for listing on the National Register, the California Register or Fresno's Local Register. Of the four buildings which will be preserved in place and adaptively reused, two (Map reference #5 and Map reference #9) are eligible for listing on the Local Register and pursuant to Public Resources Code 5024.1(g) are historical resources for the purposes of the California Environmental Quality Act (CEQA).

Regulatory Context

The California Environmental Quality Act (1970) requires consideration of project impacts on archaeological or historical sites deemed to be "historical resources." A substantial adverse change in the significant qualities of a historical resource is considered a significant impact. For the purposes of CEQA, a "historical resource" is a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources (CRHR). Historical resources may include, but are not limited to:

> *A resource included in a local register of historical resources… or identified in an historical resource survey meeting the requirements section 5024.1(g) of the Public Resources Code…*
>
> *Any object, building, structure, site, area, place, record or manuscript which a lead agency determines to be historically significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. . .[14 California Code of Regulations (CCR) 15064.5(a)(3)].*

The eligibility criteria for the California Register are the definitive criteria for assessing the significance of historical resources for the purposes of CEQA (Office of Historic Preservation n.d.). Generally, a resource shall be considered "historically significant" if it meets the criteria for listing on the CRHR, as defined in the Public Resources Code (PRC) below, and it has been found and/or treated eligible by the State Historical Resources Commission or the local agency:

> *(1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.*

(2) Is associated with the lives of persons important in our past.

(*3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.*

(4) Has yielded, or may be likely to yield, information important in prehistory or history. [PRC 5024.1(c)].

City of Fresno Historic Preservation Ordinance. The City of Fresno Historic Preservation Ordinance was adopted in 1979 and amended in 1999. It provides for the designation, preservation, promotion, and improvement of historic resources and districts for the educational, cultural, economic, and general welfare of the public and the City of Fresno. [FMC12-1600 et seq.]

The City of Fresno Historic Preservation Commission and City Council may designate any building, structure, object, or site as a Historic Resource if it is found to meet the following criteria:

It has been in existence for more than fifty years and possesses integrity of location, design, setting, materials, workmanship, feeling, and association, and:

(i) It is associated with events that have made a significant contribution to the broad patterns of our history; or

(ii) It is associated with the lives of persons significant in our past; or

(iii) It embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values; or

(iv) It has yielded or may be likely to yield, information important in prehistory or history.

Additionally, a property may be eligible for designation as a Historic Resource if it is less than fifty years old and meets the above-listed criteria, and is found to have exceptional importance within the appropriate historical context at the local, state, or national level.

Eligibility to the National, State and/or Local Registers

No federal funds or federal permits are anticipated for this proposed project. Thus each building was evaluated under CEQA guidelines only and for the potential of the proposed project to significantly impact a historic resource. Two of the buildings (Map references #5 and #9) have been evaluated as eligible for Fresno's Local Register of Historic Resources and as historical resources pursuant to Public Resource Code 5024.1(g) (a survey that meets professional criteria). The two buildings, the 1940 Recreation Hall designed by Franklin and Kump, and the circa 1910 brick masonry building associated with the earlier Orphanage, were constructed on a campus and in a neighborhood that has changed significantly over the last 100 years. In addition, the demolition of the six post-1957 buildings are north of these two resources and thus the project will not create a substantial adverse change in the qualities that have made these buildings eligible as historical resources under CEQA.

Map Reference #1, 3920 E. Ventura Avenue, 1969. This addition to the Juvenile Court Building was constructed in 1969 and is the face of the complex with its Ventura Avenue elevation. The irregular plan full two-story building is of concrete block construction and is an example of New Formalism (1955-1975) with its full elevation patterned facade screen.

Map Reference #2, 742 S. 10th Street, The Juvenile Courts Building. No date is available for this full two story addition which does not appear on the 1970 Sanborn Map. An entrance corridor leads past a wall of cobalt red tile to the south facing double glass doors. Best described as Corporate Modern or even Miesian, the building is expressed as a series of interlocking concrete volumes, with horizontal bands of fixed windows. Of interest is the treatment of the stucco veneer on the cantilevered second story which has been manually carved with decorative vertical cut grooves.

Map Reference #3, 744 S. 10th Street, Juvenile Hall (1957). This purpose-built Mid-Century modern building was started in 1956 and completed in 1957 of reinforced concrete. The 10th street facing entrance is inset under an overhang that functions as an atrium. Four tall vertical windows on both the east and north elevations have 72 individual lights with steel sash muntins and are inset within a series of concrete piers. A concrete block extension on the south end steps back from the plane of the main facade and has a series of fixed clerestory windows and a large door for equipment storage.

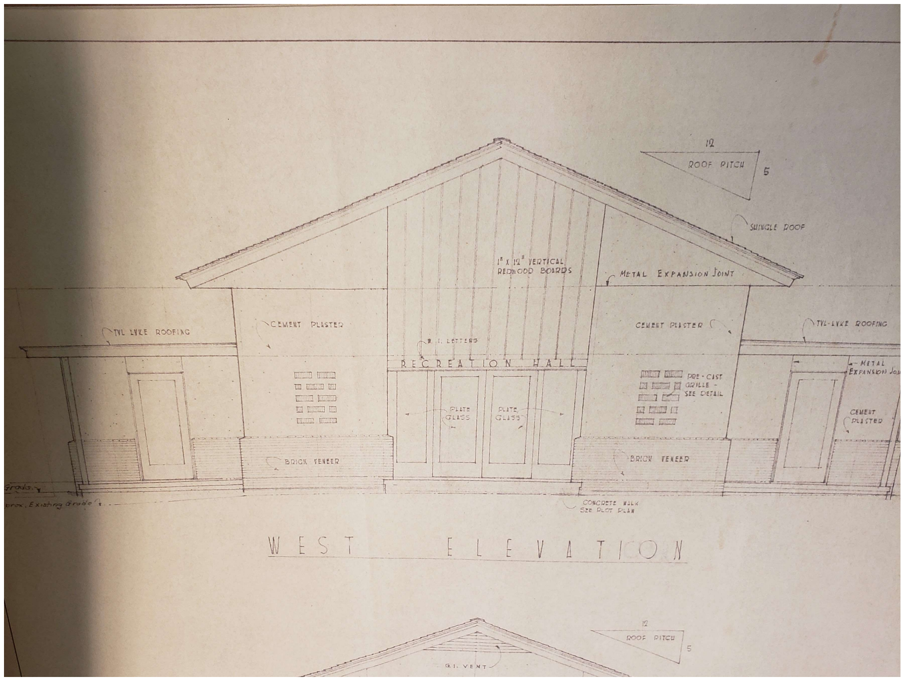
Map Reference #4, 746 S. 10th Street Fresno County Youth Center/C.K. Wakefield School (1967). In 1967 Juvenile Hall was expanded to include the Fresno County Youth Center which included a dormitory, office, classroom, dining room and most recently the Wakefield School. The reinforced concrete block building quoted the window treatment of the earlier Juvenile Hall with tall vertical windows, six to the south of the north facing and inset entrance and four to the north, consisting of 40 lights each with steel muntins. The windows were framed with concrete block units set vertically on edge to form a narrow pilaster.

The sign for "C.K. Wakefield School" was affixed to a brown textured wall that served as a screen for the entrance. The north end of the building included a tall one story unit with a series of clerestory windows. The former Fresno County Youth Center has since been demolished.

Map Reference #5, 890 S. 10th Street, Fresno County Old Peoples' Home/Fresno County Probation Department. This 1940 wood framed, stucco and wood clad building was originally constructed for the Fresno County Old Peoples' Home as a Recreation Hall, complete with stage at the east end, a small library and a dressing/storage room at each corner of the east elevation. The Mid-Century Modern design was by Charles Franklin and Ernest Kump Jr. who a year earlier had completed their drawings for the Fresno City Hall, constructed in 1941 (now Fresno City Hall Annex). The firm received national attention when their radically modern City Hall was selected by the Museum of Modern Art in New York as one of the most significant American structures built between 1932 and 1944 (Powell 2004). (See survey forms for more on Franklin and Kump).

The building served as the “reading room” by 1950 (Sanborn Map 1950) and by 1963 had been converted for use as the Probation Office for the Juvenile Hall complex (Sanborn Map 1963). By 1963 the outside terraces had been infilled with T 1-11 vertical siding and the original steel sash casement windows moved to the outside. An interior remodel by architect Jack Schutt occurred in 1981.

Other than the infill of the outside wings (over 50 years ago), the integrity of the building remains remarkably high to its period of significance of 1940. The building is associated with one of the premier architectural firms working in Fresno during the 1930s and 1940s and is eligible for listing on Fresno's Local Register of Historic Resources under Criteria i, ii and iii.



Franklin and Kump drawings on file, FUSD

Map Reference #6 and 7, 808 and 810 S. 10th, Modular Offices (by 1970 and later). Two metal clad modular buildings located side by side on the west side of the parcel served as offices and most recently as a Pretrial Unit for the Probation Department. These buildings were the first to be demolished for the project.

Map Reference #8, 890 S. 10th Street, County Probation Building (1978). This building was constructed for use as the new County Probation Building. It is slated for adaptive reuse by the FUSD and is less than 50 years of age.

Map Reference #9, 940 S. 10th Street, Fresno County Orphanage School Building (circa 1910). This masonry brick building has a rectangular footprint and lies parallel to South 10th Street near the south end of the parcel. The building is first depicted on the 1919-1919 Sanborn and is associated with the Fresno County Orphanage. It was probably built around 1910 although it was architecturally anachronistic even then with its Italianate style double hung sash windows with segmental arch. By 1948 the building had been doubled in length and was associated with the Fresno County Old Peoples' Home. Unfortunately the function of the building in 1948 cannot be deciphered from the Sanborn map. By 1963 through 1970 it was used by the City of Fresno as a recreation office (Sanborn Maps, 1963, 1970). The building was remodeled in 1963 by Bates, Grote and Wong of Fresno to include a seismic upgrade, a reinforced roof, air conditioning, and a dropped ceiling (Plans FUSD). Most important architecturally, the two chimney stacks were cut off at the roof line although the chimneys remain on the interior of the building (Jundt 2019). A photo included in the Probation Department's Centennial video includes a citation of May 1964 identifying the building as the “Boys Field Supervision Building.” Clearly pictured is a dormer window on the facade (no longer extant).

The building has a river rock retaining wall lining the pathway to the building. This may date to the Arts and Crafts era of the early 20th century when the building was constructed or perhaps is a later addition.

Map Reference #9 is the oldest building on the campus. It is at least 100 years old and is the only extant building associated with the earlier Fresno County Orphanage and Fresno County Old Peoples' Home. It is therefore eligible for inclusion on Fresno's Local Register of Historic Resources under Criterion i and Criterion iii. Other than interior upgrades and the extension of the building by 1948 the building remains unaltered with high integrity to its period of significance.

Map Reference #10, 1020 S. 10th Street, Fresno County Computer Services Center (1974). The concrete block building with pre-cast columns and beams was constructed by Fujii-Parsons for the County's use as a computer services center. This one-story building has an atrium in the center. It is less than 50 years of age and architecturally is not significant. It is therefore not a historical resource for the purposes of CEQA. It is slated to be adaptively reused by the District.

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Preparer's Qualifications

Karana Hattersley-Drayton has a B.A., an M.A. and completed three years of Ph. D. work in Architectural History, all at U.C. Berkeley. She previously served on the California State Historical Resources Commission as well as the Board of Directors for the Vernacular Architecture Forum. She edited and wrote several articles for the 2008 VAF publication, “Architecture, Ethnicity and Historic Landscapes of California's San Joaquin Valley” which won both a California Preservation Foundation award as well as a Governor's Historic Preservation award. Ms. Drayton moved to the San Joaquin Valley in 1999 to work as an Architectural Historian for Caltrans, District 06 and from 2002 to January 2017 served as the City of Fresno's Historic Preservation Project Manager. Her special interests include the adobe buildings of the San Joaquin Valley, vernacular architecture, and gendered and ethnic landscapes.

Figure 1: Project Map Ventura Alternative Education Campus

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code
Other Listings
Review Code Reviewer Date

Map Ref. #5

P1. Resource Name: County of Fresno Old Peoples' Home Recreation Hall

***P2. Location: *a. County:** Fresno

***b. USGS 7.5' Quad:** Fresno South Section n/e ¼ of Section 12 R20E T14S

c. Address: 890 S. 10th Street, Fresno

d. Assessor's Parcel Number: 470-021-01T

***P3a. Description:** This former Recreation Hall has a nominally rectangular plan and is sited on the parcel on an east-west alignment. The building is wood framed and clad in stucco and wood with brick veneer on both the facade and rear elevation. The main building has a medium pitch front facing gable roof with a wide overhang and boxed cornice. Vertical 1/12 redwood boards are located under the facade cornice. Former side terraces have been infilled (pre-1963) with t-11 vertical siding and the original steel sash casement windows on the sides of the building moved to be on the exteriors of these wings. The front entrance faces west and consists of three plate glass doors (one now boarded) which are partially inset. A decorative "pre-cast grill" is located on either side of the entrance.

***P3b. Resource Attributes:** HP13 (Social Hall); HP14 (Probation Building)

***P4. Resources Present:** ●Building

P5b Photo date: 24 June 2019

***P6. Date Constructed/Age and Sources:** 1940, original drawings, Franklin and Kump

***P7. Owner and Address:**
Fresno Unified School District
4600 N. Brawley Avenue
Fresno 93722

***P8. Recorded by:** Karana Hattersley-Drayton M.A., 4110 N. Maroa Avenue 93704

***P9. Date Recorded:** 24 June 2019

***P10. Survey Type:** Intensive

***P11. Report Citation:** "Historic Architectural Survey Report (HASR) for the Ventura Alternative Education Campus and Administrative Office Project" Prepared for Odell Planning and Research Inc. 1 July 2019

***Attachments:** ●Building, Structure and Object Report; ●Continuation Sheet

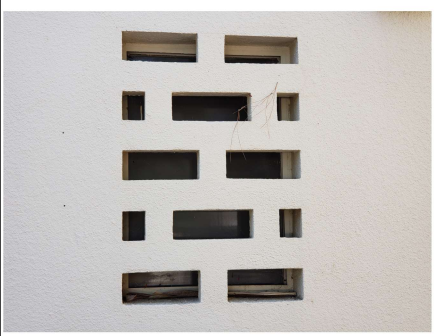
Charles Franklin (1891-1956) apprenticed with the Reid Brothers in San Francisco in 1906. The Reids are best known for their design of the world famous Hotel Del Coronado. In 1912 Franklin moved to Fresno to work for the R.F. Felchlin Company. Franklin was licensed as an architect in 1917 and became a full partner in the firm of Felchlin, Shaw and Franklin in 1925. The design-build company constructed many of Fresno's classic revival high rises of the early 20th century including the Bank of Italy (1918) and the San Joaquin Light and Power Company (1923). When the firm dissolved in 1930 Franklin worked on his own and in 1933 designed the art deco Kearney Boulevard Gateway (Powell 1996).

In 1937 Franklin became partners with Ernest Kump Jr. (1911-1999) who had served as a draftsman in his office. Kump Jr. was born in Bakersfield and had the good fortune to study architectural drawing under Clarence Cullimore FAIA at Kern County Union High School. Class assignments including drawing exercises at Old Fort Tejon, whose adobe buildings would serve Kump (and Franklin) as models for adobe homes they designed in Fresno's Old Fig Garden in the 1940s. Kump received an undergraduate degree at U.C. Berkeley and began studies at Harvard. In returning to California he joined Charles Franklin's office where the duo designed the 1936 Fresno School Administration Building, considered a “gem” in the Dutch Modern style. In 1937 Franklin and Kump went into partnership with offices in Fresno and Bakersfield. One early project was the Fowler Grammar School (1937) which Kump used as his Master's thesis at Harvard, which was supervised by Walter Gropius, the German Bauhaus modernist.

Kump was eventually recognized as an expert in school architecture and is most closely associated with Foothill College (1962) in Los Altos, California. He also designed De Anza College in Cupertino (1967) and Crown College at UC Santa Cruz (1967) (Powell 2004).

Other than the infill of the outside wings (pre-1963), the integrity of the former Recreation Hall building remains remarkably high to its period of significance of 1940. The building is associated with the County of Fresno Old People's Home and with one of the premier architectural firms working in Fresno during the 1930s and 1940s and is eligible for listing on Fresno's Local Register of Historic Resources under Criteria i, ii and iii.

Decorative grill on facade; looking northwest on rear elevation



State of California — The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code**: **5N**

***Resource Name:** County of Fresno Old Peoples' Home Recreation Hall

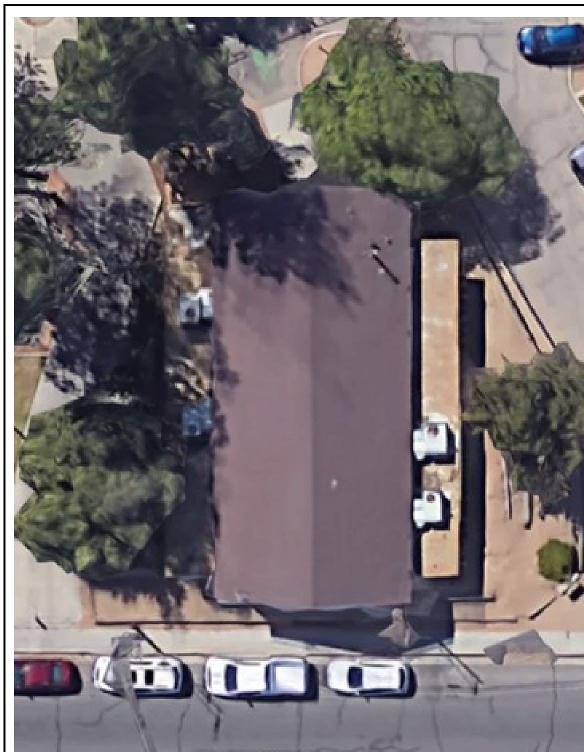
B3. Original Use: Recreation Hall for the County of Fresno Old Peoples' Home **B4. Present Use**: Vacant
***B5. Architectural Style:** Mid-Century Modern
***B6. Construction History:** Designed by Franklin and Kump 21 July 1940; side terraces infilled by 1963 (Sanborn map).

***B7. Moved?** ■**No**
***B8. Related Features:** The building is part of a 10-building complex most recently used as the County of Fresno Juvenile Hall and Probation Department.

B9a. Architect: Charles Franklin/Ernest Kump Jr. **B9b. Builder**: Unknown
***B10. Significance: Theme:** History of Fresno County Old Peoples' Home and Fresno County Juvenile Hall
Area: East Fresno **Period of Significance:** 1940 **Property Type:** Recreation Hall
Applicable Criteria: Local Register i, ii and iii

This building was originally constructed for the Fresno County Old Peoples' Home as a Recreation Hall, complete with stage at the east end, a small library and a dressing/storage room at each corner of the east elevation. The building served as the "reading room" by 1950 (Sanborn Map 1950) and by 1963 had been converted for use as the Probation Office for the Juvenile Hall complex (Sanborn Map 1963). By 1963 the outside terraces had been infilled with T 1-11 vertical siding and the original steel sash casement windows moved to the outside. An interior remodel by architect Jack Schutt occurred in 1981.

The Mid-Century Modern design was by Charles Franklin and Ernest Kump Jr. who a year earlier had completed their drawings for the Fresno City Hall, constructed in 1941 (now Fresno City Hall Annex). The firm received national attention when their radically modern City Hall was selected by the Museum of Modern Art in New York as one of the most significant American structures built between 1932 and 1944 (Powell 2004).



11. Additional Resource Attributes:
***B12. References:** Sanborn Insurance Maps, Fresno, California. 1898, 1906, 1918-1919, 1948, 1950, 1963, 1968-70. New York City: Sanborn Map Company; .Powell, John Edward. "Charles H. Franklin (1891-1956)," in A Guide to Historic Architecture in Fresno, California, 1996; Powell, John Edward, "Ernest J. Kump, Jr. (1911-1999)" in A Guide to Historic Architecture in Fresno, California, 2004; Franklin and Kump, "Architectural Plans for a Recreation Hall for the Fresno County Old Peoples' Home" 21 July 1940 (archives, FUSD Facilities Management and Planning).

***B14. Evaluator:** Karana Hattersley-Drayton, M.A.
4110 N. Maroa Avenue Fresno, CA 93704

***Date of Evaluation:** 1 July 2019

(This space reserved for official comments.)

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code
Other Listings
Review Code Reviewer Date

Map Ref. #9

P1. Resource Name: Fresno County Orphanage School Building/City of Fresno Parks and Recreation Office
***P2. Location: *a. County:** Fresno
***b. USGS 7.5' Quad:** Fresno South Section n/e ¼ of Section 12 R20E T14S
c. Address: 940 South 10th Street, Fresno 93720
d. Assessor's Parcel Number: 470-021-01T

***P3a. Description:** The building has a rectangular footprint and is aligned north/south on the parcel. The masonry brick construction is clad in stucco cement with a decorative belt course near the foundation. The asbestos shingle hip roof has a wide overhang and a boxed cornice with a soffit of narrow tongue and groove boards. A solid wood front door is inset and centrally placed on the north end of the building and has a 1/1 double hung sash wood windows on either side. The front entrance is covered by a porch with hip roof which is supported by two wood square posts and is accessed by six cement steps from both sides. A flagstone lined planter is in front of the entrance and decorative river rock retaining walls line the walkway from the sidewalk to the building. Windows on the building are mostly 1/1 double hung wood sash and are inset within a segmental arch with a prominent lug sill. Two windows on the west and east elevation are now fixed glass. A side door on the west elevation has stairs and handrails; two windows on the south of this entrance are smaller as are four windows on the rear elevation of the building.

***P3b. Resource Attributes: HP15/HP14** Schoolhouse/parks and recreation office
***P4. Resources Present:** ●Building

P5b Photo date: 11 June 2019

***P6. Date Constructed/Age and Sources:** circa 1910 (on 1918 Sanborn)

***P7. Owner and Address:**
Fresno Unified School District
4600 N. Brawley Avenue
Fresno 93722

***P8. Recorded by:** Karana Hattersley-Drayton, M.A.
4110 N. Maroa Avenue, Fresno 93704

***P9. Date Recorded:** 24 June 2019

***P10. Survey Type:** Intensive

***P11. Report Citation:** "Historic Architectural Survey Report (HASR) for the Ventura Alternative Education Campus and Administrative Office Project" Prepared for Odell Planning and Rsearch Inc. 1 July 2019

***Attachments:** ● Building, Structure and Object Report; ●Continuation Sheet

Resource: Fresno County Orphanage School Building

***Recorded by**: Karana Hattersley-Drayton, M.A. ***Date: 1 July 2019** ■ Continuation

The building has a river rock retaining wall lining the pathway to the building. This may date to the Arts and Crafts era of the early 20th century when the building was constructed or perhaps is a later addition.

Rear elevation 20 June 2019

Map Reference #9, the Fresno County Orphanage School, is the oldest building on the campus. It is at least 100 years old and is the only extant building associated with the earlier Fresno County Orphanage and Fresno County Old Peoples' Home. It is therefore eligible for inclusion on Fresno's Local Register of Historic Resources under Criterion i and Criterion iii. Other than interior upgrades and the extension of the building by 1948 the building remains unaltered with high integrity to its period of significance.

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code**: **5S3**

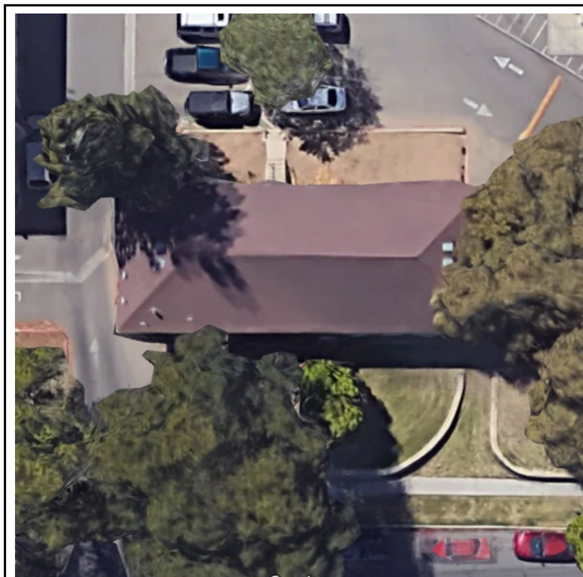
***Resource Name:** Fresno County Orphanage School Building

B3. Original Use: Schoolhouse **B4. Present Use**: Vacant
***B5. Architectural Style:** Vernacular with Italianate details
***B6. Construction History:** The building appears on the 1918-1919 Sanborn map but was probably built by 1910 or before.

***B7. Moved?** ■**No**
***B8. Related Features:** The building is part of a 10-building campus most recently used as the County of Fresno Juvenile Hall and Probation Department.

B9a. Architect: Unknown **B9b. Builder**: Unknown
***B10. Significance: Theme:** History of the Fresno County Orphanage and Juvenile Hall **Area:** East Fresno
Period of Significance: c1910-1970 **Property Type:** School building **Applicable Criteria:** Local Register i and iii

The masonry brick building is first depicted on the 1918-1919 Sanborn Map as the school for the Fresno County Orphanage. It was probably built around 1910 although it was architecturally anachronistic even then with its Italianate style double hung sash windows with segmental arch. By 1948 the building had been doubled in length and was associated with the Fresno County Old Peoples' Home. Unfortunately the function of the building in 1948 cannot be deciphered from the Sanborn map. By 1963 through 1970 it was used by the City of Fresno as a recreation office (Sanborn Maps, 1963, 1970). The building was remodeled in 1963 by Bates, Grote and Wong of Fresno to include a seismic upgrade, a reinforced roof, air conditioning, and a dropped ceiling (Plans FUSD). Most important architecturally, the two chimney stacks were cut off at the roof line although the chimneys remain on the interior of the building (Jundt 2019). A photo included in the Probation Department's Centennial video includes a citation of May 1964 identifying the building as the "Boys Field Supervision Building." Clearly pictured is a dormer window on the facade (no longer extant). (Continued)



B11. Additional Resource Attributes:
***B12. References:** 1898, 1906, 1918/1919, 1948, 1950, 1963 and 1968-70 Sanborn Fire Insurance Maps; Centennial video produced by the County of Fresno Probation Department; Clough, Charles W. et al. Fresno County in the 20th Century: From 1900 to the 1980s. Fresno, California: Panorama West Books, 1986; McAlester, Virginia and Lee. A Field Guide to American Houses, 2002; Jundt, Michael 2019.

***B14. Evaluator:** Karana Hattersley-Drayton, M.A.
4110 N. Maroa Avenue Fresno, CA 93704

***Date of Evaluation:** 1 July 2019

(This space reserved for official comments.)

Appendix 3

Geological/Environmental Hazards Report

AECOM

GEOLOGICAL/ENVIRONMENTAL HAZARDS REPORT
Planned School Site
12.8 Acres at Southwest Corner of Ventura Ave. and 10th Street
Fresno, California

Prepared for:
Fresno Unified School District

April 9, 2019

AECOM – Fresno, California
Project No. 60582802

AECOM

April 9, 2019

Mr. Rick Andreasen, Project Manager
Facilities Management and Planning
Fresno Unified School District
4600 North Brawley Avenue
Fresno, California 93722

Subject: Geological/Environmental Hazards Report
Planned School Site
12.8 Acres at the Southwest Corner of Ventura Ave. and 10th Street
Fresno, California
(AECOM Project No. 60582802)

Dear Mr. Andreasen:

AECOM Technical Services, Inc. prepared the enclosed report on behalf of the Fresno Unified School District (FUSD, Client) in accordance with the scope of services you authorized by approval of our proposal. The report presents the methods and results of a geological/environmental hazards investigation of the subject planned school site.

Please do not hesitate to contact Stuart St. Clair at 559-490-8308 if you have any questions. We appreciate your selection of AECOM for this project.

Sincerely,
AECOM Technical Services, Inc.

Stuart St. Clair

REGISTERED PROFESSIONAL ENGINEER
STUART BRIAN ST CLAIR
No. C 60945
Exp. 12/31/20
CIVIL
STATE OF CALIFORNIA

Stuart B. St. Clair, PE
Project Civil Engineer/Project Manager

Thomas A. Pender, PG
Senior Geologist

Enclosure

c: Scott Odell, AICP, Odell Planning & Research, Inc.

AECOM Technical Services, Inc.
1360 E. Spruce Avenue, Suite 101
Fresno, CA 93720
Tel: 559-448-8222
Fax: 559-448-8233

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APPENDICES

1.0 INTRODUCTION

AECOM Technical Services, Inc. (AECOM) prepared this Geological/Environmental Hazards Report for the planned school (the "site") comprising approximately 12.8 acres of land located southwest of the intersection of Ventura Avenue and 10th Street, in the city of Fresno in Fresno County, California (Figure 1). This report was prepared by AECOM on behalf of the Fresno Unified School District (FUSD, Client). AECOM is also concurrently conducting a Preliminary Environmental Assessment (PEA) for the site. The results of the PEA will be presented in a separate report.

This Report is organized as follows:

- Section 1.0 presents an introduction to the project.
- Section 2.0 presents the objective and scope of the project.
- Section 3.0 presents the site location and description.
- Section 4.0 presents the site's geologic setting.
- Section 5.0 presents engineering geology and seismology findings.
- Section 6.0 presents environmental hazards findings.
- Section 7.0 presents a summary of the findings and recommendations.
- Section 8.0 presents limitations of this report.
- Section 9.0 presents relevant references.
- Tables, figures and appendices follow Section 9.0.

2.0 OBJECTIVE AND SCOPE

The objective of AECOM's evaluation was to assess whether the site is subject to geological hazards that may require project mitigation, as set forth in California Education Code (CEC) sections 17212 and 17212.5 and in California Code of Regulations (CCR), Title 5, section 14010(f), (g) and (i). In particular, AECOM evaluated the following questions:

- Is the site located within the boundaries of an Earthquake Fault Zone designated by California Geological Survey (CGS) under the Alquist-Priolo Earthquake Fault Zoning Act, or within an area designated as geologically hazardous in the safety element of the local general plan?
- Does the site contain an active earthquake fault or fault trace (i.e., a fault or fault trace along which surface rupture can reasonably be expected to occur within the life of the school)?
- Is the site potentially subject to significant ground shaking due to nearby faults or fault traces?
- Is the site potentially subject to significant liquefaction or seismic settlement?
- Is the site potentially at risk due to expansive soils?
- Is the site potentially subject to landslides or other slope stability issues?
- Is the site potentially subject to subsidence or hydrocollapse of soils?
- Is the site potentially at risk due to flooding or dam inundation?
- Is the site potentially at risk due to tsunami or seiche inundation?
- Is the site potentially at risk due to volcanic eruption?

AECOM also evaluated the following potential environmental hazards, as set forth in CEC sections 17212.2 and 17213 and in Title 5 CCR section 14010(c), (h), and (q):

- Hazardous pipelines located within 1,500 feet of the site.
- Electrical power lines of greater than 50 kilovolts located within 350 feet of the site.
- Hazardous air emitters or hazardous material handlers located within ¼ mile of the site.
- Aboveground storage tanks for water or fuel (gasoline/diesel/propane) located within ¼ mile of the site.
- Railroad tracks located within 1,500 feet of the site.

Data collection for this report included review of publicly available geologic references and maps, inquiries with local utility companies and state and local agencies, and visual review of the site and properties near the site as viewable from the site or public roadways.

The Geological/Environmental Hazards Report complies with California legal requirements and guidelines for planned school sites, and was prepared under the supervision of, and is signed by, a California-registered civil engineer or geologist experienced in such assessments. For potentially significant geologic/seismic hazards identified at the site, potential mitigation measures are discussed at a conceptual level in the report. Preparation of design-level mitigation measures would require supplemental exploration and analysis beyond the scope of services presented in this report. AECOM can provide a separate proposal for such services, if needed.

3.0 SITE LOCATION AND DESCRIPTION

The site is located southwest of the intersection of Ventura Avenue and 10th Street, in the city of Fresno in Fresno County, California (Figure 1). The approximately 12.8 acre site consists of the entirety of the following parcels:

Assessor Parcel Number (APN)	Acreage	Street Addresses
470-021-01	9.275	3920 E. Ventura St. 742 S. 10th St. 1020 S. 10th St.
470-054-04	0.241	3870 E. Ventura St. 3872 E. Ventura St.
470-054-09	0.509	None assigned
470-054-10	0.255	747 S. 9th St.
470-054-11	0.246	807 S. 9th St.
470-054-12	0.327	809 S. 9th St.
470-054-13	0.327	821 S. 9th St.
470-054-14	0.193	3880 E. Ventura St.
470-054-16	0.065	None assigned
470-124-07	0.464	943 S. 9th St.
470-124-09	0.355	841 S. 9th St.
470-133-01	0.547	945 S. 9th St.

The assessor's maps are provided in Appendix A. All of the parcels are owned by the County of Fresno. The Site occupies a portion of Section 11, Township 14 South, Range 20 East, Mount Diablo Baseline and Meridian [USGS, 1981].

The Site contains ten wood-frame or masonry-block structures, asphalt basketball courts located immediately west of Building 3, a baseball field located immediately west of the asphalt basketball courts, and paved and unpaved parking areas (Figure 2).

Land use adjacent to the Site consists of Lane Avenue to the south with residences beyond; 9th Street to the west with residences beyond; Ventura Avenue to the north with commercial businesses beyond; and 10th Street to the east with residences beyond.

4.0 GEOLOGIC SETTING

This section summarizes available information on the topography, geology, and hydrology of the site and vicinity.

4.1 TOPOGRAPHY

The site is located in the San Joaquin Valley at an elevation of about 300 feet above mean sea level (amsl) [USGS, 2018]. The topography in the vicinity of the site is relatively flat and level, sloping gently downward to the west-southwest at approximately 10 feet per mile.

4.2 GEOLOGY

4.2.1 Regional Geology

The site lies near the eastern edge of the Great Valley Geomorphic Province of California. The valley is approximately 400 miles long and averages 50 miles wide. The valley has been filled with a thick sequence of marine and nonmarine sediments dating from the late Jurassic to the Holocene periods. The uppermost strata of the Great Valley represent, for the most part, the alluvial, flood, and delta plains of two major rivers, the Sacramento River in the north and the San Joaquin River in the south, and their tributaries.

The valley deposits are derived from the Coast Ranges to the west and the Sierra Nevada to the east. Granitic and metamorphic rocks outcrop along the eastern and southeastern flanks of the valley. Marine sedimentary rocks outcrop along most of the western, southwestern, and southern flanks; and volcanic rocks and deposits outcrop along the northeastern flanks of the valley. The valley geomorphology includes dissected uplands, low alluvial plains and fans, river flood plains and channels, and overflow lands and lake bottoms.

The San Joaquin Valley is a synclinal structure between the tilted block of the Sierra Nevada on the east and the complexly folded and faulted Coast Ranges on the west. The Sierra Nevada is uplifted along its eastern flank and depressed along its western flank where it is overlain by sedimentary deposits of the San Joaquin Valley. Beneath the San Joaquin Valley, a westwardly thickening wedge of sediments overlies crystalline basement rocks similar to those exposed in the Sierra Nevada. Indirect evidence suggests that the Sierra Nevada block extends westward to the flanks of the Coast Ranges [Miller et al., 1971].

The large northwest-trending syncline between the Sierra Nevada and the Coast Ranges is the principal late Cenozoic structure in the San Joaquin Valley. The axial plane of the syncline has subsided at a minimum rate of 0.7 to 1 foot per 1,000 years during the past 600,000 years. The structural axis, located 3 to 6 miles east of the western valley margin, has remained stationary during the late Quaternary period and governs the general location and orientation of the valley. The topographic axis (trough) of the valley, approximated by the interface of Sierran alluvium and Coast Ranges alluvium on the valley floor, has rarely coincided with the structural axis, suggesting that rates of sedimentation have equaled or exceeded rates of subsidence [Lettis, 1982].

4.2.2 Local Geology

The site is in an area classified as having surficial deposits consisting of older alluvium of Quaternary age [Page & LeBlanc, 1969; Figure 2]. Alluvial, lacustrine, playa, and fluvial deposits underlie the site and are described as unconsolidated and semi-consolidated. One of the more regionally significant units is the Pleistocene Corcoran Clay Member (E-Clay) of the Tulare Formation [Ireland et al., 1984]; the eastern extent of this unit is estimated to be about 12 miles west and southwest of the site [Page, 1986]. There are no rock outcrops at the site. The depth to the basement complex of consolidated rocks is more than one thousand feet [Page & LeBlanc, 1969; also see figures titled Geologic Cross Section D-D' and Geologic Map of the Fresno Area in Appendix B].

The site is located approximately 16 miles southwest of the nearest known ultramafic rock outcropping [CDMG, 2000a]. There are no rock outcrops at the site.

The surface soils at the site are mapped as Delhi loamy sand, 3 to 9 percent slopes and Ramona sandy loam (http://websoilsurvey.nrcs.usda.gov). A U.S Department of Agriculture, Natural Resources Conservation Service figure depicting the soil types mapped at the site is included in Appendix B, along with a description of the soil types.

4.2.3 Plate Tectonic Setting

The boundary between the North American and Pacific tectonic plates lies approximately 68 miles southwest of the site. The site is located on the North American tectonic plate, which is separated from the Pacific tectonic plate by the San Andreas fault. The relative motion between these two plates has been determined from paleomagnetic lineations in the Gulf of California, from global solutions to known slip rates along plate boundaries, from geology, and from geodesy [Minster and Jordan, 1978; DeMets et al., 1987; Wallace, 1990] to be primarily horizontal at a rate of about 50 millimeters a year [DeMets et al., 1987]. On a broad scale, the North American-Pacific tectonic plate boundary in California is a transform fault that extends from the Gulf of California to Cape Mendocino. The San Andreas fault and the transform plate boundary end to the north at the Mendocino Triple Junction in northernmost California. North of Cape Mendocino, the spreading center and subduction zone of the Juan de Fuca plate lie between the North American and Pacific tectonic plates. At the southern end, another spreading center lies in the Gulf of California, creating parts of the Pacific and Rivera tectonic plates. The transform faults of that spreading center merge into the

San Andreas fault system near the Imperial Valley and the Salton Sea [Hutton et al., 1991].

4.2.4 Faults and Seismicity

Most of Fresno County is situated within an area of relatively low seismic activity. Faults and fault systems that lie along the eastern and western boundaries of the County, as well as other regional faults, have the potential to produce high-magnitude earthquakes. High magnitude earthquakes on these faults could cause moderate intensity groundshaking in the County [Fresno County, 2000].

Quaternary faults located within about 62 miles (100 kilometers) of the site include the Nunez fault, and small sections of the Ortagalita fault zone, O'neill fault system and San Joaquin fault, near their southern extremities. An "active fault" is defined by the CGS as one that has had surface displacement within the last 11,000 years. [CGS, 2000b]. Faults with no evidence of surface displacement within the last 11,000 years (i.e., Holocene age) are not necessarily inactive. Potentially active faults have shown displacement within the last 1.6 million years (Quaternary age). "Inactive faults" show no evidence of movement in historic or recent geologic time, suggesting that the faults are dormant [Fresno County, 2000]. Figure 4 presents a regional fault map. Significant Quaternary faults are summarized below:

Ortigalita Fault Zone

The Ortigalita fault zone is approximately 50-miles long, originating near Crow Creek in western Stanislaus County and extending southeast to a few miles north of Panoche in western Fresno County. Most of the fault is considered active due to displacement during Holocene time [Fresno County, 2000; Jennings and Bryant, 2010]. The Ortagalita fault zone is designated an Earthquake Fault Zone by CGS [CGS, 2000b]

The Ortigalita fault zone is a major Holocene dextral strike-slip fault in the central Coast Ranges that is an eastern part of the larger San Andreas fault system. The fault zone is about 63 miles from the site at its closest point. The Ortigalita fault zone is characterized by echelon fault traces separated by pull-apart basins. The fault zone is divided into four sections. The Little Panoche Valley section is the southernmost section and is closest to the site. The Little Panoche Valley section is late-Holocene active. Late Quaternary slip rates and recurrence intervals are unknown, although the recurrence interval for the entire Ortigalita fault zone is about 2,000 to 5,000 years. The vertical slip rate is at least 0.01-0.04 millimeters per year. The dextral slip component is probably greater than the vertical component and is estimated to be 0.5 to 1.5 millimeters per year [USGS, 2006a].

San Andreas Fault Zone

The San Andreas fault zone lies to the west and southwest of the site. The fault is considered active by the State of California [Jennings and Bryant, 2010] and is of primary concern in evaluating seismic hazards throughout western Fresno County [Fresno County 2000]. The 684-mile-long San Andreas fault zone is the principal element of the San Andreas fault system, a network of faults with predominantly dextral strike-slip displacement that collectively accommodates the majority of relative north-south motion between the North American and Pacific plates. The San Andreas fault zone is the most extensively studied fault in California, and perhaps the world. The creeping section of the San Andreas fault is about 68 miles from the site at its closest point. The San Andreas fault zone is considered to be a late-Holocene-active dextral strike-slip fault that extends along most of coastal California from its complex junction with the Mendocino fault zone on the north, southeast to the northern Transverse Range and inland to the Salton Sea, where a well-defined zone of seismicity transfers the slip to the Imperial fault along a right-releasing step [USGS, 2006b]. The San Andreas fault zone is designated an Earthquake Fault Zone by CGS [CGS, 2000b].

Two major surface-rupturing earthquakes have occurred on the San Andreas fault in historic time: the 1857 Fort Tejon and 1906 San Francisco earthquakes. Additional historic surface rupturing earthquakes include the unnamed 1812 earthquake along the Mojave section and the northern part of the San Bernardino Mountains section, and a large earthquake in the San Francisco Bay area that occurred in 1838 that was probably on the Peninsula section. Historic fault creep rates are as high as 32 millimeters per year for the 82-mile-long creeping section in central California with creep rates gradually tapering to zero at the northwestern and southeastern ends of the section. Average slip rates for the San Andreas fault zone exceed 5.0 millimeters per year [USGS, 2006b].

<u>Nunez Fault</u>

The Nunez fault is located approximately 6 to 7 miles northwest of Coalinga and is about 54 miles from the site at its closest point. The fault is about 2.6 miles long and is considered active based on surface rupture associated with the 1983 Coalinga earthquake [Jennings and Bryant, 2010]. The fault is divided into two north and south trending segments. About 2.1 miles of right-reverse surface rupture occurred on the segments. Total displacement and timing of past fault movements are poorly constrained [Rymer and Ellsworth, 1990; Fresno County, 2000]. The Nunez fault is designated an Earthquake Fault Zone by CGS [CGS, 2000b].

<u>Clovis Fault</u>

The northwest-trending Clovis fault is believed to be located approximately five to six miles east of the City of Clovis, extending from an area just south of the San Joaquin River to a few miles south of Fancher Creek. The fault is about 10 miles from the site at its closest point. The Clovis fault is considered a pre-Quaternary fault with no recognized Quaternary displacement [Jennings and Bryant, 2010]. The fault is not necessarily inactive [Fresno County, 2000]. The Clovis fault is not designated an Earthquake Fault Zone by CGS [CGS, 2000b].

Foothills Fault System

The southern part of the Foothills fault system includes the Bear Mountains fault and the Melones fault zone, as well as numerous smaller, but related faults. The fault system is about 54 miles north-northwest of the site at its closest point. According to CGS data, portions of these faults (greater than 100 km from the site) are considered to be Quaternary or late Quaternary active faults [Jennings and Bryant, 2010]. Geologic investigations of the seismic safety of the Auburn Dam site suggest that these faults are potentially active. Therefore, the possibility exists that earthquakes could occur on these faults [Fresno County, 2000]. The Foothills fault zone is not designated an Earthquake Fault Zone by CGS [CGS, 2000b].

Great Valley Thrust Faults

The Great Valley thrust faults have been divided into at least 14 segments extending over 300 miles in cumulative length based on geomorphic interpretation of the range front bordering the western edge of the Central Valley [USGS, 2006b]. The Great Valley thrust faults' locations are poorly constrained. The closest Great Valley thrust fault is about 45 miles from the site at its closest point. Recent evidence suggests that the faults located along the western boundary of the San Joaquin Valley may be more active than once believed. Asymmetrical folds identified on the eastern slopes of the Coast Ranges can hide faults that show no surface rupture. The faults and folds along the Coast Range-Sierran Block Boundary (Great Valley thrust faults) are similar to or include the faults and folds that were the source of the 1983 Coalinga earthquake. The Great Valley thrust faults are now believed to be active and capable of generating large magnitude earthquakes [Rymer and Ellsworth, 1990; Fresno County, 2000]. The Great Valley thrust faults are not designated as Earthquake Fault Zones by CGS [CGS, 2000b].

4.3 HYDROLOGY

The San Joaquin River is located approximately 9 miles northwest of the site and the Kings River is located approximately 13 miles east of the site. Except for irrigation canals and small, man-made basins, there are no other surface water bodies within several miles of the site.

The site is located within the Kings Subbasin of the San Joaquin Valley groundwater basin [DWR, 1980]. Groundwater occurs in an unconfined/semiconfined aquifer in unconsolidated alluvium [Page & LeBlanc, 1969]. Review of groundwater data collected by the California Department of Water Resources (DWR) for a water well located approximately 0.75 miles northeast of the site shows that the depth to groundwater declined from approximately 46 feet below ground surface (bgs) in March 1950 to 102 feet bgs in January of 2003 (www.casgem.water.ca.gov). A map of the well location and a hydrograph presenting historical groundwater level data are provided in Appendix B.

Review of the groundwater elevation contour map for Spring 2018 (the most recent available data) available using the DWR online Groundwater Information Center Interactive Map Application (gis.water.ca.gov/app/gicima) indicates that the groundwater elevation beneath the site was approximately 220 feet amsl, which corresponds to a depth to groundwater of approximately 80 feet bgs. The DWR contour map indicates that the groundwater flow direction at the site was toward the west-southwest in Spring 2018. The groundwater flow direction may vary based on many factors, including regional recharge conditions and nearby groundwater extraction wells. The actual groundwater flow direction and depth in the vicinity of the subject property cannot be assessed without site-specific groundwater monitoring well data.

5.0 ENGINEERING GEOLOGY AND SEISMOLOGY FINDINGS

The following sections describe potential geologic hazards at the site. The potential occurrence of each hazard has been qualitatively classified as negligible, low, moderate or high.

5.1 SURFACE RUPTURE

The Alquist-Priolo Earthquake Fault Zoning Act stipulates that no structure for human occupancy may be constructed within an Earthquake Fault Zone designated by CGS until a site-specific evaluation of surface fault rupture and fault creep has been performed. These zones are established by the CGS along faults or segments of faults that are judged to be sufficiently active and well defined as to constitute a potential hazard to structures from surface faulting or fault creep.

The site is not located within an Earthquake Fault Zone. The nearest Earthquake Fault Zone is the Nunez fault, which is about 54 miles from the site at its closest point. No faults were identified within approximately 10 miles of the site [Bartow 1991; Fresno County 2000]. Considering this distance and the lack of observed historical faulting in the site vicinity, AECOM judges the potential for fault rupture at the site to be negligible.

5.2 GROUND SHAKING

Although the site is situated within an area of relatively low seismic activity [Fresno County, 2000], moderate ground shaking is considered possible at the site. However, it should be noted that this would be true for any potential school site within the FUSD boundaries.

The estimated peak horizontal ground acceleration as a fraction of acceleration due to gravity (g) based on a 10 percent probability of being exceeded in 50 years is between 0.10g and 0.15g at the site [USGS, 2014]. Estimated peak horizontal ground acceleration based on a 2 percent probability of being exceeded in 50 years is between 0.20g and 0.30g at the site [USGS, 2014]. See respective figures titled USGS Seismic-Hazard Maps in Appendix B. Estimated ground motions based on interpolated values may not equal values calculated for a specific site, and should be considered preliminary.

5.3 LIQUEFACTION AND SEISMIC SETTLEMENT

Liquefaction is a phenomenon whereby loose, saturated, granular soils lose their inherent shear strength due to excess pore water pressure build-up such as that generated during repeated cyclic loading from an earthquake. A low relative density of the granular materials, shallow groundwater table (generally less than 50 feet bgs), long duration, and high acceleration of seismic shaking are some of the factors associated with liquefaction. The presence of predominantly cohesive or fine-grained materials and/or absence of saturated conditions can preclude liquefaction. Liquefaction hazards are usually manifested during seismic events in the form of buoyancy forces, increase in lateral earth pressures, and horizontal and vertical movements resulting from lateral spreading, and post-earthquake settlement of the liquefied materials.

Ground accelerations must approach 0.3g before liquefaction occurs in a sandy soil with relative densities typical of Kings River alluvial deposits [Fresno County, 2000]. The depth to groundwater in the site vicinity is estimated to be somewhere between 80 and 100 feet bgs, based on sources cited in Section 4.3. With depth to groundwater greater than 50 feet, and the moderate ground shaking potential at the site, the risk of liquefaction is considered negligible.

Seismic settlement can occur in poorly consolidated soils during ground shaking. During settlement, the soil materials are physically rearranged by the shaking to result in a less stable alignment of the individual minerals. Settlement of sufficient magnitude to cause significant structural damage is normally associated with rapidly deposited alluvial soils, or improperly founded or poorly compacted fill. These areas are known to undergo extensive settling with the addition of irrigation water. Based on the soil type mapped at the site (Section 4.2.2), the risk of seismic settlement is considered negligible.

5.4 EXPANSIVE SOILS

Expansive soils greatly increase in volume when they absorb water and shrink when they dry out. Expansion is measured by shrink-swell potential, which is relative volume change in soil with a gain in moisture. Expansive soils may damage buildings, roads, and other structures built on them. The site is not located within an area of soils known to have moderately high-to-high expansion potential (see figure titled Expansive Soils in Appendix B). Furthermore, the soil type mapped at the site does not appear likely to present an expansive soil hazard (Section 4.2.2). Therefore, the risk of expansive soils at the site is considered negligible to low.

5.5 LANDSLIDES AND SLOPE STABILITY

The CGS has not developed landslide hazard maps for Fresno County. There is virtually no risk of large landslides in most of the valley area due to its relatively flat topography (see figure titled Landslide Hazards and Areas of Subsidence in Appendix B). There is potential for small slides and slumping along the steep banks of rivers or creeks [Fresno County, 2000].

The existing topography at the site does not provide sufficient relief to cause concern due to potential landslides. There are no topographic features of significant relief that could present a landslide hazard to the facility within several miles of the site.

5.6 SUBSIDENCE OR HYDROCOLLAPSE

Subsidence occurs when a large portion of land is displaced vertically, usually due to the withdrawal of groundwater, oil, or natural gas. Soils that are particularly susceptible to subsidence include those with high silt or clay contents. Subsidence caused by groundwater withdrawal can affect large areas [Fresno County, 2000].

About one-half of the San Joaquin Valley has been affected by subsidence [Poland, et al., 1975]. Most of the subsiding area in the San Joaquin Valley is underlain by a continuous and extensive confining bed, and most of the pumping overdraft and compaction due to head decline occurs in the confined aquifer system beneath this bed. North of Wasco, the confining bed is the Pleistocene Corcoran Clay Member (E-Clay) of the Tulare Formation [Ireland, et al., 1984]; these deposits are located about 12 miles southwest of the site [Page, 1986]. The site is located in an area with little or no subsidence [Poland, et al., 1975, Ireland, et al., 1984, Ireland, 1986; also see figure titled Landslide Hazards and Areas of Subsidence in Appendix B].

5.7 FLOODING OR DAM INUNDATION

The eastern portion of Fresno County is drained primarily by the San Joaquin and Kings rivers. The drainage of the site is toward the southwest and consists of overland sheet flow. The topography slopes to the southwest at less than 1 percent grade [USGS, 2018]. The site is ultimately drained by the Kings River into the Sacramento River delta or inland basins to the south. Major flooding is not expected at the site, but sheet overland flow and pooling in low areas is probable during heavy or prolonged storms.

The entire site is outside the 100-year floodplain. The northern approximately one-third of the site is located within the 500-year floodplain (Zone X, 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile). The southern approximately two-thirds of the site are located outside the 500-year floodplain (Zone X, Area determined to be outside the 0.2% annual chance floodplain), as shown on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), which is provided in Appendix B (see also figure titled 100 Year Flood Inundation Areas in Appendix B). The floodplain boundaries are delineated by FEMA on the basis of hydrology, topography, and modeling of flow during predicted rainstorms. The analysis of predicted flooding does not account for the effects of continued land subsidence or increases in sea level [Fresno County, 2000].

According to DWR records, there are 33 dams located within Fresno County [Fresno County, 2000]. Of these, four major dams could cause substantial flooding in Fresno County in the event of a failure: Friant Dam, Big Dry Creek Dam, Redbank-Fancher Creek Project Dams, and Pine Flat Dam. Failure of these dams is considered a very unlikely event. The site is located outside the reported flood inundation areas in the event of failure of these dams (see the figure titled Dam Failure Flood Inundation Areas in Appendix B).

5.8 TSUNAMIS OR SEICHES

A tsunami is a large, transient long-period sea wave caused by submarine landslides, earthquakes, or volcanic eruptions. Based on the site's distance from the ocean, tsunami hazards at the site are not considered possible.

Seiches are standing waves produced in a body of water such as a reservoir, lake, or harbor by wind, atmospheric changes, or earthquakes. No large bodies of water have been identified within approximately 15 miles of the site. Therefore, seiche hazards at the site are not considered possible.

5.9 VOLCANOES

The Mono Lake-Long Valley area is the closest known active volcanic region to the site. This area is located approximately 80 miles northeast of the site. Lava, tephra (ejected materials such as dust, ash, and cinder transported through the air), and pyroclastic (rock fragment) flows often occur during large volcanic events. With increased distance from a volcano, there is decreased risk of impacts. Should a volcanic eruption occur, it is likely that a significant amount of ash would be released into the atmosphere. The likelihood that ash would affect the site depends on the frequency with which winds at various heights above the volcano blow toward the area [Fresno County, 2000]. Historic wind directions and wind speeds suggest that most volcanic ash from Mono Lake-Long Valley area eruptions would be deposited to the east of the volcano or volcanic vents.

In the event of an eruption, the site could conceivably be subject to the deposition of volcanic ash. However, it should be noted that the risk would be essentially equal at any potential school site within the FUSD boundaries.

6.0 ENVIRONMENTAL HAZARDS FINDINGS

AECOM conducted surveys for hazardous pipelines, electrical power lines, air toxics sources, aboveground storage tanks, and railroad tracks at the site and out to the respective radii from the site boundaries that are established for these various potential hazards in the California Education Code and/or in CDE regulations or guidance documents.

6.1 HAZARDOUS PIPELINE SURVEY

AECOM contacted the State Fire Marshal (SFM), the local natural-gas service provider (Pacific Gas and Electric Company [PG&E]), the City of Fresno, and Fresno Irrigation District (FID) regarding whether hazardous pipelines or high-volume water supply pipelines, as defined by CDE, are located within 1,500 feet of the site (see documentation in Appendix C). AECOM also reviewed maps of oil/gas/geothermal fields prepared by the California Division of Oil, Gas & Geothermal Resources (DOGGR), and conducted a field survey for pipeline markers visible at or from the site or from road rights-of-way within 1,500 feet of the site. AECOM found that:

- There are no pipelines jurisdictional to the SFM within 1,500 feet of the site.

- PG&E has no natural gas transmission pipelines within 1,500 feet of the site.

- The City of Fresno has a 12-inch-diameter, underground water supply pipeline that extends east-west in an alley approximately 240 feet north of the site. The City of Fresno also a 12-inch-diameter, underground water supply pipeline in the right of way of S. 7th Street, approximately 540 feet northwest of the site. The City of Fresno also has a 12-inch-diameter, underground water supply pipeline in the right of way of S. Cedar Avenue, approximately 1,000 feet east of the site. The City of Fresno also has a 12-inch-diameter, underground water supply pipeline in the right of way of E. Butler Avenue, approximately 1320 feet south of the site. Should a leak develop in any of these pipelines, presumably much of the water would drain westward and southward within existing street rights of way and would enter the municipal storm drain system. While it may be possible for some water to reach the site should a leak develop in one of these pipelines, it is considered very unlikely that significant human injury or property damage could be caused by such a leak.

- FID knows of no irrigation water pipelines of 12-inches or greater in diameter that are within 1,500 feet of the site.

- The site is not mapped as being within an oil, gas or geothermal field, so there was no need to contact DOGGR regarding potential pipelines.
- No pipeline markers were observed within 1,500 feet of the site.

6.2 ELECTRICAL POWERLINE SURVEY

AECOM contacted the local electrical service provider (PG&E) regarding whether overhead electrical powerlines rated for greater than 50 kilovolts (kv) are located within 350 feet of the site (see documentation in Appendix C). AECOM also conducted a field survey for such powerlines visible at or from the site or from road rights-of-way within 350 feet of the site. No electrical powerlines rated for greater than 50 kv were identified within 350 feet of the site.

6.3 AIR TOXICS SURVEY

AECOM contacted the Fresno County Environmental Health Division (FCEHD) and the San Joaquin Valley Air Pollution Control District (SJVAPCD) regarding whether there are facilities that may produce hazardous air emissions and/or handle hazardous materials within ¼ mile of the site (see documentation in Appendix C). AECOM also conducted a field survey for such facilities within ¼ mile of the site that are visible at or from the site or from road rights-of-way. AECOM found that:

- The FCEHD reported 11 active and 13 inactive facilities within ¼ mile of the site which might reasonably be anticipated to handle hazardous materials.
- The SJVAPCD reported 9 permitted facilities within ¼ mile of the site.

6.4 ABOVEGROUND STORAGE TANKS SURVEY

AECOM contacted FID regarding whether there are aboveground fuel or water storage tanks located within ¼ mile of the site (see documentation in Appendix C). AECOM also reviewed a 2016 aerial photograph and City of Fresno water facility maps, and conducted a field survey for such storage tanks visible at or from the site or from road rights-of-way within ¼ mile of the site. AECOM found that:

- FID has no such storage tanks within ¼ mile of the site.
- AECOM observed no such storage tanks within ¼ mile of the site.

6.5 RAILROAD TRACKS SURVEY

AECOM reviewed a 2016 aerial photograph and a 1981 USGS topographic map and conducted a field survey for railroad tracks located within 1,500 feet of the site. AECOM found that there do not appear to be any railroad tracks located within 1,500 feet of the site.

7.0 SUMMARY AND RECOMMENDATIONS

The only geologic hazards identified as having a more than insignificant risk level for the site are: 1) moderate ground shaking during an earthquake, and 2) deposition of volcanic ash in the event of volcanic eruption in the Mono Lake-Long Valley area. It should be noted that these geologic hazards would affect any potential school site within the FUSD boundaries. Based on the data reviewed, the soils present at the site do not appear to present a significant hazard of liquefaction, seismic settlement, or expansion.

The following potentially significant environmental hazard was identified for the site:

- Several facilities that may produce hazardous air emissions and/or handle hazardous materials within ¼ mile of the site (Section 6.3).

AECOM recommends the following:

- Prior to construction of the planned facility, a full geotechnical engineering investigation, including on-site borings and testing of soil samples, should be conducted by a California-registered Geotechnical Engineer. Also, an engineering geology and seismology study should be conducted in accordance with CGS Note 48.
- An air quality assessment should be conducted for the facilities identified in Section 6.3.

8.0 LIMITATIONS

This document was prepared by AECOM for the sole use of Client. This document was prepared in a manner consistent with the level of care and skill ordinarily exercised by professional engineers, geologists, and environmental scientists engaged in similar projects in the geographic area of the site. AECOM provides no other warranties, either express or implied, concerning the contents of this document, which was prepared under the technical direction of the registered professional(s) who signed the cover letter.

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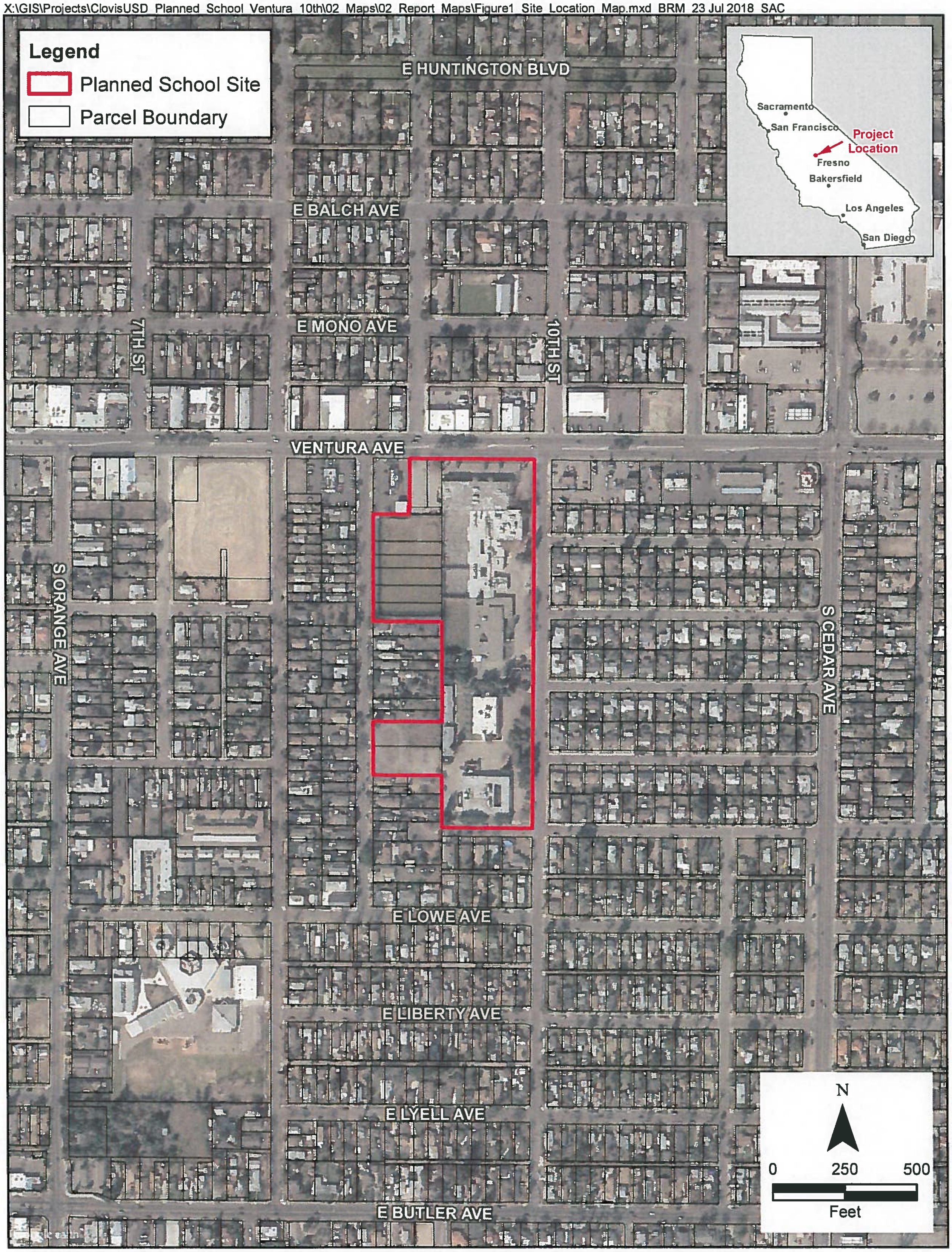


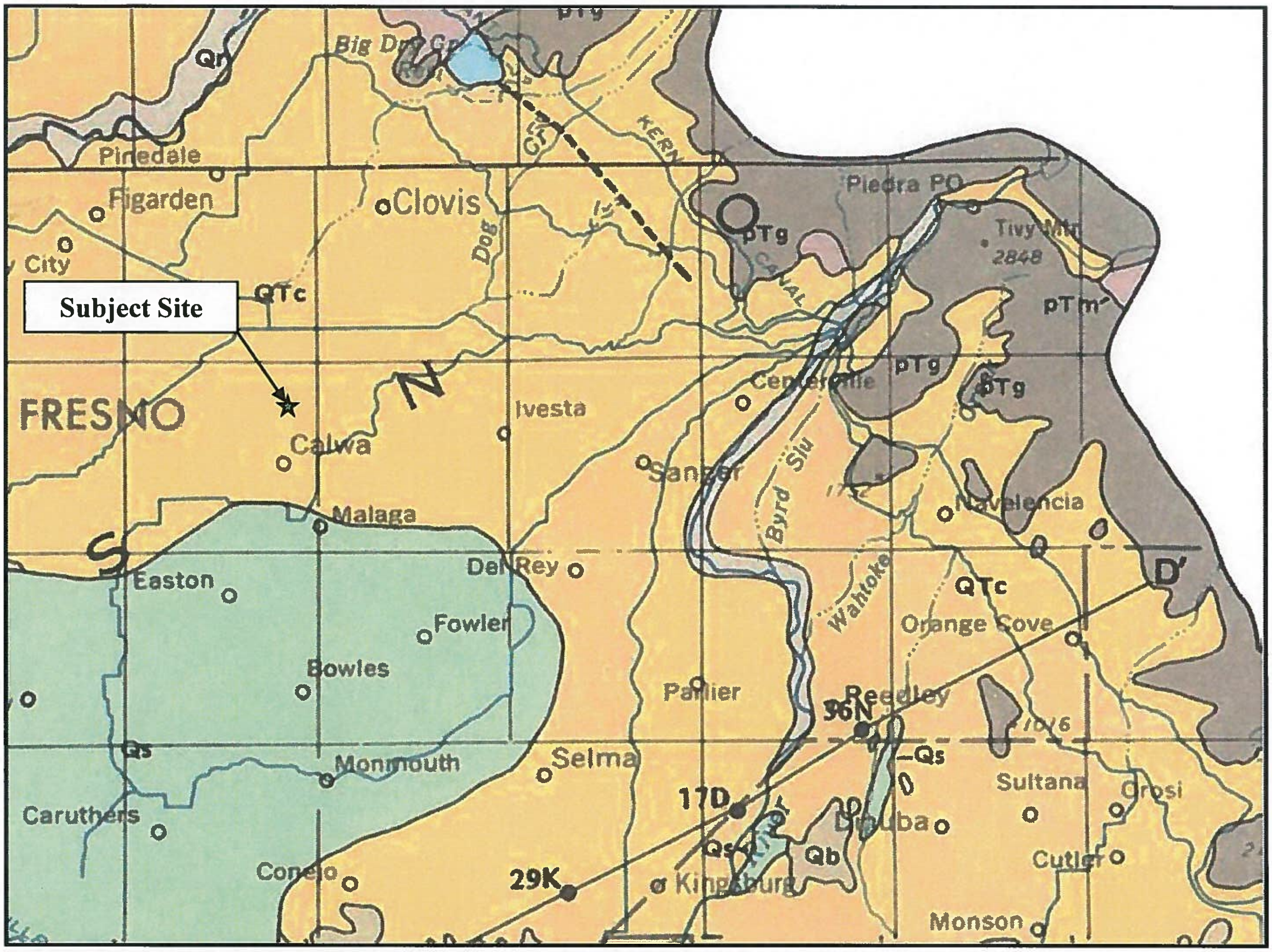
Aerial Photo: February 2018

Site Location Map

Planned School Site
Southwest of Ventura Ave. & 10th St.
Fresno, CA

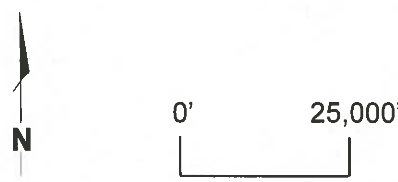
AECOM

Figure 1



DESCRIPTION OF MAP UNITS

Qs	**Sand dunes (Holocene)** Windblown sand and dune sand
Qb	**Flood-basin deposits (Holocene)** Clay, silt, and some sand; near Stockton consist of muck, peat, and other organic soils. In places may include part of the Modesto Formation (Pleistocene)
Qr	**River deposits (Holocene)** Gravel, sand, silt, and minor amounts of clay; deposited along channels, flood plains, and natural levees of main streams. In places may include part of Modesto Formation (Pleistocene)
QTl	**Lacustrine and marsh deposits (Pliocene to Holocene)** Clay, silt, and some sand; in subsurface include three widespread clays: A clay (Pleistocene and Holocene?); C clay (Pleistocene); and modified E clay (Pleistocene), includes Corcoran Clay Member of Tulare and Turlock Lake Formations
QTc	**Continental rocks and deposits (Miocene to Holocene)** Heterogeneous mix of generally poorly sorted clay, silt, sand, and gravel; some beds of claystone, siltstone, sandstone, and conglomerate. Include some informal units: younger alluvium (Holocene), older alluvium (Pleistocene and Holocene?) and continental deposits (Pliocene and Pleistocene); three formations of Pleistocene age: Modesto, Riverbank, and Turlock Lake; Tulare Formation (Pliocene and Pleistocene) on western side of valley, Laguna Formation (Pliocene) on eastern side, and Kern River Formation (Miocene to Pleistocene?) on southeastern part
pTg	**Granitic rocks (Pre-Tertiary)** Chiefly granitic rocks on eastern side of valley, in places consists of mafic intrusive rocks



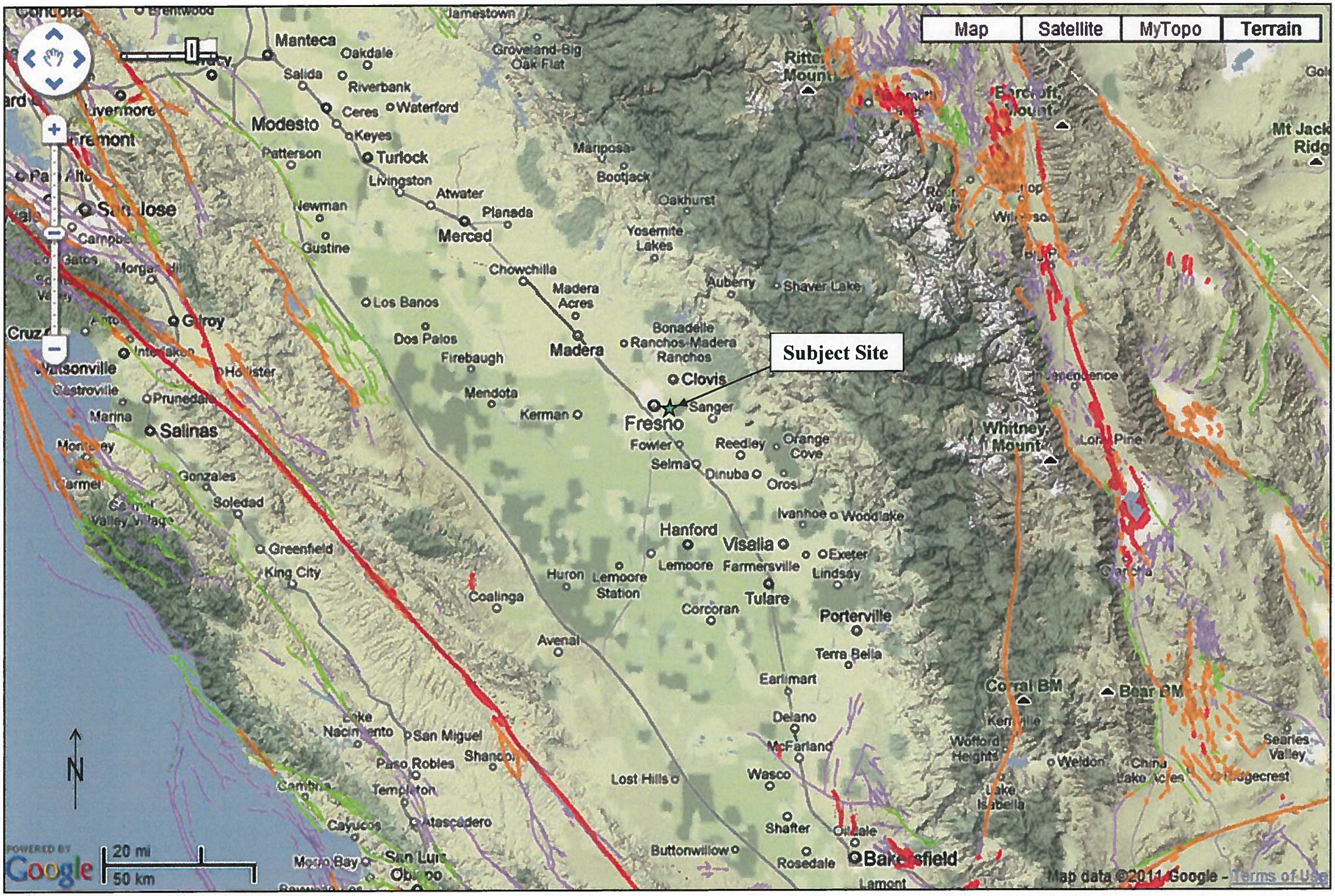
———	**Contact** Approximately located
– – – –······	**Fault** Dashed where approximately located, dotted where concealed
D —— D'	**Line of geologic section**
● 34A	**Well and number**

Source: Geologic Map of the San Joaquin Valley, California (Page, 1986)

Regional Geology Map
Planned School Site
Southwest of Ventura Ave. & 10th St.
Fresno, CA

AECOM

Figure 2



Note: see Figure 3B titled Regional Fault Map Explanation

AECOM

Source: Jennings and Bryant (2010)

Regional Fault Map
Planned School Site
Southwest of Ventura Ave. & 10th St.
Fresno, CA

Figure 3A

EXPLANATION

Fault traces on land are indicated by solid lines where well located, by dashed lines where approximately located or inferred, and by dotted lines where concealed by younger rocks or by lakes or bays. Fault traces are queried where continuation or existence is uncertain. Concealed faults in the Great Valley are based on maps of selected subsurface horizons, so locations shown are approximate and may indicate structural trend only. All offshore faults based on seismic reflection profile records are shown as solid lines where well defined, dashed where inferred, queried where uncertain.

FAULT CLASSIFICATION COLOR CODE
(Indicating Recency of Movement)

Fault along which historic (last 200 years) displacement has occurred and is associated with one or more of the following:

(a) a recorded earthquake with surface rupture. (Also included are some well-defined surface breaks caused by ground shaking during earthquakes, e.g. extensive ground breakage, not on the White Wolf fault, caused by the Arvin-Tehachapi earthquake of 1952). The date of the associated earthquake is indicated. Where repeated surface ruptures on the same fault have occurred, only the date of the latest movement may be indicated, especially if earlier reports are not well documented as to location of ground breaks.

(b) fault creep slippage - slow ground displacement usually without accompanying earthquakes.

(c) displaced survey lines.

A triangle to the right or left of the date indicates termination point of observed surface displacement. Solid red triangle indicates known location of rupture termination point. Open black triangle indicates uncertain or estimated location of rupture termination point.

Date bracketed by triangles indicates local fault break.

No triangle by date indicates an intermediate point along fault break.

Fault that exhibits fault creep slippage. Hachures indicate linear extent of fault creep. Annotation (creep with leader) indicates representative locations where fault creep has been observed and recorded.

Square on fault indicates where fault creep slippage has occured that has been triggered by an earthquake on some other fault. Date of causative earthquake indicated. Squares to right and left of date indicate terminal points between which triggered creep slippage has occurred (creep either continuous or intermittent between these end points).

Holocene fault displacement (during past 11,700 years) without historic record. Geomorphic evidence for Holocene faulting includes sag ponds, scarps showing little erosion, or the following features in Holocene age deposits: offset stream courses, linear scarps, shutter ridges, and triangular faceted spurs. Recency of faulting offshore is based on the interpreted age of the youngest strata displaced by faulting.

Late Quaternary fault displacement (during past 700,000 years). Geomorphic evidence similar to that described for Holocene faults except features are less distinct. Faulting may be younger, but lack of younger overlying deposits precludes more accurate age classification.

Quaternary fault (age undifferentiated). Most faults of this category show evidence of displacement sometime during the past 1.6 million years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age. Unnumbered Quaternary faults were based on Fault Map of California, 1975. See Bulletin 201, Appendix D for source data.

Pre-Quaternary fault (older that 1.6 million years) or fault without recognized Quaternary displacement. Some faults are shown in this category because the source of mapping used was of reconnaissence nature, or was not done with the object of dating fault displacements. Faults in this category are not necessarily inactive.

ADDITIONAL FAULT SYMBOLS

Bar and ball on downthrown side (relative or apparent).

Arrows along fault indicate relative or apparent direction of lateral movement.

Arrow on fault indicates direction of dip.

Low angle fault (barbs on upper plate). Fault surface generally dips less than 45° but locally may have been subsequently steepened. On offshore faults, barbs simply indicate a reverse fault regardless of steepness of dip.

OTHER SYMBOLS

Numbers refer to annotations listed in the appendices of the accompanying report. Annotations include fault name, age of fault displacement, and pertinent references including Earthquake Fault Zone maps where a fault has been zoned by the Alquist-Priolo Earthquake Fault Zoning Act. This Act requires the State Geologist to delineate zones to encompass faults with Holocene displacement.

Structural discontinuity (offshore) separating differing Neogene structural domains. May indicate discontinuities between basement rocks.

Brawley Seismic Zone, a linear zone of seismicity locally up to 10 km wide associated with the releasing step between the Imperial and San Andreas faults.

Geologic Time Scale			Years Before Present (Approx.)	Fault Symbol	Recency of Movement	DESCRIPTION: ON LAND	DESCRIPTION: OFFSHORE
Quaternary	Late Quaternary	Historic	200			Displacement during historic time (e.g. San Andreas fault 1906). Includes areas of known fault creep.	
		Holocene	11,700			Displacement during Holocene time	Fault offsets seafloor sediments or strata of Holocene age
		Pleistocene	700,000			Faults showing evidence of displacement during late Quaternary time	Fault cuts strata of Late Pleistocene age
	Early Quaternary		1,600,000			Undivided Quaternary faults - most faults in this category show evidence of displacement during the last 1,600,000 years; possible exceptions are faults which displace rocks of undifferentiated Plio-Pleistocene age.	Fault cuts strata of Quaternary age
Pre-Quaternary			4.5 billion (Age of Earth)			Faults without recognized Quaternary displacement or showing evidence of no displacement during Quaternary time. Not necessarily inactive.	Fault cuts strata of Pliocene or older age.

* Quaternary now recognized as extending to 2.6 Ma (Walker and Geissman, 2009). Quaternary faults in this map were established using the previous 1.6 Ma criterion.

AECOM

Source: Jennings and Bryant (2010)

Regional Fault Map Explanation
Planned School Site
Southwest of Ventura Ave. & 10th St.
Fresno, CA

Figure 3B

APPENDIX A

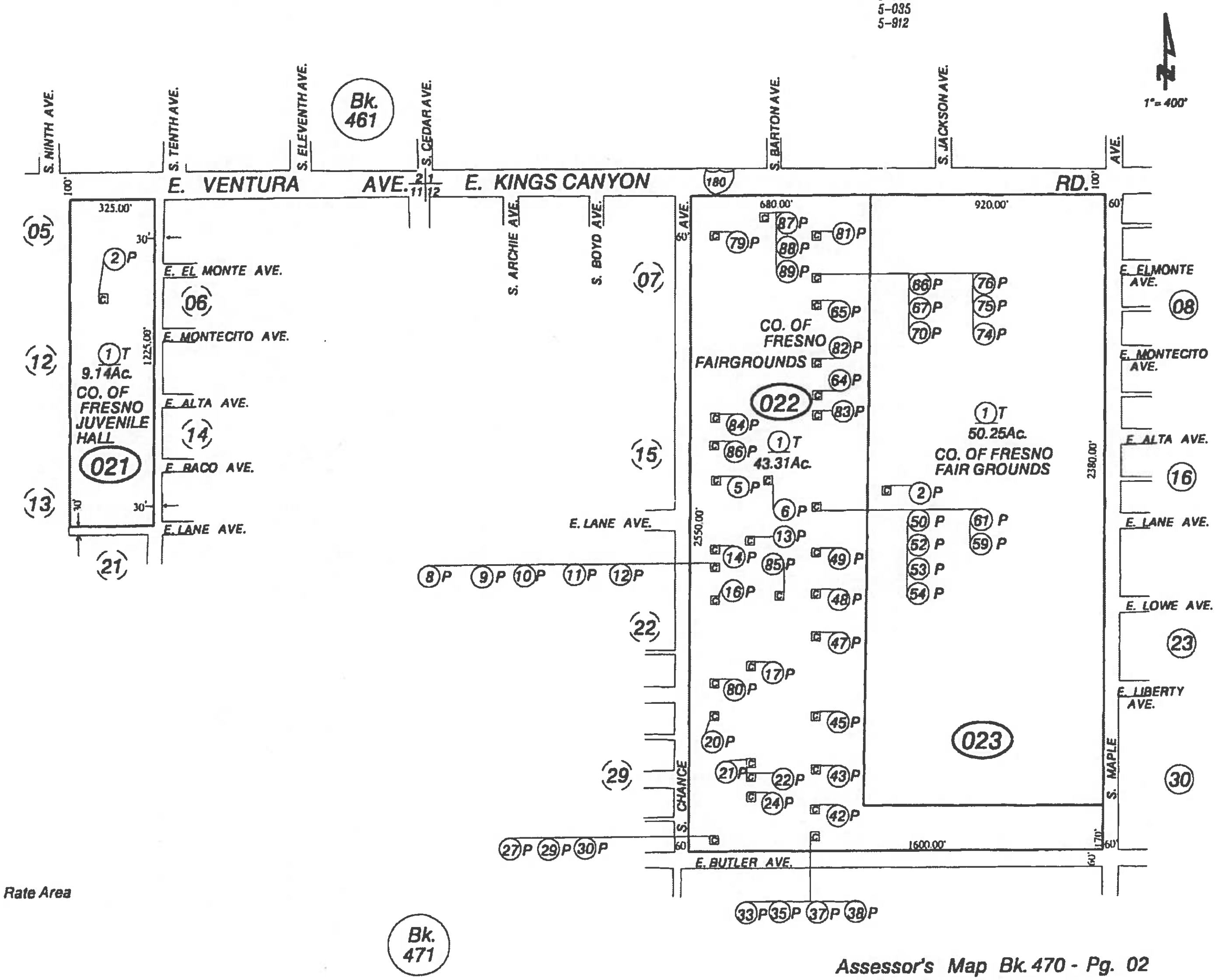
ASSESSOR'S MAPS

--- NOTE ---
This map is for Assessment purposes only. It is not to be construed as portraying legal ownership or divisions of land for purposes of zoning or subdivision law.

POR. SEC.11&12, T.14S., R.20E., M.D.B.&M.

Tax Rate Area
5-001
5-035
5-912

470-02



* Blocks By Tax Rate Area

Assessor's Map Bk. 470 - Pg. 02
County of Fresno, Calif.

NOTE - Assessor's Block Numbers Shown in Ellipses.
Assessor's Parcel Numbers Shown in Circles.

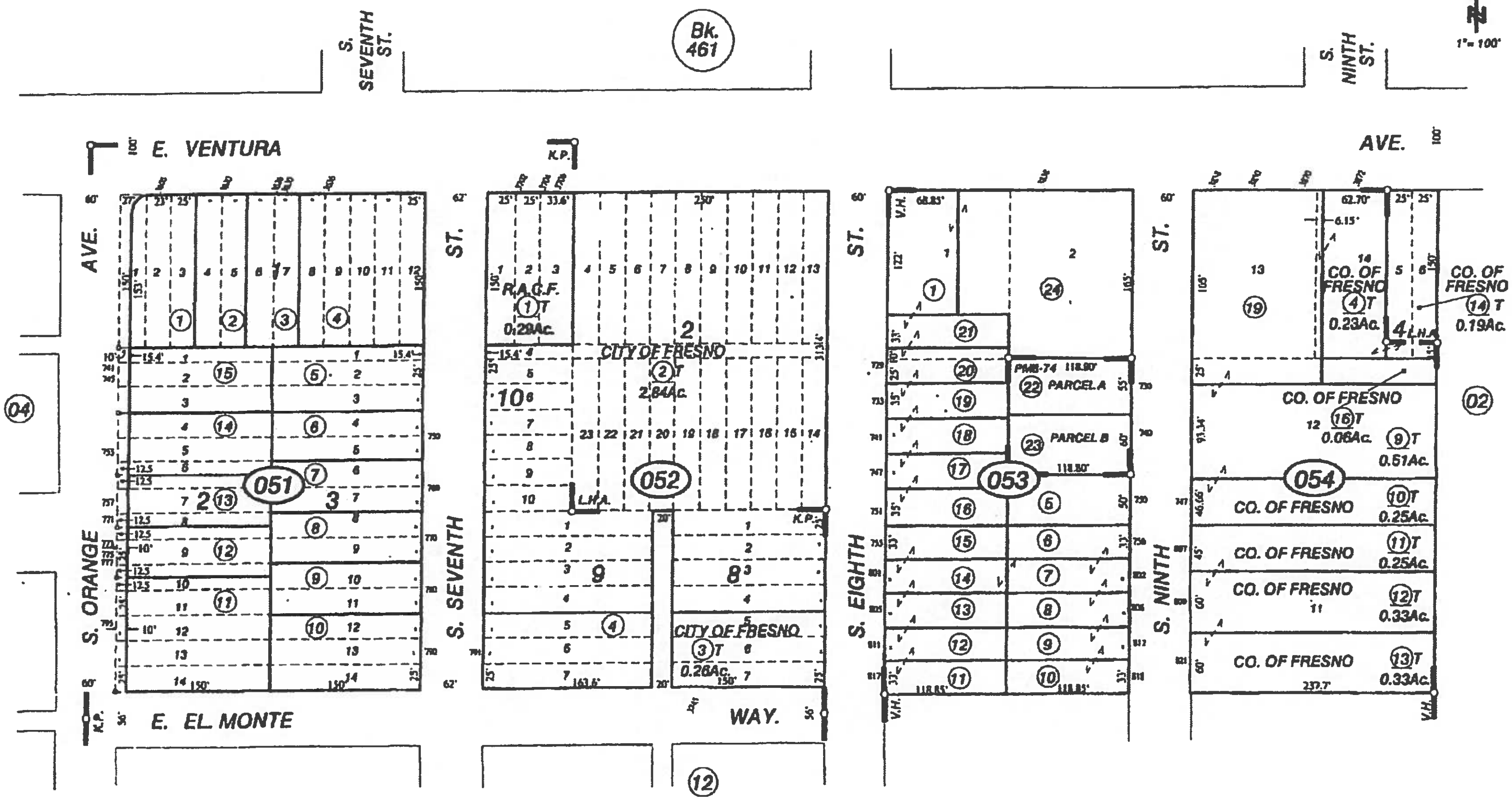
10-29-97

--- NOTE ---
This map is for Assessment purposes only. It is not to be construed as portraying legal ownership or divisions of land for purposes of zoning or subdivision law.

SUBDIVIDED LAND & POR. SEC. 11, T.14S., R.20E., M.D.B.&M.

Tax Rate Area
5-001
5-034
5-062
5-912

470-05



Kenmore Park - R.S. Bk. 7, Pg. 4
Lincoln Hills Addition - Bk. 1, Pg. 71
Parcel Map No. 72-74 - Bk. 8, Pg. 74
Ventura Heights - R.S. Bk. 3, Pg. 3

3-26-08

Assessor's Map Bk. 470 - Pg. 05
County of Fresno, Calif.

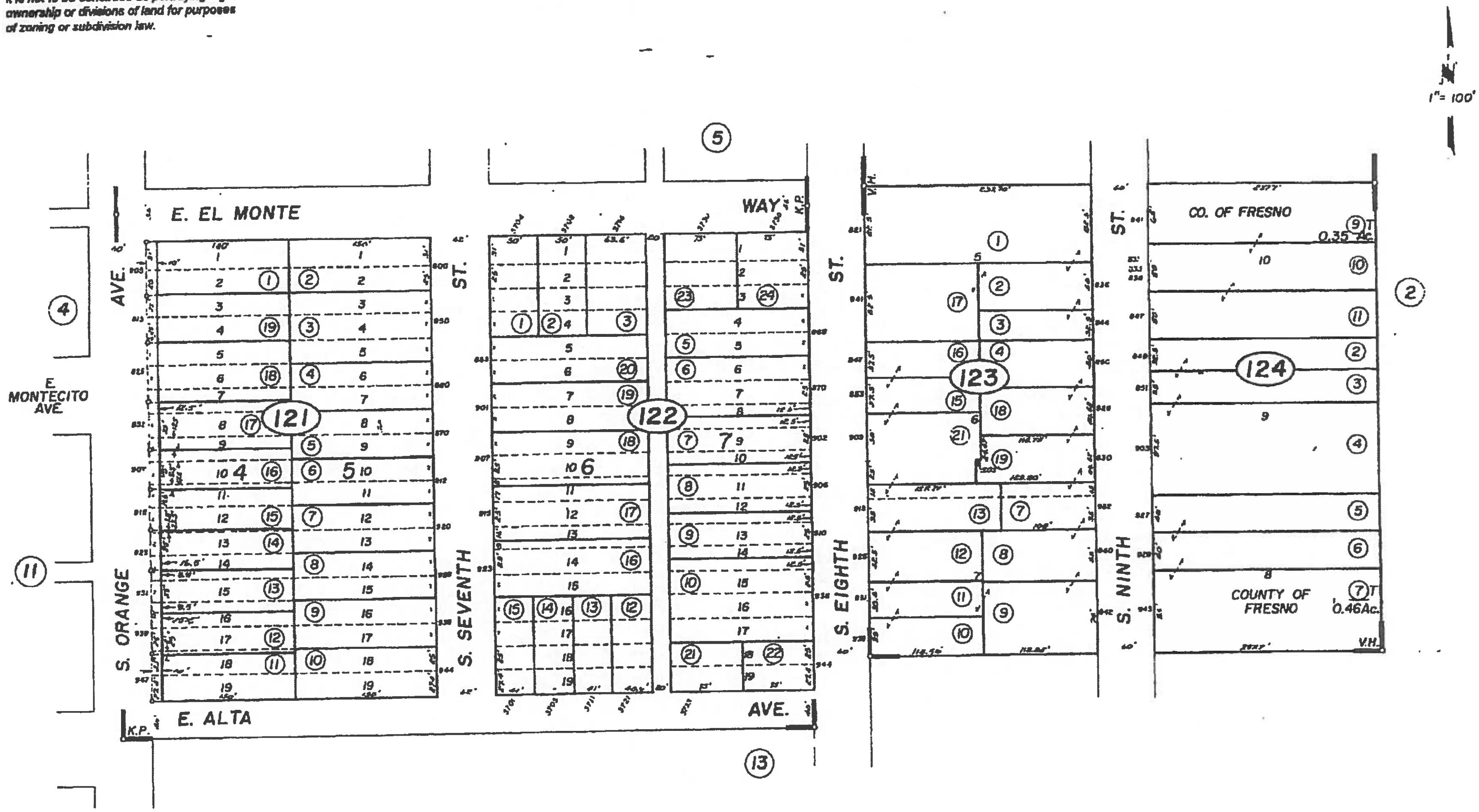
NOTE - Assessor's Block Numbers Shown in Ellipses.
Assessor's Parcel Numbers Shown in Circles.

—NOTE—
This map is for Assessment purposes only. It is not to be construed as portraying legal ownership or divisions of land for purposes of zoning or subdivision law.

SUBDIVIDED LAND IN POR. SEC. 11, T.14 S., R.20 E., M.D.B.& M.

Tax Area 5-912

470-12



Kenmore Park—R.S. Bk. 7, Pg. 4
Ventura Heights—R.S. Bk. 3, Pg. 3

1960

NOTE—Assessor's Block Numbers Shown in Ellipses.
Assessor's Parcel Numbers Shown in Circles.

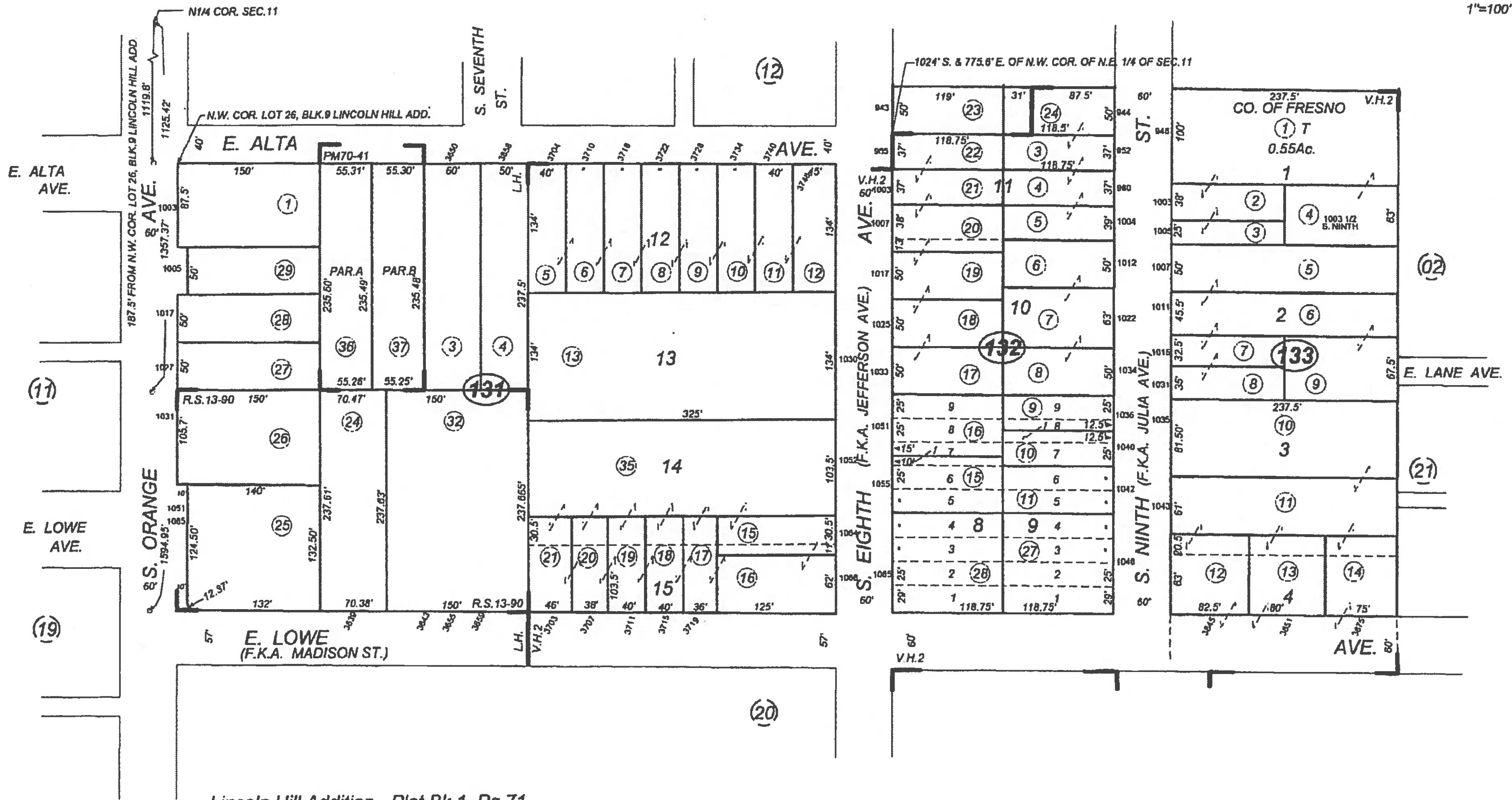
Assessor's Map Bk. 470—Pg. 12
County of Fresno, Calif.

-NOTE-
This map is for Assessment purposes only. It is not to be construed as portraying legal ownership or divisions of land for purposes of zoning or subdivision. law.

SUBDIVIDED LAND IN POR. SEC. 11, T.14S., R.20E., M.D.B.&M.

Tax Rate Area
5-912

470-13



Lincoln Hill Addition - Plat Bk.1, Pg.71
Parcel Map No. 2007-07, Pg.70, Pg.41-42
Record of Survey - Bk.13, Pg.90
Ventura Heights No.2 - R.S. Bk.3, Pg.49

9/14/2016

Assessor's Map Bk.470 - Pg.13
County of Fresno, Calif.

Note - Assessor's Block Numbers Shown in Ellipses
Assessor's Parcel Numbers Shown in Circles

APPENDIX B

REFERENCE FIGURES

U. S. GEOLOGICAL SURVEY

Prepared in cooperation with CALIFORNIA DEPARTMENT OF WATER RESOURCES

FIGURE 7

(200)
P145g

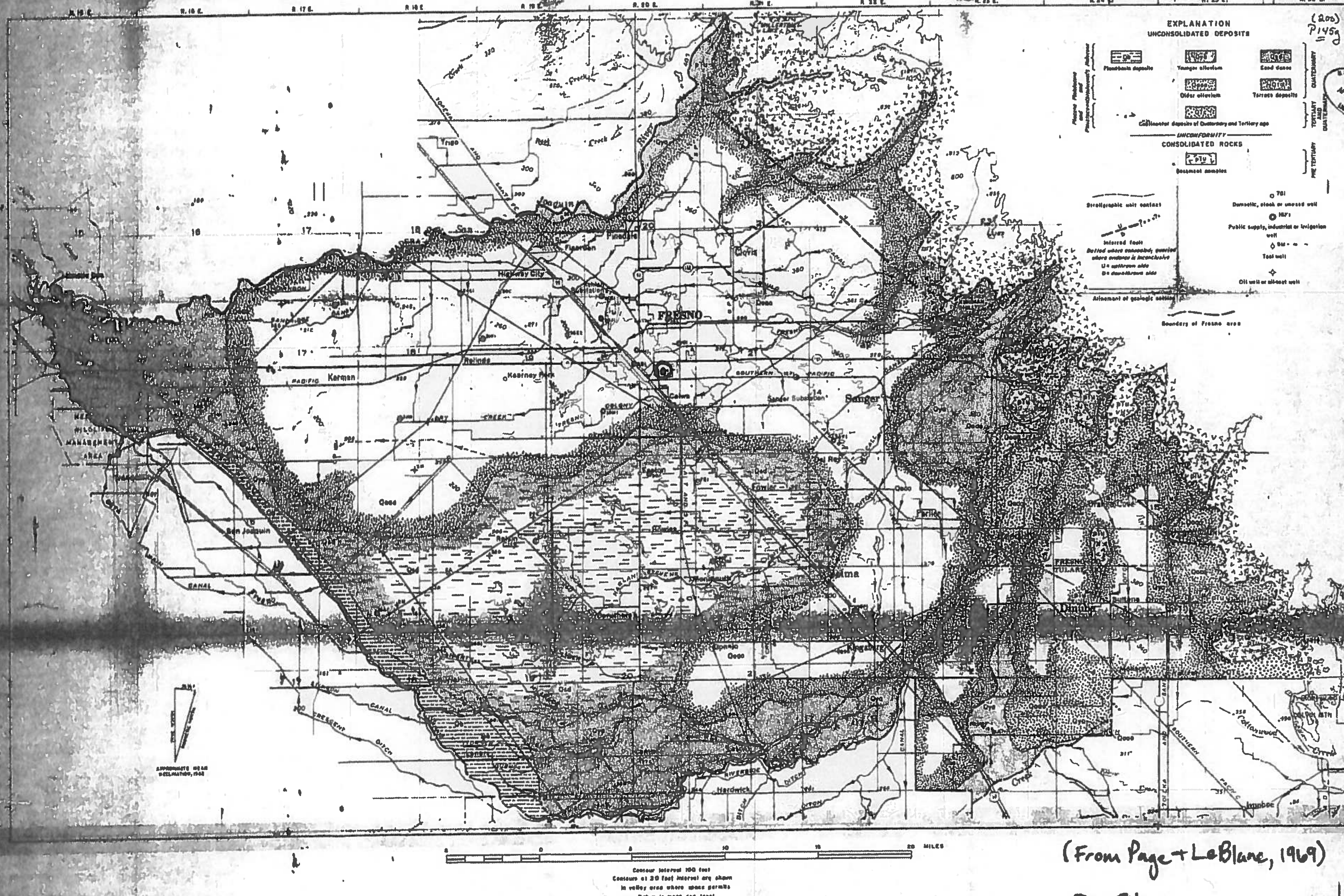


FIGURE 7.-GEOLOGIC MAP OF THE FRESNO AREA, SAN JOAQUIN VALLEY, CALIFORNIA

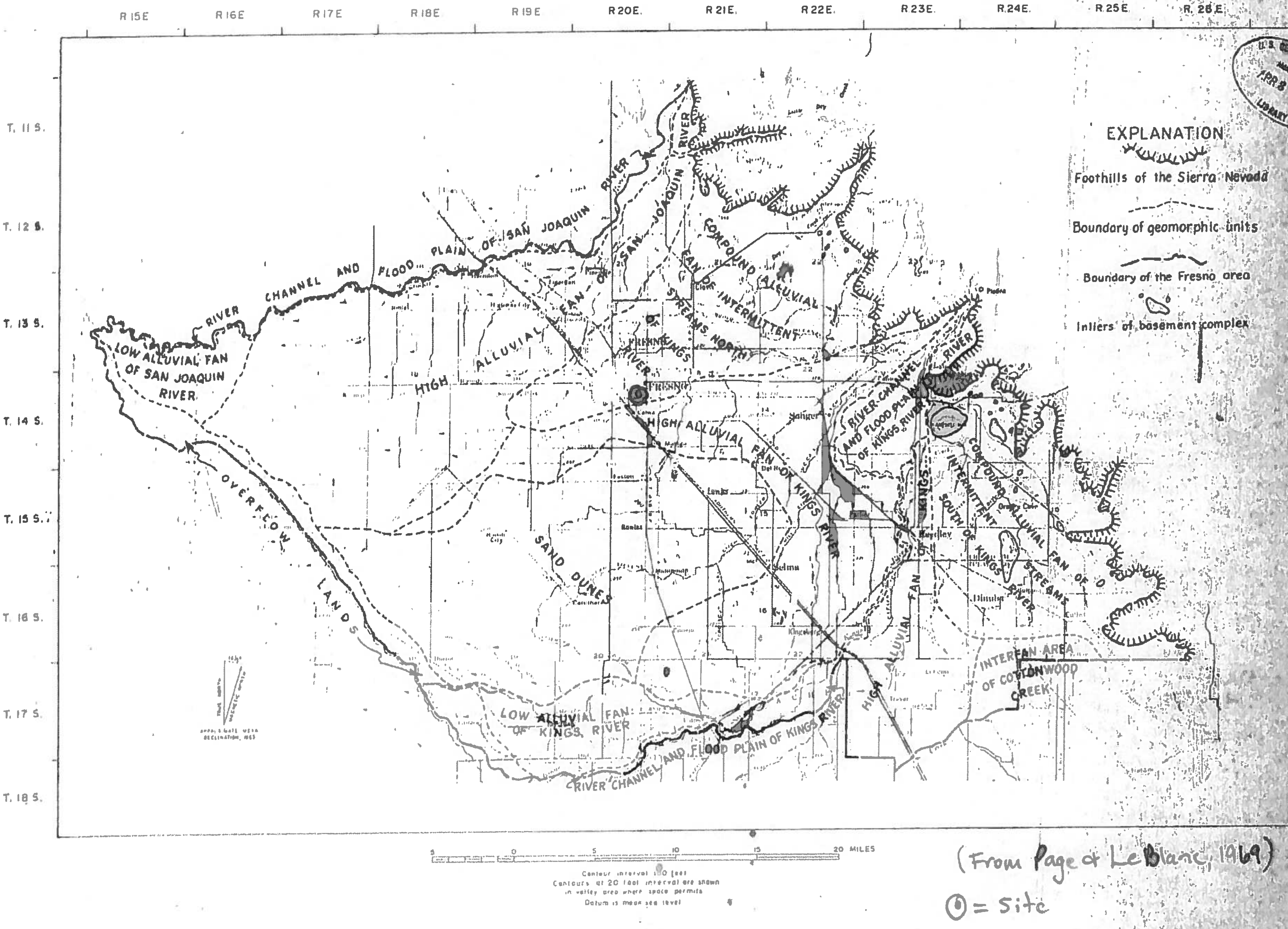
(From Page + LeBlanc, 1969)

⊙ = Site

U.S. GEOLOGICAL SURVEY

Prepared in cooperation with CALIFORNIA DEPARTMENT OF WATER RESOURCES

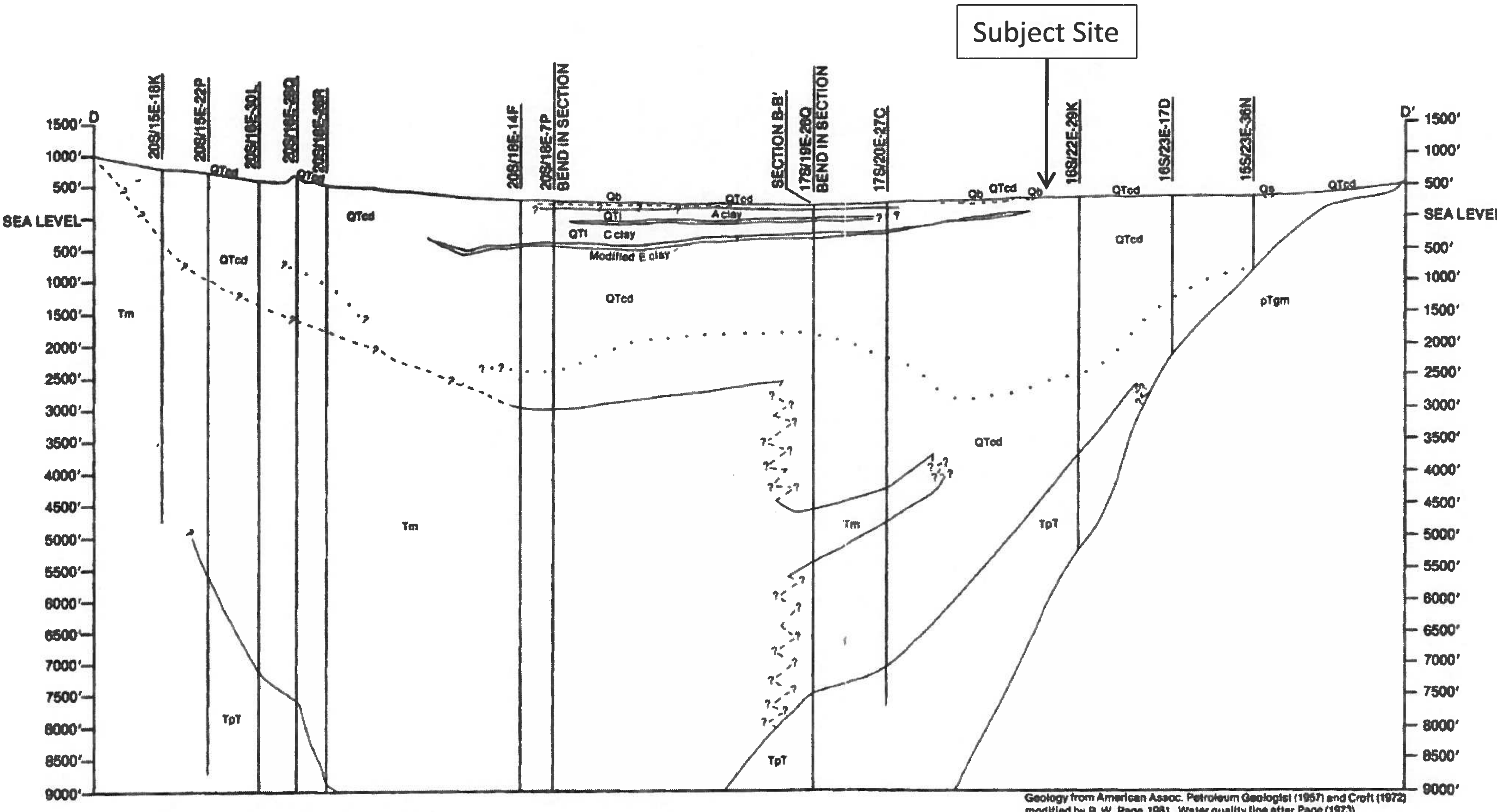
FIGURE 5



(From Page & LeBlanc, 1969)

⊙ = site

FIGURE 5.— MAP SHOWING GEOMORPHIC FEATURES OF THE FRESNO AREA, SAN JOAQUIN VALLEY, CALIFORNIA



Geologic section D - D', San Joaquin Valley, California
(See Plate 2 for location of section)

Geologic Cross Section D-D'
San Joaquin Valley, California
(Page, 1986)

Map Scale: 1:2,970 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Fresno Area, California
Survey Area Data: Version 11, Sep 12, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Feb 26, 2017—May 21, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
DhB	Delhi loamy sand, 3 to 9 percent slopes	29.7	82.6%
Ra	Ramona sandy loam	6.2	17.4%
Totals for Area of Interest		**35.9**	**100.0%**

Eastern Fresno Area, California

Ra—Ramona sandy loam

Map Unit Setting

National map unit symbol: hl8k
Elevation: 250 to 500 feet
Mean annual precipitation: 9 to 15 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 225 to 275 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ramona and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ramona

Setting

Landform: Alluvial fans, stream terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

A - 0 to 12 inches: sandy loam
BAt - 12 to 24 inches: sandy loam
Bt - 24 to 38 inches: sandy clay loam
C - 38 to 60 inches: coarse sandy loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Unnamed, coarse sandy loam
Percent of map unit: 10 percent
Landform: Alluvial fans, stream terraces
Hydric soil rating: No

Unnamed, fine sandy loam
Percent of map unit: 5 percent
Landform: Stream terraces, alluvial fans
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eastern Fresno Area, California
Survey Area Data: Version 11, Sep 12, 2018

Eastern Fresno Area, California

DhB—Delhi loamy sand, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: hl3h
Elevation: 230 to 400 feet
Mean annual precipitation: 9 to 12 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 225 to 250 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Delhi and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Delhi

Setting

Landform: Dunes on fan remnants
Landform position (two-dimensional): Shoulder, toeslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian deposits derived from alluvium derived from granite

Typical profile

A - 0 to 7 inches: loamy sand
C1 - 7 to 25 inches: loamy sand
C2 - 25 to 60 inches: loamy sand

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.8 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Fresno

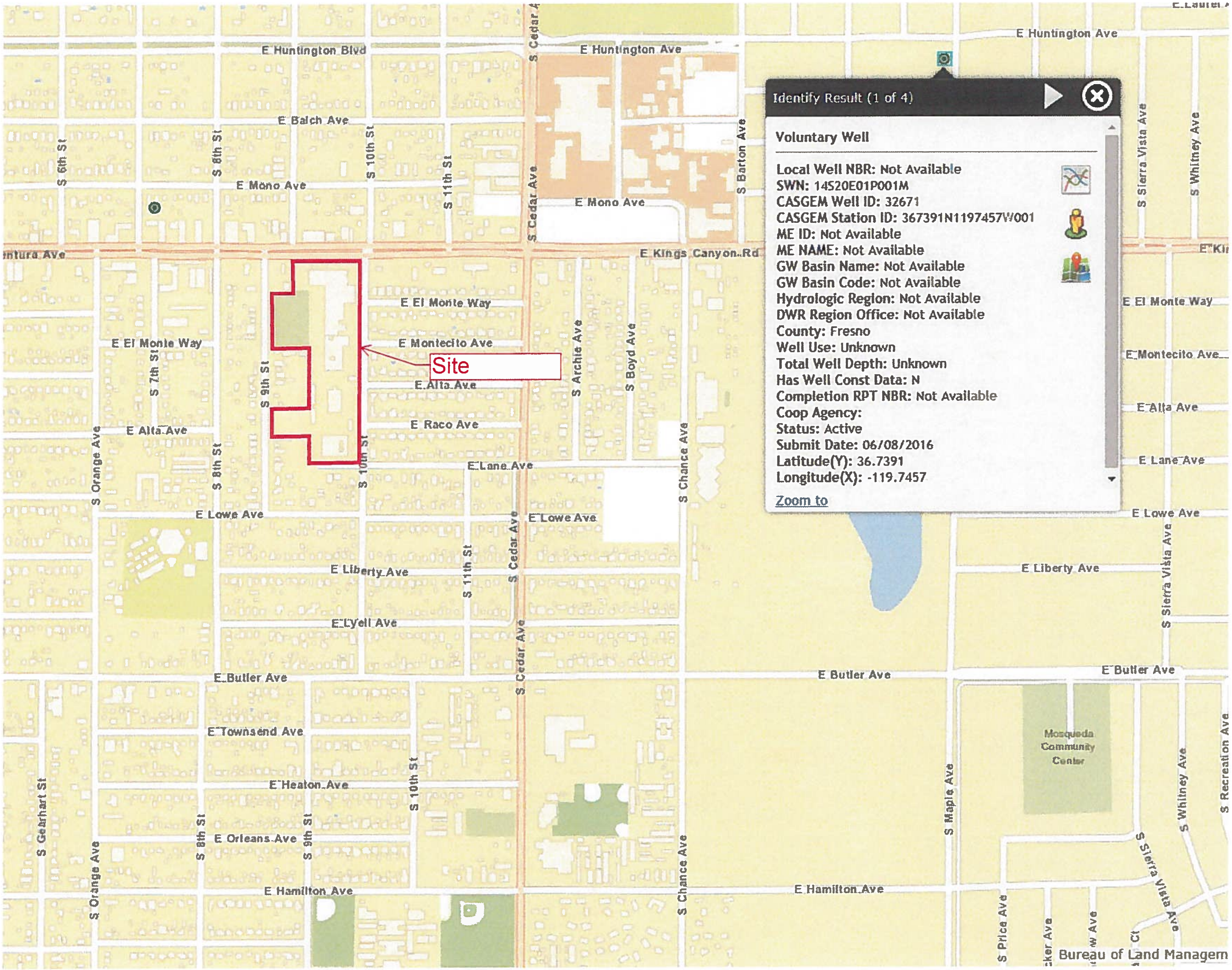
Percent of map unit: 12 percent
Landform: Fan remnants
Hydric soil rating: No

Unnamed, steeper slopes

Percent of map unit: 3 percent
Landform: Dunes on fan remnants
Hydric soil rating: No

Data Source Information

Soil Survey Area: Eastern Fresno Area, California
Survey Area Data: Version 11, Sep 12, 2018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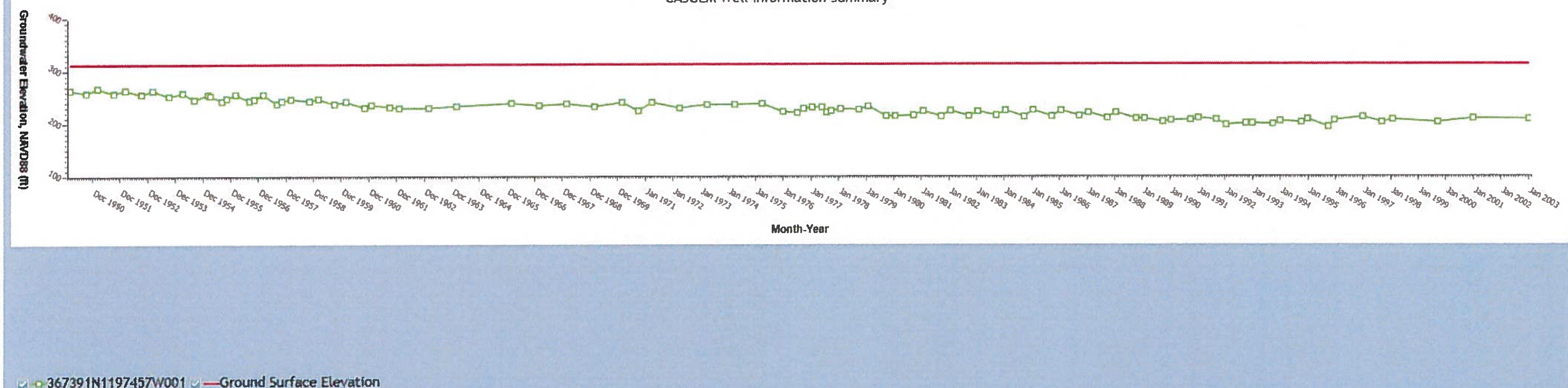
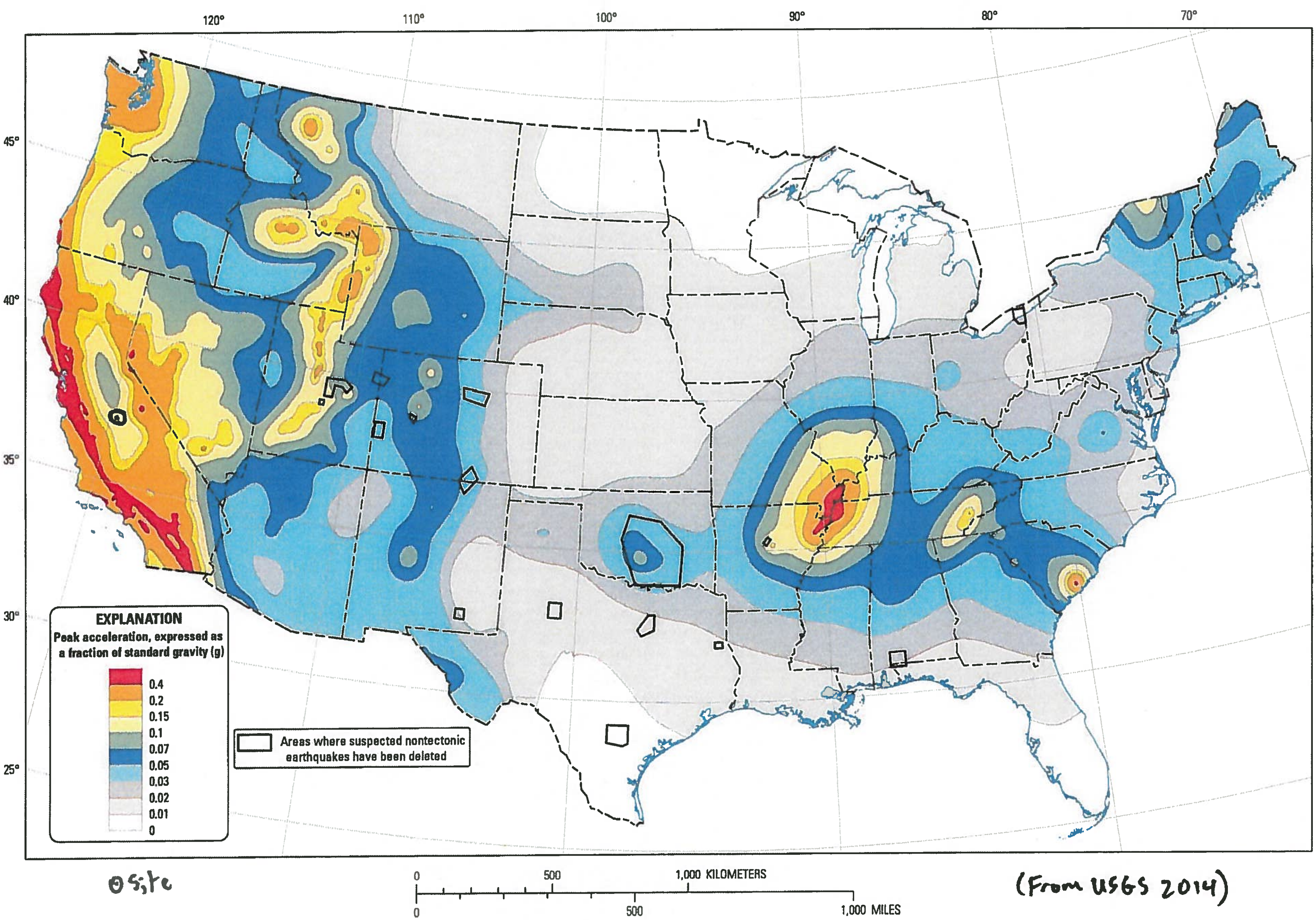
Voluntary Well
Local Well NBR: Not Available
SWN: 14S20E01P001M
CASGEM Well ID: 32671
CASGEM Station ID: 367391N1197457W001
ME ID: Not Available
ME NAME: Not Available
GW Basin Name: Not Available
GW Basin Code: Not Available
Hydrologic Region: Not Available
DWR Region Office: Not Available
County: Fresno
Well Use: Unknown
Total Well Depth: Unknown
Has Well Const Data: N
Completion RPT NBR: Not Available
Coop Agency:
Status: Active
Submit Date: 06/08/2016
Latitude(Y): 36.7391
Longitude(X): -119.7457
Zoom to
Site
Mosqueda Community Center
Bureau of Land Managem

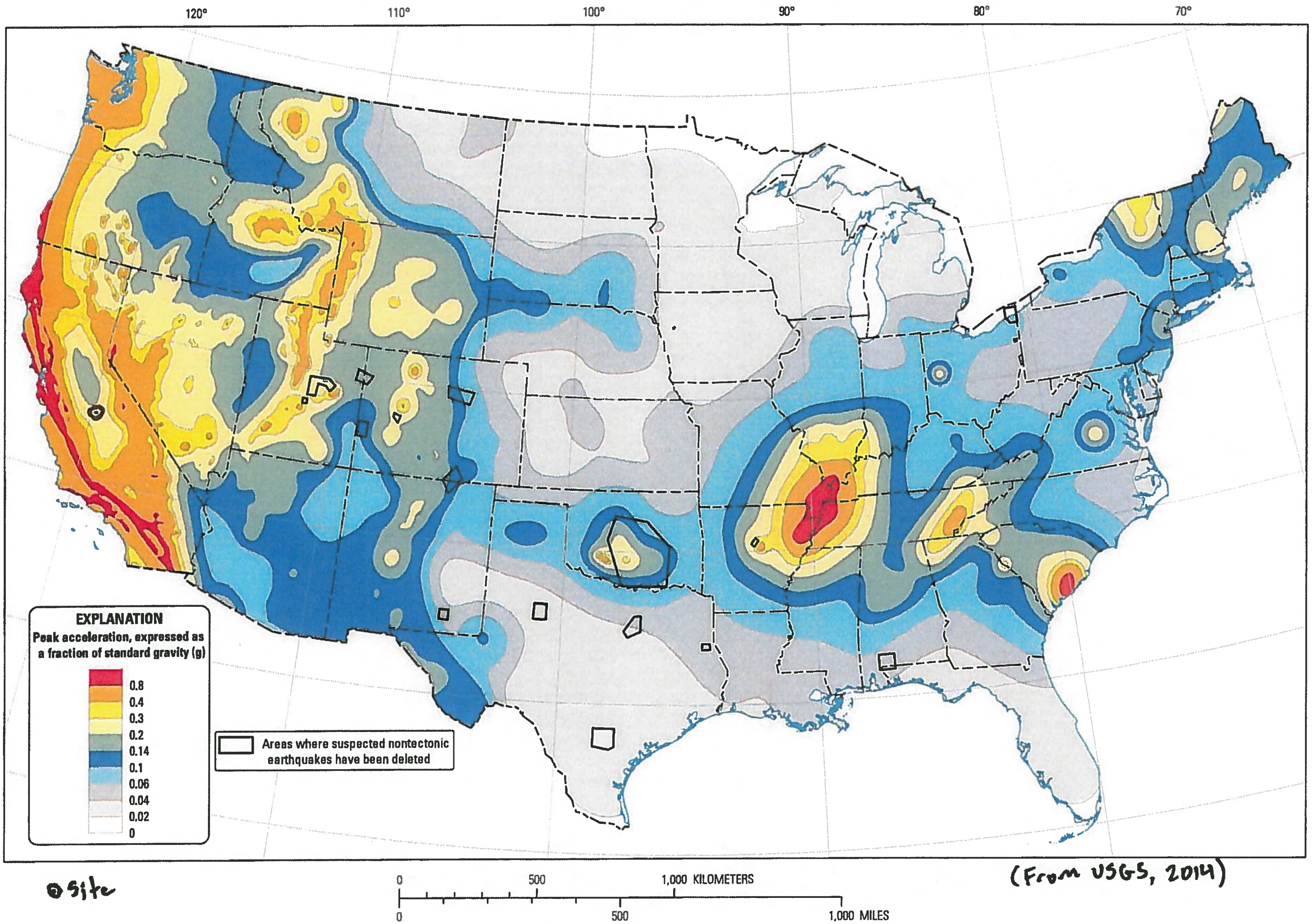
CASGEM Well Information Summary





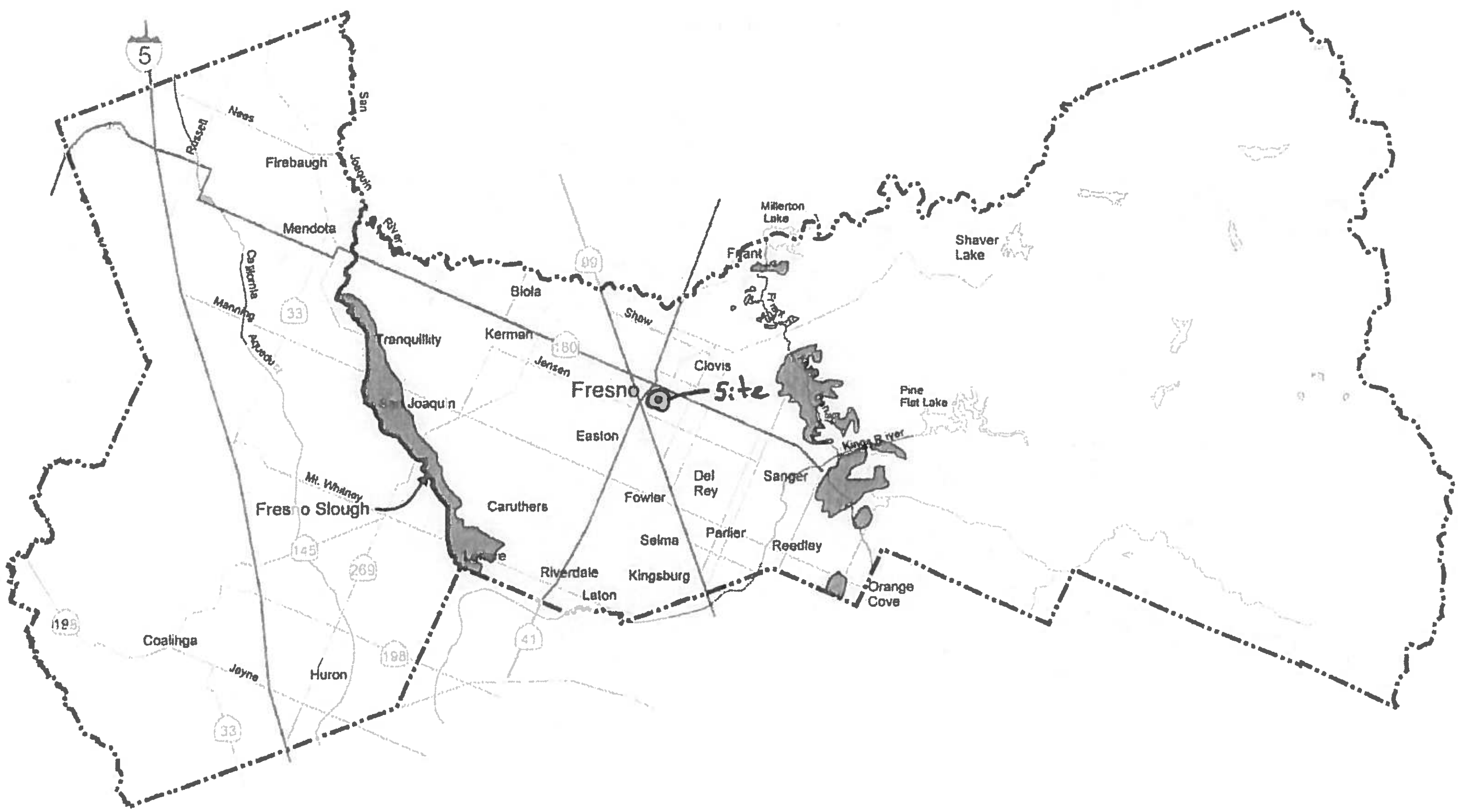
(From USGS 2014)

Ten-percent probability of exceedance in 50 years map of peak ground acceleration



(From USGS, 2014)

Two-percent probability of exceedance in 50 years map of peak ground acceleration



NORTH

0 10

1" = 10 miles

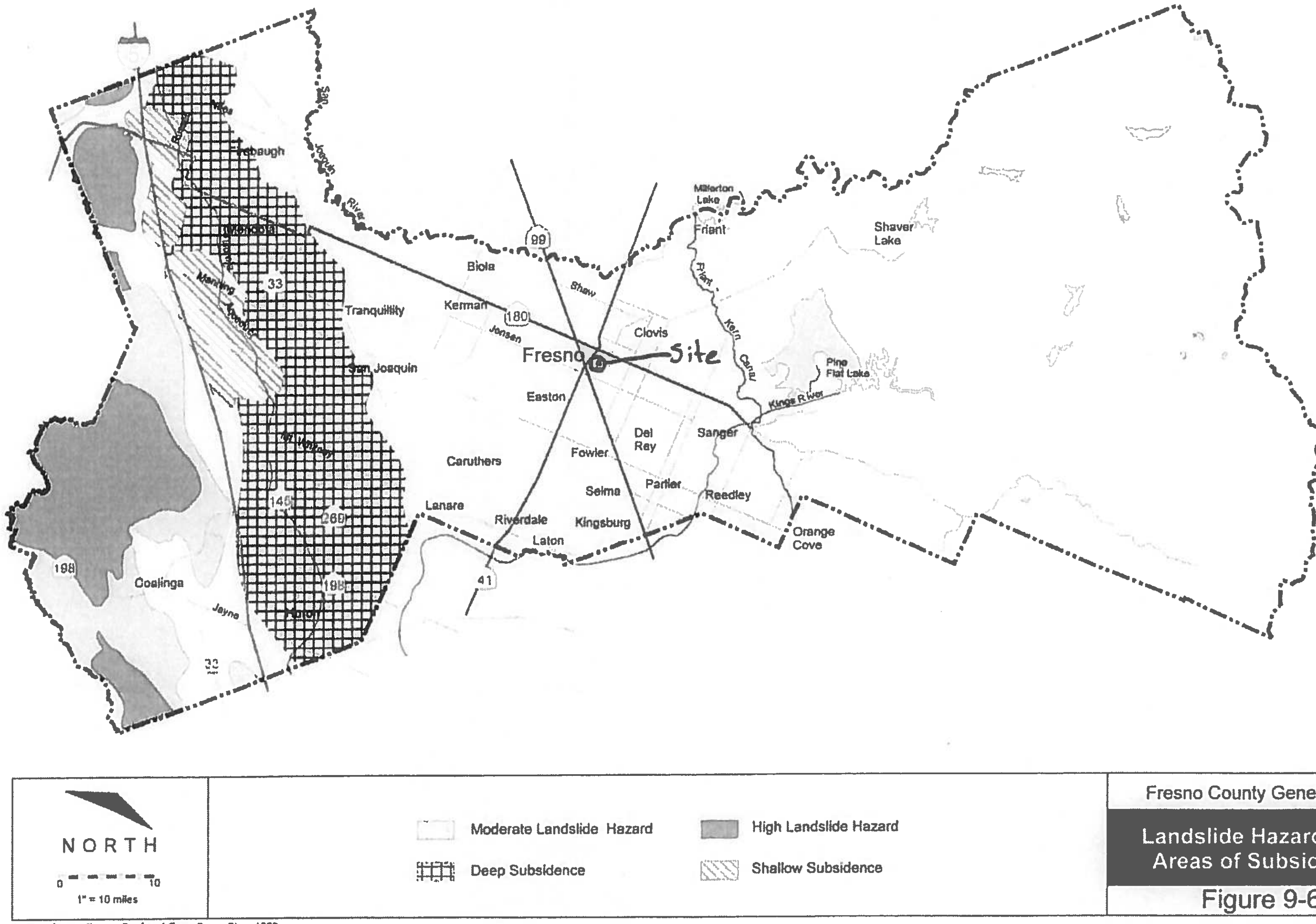
Soils Exhibiting Moderately High to High Expansion Potential (Generalized Locations)

Fresno County General Plan

Expansive Soils

Figure 7-1

Source: U.S. Department of Agriculture Soil Conservation Service



Source: Fresno County Regional Open Space Plan, 1972

Fresno County General Plan

Landslide Hazards and Areas of Subsidence

Figure 9-6

drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was California State Plane Zone IV (FIPS 404). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at http://www.ngs.noaa.gov.

Base map transportation information shown on this FIRM was provided in digital format from Fresno County. Public Land Survey System information was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1997 or later.

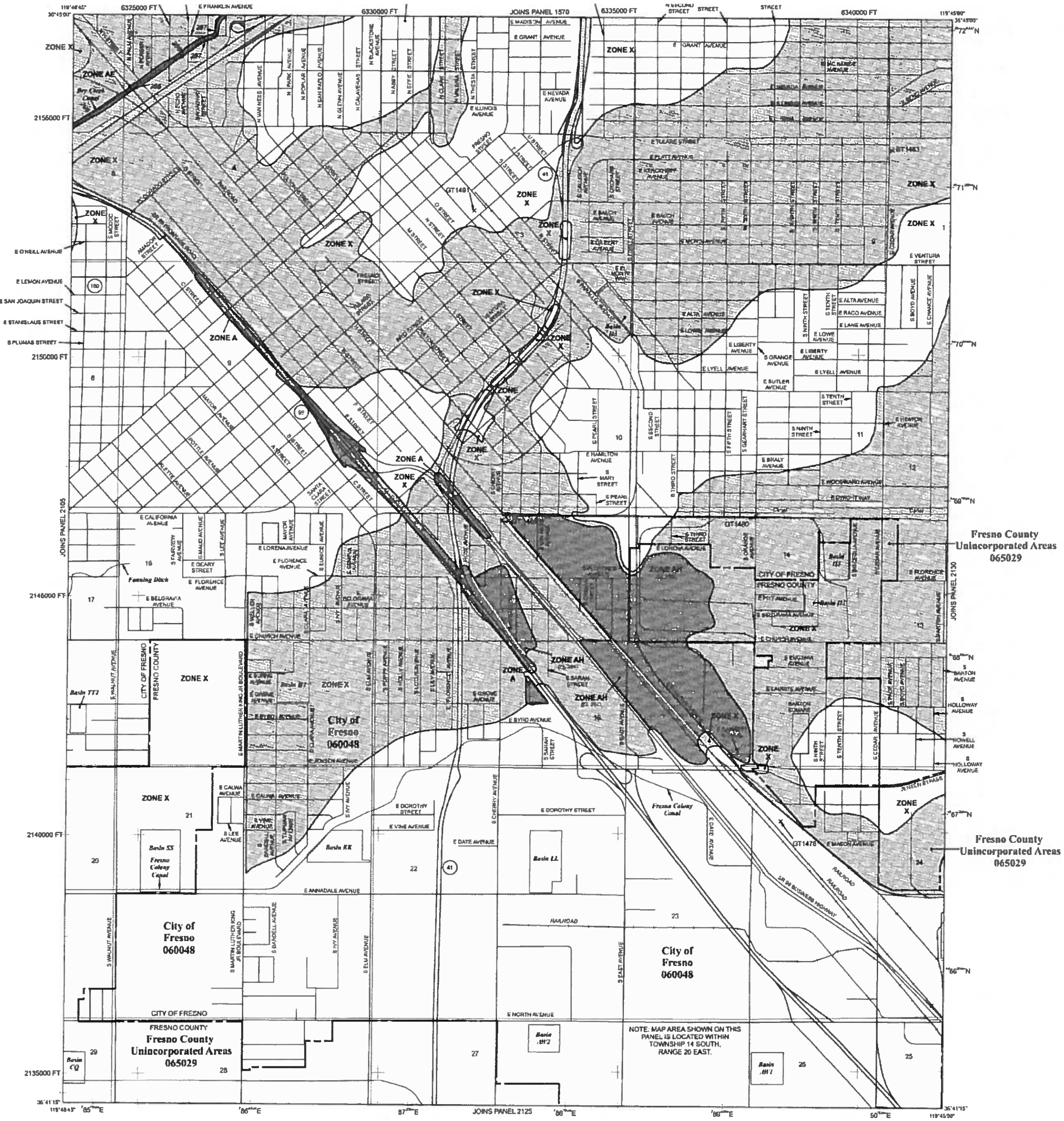
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to confirm to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.



The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Area zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
~~ 513 ~~~	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

(A)——(A)	Cross section Line
(23)- - - -(23)	Transect line
87°07'45", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
$^{47}76^{000m}$N	1000 meter Universal Transverse Mercator grid values, zone 19
600000 FT	5000-foot grid ticks: California State Plane coordinate system, zone IV (FIPSZONE 0404), Lambert Conformal Conic projection
DX5510 x	Bench mark (see explanation in Notes to Users section of this FIRM panel)
●M1.5	River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
July 19, 2001

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 18, 2009 - to update corporate limits, to change base flood elevations, floodway and Special Flood Hazard Areas, to add roads and road names and to incorporate previously issued Letters of Map Revision

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2110H

FIRM
FLOOD INSURANCE RATE MAP

FRESNO COUNTY,
CALIFORNIA
AND INCORPORATED AREAS

PANEL 2110 OF 3525
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FRESNO COUNTY	065029	2110	H
FRESNO, CITY OF	060048	2110	H

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER
06019C2110H

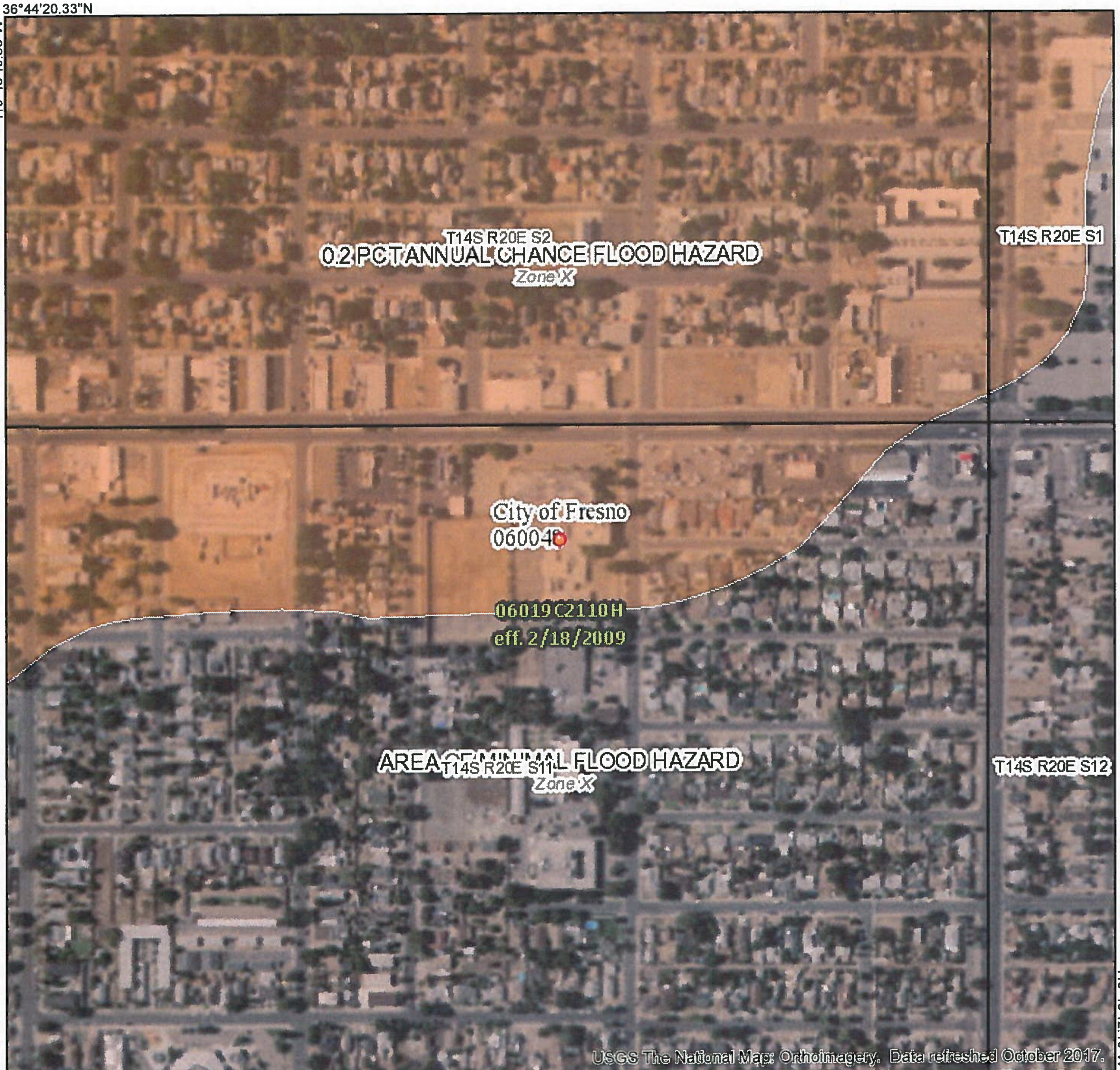
MAP REVISED

National Flood Hazard Layer FIRMette

FEMA

36°44'20.33"N

119°45'49.86"W



119°45'12.40"W

36°43'51.50"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD

- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS

- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS

- Digital Data Available
- No Digital Data Available
- Unmapped

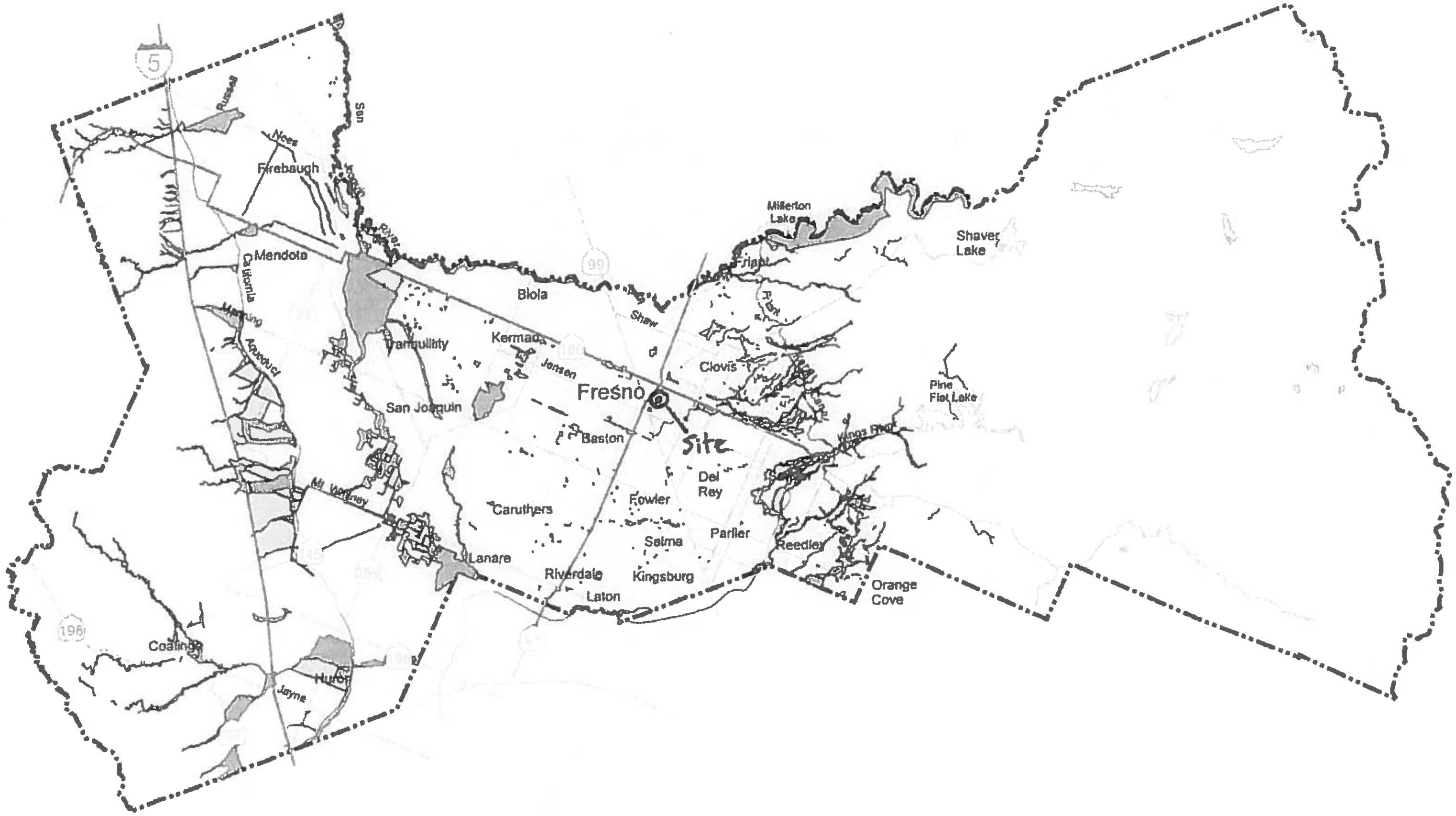
N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/12/2018 at 6:34:35 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



NORTH

0 10

1" = 10 miles

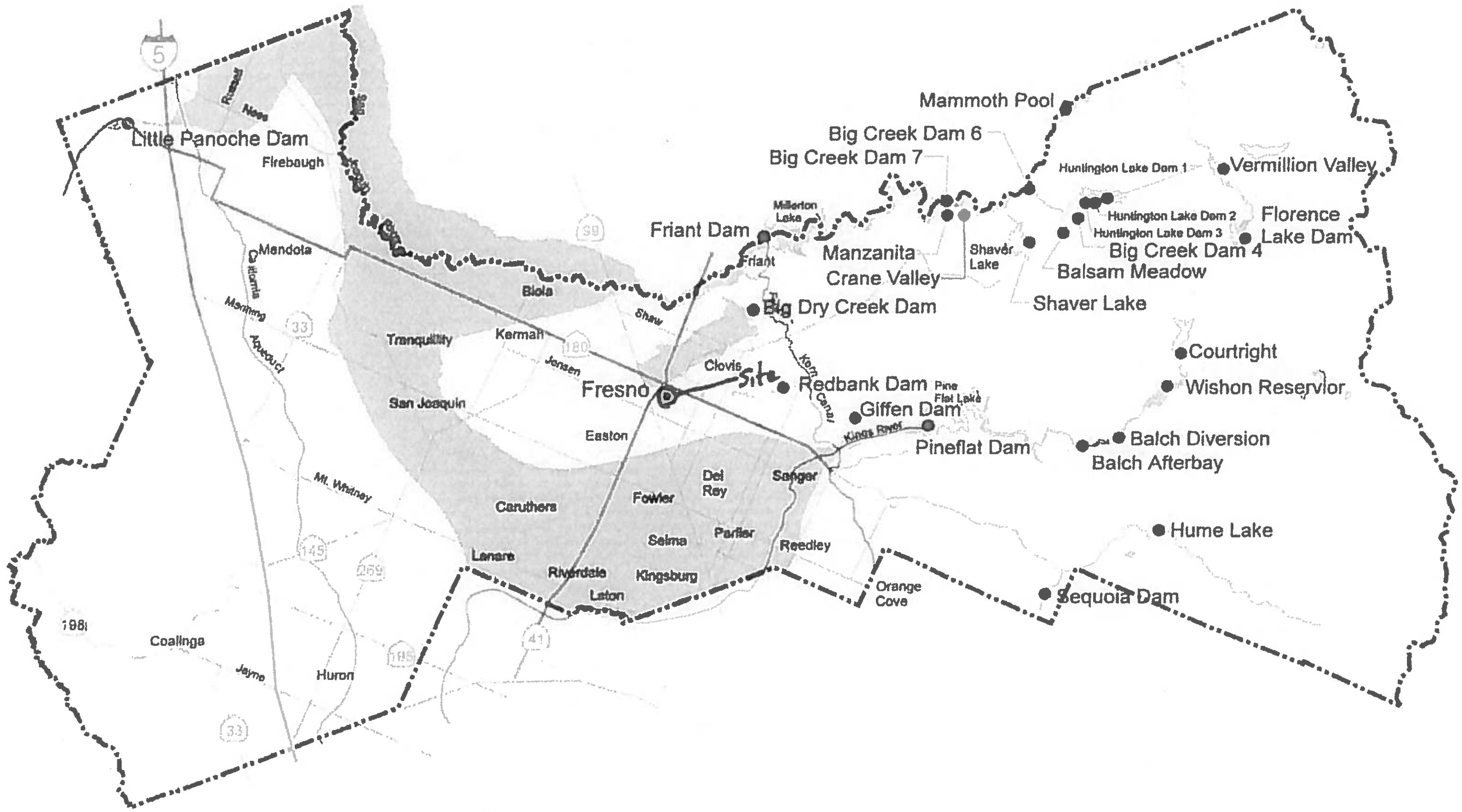
100 Year Flood Inundation Areas

Fresno County General Plan

100 Year Flood Inundation Areas

Figure 9-7

Source: Fresno County GIS Database



Dam Failure Flood Inundation Areas

NORTH

0 10

1" = 10 miles

Source: Fresno County GIS Database

Fresno County General Plan

Dam Failure Flood Inundation Areas

Figure 9-8

APPENDIX C

ENVIRONMENTAL HAZARD SURVEY DOCUMENTATION

Office of the State Fire Marshal

Pipeline Safety Division
P.O. Box 944246
Sacramento, CA 94244-2460

Request ID: 09212018SFM001

TO: AECOM
STUART ST. CLAIR
1360 E. SPRUCE AVE., STE. 101
FRESNO, CA 93720

Phone: 559 448 8222
Fax:

FROM: Lisa Dowdy

Phone: (916) 263-6300
Fax: (916) 263-3399

PIPELINE LOCATION REQUEST FOR:

VENTURA AVE & S. 10TH ST
FRESNO, CA 93702

THERE ARE NO PIPELINES JURISDICTIONAL TO THE STATE FIRE MARSHAL IN THE AREA FOR WHICH YOU HAVE INQUIRED.

- FOR NATURAL GAS PIPELINES PLEASE CONTACT YOUR LOCAL GAS COMPANY

- FOR OTHER TYPES OF PIPELINE PLEASE CONTACT THE DIVISION OF OIL AND GAS AT (714) 816-6847

- FOR PUBLIC UTILITIES PLEASE CONTACT THE PUBLIC UTILITIES COMMISSION AT (415) 703-2782

Disclaimer: The pipeline information and data represented in this correspondence varies in accuracy, scale, origin and completeness and may be changed at any time without notice. While the Office of the State Fire Marshal, Pipeline Safety Division (OSFM/PSD) makes every effort to provide accurate information, OSFM/PSD makes no warranties as to the suitability of this product for any particular purpose. Any use of this information is at the user's own risk.

For further information or suggestions regarding the data on this site, please contact the Office of the State Fire Marshal, Pipeline Safety Division at P.O. Box 944246, Sacramento, CA 94244 or call (916) 263-6300.

StClair, Stuart

From:	Alvarado, Eric <EXAS@pge.com>
Sent:	Tuesday, October 02, 2018 9:55 AM
To:	StClair, Stuart; Allen, Michael
Subject:	RE: Pipeline or Powerlines near Planned School Site, Ventura Avenue & S. 10th Street, City of Fresno, Fresno County, California

Stuart, I am very sorry.

I meant there are **no** PG&E gas transmission facilities within 1500 ft.

Thanks

Eric

Eric D. Alvarado

Sr. Gas Program Manager | Gas Transmission Integrity Management
Pacific Gas & Electric Company
6111 Bollinger Canyon Rd #4750D | San Ramon, Ca 94583
Office: 1-925-328-5866 | Mobile: 1-925-588-5443
Email: Eric.Alvarado@PGE.COM

From: StClair, Stuart <stuart.stclair@aecom.com>
Sent: Tuesday, October 02, 2018 9:54 AM
To: Alvarado, Eric <EXAS@pge.com>; Allen, Michael <MJAm@pge.com>
Subject: RE: Pipeline or Powerlines near Planned School Site, Ventura Avenue & S. 10th Street, City of Fresno, Fresno County, California

Eric,

Will you be sending us a map, showing where the gas transmission facilities are in relation to the site?

Thanks,

Stuart

From: Alvarado, Eric [mailto:EXAS@pge.com]
Sent: Monday, October 01, 2018 4:37 PM
To: StClair, Stuart; Allen, Michael
Subject: RE: Pipeline or Powerlines near Planned School Site, Ventura Avenue & S. 10th Street, City of Fresno, Fresno County, California

Stuart

There are PG&E gas transmission facilities within 1,500ft of this site.

Thanks

Eric

Eric D. Alvarado

Sr. Gas Program Manager | Gas Transmission Integrity Management
Pacific Gas & Electric Company
6111 Bollinger Canyon Rd #4750D | San Ramon, Ca 94583
Office: 1-925-328-5866 | Mobile: 1-925-588-5443
Email: Eric.Alvarado@PGE.COM

From: StClair, Stuart <stuart.stclair@aecom.com>
Sent: Thursday, September 20, 2018 2:55 PM
To: Allen, Michael <MJAm@pge.com>; Alvarado, Eric <EXAS@pge.com>
Subject: Pipeline or Powerlines near Planned School Site, Ventura Avenue & S. 10th Street, City of Fresno, Fresno County, California
Importance: High

*******CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*******

Mike/Eric

We are working for Fresno Unified School District on a 5-acre planned new school site at the southwest corner of Ventura Avenue and S. 10th Street in the city of Fresno. The zip code is 93702. Please see attached maps and lists of APNs.

We need to know about any PG&E underground natural gas pipelines within 1,500 feet of the site, or overhead electric transmission lines (> 50kv) within 350 feet of the site.

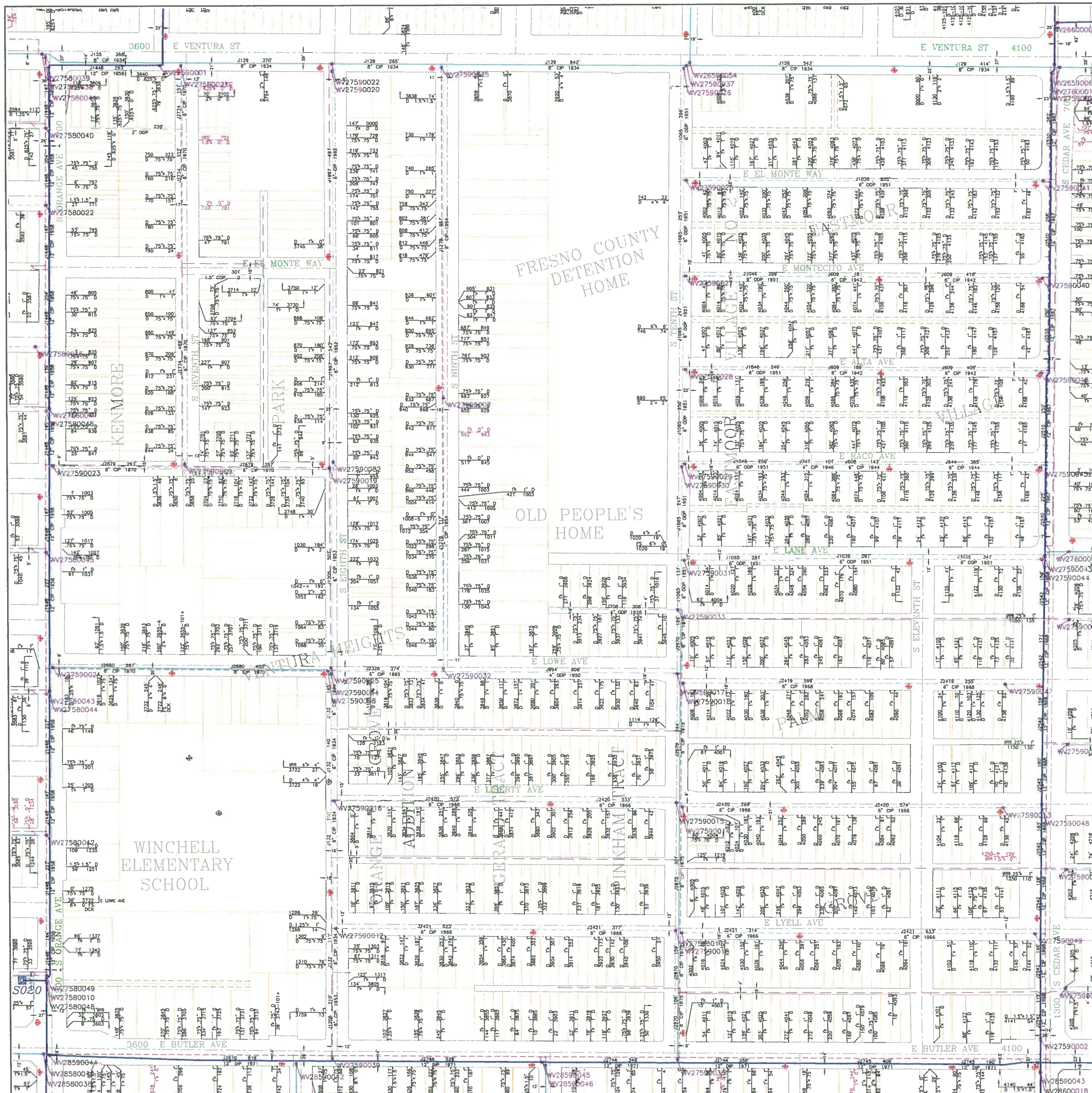
Please let me know if you require any additional information, or if I need to direct this request to somebody else. If possible, your response by September 30 would be greatly appreciated.

Thanks,

Stuart

Stuart St. Clair, PE
Project Civil Engineer, Environment
Direct: 559-490-8308
Mobile: 559-779-6311
stuart.stclair@aecom.com

AECOM
1360 E. Spruce Avenue, Suite 101
Fresno, California 93720
Telephone: 559-448-8222
aecom.com



N

SCALE IN FEET
1" = 150'

CITY OF FRESNO

DEPARTMENT OF PUBLIC UTILITIES
September 26, 2017

LEGEND

- 2" & 4" PIPE
- 6" PIPE
- 8" & 10" PIPE
- 12" & ABOVE
- RAW WATER PIPE
- PIPE CASING
- ABANDONED PIPE
- PRIVATE PIPE
- BUTTERFLY OR GATE VALVE
- OTHER VALVE
- FIRE HYDRANT
- BLOWOFF
- FITTING/TEE
- WELL SITE

LOCATION* 56' — 1234 ADDRESS
SERVICE SIZE 1" x 1" D TYPE OF SERVICE
METER SIZE
D = DOMESTIC
IRR = IRRIGATION
FS = FIRE

*SERVICE LOCATION IS MEASURED FROM NEAREST RIGHT-OF-WAY PARALLEL TO SERVICE

2658	2659	2660
2758	2759	2760
2858	2859	2860

NE 1/4

SECTION 11

T14S, R20E

CITY OF FRESNO

WATER

2759

600 S SEVENTH ST
S SEVENTH ST
S EIGHTH ST
S NINTH ST
S TENTH ST
S ELEVENTH ST
600 S CEDAR AVE
S CEDAR AVE
E VENTURA ST
3600
4100
E MONO ST
E BALCH AVE
E HUNTINGTON BLVD
E KERCKHOFF AVE
E PLATT AVE
E VERRUE AVE
3700 E TULARE ST
E TULARE ST
JACKSON ELEMENTARY SCHOOL
ALTA VISTA
PS049A
PS014A
LEGEND
2" & 4" PIPE
6" PIPE
8" & 10" PIPE
12" & ABOVE
RAW WATER PIPE
PIPE CASING
ABANDONED PIPE
BUTTERFLY OR GATE VALVE
OTHER VALVE
FIRE HYDRANT
BLOWOFF
FITTING/TEE
WELL SITE
DEPARTMENT OF PUBLIC UTILITIES
September 28, 2017
FRESNO
SCALE IN FEET
1" = 150'
N
2558 2559 2560
2658 2659 2660
2758 2759 2760
SE 1/4
SECTION 2
T14S, R20E
CITY OF FRESNO
WATER
2659

YOUR MOST VALUABLE RESOURCE - WATER

OFFICE OF
FRESNO
IRRIGATION DISTRICT

TELEPHONE (559) 233-7161
FAX (559) 233-8227
2907 S. MAPLE AVENUE
FRESNO, CALIFORNIA 93725-2208

September 26, 2018

Mr. Stuart St. Clair, PE
AECOM
1360 E. Spruce Avenue, Suite 101
Fresno, CA 93720

RE: Utility Request – Water Pipes and Storage Tanks near APN: 470-021-01
S/E Ventura and Cedar avenues

Dear Mr. St. Clair:

The Fresno Irrigation District (FID) has reviewed the utility request for water pipes and storage tanks within 1,500 feet or one quarter (1/4) mile of a proposed 13 acre new school site, APN: 470-021-01. FID has the following comments:

1. FID does not own, operate or maintain any facilities located on the applicant's property as indicated on the attached FID exhibit map.

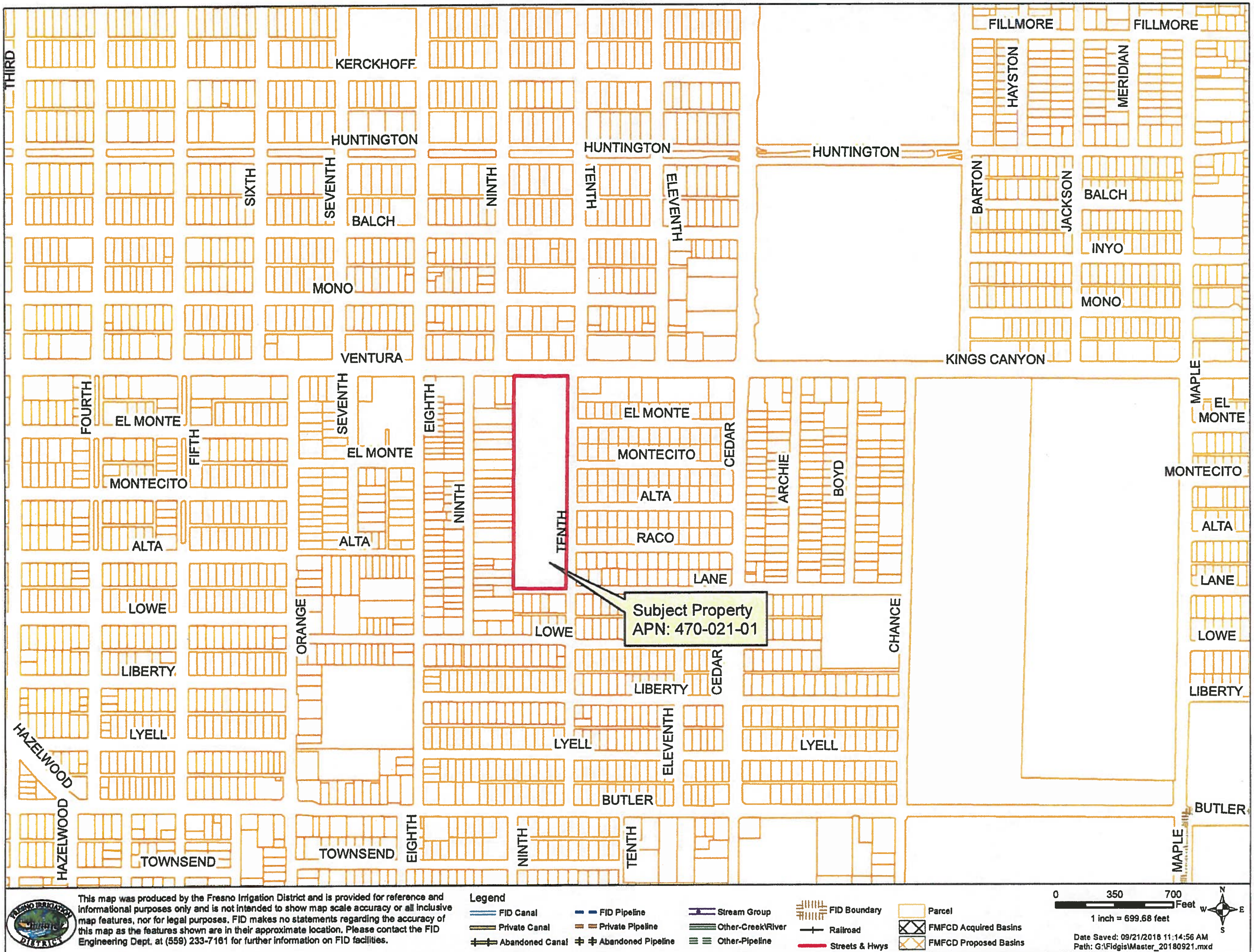
Thank you for submitting this for our review. We appreciate the opportunity to review and comment on the subject documents for the proposed project. If you have any questions please feel free to contact Jeremy Landrith at (559) 233-7161 ext. 7407 or jlandrith@fresnoirrigation.com.

Sincerely,

Laurence Kimura, P.E.
Chief Engineer

Attachment

G:\Agencies\Misc (Consultants)\AECOM\20180924 - Utility Request - Water Pipes and Storage Takes near 470-021-01.doc



This map was produced by the Fresno Irrigation District and is provided for reference and informational purposes only and is not intended to show map scale accuracy or all inclusive map features, nor for legal purposes. FID makes no statements regarding the accuracy of this map as the features shown are in their approximate location. Please contact the FID Engineering Dept. at (559) 233-7161 for further information on FID facilities.

Christopher Lundeen

From:	StClair, Stuart <stuart.stclair@aecom.com>
Sent:	Thursday, September 20, 2018 2:50 PM
To:	Engineering Review
Subject:	Water Pipelines and Storage Tanks Near Planned School Site, Ventura Avenue & S. 10th Street, City of Fresno, California
Attachments:	Figure1_Site_Location_Map.pdf; Figure2_Site_Map.pdf; List_APNs.docx
Importance:	High
Follow Up Flag:	Follow up
Flag Status:	Flagged

Hello,

Our company is helping prepare state-required documents for our client, the Fresno Unified School District. The District is considering building a new school on 13 acres of land at the southwest corner of Ventura Avenue and South 10th Street in the city of Fresno. The zip code is 93702. Please see attached maps and list of assessor's parcel numbers

To meet state safety requirements, we need to find out whether there are:

- any water pipelines of 12-inch diameter or greater, or 80 psi or greater, within 1,500 feet of the site; or
- any aboveground water storage tanks within ¼ mile of the site.

Could you please let me know whether FID has any such pipelines or tanks within those distances from the site?

If possible, your response by September 30 would be greatly appreciated. APN: 470-021-01

Thanks,

Stuart

Stuart St. Clair, PE
Project Civil Engineer, Environment
Direct: 559-490-8308
Mobile: 559-779-6311
stuart.stclair@aecom.com

AECOM
1360 E. Spruce Avenue, Suite 101
Fresno, California 93720
Telephone: 559-448-8222
aecom.com

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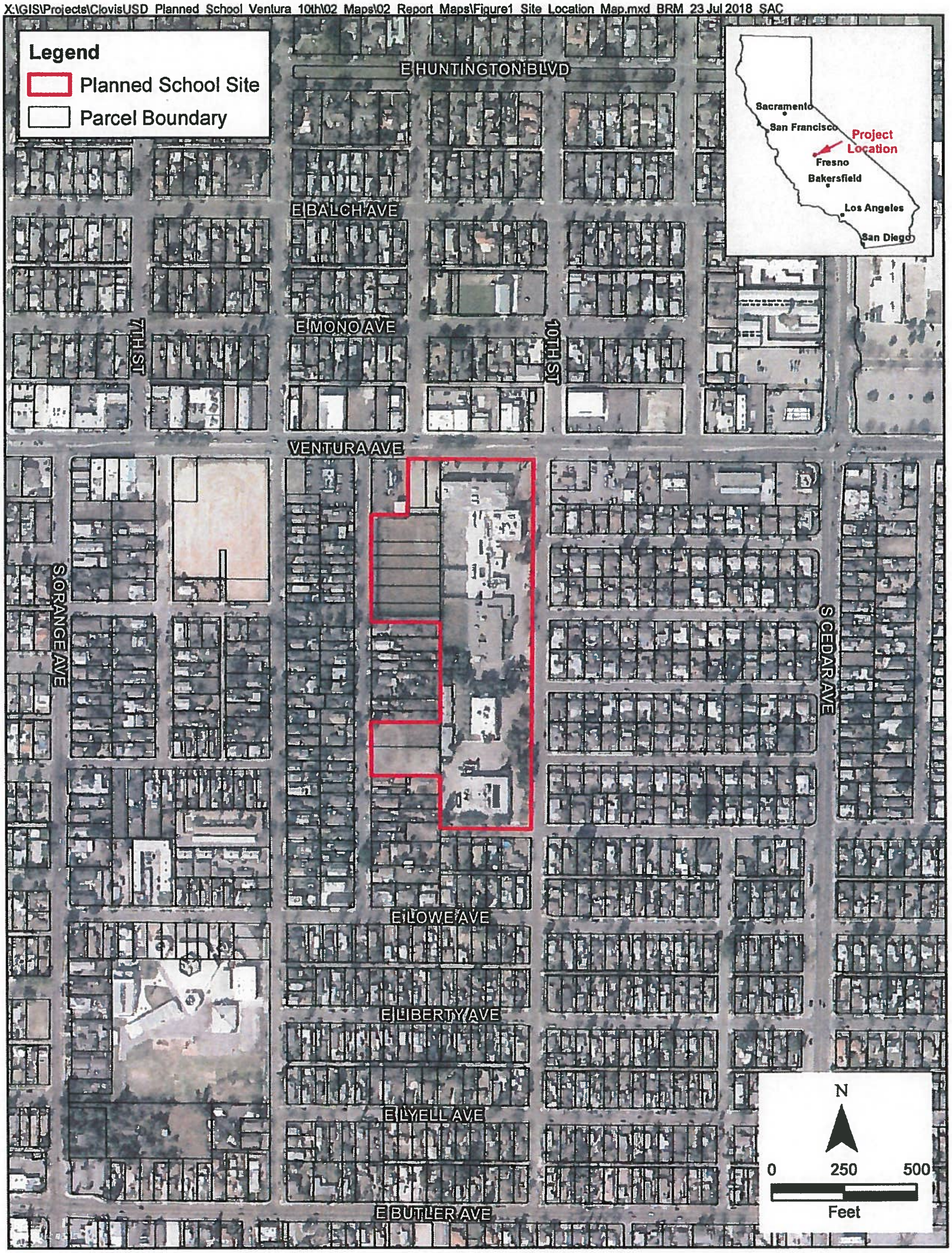
X:\GIS\Projects\ClovisUSD_Planned_School_Ventura_10th\02_Maps\02_Report_Maps\Figure1_Site_Location_Map.mxd BRM 23 Jul 2018 SAC



Aerial Photo: February 2018

Site Location Map

Planned School Site
Southwest of Ventura Ave. & 10th St.
Fresno, CA

AECOM

Figure 1

StClair, Stuart

From: Allen, Michael <MJAm@pge.com>
Sent: Thursday, September 20, 2018 9:41 PM
To: StClair, Stuart
Subject: RE: Pipeline or Powerlines near Planned School Site, Ventura Avenue & S. 10th Street, City of Fresno, Fresno County, California

Stuart,

The nearest PG&E electric transmission line to the Fresno site you have identified is about one mile away. Electric distribution lines in the vicinity are 12kV.
Let me know if there are further questions.

Mike Allen
Senior GIS Analyst
Pacific Gas and Electric Company
415-973-6083

From: StClair, Stuart <stuart.stclair@aecom.com>
Sent: Thursday, September 20, 2018 2:55 PM
To: Allen, Michael <MJAm@pge.com>; Alvarado, Eric <EXAS@pge.com>
Subject: Pipeline or Powerlines near Planned School Site, Ventura Avenue & S. 10th Street, City of Fresno, Fresno County, California
Importance: High

*****CAUTION: This email was sent from an EXTERNAL source. Think before clicking links or opening attachments.*****

Mike/Eric

We are working for Fresno Unified School District on a 5-acre planned new school site at the southwest corner of Ventura Avenue and S. 10th Street in the city of Fresno. The zip code is 93702. Please see attached maps and lists of APNs.

We need to know about any PG&E underground natural gas pipelines within 1,500 feet of the site, or overhead electric transmission lines (> 50kv) within 350 feet of the site.

Please let me know if you require any additional information, or if I need to direct this request to somebody else. If possible, your response by September 30 would be greatly appreciated.

Thanks,

Stuart

Stuart St. Clair, PE
Project Civil Engineer, Environment
Direct: 559-490-8308
Mobile: 559-779-6311
stuart.stclair@aecom.com

AECOM
1360 E. Spruce Avenue, Suite 101
Fresno, California 93720
Telephone: 559-448-8222
aecom.com

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RECEIVED

DEC 21 2018

AECOM Fresno

County of Fresno

DEPARTMENT OF PUBLIC HEALTH
David Pomaville, Director
Dr. Sara Goldgraben, Health Officer

December 14, 2018

999999999
LU0019727
PE 2600

Stuart St. Clair
AECOM
1360 East Spruce Avenue
Fresno, CA 93720

Dear Mr. St. Clair:

SUBJECT: School Site Review, Fresno Unified School District, Planned School Site
LOCATION: Southwest of Ventura Ave & 10th St, Fresno, CA
APN: 47002101T Et Al (see attached list of Assessors Parcel Numbers)

Pursuant to Public Resource Code 21151.8, this Department is notifying you of the following:

1. There is no record with this Department regarding whether the proposed project site is currently or formerly a hazardous waste disposal site or solid waste disposal site. The site did have a history of storage of hazardous materials, above ground storage of petroleum, and the removal of one underground storage tank.

2. There are two records with this Department of a hazardous substance release associated with this site. The first was an ethyl ether release that occurred on October 4, 2002; the second was an antifreeze spill that occurred on July 14, 2006. Both releases were resolved on the day off occurrence.

3. There is no record with this Department that this site contains any pipelines, situated underground or above ground, which carries hazardous substances, acutely hazardous materials, or hazardous waste, with the potential exception of a propane or natural gas line to supply propane or natural gas to the existing structures on the sites. Although the adjacent parcel, with the same address as indicated by our departmental records, contains underground storage tanks and piping associated with the fueling station.

4. This Department has records of facilities within one-fourth mile of the school site which might reasonably be anticipated to handle hazardous or acutely hazardous materials. It should be noted that there may be other sites within one-fourth mile that this Department does not have in its current data base (see attached list of facilities).

If I can be of further assistance, please contact me at (559) 600-3271.

Sincerely,

Steven T. Rhodes, R.E.H.S.,
Supervising Environmental Health Specialist
Environmental Health Division

STR

Attachments (2)
Vicinity Map

FUSD Ventura Alternative Educational Campus

Planned School Site – Ventura Ave. and 10th St.

Parcel APNs	Acreage
470-021-01	9.275
470-054-04	0.241
470-054-09	0.509
470-054-10	0.255
470-054-11	0.246
470-054-12	0.327
470-054-13	0.327
470-054-14	0.193
470-054-16	0.065
470-124-07	0.464
470-124-09	0.355
470-133-01	0.547

Total = 12.804 acres

Facility ID	CERS ID	Name
FA0269513		HEROLD RESIDENCE
FA0281079	10408801	AT&T MOBILITY - FRESNO (100275)
FA0272174	10704586	WECO SUPPLY
FA0266706		LAMOURE'S CLEANERS
FA0266708		SEIBERTS' OIL CO
FA0275754		RENEWAL BODY WORKS
FA0272175	10687126	GOLDEN WORK FINISH
FA0002755	10672126	MAGUIRE'S CHEVRON FOODMART #1
FA0266704		CHEVRON #96181*
FA0170371		PRO CHECK AUTO CARE
FA0282306	10455181	VERIZON WIRELESS EAST VENTURA AVENUE 211849
FA0270390		SUNNYSIDE CAR WASH
FA0170373	10703986	U-HAUL CENTER KINGS CANYON
FA0269273		JESSE SEPTIC TANK SERVICE
FA0283356	10694293	CITY OF FRESNO WELL 49A
FA0266595		FORMERLY TRIPLE A RADIATOR
FA0275496		TRIPLE A RADIATOR SERVICE
FA0276680		TRIPLE A AUTOMOTIVE
FA0280224		LEE AUTO SALES
FA0266705		RED TRIANGLE
FA0284861	10730803	FAMILY DOLLAR #31743
FA0276628		99 AUTO BODY SHOP
FA0270269	10694935	COF-INTERNAL SERVICES DEPT
FA0270992		JUVENILE HALL/CK WAKEFIELD SCH

Full Site Address	City/State/Zip	APN
4115 E BALCHFRESNO, CA 93725	FRESNO, CA 93725	46120215
3637 E VENTURA AVEFRESNO, CA 93702	FRESNO, CA 93702	46125615
3735 E VENTURAFRESNO, CA 93702	FRESNO, CA 93702	46126419
3857 E VENTURAFRESNO, CA 93702	FRESNO, CA 93702	46126509
3839 E VENTURAFRESNO, CA 93726	FRESNO, CA 93726	46126511
3825 E VENTURAFRESNO, CA 93702-3405	FRESNO, CA 93702-3	46126512
3951 E VENTURA AVEFRESNO, CA 93702	FRESNO, CA 93702	46126615
4161 E VENTURA AVEFRESNO, CA 93702	FRESNO, CA 93702	46127326
4161 E VENTURAFRESNO, CA 93702	FRESNO, CA 93702	46127326
4006 E VENTURAFRESNO, CA 93702	FRESNO, CA 93702	47006101
4066 E VENTURA AVEFRESNO, CA 93702	FRESNO, CA 93702	47006116
4130 E VENTURA AVEFRESNO, CA 93702	FRESNO, CA 93702	47006119
4036 E VENTURA STFRESNO, CA 93702	FRESNO, CA 93702	47006120
3704 E ALTAFRESNO, CA 93702	FRESNO, CA 93702	47013105
3905 E MONO AVEFRESNO, CA 93702	FRESNO, CA 93702	46126317T
4059 E VENTURA STFRESNO, CA 93702	FRESNO, CA 93702	46127210T
4059 E VENTURAFRESNO, CA 93702	FRESNO, CA 93702	46127210T
4061 E VENTURAFRESNO, CA 93702	FRESNO, CA 93702	46127210T
4007 E VENTURA AVEFRESNO, CA 93702	FRESNO, CA 93702	46127216T
4007 E VENTURA AVEFRESNO, CA 93702	FRESNO, CA 93702	46127216T
4007 E VENTURA BLVDFRESNO, CA 93702	FRESNO, CA 93702	46127216T
4015 E VENTURAFRESNO, CA 93702	FRESNO, CA 93702	46127217T
1020 S TENTH STFRESNO, CA 93702	FRESNO, CA 93702	47002101T
742-746 S TENTH STFRESNO, CA 93702	FRESNO, CA 93702	47002101T

Facility Status
Inactive
Active
Active
Inactive
Inactive
Inactive
Active
Active
Inactive
Active
Active
Active
Active
Inactive
Active
Inactive
Inactive
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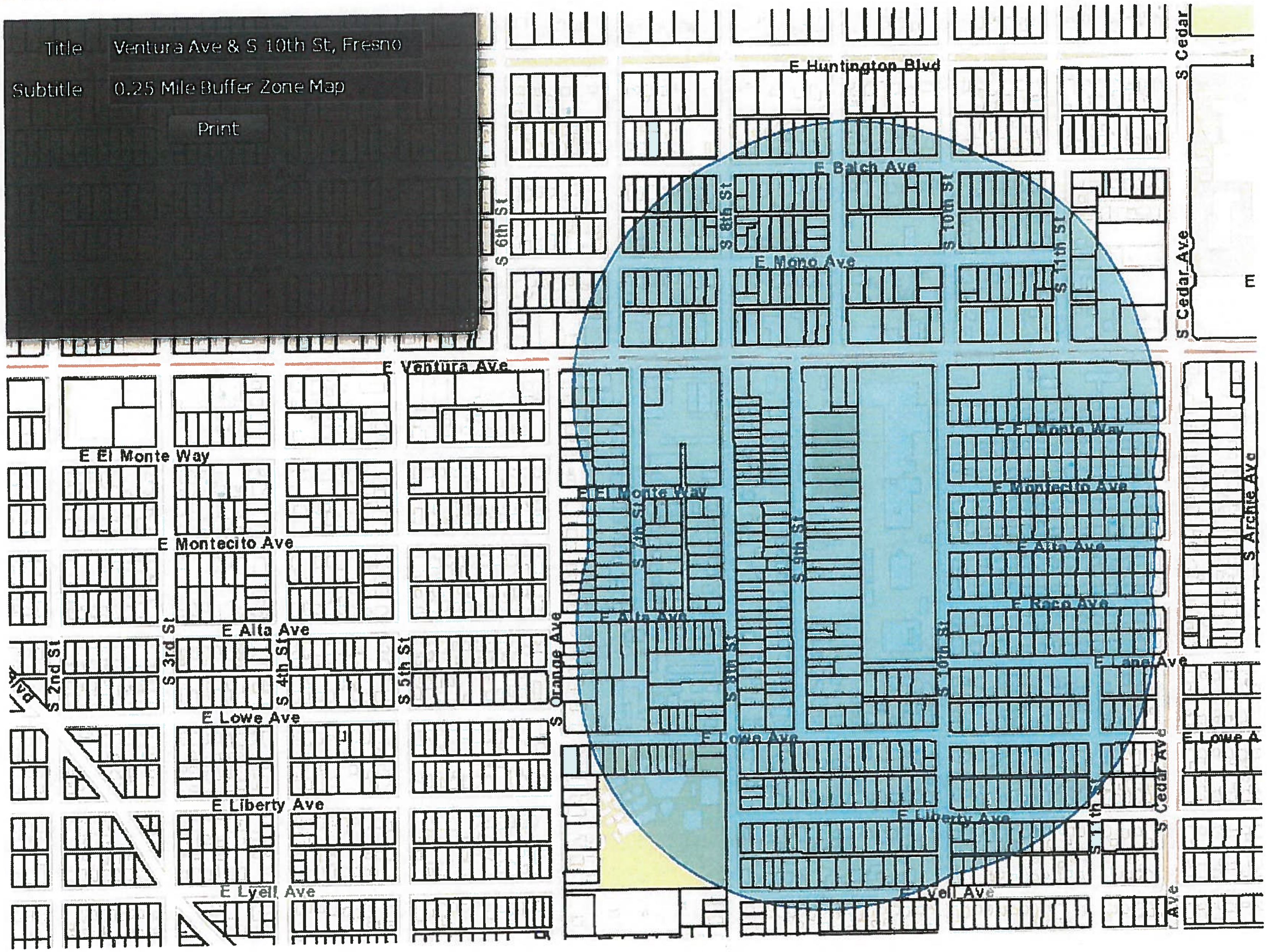
Title Ventura Ave & S 10th St, Fresno
Subtitle 0.25 Mile Buffer Zone Map
Print
E Huntington Blvd
S Cedar
E Balch Ave
S 6th St
S 8th St
S 10th St
S 11th St
E Mono Ave
S Cedar Ave
E Ventura Ave
E El Monte Way
E Montecito Ave
S Archie Ave
E Alta Ave
S 7th St
S 9th St
E Raco Ave
S 2nd St
S 3rd St
S 4th St
S 5th St
S Orange Ave
E Lane Ave
E Lowe Ave
E Liberty Ave
E Lyell Ave

PUBLIC RECORD RELEASE REQUEST
FOR

AECOM – Stuart St. Clair
PRR Request #: C-2018-9-75

Proposed Location:
The school is located on the south side of Ventura Avenue and West of South 10th street in Fresno, California.

The San Joaquin Valley Air Pollution District has reviewed the location according to Public Resource Code 21151.8 and makes the following conclusions:

Permitted Facilities:

- Permitted facilities are located within a ¼ mile.

50	C&B ARCO DBA H&R	4210 E BUTLER	FRESNO	93702	36.728483	-119.754192
287	WKM ASSOCIATES INC	4161 E	FRESNO	93702	36.736015	-119.755095
947	FAMILY EXPRESS FOOD &	4205 E BUTLER	FRESNO	93702	36.728751	-119.754265
1333	COUNTY OF FRESNO	445 S CEDAR	FRESNO	93702	36.738961	-119.754273
1623	FRESNO COUNTY BUILD	1020 S 10TH	FRESNO	93702	36.732038	-119.75817
2250	WONG CORPORATION	4202 E KINGS	FRESNO	93702	36.735713	-119.754376
3088	FRESNO COUNTY BUILD	744 S 10TH ST	FRESNO	93702	36.735155	-119.758142
3257	CITY OF FRESNO WATER	3905 E MONO	FRESNO	93703	36.736948	-119.7592
3812	GOLDEN WORK FINISH	3951 E	FRESNO	93702	36.73608	-119.758698

Freeway, High Volume Roadways, & Railways:

- The District recommends the PRR applicant contact CALTRANs and/or their local transportation agency to identify freeways and busy traffic corridors as defined in the Health and Safety Code.
- No Railways are located within a ¼ mile.

Prepared by
Will Worthley
Technical Services


INQUIRY #: 5374766.5
YEAR: 2016
= 500'
N
EDR

Appendix 4

Noise & Groundborne Vibration Impact Analysis

NOISE & GROUNDBORNE VIBRATION IMPACT ANALYSIS

FOR

VENTURA ALTERNATIVE EDUCATION CAMPUS PROJECT

FRESNO UNIFIED SCHOOL DISTRICT
FRESNO, CA

JUNE 2019

PREPARED FOR:

ODELL PLANNING & RESEARCH, INC.
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OAKHURST, CA 93644

PREPARED BY:

AMBIENT
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PASO ROBLES, CA 93446

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LIST OF COMMON TERMS AND ACRONYMS

ANSI	Acoustical National Standards Institute, Inc.
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	Decibels
dBA	A-Weighted Decibels
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
HVAC	Heating Ventilation & Air Conditioning
in/sec	Inches per Second
L_{dn}	Day-Night Level
L_{eq}	Equivalent Sound Level
L_{max}	Maximum Sound Level
ppv	Peak Particle Velocity
U.S. EPA	United States Environmental Protection Agency

INTRODUCTION

This report discusses the existing setting, identifies potential noise impacts associated with implementation of the proposed project. Noise mitigation measures are recommended where the predicted noise levels would exceed applicable noise standards.

PROPOSED PROJECT SUMMARY

The proposed project includes the acquisition of a 12.65-acre project site located on the south side Ventura Avenue between Ninth Street and Tenth Street within the City of Fresno (See Figures 1 and 2). The northern portion of the site previously housed the former Fresno County Juvenile Hall and Court, and the southern portion of the site housed County offices. The existing site includes nine buildings (total of 182,005 square feet), a fenced athletic/recreation yard, asphalt-paved parking areas, a vacant unpaved area at the southwest portion of the site, and landscaping.

The project entails the demolition of six existing buildings at the site (total of 139,805 square feet), predominately the Juvenile Hall and Juvenile Court buildings located on the northern portion of the property. The project also includes the development and operation of a new alternative education campus, as well as operation of District-level administrative offices in existing office buildings, which would function separately from the proposed campus..

The proposed alternative education campus includes construction of eight new buildings (67,850 square feet) within the northern portion of the site. The proposed facilities and programs at the campus include a career technical education program (CTE), a continuation school, independent study, Educational Resource Center (ERC), E-Learn academy, a health building, a cafeteria/student union building, an early learning center, hardcourt recreation areas, and parking areas. The entire campus is anticipated to include 44 classrooms.

The alternative education campus would serve up to 1,180 students in grades 9-12 and include an early learning center which is expected to serve 60 pre-K students. Not all students would be on the site at one time as student instruction would be provided through a combination of conventional classroom settings and alternative settings where students spend less time physically present at the campus (e.g. independent study, E-Learn). The campus would have up to 103 employees, including administrators, faculty, and support staff. The maximum number of students and employees on the campus at one time is estimated to be 930. Most of the activity on the campus would take place during the day with some limited evening activities.

The proposed administrative offices would utilize three existing buildings (total of 42,200 square feet) located in the southern portion of the project site. The buildings would house up to 165 employees and operate year-round.

The project is expected to be completed in three phases, with the initial phase consisting of the property acquisition followed shortly by the demolition of the six existing buildings. This initial phase will begin in early 2019.

The second phase of the project will focus on the reuse of the three remaining buildings located on the southern portion of the property for District administrative offices. The administrative offices would tentatively begin operations in late 2019.

The final phase of the project would entail the construction of the alternative education campus. This phase of the project is dependent on yet-to-be-identified funding, therefore the timeline is much less predictable; it may possibly begin in the next 3 to 10 years.

Figure 1
Project Site Location and Nearby Sensitive Land Uses

All locations are approximate. Not to scale.

Source: OPR 2018

Figure 2
Project Site Location

Source: OPR 2018

EXISTING SETTING

CONCEPTS AND TERMINOLOGY

ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound is mechanical energy transmitted in the form of a wave because of a disturbance or vibration. Sound levels are described in terms of both amplitude and frequency.

Amplitude

Amplitude is defined as the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. For example, a 65-dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3-dB change in amplitude as the minimum audible difference perceptible to the average person.

Frequency

The frequency of a sound is defined as the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. For instance, the human ear is more sensitive to sound in the higher portion of this range than in the lower and sound waves below 16 Hz or above 20,000 Hz cannot be heard at all. To approximate the sensitivity of the human ear to changes in frequency, environmental sound is usually measured in what is referred to as "A-weighted decibels" (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA (U.S. EPA 1971). Common community noise sources and associated noise levels, in dBA, are depicted in Figure 3.

Addition of Decibels

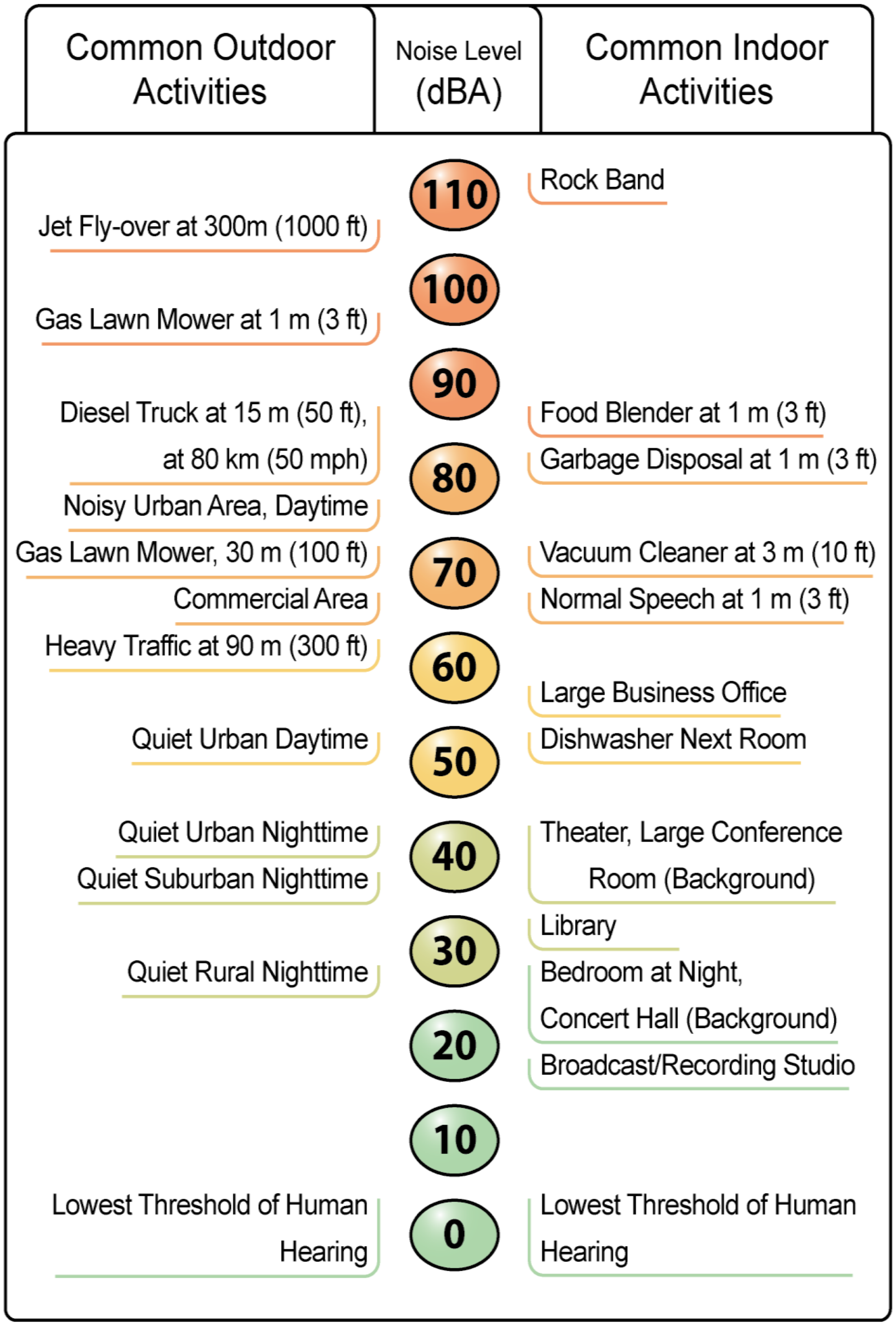
Because decibels are logarithmic units, sound levels cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces a sound level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

Sound Propagation & Attenuation

Geometric Spreading

Sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level decreases (attenuates) at a rate of approximately 6 decibels for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 decibels for each doubling of distance from a line source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground

Figure 3
Common Community Noise Sources & Noise Levels



Source: Caltrans 2018

surface between the source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation for soft surfaces results in an overall attenuation rate of 4.5 decibels per doubling of distance from the source.

Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) from the highway due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in minimum 5 dB of noise reduction. Taller barriers provide increased noise reduction.

Noise reductions afforded by building construction can vary depending on construction materials and techniques. Standard construction practices typically provide approximately 15 dBA exterior-to-interior noise reductions for building facades, with windows open, and approximately 20-30 dBA, with windows closed. With compliance with current Title 24 energy efficiency standards, which require increased building insulation and inclusion of an interior air ventilation system to allow windows on noise-impacted façades to remain closed, exterior-to-interior noise reductions typically average approximately 25 dBA. The absorptive characteristics of interior rooms, such as carpeted floors, draperies and furniture, can result in further reductions in interior noise.

NOISE DESCRIPTORS

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the sound-pressure level in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies, which is referred to as the "A-weighted" sound level (expressed in units of dBA). The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with environmental noise.

The intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are typically used. For the evaluation of environmental noise, the most commonly used descriptors are L_{eq}, L_{dn}, CNEL and SEL. The energy-equivalent noise level, L_{eq}, is a measure of the average energy content (intensity) of noise over any given period. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, L_{dn}, is the 24-hour average of the noise intensity, with a 10-dBA "penalty" added for nighttime noise (10 p.m. to 7 a.m.) to account for the greater sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to L_{dn} but adds an additional 5-dBA penalty for evening noise (7 p.m. to 10 p.m.) Another descriptor that is commonly discussed is the single-event noise exposure level, also referred to as the sound-exposure level, expressed as SEL. The SEL describes a receiver's cumulative noise exposure from a single noise event, which is defined as an acoustical event of short duration (0.5 second), such as a backup beeper, the sound of an airplane traveling overhead, or a train whistle. Common noise level descriptors are summarized in Table 1.

Table 1
Common Acoustical Descriptors

Descriptor	Definition
Energy Equivalent Noise Level (L_{eq})	The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
Minimum Noise Level (L_{min})	The minimum instantaneous noise level during a specific period of time.
Maximum Noise Level (L_{max})	The maximum instantaneous noise level during a specific period of time.
Day-Night Average Noise Level (DNL or L_{dn})	The DNL was first recommended by the U.S. EPA in 1974 as a "simple, uniform and appropriate way" of measuring long term environmental noise. DNL takes into account both the frequency of occurrence and duration of all noise events during a 24-hour period with a 10 dBA "penalty" for noise events that occur between the more noise-sensitive hours of 10:00 p.m. and 7:00 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours to account for increases sensitivity to noise during these hours.
Community Noise Equivalent Level (CNEL)	The CNEL is similar to the L_{dn} described above, but with an additional 5 dBA "penalty" added to noise events that occur between the hours of 7:00 p.m. to 10:00 p.m. The calculated CNEL is typically approximately 0.5 dBA higher than the calculated L_{dn}.
Sound Exposure Level (SEL)	The level of sound accumulated over a given time interval or event. Technically, the sound exposure level is the level of the time-integrated mean square A-weighted sound for a stated time interval or event, with a reference time of one second.

HUMAN RESPONSE TO NOISE

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted: the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. Regarding increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans;
- Outside of the laboratory, a 3-dB change is considered a just-perceivable difference;

- A change in level of at least 5 dB is required before any noticeable change in community response would be expected. An increase of 5 dB is typically considered substantial;
- A 10-dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Effects of Noise on Human Activities

The extent to which environmental noise is deemed to result in increased levels of annoyance, activity interference, and sleep disruption varies greatly from individual to individual depending on various factors, including the loudness or suddenness of the noise, the information value of the noise (e.g., aircraft overflights, child crying, fire alarm), and an individual's sleep state and sleep habits. Over time, adaptation to noise events and increased levels of noise may also occur. In terms of land use compatibility, environmental noise is often evaluated in terms of the potential for noise events to result in increased levels of annoyance, sleep disruption, or interference with speech communication, activities, and learning. Noise-related effects on human activities are discussed in more detail, as follows:

Speech Communication

For most noise-sensitive land uses, an interior noise level of 45 dB L_{eq} is typically identified for the protection of speech communication in order to provide for 100-percent intelligibility of speech sounds. Assuming a minimum 20-dB reduction in sound level between outdoors and indoors, with windows closed, this interior noise level of 45 dB L_{eq} would equate to an exterior noise level of 65 dBA L_{eq}. For outdoor voice communication, an exterior noise level of 60 dBA L_{eq} allows normal conversation at distances up to 2 meters with 95 percent sentence intelligibility (U.S. EPA 1974.) Based on this information, speech interference begins to become a problem when steady noise levels reach approximately 60 to 65 dBA. Within interior noise environments, an average-hourly background noise level of 45 dBA L_{eq} is typically recommended for noise-sensitive land uses, such as educational facilities (Caltrans 2002).

Learning

Closely related to speech interference are the effects of noise on learning and, more broadly, on cognitive tasks. Recent studies have shown a strong relationship between noise and children's reading ability. Children's attention spans also appear to be adversely affected by noise. Adults are affected as well. Some studies indicate that, in a noisy environment, adults have increased difficulty accomplishing complex tasks. One of the issues associated with assessment of these effects is which noise metric correlates most closely with the impacts. For example, the average-daily noise level (i.e., CNEL/L_{dn}), which incorporates a nighttime weighting, may not be the best measure of noise impacts on schools given that operational activities are often limited to the daytime hours (Caltrans 2002).

Various standards and recommended criteria have been developed to specifically address classroom noise. For instance, with regard to transportation sources, the California Department of Transportation has adopted abatement criteria that limit the maximum interior average-hourly noise level within classrooms and other noise-sensitive interior uses, to 52 dBA L_{eq}. In June 2002, the American National Standards Institute, Inc. (ANSI) released a new classroom acoustics standard entitled Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools" (ANSI S12.60-2002). For schools exposed to intermittent background noise sources, such as airport and other transportation noise, the ANSI standards recommend that interior noise levels not exceed 40 dBA L_{eq} during the noisiest hour of the day. At present complying with the ANSI-recommended standard is voluntary in most locations.

Annoyance & Sleep Disruption

With regard to potential increases in annoyance, activity interference, and sleep disruption, land use compatibility determinations are typically based on the use of the cumulative noise exposure metrics (i.e., CNEL or L_{dn}). Perhaps the most comprehensive and widely accepted evaluation of the relationship between noise exposure and the extent of annoyance was one originally developed by Theodore J. Schultz in 1978. In 1978 the research findings of Theodore J. Schultz provided support for L_{dn} as the descriptor for environmental noise. Research conducted by Schultz identified a correlation between the cumulative noise exposure metric and individuals who were highly annoyed by transportation noise. The Schultz curve, expressing this correlation, became a basis for noise standards. When expressed graphically, this relationship is typically referred to as the Schultz curve. The Schultz curve indicates that approximately 13 percent of the population is highly annoyed at a noise level of 65 dBA L_{dn}. It also indicates that the percent of people describing themselves as being highly annoyed accelerates smoothly between 55 and 70 dBA L_{dn}. A noise level of 65 dBA L_{dn} is a commonly referenced dividing point between lower and higher rates of people describing themselves as being highly annoyed (Caltrans 2002).

The Schultz curve and associated research became the basis for many of the noise criteria subsequently established for federal, state, and local entities. Most federal and state of California regulations and policies related to transportation noise sources establish a noise level of 65 dBA CNEL/L_{dn} as the basic limit of acceptable noise exposure for residential and other noise-sensitive land uses. For instance, with respect to aircraft noise, both the Federal Aviation Administration (FAA) and the State of California have identified a noise level of 65 dBA L_{dn} as the dividing point between normally compatible and normally incompatible residential land use generally applied for determination of land use compatibility. For noise-sensitive land uses exposed to aircraft noise, noise levels in excess of 65 dBA CNEL/L_{dn} are typically considered to result in a potentially significant increase in levels of annoyance (Caltrans 2002).

Allowing for an average exterior-to-interior noise reduction of 20 dB, an exterior noise level of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA CNEL/L_{dn}. An interior noise level of 45 dB CNEL/L_{dn} is generally considered sufficient to protect against activity interference at most noise-sensitive land uses, including residential dwellings, and would also be sufficient to protect against sleep interference (U.S. EPA 1974.) Within California, the California Building Code establishes a noise level of 45 dBA CNEL as the maximum acceptable interior noise level for residential uses (other than detached single-family dwellings). Use of the 45 dBA CNEL threshold is further supported by recommendations provided in the State of California Office of Planning and Research's *General Plan Guidelines*, which recommend an interior noise level of 45 dB CNEL/L_{dn} as the maximum allowable interior noise level sufficient to permit "normal residential activity."

The cumulative noise exposure metric is currently the only noise metric for which there is a substantial body of research data and regulatory guidance defining the relationship between noise exposure, people's reactions, and land use compatibility. However, when evaluating environmental noise impacts involving intermittent noise events, such as aircraft overflights and train passbys, the use of cumulative noise metrics may not provide a thorough understanding of the resultant impact. The general public often finds it difficult to understand the relationship between intermittent noise events and cumulative noise exposure metrics. In such instances, supplemental use of other noise metrics, such as the L_{eq} or L_{max} descriptor, may be helpful as a means of increasing public understanding regarding the relationship between these metrics and the extent of the resultant noise impact (Caltrans 2002).

AFFECTED ENVIRONMENT

NOISE-SENSITIVE LAND USES

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

Sensitive land uses located in the vicinity of the proposed project site consist predominantly of residential land uses. The nearest residential land uses are located to the west, east, and south of the project site. Nearby residential land uses are depicted in Figure 1.

AMBIENT NOISE ENVIRONMENT

Ambient noise levels within the project area are predominantly influenced by vehicle traffic on Ventura Avenue. To document existing ambient noise levels in the project area, short-term ambient noise measurements were conducted on May 22, 2019 using a Larson Davis Laboratories, Type I, Model 820 integrating sound-level meter. A noise measurement survey was also conducted along 10th Street, south of Ventura Avenue. The meter was calibrated before use and is certified to be in compliance with ANSI specifications. Measured ambient noise levels are summarized in Table 2.

Table 2
Summary of Measured Ambient Noise Levels

Location	Monitoring Period	Noise Levels (dBA)	
		L_{eq}	L_{max}
Ventura Avenue. Approximately 200 feet east of 9th Street, 50 feet from the road centerline.	1720-1730	63.2	81.3
	1810-1820	62.8	79.6
	2200-2210	58.0	78.9
10th Street. Approximately 650 feet south of Ventura Avenue, 25 feet from the road centerline.	1740-1750	49.4	77.5
Ambient noise measurements were conducted on August 7, 2018 using a Larson Davis Laboratories, Type I, Model 820 integrating sound-level meter.			

As indicated in Table 2, measured ambient noise levels in the project area ranged from approximately 49 to 63 dBA L_{eq}. Ambient noise levels were highest near the northern site boundary due largely to vehicle traffic along Ventura Avenue. Ambient noise levels during the evening and nighttime hours are generally 5 to 10 dB lower than daytime noise levels.

REGULATORY FRAMEWORK

NOISE

State of California

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria.

California General Plan Guidelines

The *State of California General Plan Guidelines*, published by the Governor's Office of Planning and Research (OPR 2003), also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution. For school land uses, the *State of California General Plan Guidelines* identify a "normally acceptable" exterior noise level of up to 70 dBA CNEL/L_{dn}. Schools are considered "conditionally acceptable" within noise environments of 60 to 70 dBA CNEL/L_{dn} and "normally unacceptable" within exterior noise environments of 70 to 80 CNEL/L_{dn} and "clearly unacceptable" within exterior noise environments in excess of 80 dBA CNEL/L_{dn}. Assuming a minimum exterior-to-interior noise reduction of 20 dB, an exterior noise environment of 65 dBA CNEL/L_{dn} would allow for a normally acceptable interior noise level of 45 dBA CNEL/L_{dn}.

City of Fresno

The *Fresno General Plan Noise and Safety Element* includes noise standards for both stationary and transportation noise sources for determination of land use compatibility. In accordance with General Plan policies, new noise-sensitive land uses impacted by existing or projected future transportation or stationary noise sources shall include mitigation measures so that resulting noise levels do not exceed these standards (City of Fresno 2014). The land use compatibility noise standards for non-transportation (stationary) and transportation noise sources are summarized in Tables 3 and 4, respectively. In addition, Policy NS-1-a of the *Fresno General Plan Noise and Safety Element* also establishes an exterior noise standard of 60 dBA CNEL/L_{dn} for new non-transportation noise sources that impinge on noise-sensitive land uses, such as residential dwellings. This noise standard is applied at the property line of the noise-sensitive land use.

The City of Fresno has also adopted a noise ordinance that contains additional limitations intended to prevent noise which may create dangerous, injurious, noxious, or otherwise objectionable conditions. As opposed to the City's General Plan noise standards, the City's noise ordinance is primarily used for the regulation of existing uses and activities, including construction activities, and are not typically used as a basis for land use planning. Construction activities occurring during the daytime hours of 7:00 a.m. to 10:00 p.m., Monday through Saturday, are typically considered exempt from the City's noise ordinance requirements (City of Fresno 2016). In accordance with Section 15-2506(H) of the City's noise ordinance, the sounding of school bells and school-sanctioned outdoor activities such as pep rallies, sports games, and band practices are exempt from the City's noise ordinance standards.

Table 3
City of Fresno General Plan Noise Standards - Stationary Noise Sources

Noise Descriptor	Noise Level Standards (dBA)[1]	
	Daytime (7 am - 10 pm)	Nighttime (10 pm – 7 am)
Hourly Equivalent Sound Level (L_{eq})	50	45
Maximum Sound Level (L_{max})	70	65

Notes:

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 is 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 five dB.

Source: City of Fresno 2014

Table 4
City of Fresno General Plan Noise Standards - Transportation Noise Sources

Land Use[1]	Outdoor Activity Areas[2,3] (CNEL/L_{dn} dBA)	Interior Spaces (dBA)[3]	
		Average Daily (CNEL/L_{dn})	Average Hourly (L_{eq}) [2]
Residential	65	45	--
Transient Lodging	65	45	--
Hospitals, Nursing Homes	65	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	65	--	45
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45

1. Where the location of outdoor activity areas 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.

3. Noise standards do not apply to aircraft noise.

Source: City of Fresno 2014

GROUNDBORNE VIBRATION

Vibration is like noise in that it involves a source, a transmission path, and a receiver. While vibration is related to noise, it differs in that noise is generally considered to be pressure waves transmitted through air, whereas vibration usually consists of the excitation of a structure or surface. As with noise, vibration consists of an amplitude and frequency. A person's perception to the vibration will depend on their individual sensitivity to vibration, as well as the amplitude and frequency of the source and the response of the system which is vibrating. Vibration can be measured in terms of acceleration, velocity, or displacement.

The effects of groundborne vibration levels, with regard to human annoyance and structural damage, is influenced by various factors, including ground type, distance between source and receptor, and duration. Overall effects are also influenced by the type of the vibration event, defined as either continuous or transient. Continuous vibration events would include most construction equipment, including pile drivers, and compactors; whereas, transient sources of vibration create single isolated vibration events, such as demolition ball drops and blasting. Threshold criteria for continuous and transient events are summarized in Tables 5 and 6, respectively.

Table 5
Damage Potential to Buildings at Various Groundborne Vibration Levels

Structure and Condition	Vibration Level (in/sec ppv)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely Fragile Historic Buildings, Ruins, Ancient Monuments	0.12	0.08
Fragile Buildings	0.2	0.1
Historic and Some Old Buildings	0.5	0.25
Older Residential Structures	0.5	0.3
New Residential Structures	1.0	0.5
Modern Industrial/Commercial Buildings	2.0	0.5

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Source: Caltrans 2013

Table 6
Annoyance Potential to People at Various Groundborne Vibration Levels

Human Response	Vibration Level (in/sec ppv)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely Perceptible	0.04	0.01
Distinctly Perceptible	0.25	0.04
Strongly Perceptible	0.9	0.10
Annoying to People in Buildings	--	0.2
Severe	2.0	0.4

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

-- Not Available

Source: Caltrans 2013

As indicated in Table 5, the threshold at which there is a risk to normal structures from continuous events is 0.5 in/sec ppv for newer building construction. A threshold of 0.5 in/sec ppv also represents the structural damage threshold applied to older structures for transient vibration sources. With regard to human perception (refer to Table 6), vibration levels would begin to become distinctly perceptible at levels of 0.04 in/sec ppv for continuous events and 0.25 in/sec ppv for transient events. Continuous vibration levels are considered annoying for people in buildings at levels of 0.2 in/sec ppv.

IMPACTS AND MITIGATION MEASURES

METHODOLOGY

Short-Term Construction Noise

Short-term noise impacts associated with construction activities were analyzed based on typical construction equipment noise levels and distances to the nearest noise-sensitive land uses. Noise levels were predicted based on an average noise-attenuation rate of 6 dB per doubling of distance from the source.

Long-term Operational Noise

Roadway Traffic Noise

Traffic noise levels were calculated using the Federal Highway Administration (FHWA) roadway noise prediction model (FHWA-RD-77-108) based on California vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for this project. Additional input data included day/night percentages of autos, medium and heavy trucks, vehicle speeds, ground attenuation factors, and roadway widths. The project's contribution to traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-generated traffic. The compatibility of the proposed school was evaluated based on predicted future on-site noise conditions and in comparison to the City of Fresno's "normally acceptable" exterior exterior standard of 65 dBA CNEL/L_{dn}.

The *CEQA Guidelines* do not define the levels at which temporary and permanent increases in ambient noise are considered "substantial." As discussed previously in this section, a noise level increase of 3 dBA is barely perceptible to most people, a 5 dBA increase is readily noticeable, and a difference of 10 dBA would be perceived as a doubling of loudness. For purposes of this analysis, a significant increase in ambient noise levels would be defined as an increase of 3 dBA, or greater.

Non-Transportation Noise

Noise levels associated with on-site vehicle parking activities were calculated in accordance with FHWA's *Transit Noise and Vibration Impact Assessment Guidelines* (2006) assuming a reference noise level of 92 dBA SEL. Average-hourly noise levels associated with vehicle parking-related activities were calculated based on the conservative assumption that all parking spaces would be accessed over a one-hour period. Noise levels generated by other on-site noise sources, including on-site building mechanical equipment and recreational uses were assessed based on representative noise data obtained from similar land uses. Operational noise levels for non-transportation noise sources were assumed to be limited to the daytime hours of operation, consistent with school operational hours.

Non-transportation noise levels for parking areas and building mechanical equipment were compared to the City of Fresno's daytime noise standard of 50 dBA L_{eq}/L_{50} for determination of impact significance. Because recreational uses are exempt from the City noise ordinance standards, recreational noise levels at nearby land uses were evaluated in comparison to the City's General Plan noise standard of 60 dBA CNEL/L_{dn} for determination of impact significance.

Groundborne Vibration

The *CEQA Guidelines* also do not define the levels at which groundborne vibration levels would be considered excessive. For this reason, Caltrans' recommended groundborne vibration thresholds were used for the evaluation of impacts based on increased potential for structural damage and human annoyance, as identified in Table 5 and Table 6, respectively. Based on these levels, groundborne vibration levels would be considered to have a potentially significant impact with regard to potential structural damage if levels would exceed a 0.5 in/sec ppv. Groundborne vibration in excess of 0.2 in/sec ppv within buildings would be considered to have a potentially significant impact with regard to human annoyance.

PROJECT IMPACTS

Impact Noise-A:	***Would the project result in the 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?***

Noise generated by the proposed project would occur during short-term construction and long-term operation. Noise-related impacts associated with short-term construction and long-term operations of the proposed project are discussed separately, as follows:

Short-term Construction Noise Levels

Construction noise typically occurs intermittently and varies depending upon the nature or phase (e.g., demolition/land clearing, grading and excavation, erection) of construction. Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Although noise ranges were found to be similar for all construction phases, the initial site preparation phases, including demolition and grading/excavation activities, tend to involve the most equipment and result in the highest average-hourly noise levels.

Noise levels commonly associated with construction equipment are summarized in Table 7. As noted in Table 7, instantaneous noise levels (in dBA L_{max}) generated by individual pieces of construction equipment typically range from approximately 80 dBA to 85 dBA L_{max} at 50 feet (FTA 2006). Typical operating cycles may involve 2 minutes of full power, followed by 3 or 4 minutes at lower settings. Average-hourly noise levels for individual equipment generally range from approximately 73 to 82 dBA L_{eq}. Based on typical off-road equipment usage rates and assuming multiple pieces of equipment operating simultaneously within a localized area, such as soil excavation activities, average-hourly noise levels could reach levels of approximately 80 dBA L_{eq} at roughly 100 feet.

The City has not adopted noise standards that apply to short-term construction activities. However, based on screening noise criteria commonly recommended by federal agencies, construction activities would generally be considered to have a potentially significant impact if average-hourly daytime noise levels would exceed 80 dBA L_{eq} at noise-sensitive land uses, such as residential land uses (FTA 2006). Depending on the location and types of activities conducted (e.g., building demolition, soil excavation, grading), predicted noise levels at the nearest residences, which are located adjacent to and west of the project site, could potentially exceed 80 dBA L_{eq}. Furthermore, with regard to residential land uses, activities occurring during the more noise-sensitive evening and nighttime hours could result in increased levels of annoyance and potential sleep disruption. For these reasons, noise-generating construction activities would be considered to have a ***potentially significant*** short-term noise impact.

Table 7
Typical Construction Equipment Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from Source	
	L_{max}	L_{eq}
Air Compressor	80	76
Backhoe/Front-End Loader	80	76
Compactor	80	73
Concrete Mixer Truck	85	81
Concrete Vibratory Mixer	80	73
Crane, Mobile	85	77
Dozer	85	81
Excavator	85	81
Generator	82	79
Grader	85	81
Jack Hammer	85	78
Paver	85	82
Pneumatic Tools	85	82
Roller	85	78
Sources: FTA 2006		

Mitigation Measure Noise-1: The following measures shall be implemented to reduce construction-generated noise levels:

a. Construction activities (excluding activities that would result in a safety concern to the public or construction workers) shall be limited to between the hours of 7:00 a.m. and 10:00 p.m. Construction activities shall be prohibited on Sundays and legal holidays.

b. Construction truck trips shall be scheduled, to the extent feasible, to occur during non-peak hours and truck haul routes shall be selected to minimize impacts to nearby residential dwellings.

c. Construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.

d. Stationary construction equipment (e.g., portable power generators) should be located at the furthest distance possible from nearby residences. If deemed necessary, portable noise barriers shall be erected sufficient to shield nearby residences from direct line-of-sight of stationary construction equipment.

e. When not in use, all equipment shall be turned off and shall not be allowed to idle. Provide clear signage that posts this requirement for workers at the entrances to the site.

Significance After Mitigation: Use of mufflers would reduce individual equipment noise levels by approximately 10 dBA. Implementation of the above mitigation measures would limit construction activities to the less noise-sensitive periods of the day. With implementation of the above mitigation measures, this impact would be considered ***less than significant***.

Long-term Operational Noise Levels

Potential long-term increases in noise associated with the proposed project would be primarily associated with the operation of building equipment, such as heating, ventilation, and air conditioning (HVAC) units, outdoor recreational activities, and vehicle use within onsite parking lots.

Stationary Equipment

The proposed project would not result in the introduction of any new major sources of stationary noise sources. Stationary noise sources would be predominantly associated with the operation of building mechanical equipment. Building mechanical equipment would be located within the structure, enclosed, or placed on rooftop areas away from direct public exposure. In addition, the operation of building mechanical equipment would be predominantly limited to the daytime hours of operations and not uncharacteristic of mechanical equipment operations associated with the existing buildings. As a result, significant increases in noise levels associated with onsite building mechanical equipment would not be projected to occur with project implementation. However, the type and location of onsite equipment to be included as part of the proposed project have not yet been identified. Depending on type and location of onsite equipment, predicted operational noise levels at nearby residential land uses could potentially exceed the City's exterior noise standards for non-transportation noise sources (refer to Table 3). As a result, noise generated by onsite equipment would be considered to have a **potentially-*significant*** impact.

Recreational Facilities

The project would be anticipated to include the development of some onsite recreational-use facilities, such as playgrounds commonly associated with child preschools. Noise generated by small playgrounds typically includes elevated children's voices and occasional adult voices. Based on measurement data obtained from similar land uses, noise levels associated with small playgrounds can generate intermittent noise levels of approximately 55-60 dBA L_{eq} at 50 feet. Noise levels associated with other recreational uses, such as ball fields with spectator areas, can generate higher noise levels.

The specific recreational uses to be included as part of the proposed project have not yet been identified.. Depending on type and location of onsite recreational uses to be included, on-site recreational use could result in a significant increase in ambient noise levels at nearby residential land uses, which could exceed the exterior noise standard. Noise generated by the proposed playground would be considered to have a **potentially-*significant*** impact.

Vehicle Parking Areas

The proposed project would include the use of on-site parking areas. The location of any new on-site parking areas have not yet been identified. Based on noise measurements conducted for similar school uses, operational noise levels commonly associated with parking areas typically average approximately 45 dBA Leq, or less, and are often masked by vehicle traffic on area roadways. However, depending on size and location of onsite parking areas to be constructed, on-site parking areas could result in a significant increase in ambient noise levels at nearby residential land uses, which could exceed the City's exterior noise standards (refer to Table 3). Noise generated by the proposed parking areas would be considered to have a **potentially-*significant*** impact.

Roadway Traffic

Predicted existing traffic noise levels, with and without implementation of proposed project, are summarized in Table 8. In comparison to existing traffic noise levels, the proposed project would result in a predicted increase in traffic noise levels of approximately 0.2 along Ventura Avenue to 4.6 dBA along 10th Street.

Predicted increases in future cumulative traffic noise levels along nearby roadways for proposed project are summarized in Table 9. In future years, the project's contribution to cumulative traffic noise levels would be anticipated to decline as increases in vehicle traffic due to surrounding development increases. Under future cumulative conditions, the proposed project would result in predicted increases in traffic noise levels of 0.1 to 0.2 along Ventura Avenue and 3.6 dBA along 10th Street.

Table 8
Predicted Increases in Existing Traffic Noise Levels

Roadway Segment	Predicted Noise Level at 50 feet from Centerline of Near Travel Lane (dBA CNEL/L_{dn})[1]			
	Existing Without Project	Existing With Project	Difference[2]	Significant Impact?[3]
Ventura Avenue, West of 10th Street	64.0	64.2	0.2	No
Ventura Avenue, East of 10th Street	63.8	64.0	0.2	No
10th Street, South of Ventura Avenue	48.1	52.7	4.6	No

1. Traffic noise levels were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108), based on data obtained from the traffic analysis prepared for this project.
2. Difference in noise levels reflects the incremental increase attributable to the proposed project.
3. Defined as a substantial increase in ambient noise levels in excess of the City's exterior noise standard of 65 dBA CNEL.

Table 9
Predicted Increases in Existing Traffic Noise Levels

Roadway Segment	Predicted Noise Level at 50 feet from Centerline of Near Travel Lane (dBA CNEL/L_{dn})[1]			
	Existing Without Project	Existing With Project	Difference[2]	Significant Impact?[3]
Ventura Avenue, West of 10th Street	65.2	65.4	0.2	No
Ventura Avenue, East of 10th Street	65.1	65.2	0.1	No
10th Street, South of Ventura Avenue	49.2	52.8	3.6	No

1. Traffic noise levels were calculated using the FHWA roadway noise prediction model (FHWA-RD-77-108), based on data obtained from the traffic analysis prepared for this project.
2. Difference in noise levels reflects the incremental increase attributable to the proposed project.
3. Defined as a substantial increase in ambient noise levels in excess of the City's exterior noise standard of 65 dBA CNEL.

As noted earlier in this report, changes in ambient noise levels of approximately 3 dBA, or less, are typically not discernible to the human ear and would not be considered to result in a significant impact. Implementation of the proposed project would not result in a significant increase (i.e., 3 dBA, or greater) in existing or projected future traffic noise levels that would exceed the City's commonly applied exterior noise standard (i.e., 65 dBA CNEL) at the nearest noise-sensitive land uses. Project-generated increases in traffic noise levels would be considered to have a ***less-than-significant*** impact.

Land Use Compatibility

The Fresno City General Plan Noise Element includes noise standards for determination of land use compatibility for new land uses. As previously discussed, the City's "normally acceptable" exterior noise standards for schools is 65 dBA CNEL/L_{dn}.

As noted earlier in this report, ambient noise levels in the project area are largely influenced by traffic noise emanating from Ventura Avenue. Under future cumulative conditions, with project-generated vehicle traffic included, the predicted 65 dBA CNEL/L_{dn} noise contours for Ventura Avenue would extend to 84 feet from the roadway centerline. The location of on-site structures has not yet been determined. As a result, it is conceivable that on-site structures could be located within the projected future 65 dBA CNEL contour of Ventura Avenue. Predicted exterior noise levels at onsite structures could, therefore, potentially exceed the City's "normally acceptable" exterior noise standard of 65 dBA CNEL/L_{dn}. In addition, depending on the location of onsite structures, predicted interior traffic noise levels could potentially exceed the commonly applied interior noise standard of 45 dBA CNEL/L_{dn}. This impact is considered ***potentially significant***.

Mitigation Measure Noise-2a: The following measures shall be implemented to reduce long-term operational noise impacts:

- An acoustical analysis shall be prepared for the proposed project prior to final design. The acoustical analysis shall identify noise-reduction measures to be incorporated sufficient to achieve an exterior average-hourly noise-level of 50 dBA L_{eq}, or less, at the property line of the nearest noise-sensitive land use for on-site building mechanical equipment and vehicle parking areas. Onsite recreational uses shall be evaluated in comparison to the City of Fresno's average-daily noise standard of 60 dBA CNEL. Noise-reduction measures to be incorporated may include, but are not limited to, the selection of alternative or quieter equipment and construction of noise barriers (i.e., walls).
- Noise-generating maintenance activities, such as landscape maintenance and waste-collection activities, shall be limited to between the hours of 7:00 a.m. to 10:00 p.m.

Mitigation Measure Noise-2b: The following measures shall be implemented to ensure compatibility of proposed school uses with on-site noise levels:

- Prior to final site design, an acoustical analysis shall be prepared for structures to be used for educational instruction purposes that are located within the projected future 65 dBA CNEL/L_{dn} noise contour of Ventura Avenue. The *acoustical* analysis shall include evaluation of predicted interior noise levels for occupied rooms. Noise-reduction measures shall be identified sufficient to achieve applicable exterior and interior noise standards (e.g., 65 dBA CNEL/L_{dn} and 45 dBA CNEL/L_{dn}, respectively). Based on the analysis prepared for this project, the projected future 65 dBA CNEL/L_{dn} noise contour of Ventura Avenue would extend 84 feet from the roadway centerline.

Significance After Mitigation:

Implementation of Mitigation Measure Noise-2a would limit on-site maintenance activities to the daytime hours of operation. In addition, an acoustical analysis would also be required, prior to final site design, to further evaluate noise levels associated with on-site non-transportation noise sources and to incorporate additional mitigation sufficient to achieve applicable noise standards. With mitigation, noise impacts associated with on-site non-transportation noise sources would be considered ***less than significant***.

Implementation of Mitigation Measure Noise-2b would require the preparation of an acoustical analysis, prior to final site design, to further evaluate the compatibility of proposed on-site uses with projected future noise levels. Additional mitigation measures would be identified sufficient to achieve applicable exterior and interior noise standards. With mitigation, predicted on-site noise levels at educational-use facilities would not exceed applicable noise standards. With mitigation, this impact would be considered ***less than significant***.

Impact Noise-B. ***Would the project result in the generation of excessive groundborne vibration or groundborne noise levels?***

Long-term operational activities associated with the proposed project would not involve the use of any equipment or processes that would result in potentially significant levels of ground vibration. Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities. Construction activities associated with the proposed improvements would likely require the use of various off-road equipment, such as tractors, concrete mixers, and haul trucks. The use of major groundborne vibration-generating construction equipment, such as pile drivers, would not be required for this project.

Groundborne vibration levels associated with representative construction equipment are summarized in Table 10. As depicted, ground vibration generated by construction equipment would be approximately 0.089 in/sec ppv, or less, at 25 feet. Predicted vibration levels at the nearest existing structures would not be anticipated to exceed commonly applied criteria for structural damage or human annoyance (i.e., 0.5 and 0.2 in/sec ppv, respectively). In addition, no fragile or historic structures have been identified in the project area. As a result, this impact would be considered ***less than significant***.

Table 10
Representative Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity at 25 Feet (In/Sec)
Large Bulldozer	0.089
Loaded Truck	0.076
Jackhammer	0.035
Small Bulldozer	0.003
Source: FTA 2006, Caltrans 2004	

Impact Noise-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?***

The nearest airports in the project vicinity include the Fresno Yosemite International Airport and the Fresno Chandler Downtown airport, which are located approximately three miles to the northeast and west of the project site, respectively. The proposed project is not located within the projected 60 dBA CNEL/L_{dn} noise contours of these airports (City of Fresno 2014). No private airstrips were identified within two miles of the project site. Implementation of the proposed project would not result in the exposure of sensitive receptors to aircraft noise levels nor would the proposed project affect airport operations. This impact is considered ***less than significant***.

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APPENDIX A
Noise Prediction Modeling & Supportive Documentation

Input Data

Case Description: Ventura AEC - Highest Construction Noise Levels Calc

Receptor

	Description	Land Use	Daytime Baseline (dBA)	Evening Baseline (dBA)	Nighttime Baseline (dBA)
1	RAW Excavation	Residential	5.0	5.0	5.0
2					
3					
4					

Noise Metric: Leq

Noise Limit Criteria

Receptor #1

Noise Limits

Equipment **Receptor #1: RAW Excavation**

	Active	Description	Impact Device	Usage(%)	Spec Lmax (dBA)		Actual Lmax (dBA)		Distance to Receptor (feet)	Estimated Shielding (dBA)
1	[x]	Excavator	[ ]	40%	[ ]	85.0	[x]	80.7	100.0	0.0
2	[x]	Excavator	[ ]	40%	[ ]	85.0	[x]	80.7	100.0	0.0
3	[x]	Tractor	[ ]	40%	[x]	84.0	[ ]	N/A	100.0	0.0
4	[x]	Tractor	[ ]	40%	[x]	84.0	[ ]	N/A	100.0	0.0
5	[x]	Dump Truck	[ ]	40%	[ ]	84.0	[x]	76.5	100.0	0.0
6	[x]	Dump Truck	[ ]	40%	[ ]	84.0	[x]	76.5	100.0	0.0

Results

Receptor #1: RAW Excavation

		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
	Equipment	Lmax*	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
	Total	78.0	79.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	Excavator	74.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	Excavator	74.7	70.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	Tractor	78.0	74.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Tractor	78.0	74.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	Dump Truck	70.4	66.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Total Lmax is the value for the loudest piece of equipment.

TRAFFIC NOISE MODELING

EXISTING CONDITIONS

SEGMENT	VOLUME (ADT)	SPEED (MPH)	AUTO	MDV	HDV	CNEL AT 50FT FROM NTLCL	DISTANCE (FEET) TO CONTOUR	
							65	60
VENTURA AVE WEST OF 10TH ST	14730	35	97.42	1.84	0.74	64.0	70	140
VENTURA AVE EAST OF 10TH ST	14240	35	97.42	1.84	0.74	63.8	69	137
10TH ST SOUTH OF VENTURA AVE	756	25	98.15	1.84	0.1	48.1	WR	WR

EXISTING PLUS PROJECT CONDITIONS

SEGMENT	VOLUME (ADT)	SPEED (MPH)	AUTO	MDV	HDV	CNEL AT 50FT FROM NTLCL	DISTANCE (FEET) TO CONTOUR	
							65	60
VENTURA AVE WEST OF 10TH ST	15470	35	97.42	1.84	0.74	64.2	72	145
VENTURA AVE EAST OF 10TH ST	14770	35	97.42	1.84	0.74	64.0	70	140
10TH ST SOUTH OF VENTURA AVE	2170	25	98.15	1.84	0.1	52.7	WR	WR

FUTURE CUMULATIVE CONDITIONS

SEGMENT	VOLUME (ADT)	SPEED (MPH)	AUTO	MDV	HDV	CNEL AT 50FT FROM NTLCL	DISTANCE (FEET) TO CONTOUR	
							65	60
VENTURA AVE WEST OF 10TH ST	19510	35	97.42	1.84	0.74	65.2	82	168
VENTURA AVE EAST OF 10TH ST	19090	35	97.42	1.84	0.74	65.1	81	165
10TH ST SOUTH OF VENTURA AVE	970	25	98.15	1.84	0.1	49.2	WR	WR

FUTURE CUMULATIVE PLUS PROJECT CONDITIONS

SEGMENT	VOLUME (ADT)	SPEED (MPH)	AUTO	MDV	HDV	CNEL AT 50FT FROM NTLCL	DISTANCE (FEET) TO CONTOUR	
							65	60
VENTURA AVE WEST OF 10TH ST	20250	35	97.42	1.84	0.74	65.4	84	172
VENTURA AVE EAST OF 10TH ST	19620	35	97.42	1.84	0.74	65.2	83	168
10TH ST SOUTH OF VENTURA AVE	2240	25	98.15	1.84	0.1	52.8	WR	WR

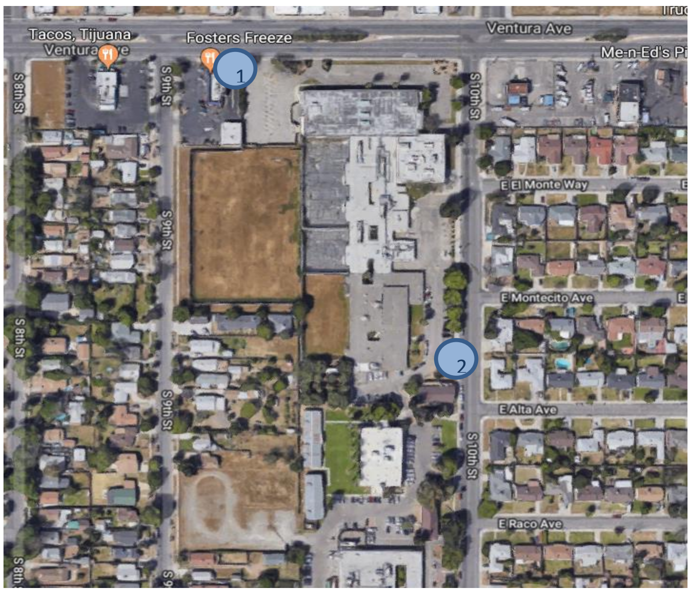
PREDICTED INCREASE

SEGMENT	EX	EX+P	INCREASE	CUM	CUM+P	INCREASE
VENTURA AVE WEST OF 10TH ST	64.0	64.2	0.2	65.2	65.4	0.2
VENTURA AVE EAST OF 10TH ST	63.8	64.0	0.2	65.1	65.2	0.1
10TH ST SOUTH OF VENTURA AVE	48.1	52.7	4.6	49.2	52.8	3.6

AMBIENT
AIR QUALITY & NOISE CONSULTING

NOISE MEASUREMENT SURVEY FORM

DATE:	22-May-19
NOISE MONITORING LOCATION	Fresno, CA



N

MET CONDITIONS:	TEMP: 67 F. HUMIDITY: 40 % WIND SPEED: 2-4 MPH SKY: Clear/OC GROUND: Dry
NOISE MONITORING EQUIPMENT:	LARSON DAVIS MODEL 820 LXT, TYPE I SLM

CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS: YES

LOCATION	MONITORING PERIOD	LOCATION DESCRIPTION	NOISE LEVEL			PRIMARY NOISE SOURCES/NOTES
			LEQ	LMAX		
1	17:20-17:30	Ventura Ave. Approx 50 feet from road CL.	63.2	81.3		Vehicle Traffic Primary
1	18:10-18:20	Ventura Ave. Approx 50 feet from road CL.	62.8	79.6		Vehicle Traffic Primary
1	22:00-22:10	Ventura Ave. Approx 50 feet from road CL.	58	78.9		Vehicle Traffic Primary
2	17:40-17:50	10th St. Approx 25 feet from road CL.	49.4	77.5		Vehicle Traffic Primary

Appendix 5

Traffic Impact Analysis

Draft Traffic Impact Analysis

Fresno Unified School District
Ventura Alternative Education Campus

Located on the Southwest Corner of Tenth Street and Ventura Avenue

In the City of Fresno, California

Prepared for:

Fresno Unified School District
4600 North Brawley Avenue
Fresno, CA 93722

June 19, 2019

JLB Project No. 004-068

JLB Traffic Engineering, Inc.

Traffic Engineering, Transportation Planning, & Parking Solutions

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
Phone: (559) 570-8991
www.JLBtraffic.com

Traffic Engineering, Inc.

Traffic Engineering, Transportation Planning, & Parking Solutions

Draft Traffic Impact Analysis

For the Fresno Unified School District Ventura Alternative Education Campus located on the Southwest Corner of Tenth Street and Ventura Avenue

In the City of Fresno, CA

June 19, 2019

This Draft Traffic Impact Analysis has been prepared under the direction of a licensed Traffic Engineer. The licensed Traffic Engineer attests to the technical information contained therein and has judged the qualifications of any technical specialists providing engineering data from which recommendations, conclusions, and decisions are based.

Prepared by:

Jose Luis Benavides, PE, TE

President

REGISTERED PROFESSIONAL ENGINEER
JOSE LUIS BENAVIDES
No.T 2328
Exp:06/30/21
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STATE OF CALIFORNIA

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Introduction and Summary

Introduction

This report describes a Traffic Impact Analysis (TIA) prepared by JLB Traffic Engineering, Inc. (JLB) for the proposed Fresno Unified School District (District) Ventura Alternative Education Campus and Administrative Office (Project) located in the City of Fresno. The Project proposes to include a preschool, high school and administrative offices. Figure 1 shows the location of the proposed Project site relative to the surrounding roadway network.

The proposed Project includes the acquisition of a 12.65-acre site located on the south side of Ventura Avenue between Ninth Street and Tenth Street. The northern portion of the site previously housed the former Fresno County Juvenile Hall and Court, and the southern portion of the site housed County offices. The existing site includes nine buildings (total of 182,005 square feet), a fence athletic/recreation yard, asphalt-paved parking areas, a vacant unpaved area at the southwest portion of the site, and landscaping.

The Project entails the demolition of five existing buildings at the site (total of 135,605 square feet), predominantly the Juvenile Hall and Juvenile Court buildings located on the northern portion of the property. The Project also includes the development and operation of a new alternative education campus, as well as operation of District-level administrative offices in the existing office buildings, which would function separately from the proposed campus.

The proposed alternative education campus includes construction of eight new buildings (67,850 square feet) within the northern portion of the site. The proposed facilities and programs at the campus include a career technical education program (CTE), a continuation school, independent study, Educational Resource Center (ERC), E-Learn academy, a health building, a cafeteria/student union building, an early learning center, hardcourt recreation areas, and parking areas. The entire campus is anticipated to include 44 classrooms.

The alternative education campus would serve up to 1,180 students in grades 9-12 and include an early learning center which is expected to serve 60 pre-K students. Not all students would be on the site at one time as student instruction would be provided through a combination of conventional classroom settings and alternative settings where students spend less time physically present at the campus (e.g. independent study, E-Learn). The campus would have up to 103 employees, including administrators, faculty, and support staff. The maximum number of students and employees on the campus at one time is estimated to be 930. Therefore, for purposes of this study, the maximum number of students assumed to be on campus at one time is 827 students (930 total – 103 staff = 827 students). Most of the activity of the campus would take place during the day with some limited evening activities.

The proposed administrative offices would utilize four existing buildings (total of 46,400 square feet) located in the southern portion of the site. The buildings would house up to 165 employees and operate year-round.

The purpose of the TIA is to evaluate the potential on-site and off-site traffic impacts, identify short-term roadway and circulation needs, determine potential mitigation measures, and identify any critical traffic issues that should be addressed in the on-going planning process. The TIA primarily focused on evaluating traffic conditions at study intersections that may potentially be impacted by the proposed Project. The Scope of Work was prepared via consultation with City of Fresno, County of Fresno and Caltrans staff.

Summary

The potential traffic impacts of the proposed Project were evaluated in accordance with the standards set forth by the Level of Service (LOS) policy of the City of Fresno, County of Fresno and Caltrans.

Existing Traffic Conditions

- JLB conducted a search of SWITRS and TIMS to review collision reports for the most recent three-year period (January 1, 2015 to December 31, 2017). In the three-year period, a total of six (6) collisions were reported within the influence zone of the existing study intersections.
- At present, all study intersections operate at an acceptable LOS during both peak periods.

Existing plus Project Traffic Conditions

- It is recommended that proposed Project driveway(s) be placed in line with existing roadways connected to the east, or be offset by at least 125 feet from the roadways connecting to the east side of Tenth Street. By implementing this recommendation, the Project driveway(s) will be located at points that minimize traffic operational impacts to the existing roadway network.
- At buildout, the proposed Project is estimated to generate a maximum of 2,459 daily trips, 580 AM peak hour trips and 221 PM peak hour trips.
- It is recommended that the Project retain the Class II Bike Lane along its frontage to Ventura Avenue.
- It is recommended that the Project retain the existing walkways that are in a good state and ADA compliant along its frontages to Ventura Avenue, Ninth Street, Lane Avenue and Tenth Street. Any gaps shall be filled and the Project shall reconstruct walkways where needed to conform to current ADA guidelines.
- As the Project will be used to serve an expanding student population, it is likely that the Project would not add VMT per capita, or service population to the surrounding area. Additionally, the Project site is located near transit service and pedestrian and bicycle networks. Moreover, the Project will provide transit passes to students and include bicycle parking.
- It is recommended that the District work with the City of Fresno to implement a Safe Routes to School plan and seek grant funding to help build walkways where they are lacking within a one-mile radius of the proposed Project site.
- It is recommended that the Project prepare a school signage and striping plan in the vicinity of the Project, that these be reviewed and approved by the City of Fresno, and subsequently implemented prior to opening day of the school component of the Project.

- Soil on the site was tested and analyzed under the oversite of the Department of Toxic Substances Control as required by the California Education Code. This process determined that approximately 6,600 cubic yards of contaminated soil will need to be removed from the site. It is estimated that up to 500 truck trips will be required to transport the contaminated soil to a disposal facility, which will require 25 trucks making two (2) trips per day for 10 working days. The removal of the soil is planned to occur during the fall of 2019.
- Since the existing PM peak hour traffic at Tenth Street and Ventura Avenue is operating at LOS D, it is recommended that the trucks not run during the period between 4 to 6 PM and that working days do not coincide with the Big Fresno Fair located approximately 0.4 miles to the east of the proposed Project and scheduled from October 2-14, 2019.
- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the Project is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 86.4 sec/veh (LOS F) during the AM peak period and 69.1 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five (5) seconds would be considered a direct impact. Therefore, to improve the LOS at this intersection, it is recommended that the intersection be signalized with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches. This intersection shall include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg.

Near Term plus Project Traffic Conditions

- The total trip generation for the Near Term Projects is 1,130 daily trips, 96 AM peak hour trips and 78 PM peak hour trips.
- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the Project coupled with the Near Term Project is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 97.9 sec/veh (LOS F) during the AM peak period and 72.9 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five (5) seconds would be considered a cumulative impact. Therefore, to improve the LOS at this intersection, it is recommended that the intersection be signalized with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches. This intersection shall include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg.

Cumulative Year 2035 No Project Traffic Conditions

- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, background growth in traffic is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 27.8 sec/veh (LOS D) during the PM peak period to 60.3 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, it may want to consider changing the traffic controls of this intersection to improve traffic operations and LOS. One option for the City's consideration to improve LOS at this intersection is to signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.

Cumulative Year 2035 plus Project Traffic Conditions

- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the Project coupled with background growth in traffic is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 269.3 sec/veh (LOS F) during the AM peak period and 359.0 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five (5) seconds would be considered a cumulative impact. Therefore, to improve the LOS at this intersection, it is recommended that the intersection be signalized with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches. This intersection shall include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg.

Queuing Analysis

- It is recommended that the City consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.

Project's Equitable Fair Share

- It is recommended that the Project contribute its equitable fair share as listed in Table X for the existing funding shortfall, if any, to future improvements necessary to maintain an acceptable LOS.

Scope of Work

The TIA primarily focused on evaluating traffic conditions at study intersections that may potentially be impacted by the proposed Project. On December 14, 2018, a Draft Scope of Work for the preparation of a TIA for this Project was provided to the City of Fresno, County of Fresno and Caltrans for their review and comment. The Draft Scope of Work was based on communication with City of Fresno staff. Any comments to the proposed Scope of Work were to be provided by January 4, 2019.

On December 17, 2018, the County of Fresno responded to the Draft Scope of Work and queried if the alternative education campus would follow the same boundary lines as what is posted on the FUSD website. On December 27, 2018, JLB informed the County of Fresno that while the alternative education campus would draw students within the entire District, a large percentage of students are projected to reside in central and southeast Fresno. On January 2, 2019, the County of Fresno asked if the District would offer bussing services to students outside of a certain radius. On January 3, 2019, JLB responded that the plan was for high school students to use the City bus system as they do at Cambridge High School, George M. DeWolf High School, and J.E. Young Academic Center. Preschool students must be signed in by a parent so bussing is not an option. The same day, the County of Fresno approved the Draft Scope of Work as presented.

On January 29, 2019, Caltrans responded to the Draft Scope of Work. Caltrans requested that a discussion on vehicle miles traveled (VMT) reduction and possible mitigation measures, if needed, be included in the TIA.

On January 28, 2019, the City of Fresno responded to the Draft Scope of Work and requested that they be provided with the Project's anticipated trip distribution before finalizing the scope of work. On February 6, 2019, JLB provided the City of Fresno with the Project's anticipated trip distribution. On February 26, 2019, the City of Fresno requested that the intersections of Cedar Avenue and Lane Avenue and Cedar Avenue and Butler Avenue be included in the analysis. Also, the City of Fresno requested that a collision analysis be prepared at all study locations along with traffic signal warrants 1 and 2 for unsignalized intersections.

Based on the comments received, this TIA includes the analysis of the additional intersections as requested by the City of Fresno along with the addition of the Collision Analysis for all study intersections and the preparation of Signal Warrants 1 and 2 for all unsignalized study intersections under the Existing Traffic Conditions scenario. The Draft Scope of Work and the comments received from the lead agency and responsible agencies are included in Appendix A.

Study Facilities

The existing peak hour turning movement volume counts were conducted at the study intersections in March 2019, while schools in the vicinity of the proposed Project were in session. The intersection turning movement counts included pedestrian and bicycle volumes. The traffic counts for the existing study intersections are contained in Appendix B. The existing intersection turning movement volumes, intersection geometrics and traffic controls are illustrated in Figure 2.

Study Intersections

1. Orange Avenue / Ventura Avenue
2. Ninth Street / Ventura Avenue
3. Tenth Street / Ventura Avenue
4. Cedar Avenue / Ventura Avenue
5. Cedar Avenue / Lane Avenue
6. Cedar Avenue / Butler Avenue

Study Scenarios

Existing Traffic Conditions

This scenario evaluates the Existing Traffic Conditions based on existing traffic volumes and roadway conditions from traffic counts and field surveys conducted in March 2019.

Existing plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Project Traffic Conditions. The Existing plus Project traffic volumes were obtained by adding the Project Only Trips to the Existing Traffic Conditions scenario. The Project Only Trips to the study facilities were developed based on existing travel patterns, the Fresno COG Project Select Zones, the existing roadway network, engineering judgment, data provided by the District, knowledge of the study area, existing residential and commercial densities, and the City of Fresno 2035 General Plan Circulation Element in the vicinity of the Project. The Fresno COG Models for the Project Select Zones are contained in Appendix C.

Near Term plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Near Term plus Project Traffic Conditions. The Near Term plus Project traffic volumes were obtained by adding the Near Term related trips to the Existing plus Project Traffic Conditions scenario.

Cumulative Year 2035 No Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2035 No Project Traffic Conditions. The Cumulative Year 2035 No Project traffic volumes were obtained by subtracting Project Only Trips from the Cumulative Year 2035 plus Project traffic volumes.

Cumulative Year 2035 plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2035 plus Project Traffic Conditions. The Cumulative Year 2035 plus Project traffic volumes were obtained from the Fresno COG traffic model runs (Base Year 2019 and Cumulative Year 2035) and existing traffic counts. Under this scenario, the increment method, as recommended by the Model Steering Committee was utilized to determine the Cumulative Year 2035 plus Project traffic volumes. The Fresno COG models are contained in Appendix C.

Level of Service Analysis Methodology

Level of Service (LOS) is a qualitative index of the performance of an element of the transportation system. LOS is a rating scale running from "A" to "F", with "A" indicating no congestion of any kind and "F" indicating unacceptable congestion and delays. LOS in this study describes the operating conditions for signalized and unsignalized intersections.

The *Highway Capacity Manual* (HCM) 6th Edition is the standard reference published by the Transportation Research Board and contains the specific criteria and methods to be used in assessing LOS. U-turn movements were analyzed using HCM 2000 methodologies and would yield more accurate results for the reason that HCM 6 methodologies do not allow the analysis of U-turns. Synchro software was used to define LOS in this study. Details regarding these calculations are included in Appendix D.

Criteria of Significance

The City of Fresno 2035 General Plan has established various degrees of acceptable LOS on its major streets, which are dependent on four (4) Traffic Impact Zones (TIZs) within the City of Fresno. The standard LOS threshold for TIZ I is LOS F, that for TIZ II is LOS E, that for TIZ III is LOS D, and that for TIZ IV is LOS E. Additionally, the 2035 MEIR made findings of overriding consideration to allow a lower LOS threshold that that established by the underlying TIZ. For those cases in which a LOS criterion for a roadway segment differs from that of the underlying TIZ, such criteria are identified in the roadway description. In this case, all study facilities, except for the southern leg of the intersection of Cedar Avenue and Butler Avenue, fall within TIZ I, therefore LOS F is used to evaluate the potential significance of LOS impacts to intersections within TIZ I. Since the southern leg of the intersection of Cedar Avenue and Butler Avenue falls within TIZ II, LOS E is used to evaluate the potential significance of LOS impacts to this particular intersection.

The County of Fresno has established LOS C as the acceptable level of traffic congestion on county roads and streets that fall entirely outside the Sphere of Influence (SOI) of a City. For those areas that fall within the SOI of a City, the LOS criteria of the City are the criteria of significance used in this report. LOS C is used to evaluate the potential significance of LOS impacts to Fresno County intersections that fall outside the City of Fresno SOI. In this case, all study facilities fall within the City of Fresno SOI, therefore, the City of Fresno LOS thresholds are utilized.

Caltrans endeavors to maintain a target LOS at the transition between LOS C and D on State highway facilities consistent with the *Caltrans Guide for the Preparation of Traffic Impact Studies* dated December 2002. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. In this TIA, however, all study facilities fall within the City of Fresno. Therefore, the City of Fresno LOS thresholds are utilized.

Operational Analysis Assumptions and Defaults

The following operational analysis values, assumptions and defaults were used in this study to ensure a consistent analysis of LOS among the various scenarios.

- Yellow time consistent with the California Manual of Uniform Traffic Control Devices (CA MUTCD) based on approach speeds
- Yellow time of 3.2 seconds for left-turn phases
- All-red clearance intervals of 1.0 second for all phases
- Walk intervals of 7.0 seconds
- Flashing Don't Walk based on 3.5 feet/second walking speed with yellow plus all-red clearance subtracted and 2.0 seconds added
- All new or modified signals utilize protective left-turn phasing, unless otherwise noted
- A 3 percent heavy vehicle factor
- The number of observed pedestrians at existing intersections was utilized under all study scenarios
- An average of 10 pedestrian calls per hour at signalized intersections
- At existing intersections, the observed approach Peak Hour Factor (PHF) is utilized in the Existing, Existing plus Project, and Near Term plus Project scenarios.
- For the Cumulative Year 2035 scenario, the following PHF's were utilized to reflect school traffic operations and an increase in future traffic volumes. As roadways start to reach their saturated flow rates, PHF's tend to increase to 0.90 or higher. The PHF's were established based on historical traffic counts collected by JLB for intersections in proximity of school sites.
    - A PHF of 0.88, or the existing PHF if higher, is utilized during the AM peak.
    - A PHF of 0.92, or the existing PHF if higher, is utilized during the PM peak.

Existing Traffic Conditions

Roadway Network

The Project site and surrounding study area are illustrated in Figure 1. Important roadways serving the Project are discussed below.

Orange Avenue is an existing north-south two-lane undivided collector in the vicinity of the proposed Project. In this area, Orange Avenue exists as a two-lane undivided collector between Ventura Avenue and Jensen Avenue. The City of Fresno 2035 General Plan Circulation Element designates Orange Avenue as a two-lane collector between Ventura Avenue and Jensen Avenue.

Ninth Street is an existing north-south two-lane undivided local roadway adjacent to the proposed Project. In this area, Ninth Street exists between Ventura Avenue and Lowe Avenue. The City of Fresno 2035 General Plan Circulation Element designates Ninth Street as a local roadway between Ventura Avenue and Lowe Avenue.

Tenth Street is an existing north-south two-lane undivided local roadway adjacent to the proposed Project. In this area, Tenth Street exists as local roadway between Tulare Avenue and Butler Avenue. The City of Fresno 2035 General Plan Circulation Element designates Tenth Street as a local roadway between Tulare Avenue and Butler Avenue.

Cedar Avenue is an existing north-south four-lane arterial in the vicinity of the proposed Project. In this area, Cedar Avenue exists as a four-lane divided arterial north of Ventura Avenue through the City of Fresno and a four-lane undivided arterial between Ventura Avenue and Jensen Avenue. The City of Fresno 2035 General Plan Circulation Element designates Cedar Avenue as a four-lane arterial north of Jensen Avenue.

Ventura Avenue is an existing east-west four-lane divided arterial adjacent to the proposed Project. In this area, Ventura Avenue exists as a four-lane divided arterial east of Fig Avenue. Ventura Avenue changes name to Kings Canyon Road east of Cedar Avenue. The City of Fresno 2035 General Plan Circulation Element designates Ventura Avenue as a four-lane arterial east of Fig Avenue.

Lane Avenue is an existing east-west two-lane undivided local roadway in the vicinity of the proposed Project. In this area, Lane Avenue exists as a local roadway between Tenth Street and Chance Avenue. The City of Fresno 2035 General Plan Circulation Element designates Lane Avenue as a local roadway Tenth Street and Chance Avenue.

Butler Avenue is an existing east-west two-lane collector in the vicinity of the proposed Project. In this area, Butler Avenue exists a four-lane collector between "N" Street and Orange Avenue, a two-lane undivided collector between Orange Avenue and Cedar Avenue, a two-lane collector divided by a two-way left-turn lane between Cedar Avenue and Peach Avenue, and a two-lane undivided scenic drive between Peach Avenue and Fowler Avenue. The City of Fresno 2035 General Plan Circulation Element designates Butler Avenue as a predominantly two-lane collector between "N" Street and Peach Avenue, a two-lane scenic drive between Peach Avenue and Fowler Avenue, and a two-lane connector east of Fowler Avenue.

Traffic Signal Warrants

Eight-hour and four-hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing Traffic Conditions scenario. These warrants are found in Appendix K. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized intersections satisfy either signal warrant.

Collision Analysis

JLB conducted a search of SWITRS and TIMS to review collision reports for the most recent three-year period (January 1, 2015 to December 31, 2017). SWITRS "is a database that serves as a means to collect and process data gathered from a collision scene. The internet SWITRS application is a tool by which CHP staff and members of its Allied Agencies throughout California can request various types of statistical reports in an electronic format." TIMS "has been developed over the past five-plus years by SafeTREC to provide quick, easy and free access to California crash data that has been geocoded by SafeTREC to make it easy to map out crashes." All collision reports found in SWITRS and TIMS between January 1, 2015 and December 31, 2017 were included in the analysis, however, any duplicate reports were excluded from the analysis. Collision data for each study intersection are contained in Appendix E.

In the three-year period, a total of six (6) collisions were reported within the influence zone of the existing study intersections. Table I summarizes the total number of collisions reported at each existing study intersection, the type of collision, the severity of the collision, the type of violation, and whether the collision involved a pedestrian, a bicyclist, another motor vehicle, or a fixed object. Based on the collision data recorded during the three-year period, all existing study intersections have experienced a relatively low average number of collisions per year with one exception. The exception is that the intersection of Cedar Avenue and Butler Avenue experienced four (4) total collisions during the three-year period. The type of collisions at the intersection of Cedar Avenue and Butler Avenue included two (2) broadsides, one (1) rear-end, and one (1) sideswipe. Furthermore, the type of violations included one (1) traffic signals and signs, two (2) right-of-way, one (1) driving under the influence. It is worth noting that all four of these collisions occurred within a six-month period between April 2015 and October 2015. After thorough review of the data contained within the collision reports for the three-year analysis period, JLB was able to determine that the implementation of protective left-turn phasing at the signalized intersection of Cedar Avenue and Butler Avenue could reduce the number of broadside collisions associated with eastbound and westbound left-turn movements at this intersection. Therefore, it is recommended that the City of Fresno conduct further studies to determine if the implementation of protective left-turn phasing of the intersection of Cedar Avenue and Butler Avenue meets the City's criteria for protective left-turn phasing.

Table I: Three-Year Intersection Collision Analysis

ID	Intersection	Number of Collisions	Type of Collision					Severity					Type of Violation						Motor Vehicle Involved with...			
			Broadside	Rear End	Head-On	Object	Sideswipe	Fatal	Severe Injury	Other Visible Injury	Complaint of Pain Injury	Property Damage Only	Traffic Signals & Signs	Right of Way	Unsafe Speed	Improper Turning	Driving Under Influence	Pedestrian Violation	Pedestrian	Bicyclist	Other Motor Vehicle	Fixed Object
1	Orange Avenue / Ventura Avenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Ninth Street / Ventura Avenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Tenth Street / Ventura Avenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Cedar Avenue / Ventura Avenue	1	1	-	-	-	-	-	-	1	-	-	1	-	-	-	-	-	-	1	-	-
5	Cedar Avenue / Lane Avenue	1	-	1	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	1	-
6	Cedar Avenue / Butler Avenue	4	2	1	-	-	1	-	-	-	2	2	1	2	-	-	1	-	-	-	4	-

Results of Existing Level of Service Analysis

Figure 2 illustrates the Existing Traffic Conditions turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Existing Traffic Conditions scenario are provided in Appendix F. Table II presents a summary of the Existing peak hour LOS at the study intersections.

At present, all study intersections operate at an acceptable LOS during both peak periods.

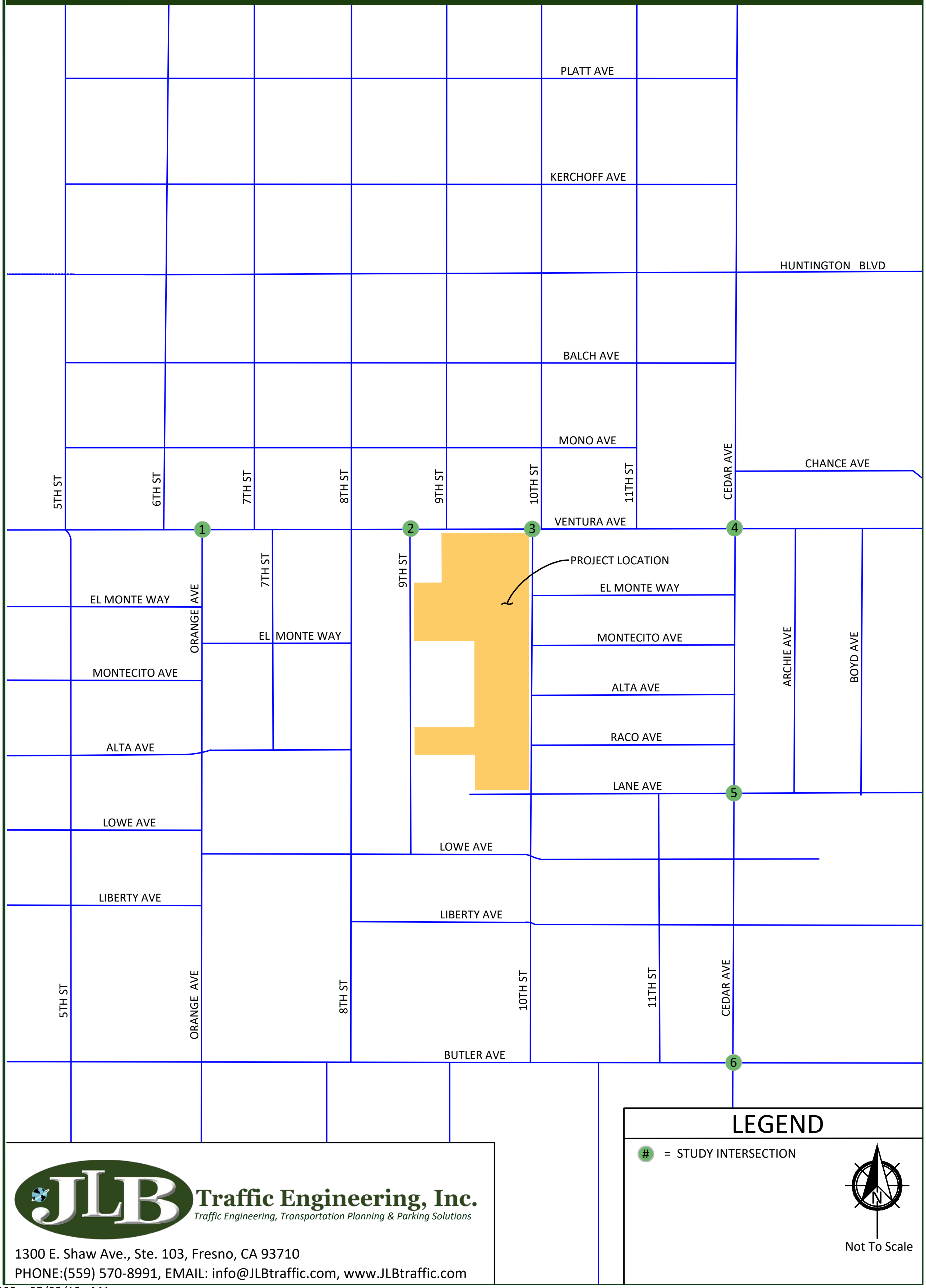
Table II: Existing Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Orange Avenue / Ventura Avenue	Signalized	11.5	B	9.5	A
2	Ninth Street / Ventura Avenue	One-Way Stop	14.3	B	23.6	C
3	Tenth Street / Ventura Avenue	Two-Way Stop	20.7	C	27.8	D
4	Cedar Avenue / Ventura Avenue	Signalized	34.1	C	25.7	C
5	Cedar Avenue / Lane Avenue	Two-Way Stop	17.3	C	19.3	C
6	Cedar Avenue / Butler Avenue	Signalized	11.5	B	8.9	A

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

FUSD Alternative Education Campus - City of Fresno
Vicinity Map

Figure 1



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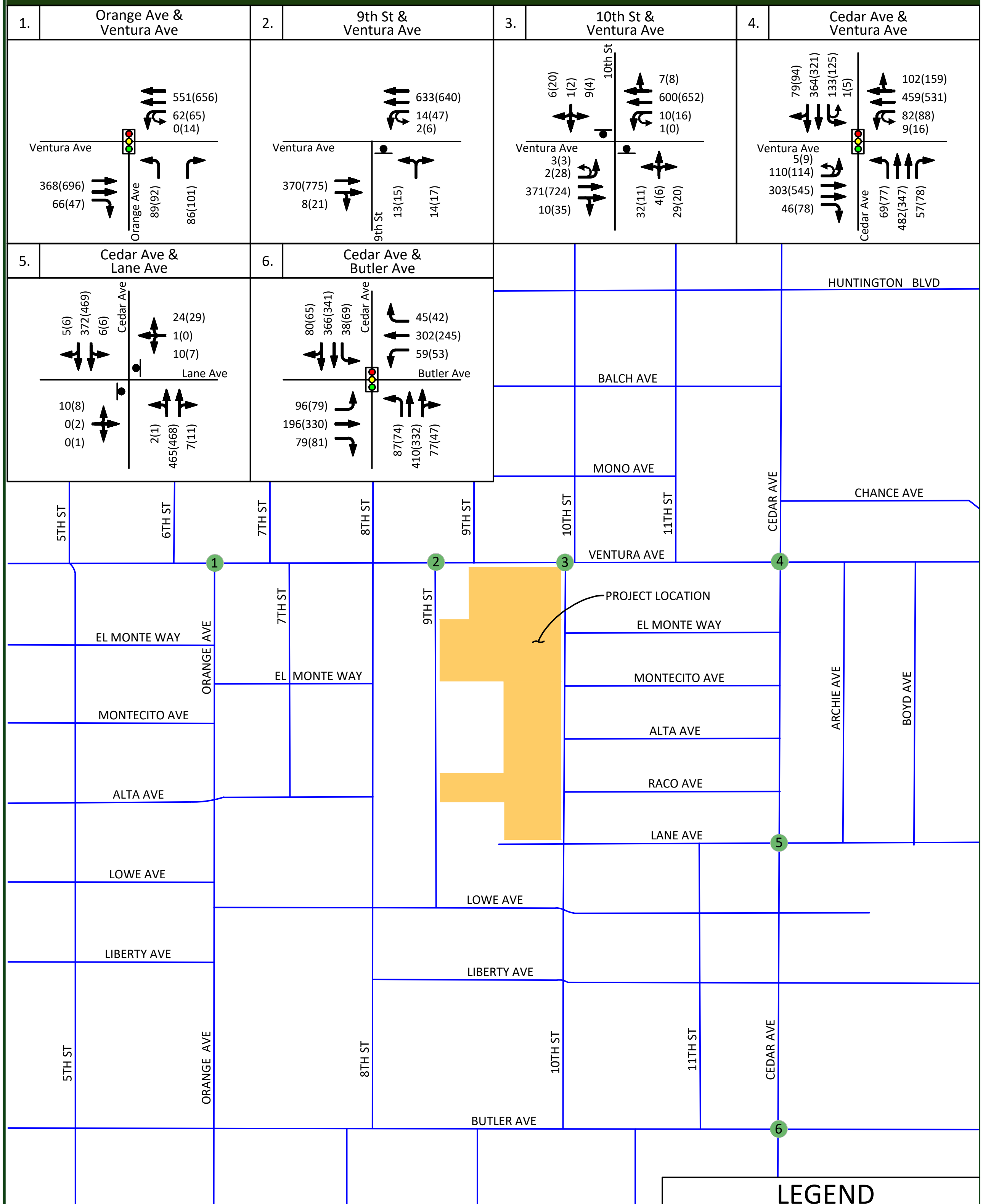
FUSD Alternative Education Campus - City of Fresno
Existing - Traffic Volumes, Geometrics and Controls

Figure 2



LEGEND

- # = STUDY INTERSECTION
- XX = AM PEAK HOUR TRIPS
- (XX) = PM PEAK HOUR TRIPS
- = SIGNALIZED INTERSECTION
- = STOP SIGN

Not To Scale

JLB Traffic Engineering, Inc.
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004-068 - 05/02/19 - MA

Existing plus Project Traffic Conditions

Project Description

The Project proposes to include a preschool, high school and administrative offices. Figure 1 shows the location of the proposed Project site relative to the surrounding roadway network. The proposed Project includes the acquisition of a 12.65-acre site located on the south side of Ventura Avenue between Ninth Street and Tenth Street. The northern portion of the site previously housed the former Fresno County Juvenile Hall and Court, and the southern portion of the site housed County offices. The existing site includes nine buildings (total of 182,005 square feet), a fence athletic/recreation yard, asphalt-paved parking areas, a vacant unpaved area at the southwest portion of the site, and landscaping.

The Project entails the demolition of five existing buildings at the site (total of 135,605 square feet), predominantly the Juvenile Hall and Juvenile Court buildings located on the northern portion of the property. The Project also includes the development and operation of a new alternative education campus, as well as operation of District-level administrative offices in the existing office buildings, which would function separately from the proposed campus.

The proposed alternative education campus includes construction of eight new buildings (67,850 square feet) within the northern portion of the site. The proposed facilities and programs at the campus include a career technical education program (CTE), a continuation school, independent study, Educational Resource Center (ERC), E-Learn academy, a health building, a cafeteria/student union building, an early learning center, hardcourt recreation areas, and parking areas. The entire campus is anticipated to include 44 classrooms.

The alternative education campus would serve up to 1,180 students in grades 9-12 and include an early learning center which is expected to serve 60 pre-K students. Not all students would be on the site at one time as student instruction would be provided through a combination of conventional classroom settings and alternative settings where students spend less time physically present at the campus (e.g. independent study, E-Learn). The campus would have up to 103 employees, including administrators, faculty, and support staff. The maximum number of students and employees on the campus at one time is estimated to be 930. Therefore, for purposes of this study, the maximum number of students assumed to be on campus at one time is 827 students (930 total – 103 staff = 827 students). Most of the activity of the campus would take place during the day with some limited evening activities.

The proposed administrative offices would utilize four existing buildings (total of 46,400 square feet) located in the southern portion of the site. The buildings would house up to 165 employees and operate year-round.

Project Access

Based on information provided by the District, access to and from the Project site will be limited to the west side of Tenth Street. As the number and approximate locations of the access point(s) is unknown, it is recommended that they be placed in line with existing roadways connected to the east, or be offset by at least 125 feet from the roadways connecting to the east side of Tenth Street. Also, it is possible that the Project will have a limited or emergency access located along the east side of Ninth Street. By implementing the recommendation presented above, the Project driveway(s) will be located at points that minimize traffic operational impacts to the existing roadway network.

Trip Generation

Trip generation rates for the proposed Project were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). Table III presents the trip generation for the proposed Project with trip generation rates for Elementary School, High School and School District Office. At buildout, the proposed Project is estimated to generate a maximum of 2,459 daily trips, 580 AM peak hour trips and 221 PM peak hour trips. However, trip generation for the High School land use was reduced to account for the fact that nearly 51 percent of currently enrolled students at Cambridge High School, George M. DeWolf High School, and J.E. Young Academic Center use public transit as their primary source of transportation to and from school.

Table III: Proposed Project Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM (7-9) Peak Hour						PM (4-6) Peak Hour					
			Rate	Total	Trip Rate	In %	Out %	In	Out	Total	Trip Rate	In %	Out %	In	Out	Total
Elementary School (520)	60	students	1.89	113	0.67	54	46	22	18	40	0.17	48	52	5	5	10
High School (530)	827	students	2.03	1,679	0.52	67	33	288	142	430	0.14	48	52	56	60	116
School District Office (538)	46.400	k.s.f.	14.37	667	2.36	76	24	84	26	110	2.04	17	83	16	79	95
Total Project Trips				**2,459**				**394**	**186**	**580**				**77**	**144**	**221**

Note: k.s.f. = Thousand Square Feet

Trip Distribution

The trip distribution assumptions were developed based on existing travel patterns, the Fresno COG Project Select Zones, the existing roadway network, engineering judgment, data provided by the District, knowledge of the study area, existing residential and commercial densities, and the City of Fresno 2035 General Plan Circulation Element in the vicinity of the Project. Trip distribution percentages for the High School land use were developed based on the existing student attendance to the Cambridge High School, George M. DeWolf High School, and J.E. Young Academic Center. Figure 3 illustrates the Project Only Trips to the study intersections.

Bikeways

Currently, Class II Bike Lanes exist in the vicinity of the proposed Project site along Orange Avenue, Cedar Avenue and Ventura Avenue. The City of Fresno “Active Transportation Plan” recommends that Class II Bike Lanes be implemented on: 1) Orange Avenue south of Ventura Avenue, 2) Cedar Avenue and 3) Butler Avenue. Therefore, it is recommended that the Project retain the Class II Bike Lane along its frontage to Ventura Avenue.

Walkways

Currently, walkways exist in the vicinity of the proposed Project site along Orange Avenue, Ninth Street, Tenth Street, Cedar Avenue, Ventura Avenue and Butler Avenue. The City of Fresno “Active Transportation Plan” recommends that walkways be implemented on: 1) Orange Avenue, 2) Ninth Street, 3) Tenth Street, 4) Cedar Avenue, and 5) Butler Avenue. Furthermore, the City of Fresno “Active Transportation Plan” recognizes that Ventura Avenue west of Cedar Avenue is an area with high pedestrian activity and that areas of Ventura Avenue west of Cedar Avenue, Cedar Avenue south of Ventura Avenue and Butler Avenue are areas with high frequency of pedestrian collisions. It is recommended that the Project retain the existing walkways that are in a good state and ADA compliant along its frontages to Ventura Avenue, Ninth Street, Lane Avenue and Tenth Street. Any gaps shall be filled and the Project shall reconstruct walkways where needed to conform to current ADA guidelines.

Transit

Fresno Area Express (FAX) is the transit operator in the City of Fresno. At present, there are three (3) FAX transit routes that operate in the vicinity of the proposed Project. These include FAX Route 1 Q Bus Rapid Transit (BRT), FAX Route 38 and FAX Route 26. Retention of the existing and expansion of future transit routes is dependent on transit ridership demand and available funding.

FAX Route 1 Q BRT runs on Ventura Avenue approximately 0.31 miles east of the proposed Project. Its nearest stop to the Project is located along the south side of Kings Canyon Road approximately 180 feet east of Cedar Avenue. FAX Route 1 Q BRT operates at 10-minute intervals on weekdays starting at approximately 6:00 AM and ending at 9:00 AM, 15-minute intervals starting at approximately 9:00 AM and ending at approximately 2:35 PM, and 10-minute intervals starting at approximately 2:35 PM and ending at 7:00 PM. This route provides a direct connection to various destinations located along Blackstone Avenue and Ventura Avenue/Kings Canyon Road.

FAX Route 38 runs on Cedar Avenue approximately 0.29 miles east of the proposed Project. Its nearest stop to the Project is located along the east side of Cedar Avenue approximately 75 feet north of Kings Canyon Road. FAX Route 38 operates at 30-minute intervals on weekdays and weekends and provides a direct connection to River Park, West Coast Bible College, Fresno State, Duncan Polytech High, Cedar Clinton Library, McLane High School, Roosevelt High, Fresno Interactive Media, Hinton Center, Edison High, Kearney Palms Shopping Center, and Chukchansi Park.

FAX Route 26 runs on Butler Avenue approximately 0.48 miles southeast of the proposed Project. Its nearest stop to the Project is located along the south side of Butler Avenue approximately 250 feet east of Cedar Avenue. FAX Route 26 operates at 30-minute intervals on weekdays and weekends and provides a direct connection to Bullard High, Hamilton Elementary, Fresno High, Tower District, Fairgrounds, Mosqueda Community Center, Fresno Pacific University, and Fresno Yosemite International Airport.

Vehicle Miles Traveled Evaluation

Senate Bill (SB) 743 (Steinberg 2013) was approved by then Governor Brown on September 27, 2013. SB 743 created a path to revise the definition of transportation impacts according to CEQA. The revised CEQA Guidelines requiring VMT analysis became effective December 28, 2018; however, agencies have until July 1, 2020 to finalize their local guidelines on VMT analysis. Therefore, as agencies finalize their VMT analysis protocol, CEQA transportation impacts are to be determined using LOS of intersections and roadways, which is a measure of congestion. The intent of SB 743 is to align CEQA transportation study methodology with and promote the statewide goals and policies of reducing vehicle miles traveled (VMT) and greenhouse gases (GHG). Three objectives of SB 743 related to development are to reduce GHG, diversify land uses, and focus on creating a multimodal environment. It is hoped that this will spur infill development.

The Technical Advisory on Evaluating Transportation Impacts in CEQA published by the Governor's Office of Planning and Research (OPR) dated December 2018 acknowledges that lead agencies should set criteria and thresholds for VMT and transportation impacts. However, the Technical Advisory provides guidance to residential, office and retail uses, citing these as the most common land uses. Beyond these three land uses, there is no guidance provided for any other land use type. The Technical Advisory also notes that land uses may have a less than significant impact if located within low VMT areas of a region. Screening maps are suggested for this determination.

VMT is simply the product of a number of trips and those trips' lengths. The first step in a VMT analysis is to establish the baseline average VMT, which requires the definition of a region. The Technical Advisory states that existing VMT may be measured at the regional or city level. On the contrary, the Technical Advisory also notes that VMT analyses should not be truncated due to "jurisdictional or other boundaries."

As the Project will be used to serve an expanding student population, it is likely that the Project would not add VMT per capita, or service population to the surrounding area. Additionally, the Project site is located near transit service and pedestrian and bicycle networks. Moreover, the Project will provide transit passes to students and include bicycle parking. Currently, Fresno COG and its member agencies, which include the City of Fresno, have begun the process to develop recommended criteria and thresholds that balance the direction from OPR and the goals of SB 743 with the vision of Fresno and economic development, access to goods and services, and overall quality of life. However, these regional recommended criteria are not anticipated to be completed until mid-2020.

Safe Routes to School

The most direct path to the Project site for students residing on the northwest quadrant of Tenth Street and Ventura Avenue would be to either head south toward Ventura Avenue and then east toward Tenth Street, or head east toward Tenth Street and then south toward Ventura Avenue. Students may utilize any combination of local streets and/or major roadways to arrive at Tenth Street or Ventura Avenue. Major roadways include First Street and Tulare Avenue, which contain a number of signalized intersections with marked crosswalks and pedestrian walkways. The majority of local streets in the area are controlled by a two-way stop with unmarked crosswalks on all approaches and contain pedestrian walkways. Students would meet at the northwest corner of Tenth Street and Ventura Avenue. The intersection of Tenth Street and Ventura Avenue is controlled by a two-way stop along Tenth Street approaches. Additionally, the intersection of Tenth Street and Ventura Avenue contains a high-visibility crosswalk and pedestrian warning signs on the eastbound approach while the remaining approaches contain unmarked crosswalks. Students may proceed to cross Ventura Avenue along the west side of Tenth Street and continue south until reaching the nearest campus entrance.

The most direct path to the Project site for students residing on the northeast quadrant of Tenth Street and Ventura Avenue would be to either head south toward Ventura Avenue and then west toward Tenth Street, or head west toward Tenth Street and then south toward Ventura Avenue. Students may utilize a combination of local streets and major roadways to arrive at either Tenth Street or Ventura Avenue. Students may utilize any combination of local streets and/or major roadways to arrive at Tenth Street or Ventura Avenue. Major roadways include Cedar Avenue and Tulare Avenue, which contain a number of signalized intersections with marked crosswalks and pedestrian walkways. The majority of local streets in the area are controlled by a two-way stop with unmarked crosswalks on all approaches and contain pedestrian walkways. Students would meet at the northeast corner of Tenth Street and Ventura Avenue. The intersection of Tenth Street and Ventura Avenue is controlled by a two-way stop along Tenth Street approaches. Additionally, the intersection of Tenth Street and Ventura Avenue contains a high-visibility crosswalk and pedestrian warning signs on the eastbound approach while the remaining approaches contain unmarked crosswalks. Students may proceed to cross Tenth Street along the north side of Ventura Avenue and then cross Ventura Avenue along the west side of Tenth Street. Students may then continue south until reaching the nearest campus entrance.

The most direct path to the Project site for students residing directly to the east between Ventura Avenue and Lane Avenue would be to head west toward Tenth Street. Students may utilize the local streets in the area to arrive at any intersection along Tenth Street between Ventura Avenue and Lane Avenue. The intersections on Tenth Street between Ventura Avenue and Lane Avenue are controlled by one-way stops on the intersecting street and contain unmarked crosswalks on all approaches. Students may cross Tenth Street and continue either north or south until reaching the nearest campus entrance.

The most direct path to the Project site for students residing directly to the east of Cedar Avenue between Kings Canyon Road and Lane Avenue would be to head west toward Cedar Avenue. Depending on their location, students may either head toward the intersection of Cedar Avenue and Ventura Avenue or Cedar Avenue and Lane Avenue. The intersection of Cedar Avenue and Ventura Avenue is signalized and contains marked crosswalks on all approaches. The intersection of Cedar Avenue and Lane Avenue is controlled by a two-way stop and contains unmarked crosswalks on all approaches. Students may proceed to cross Cedar Avenue along the south side of Ventura Avenue and continue west toward the intersection of Tenth Street and Ventura Avenue, or along the north side of Lane Avenue and proceed west toward the intersection of Tenth Street and Lane Avenue. The intersection of Tenth Street and Ventura Avenue is controlled by a two-way stop along Tenth Street approaches. Additionally, the intersection of Tenth Street and Ventura Avenue contains a high-visibility crosswalk and pedestrian warning signs on the eastbound approach while the remaining approaches contain unmarked crosswalks. Students may proceed to cross Tenth Street along the south side of Ventura Avenue continue south until reaching the nearest campus entrance. The intersection of Tenth Street and Lane Avenue is controlled by a two-way stop along Lane Avenue approaches and contains unmarked crosswalks on all approaches. Students may proceed to cross Tenth Street along the north side of Lane Avenue continue north until reaching the nearest campus entrance.

The most direct path to the Project site for students residing on the southeast quadrant of Tenth Street and Lane Avenue would be to either head north toward Lane Avenue and the west toward Tenth Street, or head west toward Tenth Street and then north toward Lane Avenue. Students may utilize a combination of local streets and major roadways to arrive at either Tenth Street or Lane Avenue. Major roadways include Cedar Avenue and Butler Avenue, which contain a number of signalized intersections with marked crosswalks and pedestrian walkways. The majority of local streets in the area are controlled by a two-way stop with unmarked crosswalks on all approaches and contain pedestrian walkways. Students would meet at the southeast corner of Tenth Street and Lane Avenue. The intersection of Tenth Street and Lane Avenue is controlled by a two-way stop along Lane Avenue approaches and contains unmarked crosswalks on all approaches. Students may proceed to cross Tenth Street along the south side of Lane Avenue and then cross Lane Avenue along the west side of Tenth Street and continue north until reaching the nearest campus entrance.

The most direct path to the Project site for students residing directly to the east of Cedar Avenue between Lane Avenue and Butler Avenue would be to head west toward Cedar Avenue. Depending on their location, students may either head toward the intersection of Cedar Avenue and Lane Avenue or Cedar Avenue and Butler Avenue. The intersection of Cedar Avenue and Lane Avenue is controlled by a two-way stop and contains unmarked crosswalks on all approaches. The intersection of Cedar Avenue and Butler Avenue is signalized and contains marked crosswalks on all approaches. Students may proceed to cross Cedar Avenue along the south side of Lane Avenue and continue west toward the intersection of Tenth Street and Lane Avenue, or along the north side of Butler Avenue and continue west toward the intersection of Tenth Street and Butler Avenue. The intersection of Tenth Street and Butler Avenue is controlled by a one-way stop on Tenth Street and contains unmarked crosswalks on all approaches. Students may continue north toward the intersection of Tenth Street and Lane Avenue. The intersection of Tenth Street and Lane Avenue is controlled by a two-way stop along Lane Avenue approaches and contains unmarked crosswalks on all approaches. Students may proceed to cross Tenth Street along the south side of Lane Avenue and then cross Lane Avenue along the west side of Tenth Street and continue north until reaching the nearest campus entrance.

The most direct path to the Project site for students residing on the southwest quadrant of Tenth Street and Lane Avenue would be to either head north toward Lane Avenue and the east toward Tenth Street, or head east toward Tenth Street and then north toward Lane Avenue. Students may utilize a combination of local streets and major roadways to arrive at either Tenth Street or Lane Avenue. Major roadways include Orange Avenue and Butler Avenue, which contain a number of signalized intersections with marked crosswalks and pedestrian walkways. The majority of local streets in the area are controlled by a two-way stop with unmarked crosswalks on all approaches and contain pedestrian walkways. Students would meet at the southwest corner of Tenth Street and Lane Avenue. The intersection of Tenth Street and Lane Avenue is controlled by a two-way stop along Lane Avenue approaches and contain unmarked crosswalks on all approaches. Students may proceed to cross Lane Avenue along the west side of Tenth Street and continue north until reaching the nearest campus entrance.

The most direct path to the Project site for students residing directly to the west between Ventura Avenue and Lowe Avenue would be to head east toward Ninth Street and then north toward Ventura Avenue or south toward Lowe Avenue. Students may utilize the local streets in the area to arrive at the intersection of Ninth Street and Ventura Avenue or Ninth Street and Lowe Avenue. The intersection of Ninth Street and Ventura Avenue is controlled by a one-way stop on Ninth Street and contains unmarked crosswalks on all approaches. Students may proceed to cross Ninth Street along the south side of Ventura Avenue and continue east toward the intersection of Tenth Street and Ventura Avenue. The intersection of Tenth Street and Ventura Avenue is controlled by a two-way stop along Tenth Street approaches. Additionally, the intersection of Tenth Street and Ventura Avenue contains a high-visibility crosswalk and pedestrian warning signs on the eastbound approach while the remaining approaches contain unmarked crosswalks. Students may continue south until reaching the nearest campus entrance. The intersection of Ninth Street and Lowe Avenue is controlled by a one-way stop on Ninth Street and contains unmarked crosswalks on all approaches. Students may proceed to cross Ninth Street along the north side of Lowe Avenue and continue east toward the intersection of Tenth Street and Lowe Avenue. The intersection of Tenth Street and Lowe Avenue is controlled by two-way stop on Lowe Avenue approaches and contains unmarked crosswalks on all approaches. Students may continue north toward the intersection of Tenth Street and Lane Avenue. The intersection of Tenth Street and Lane Avenue is controlled by a two-way stop along Lane Avenue approaches and contains unmarked crosswalks on all approaches. Students may proceed to cross Lane Avenue along the west side of Tenth Street and continue north until reaching the nearest campus entrance.

Most of the areas are well-developed with walkways and intersection controls, but there are a few exceptions. Therefore, it is recommended that the District work with the City of Fresno to implement a Safe Routes to School plan and seek grant funding to help build walkways where they are lacking within a one-mile radius of the proposed Project site. It is also recommended that the Project prepare a school signage and striping plan in the vicinity of the Project, that these be reviewed and approved by the City of Fresno, and subsequently implemented prior to opening day of the school component of the Project.

Soil Removal Action Evaluation

Soil on the site was tested and analyzed under the oversite of the Department of Toxic Substances Control as required by the California Education Code. This process determined that approximately 6,600 cubic yards of contaminated soil will need to be removed from the site. It is estimated that up to 500 truck trips will be required to transport the contaminated soil to a disposal facility, which will require 25 trucks making two (2) trips per day for 10 working days. The removal of the soil is planned to occur during the fall of 2019.

If the soil is determined to be non-hazardous waste, it will likely be disposed of at the Waste Connections, Inc. Avenal Disposal Site located at 201 Hydril Road, Avenal, California, 93204. If the soil is determined to be hazardous waste, it will likely be disposed of at the Clean Harbors Buttonwillow Landfill located at 2500 West Lokern Road, Buttonwillow, California, 93206, or at the Chemical Waste Management Disposal Site located at 35251 Old Skyline Road, Kettleman City, California, 93239.

This TIA indicates that under the Existing Traffic Conditions scenario, all study intersections operate at an acceptable LOS. Given the limited number and duration of the truck trips, the removal action would not be considered significant in relation to potential degradation of the surrounding roadway network. However, since the existing PM peak hour traffic at Tenth Street and Ventura Avenue is operating at LOS D, it is recommended that the trucks not run during the period between 4 to 6 PM and that working days do not coincide with the Big Fresno Fair located approximately 0.4 miles to the east of the proposed Project and scheduled from October 2-14, 2019.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing plus Project Traffic Conditions scenario. These warrants are found in Appendix K. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized study intersections are projected to satisfy the peak hour signal warrant during either peak period.

Results of Existing plus Project Level of Service Analysis

The Existing plus Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figure 4 illustrates the Existing plus Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Existing plus Project Traffic Conditions scenario are provided in Appendix G. Table IV presents a summary of the Existing plus Project peak hour LOS at the study intersections.

Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the Project is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 86.4 sec/veh (LOS F) during the AM peak period and 69.1 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five (5) seconds would be considered a direct impact. Therefore, to improve the LOS at this intersection, it is recommended that the following improvements be implemented.

- Tenth Street / Ventura Avenue
  - Signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.
  - Include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg.

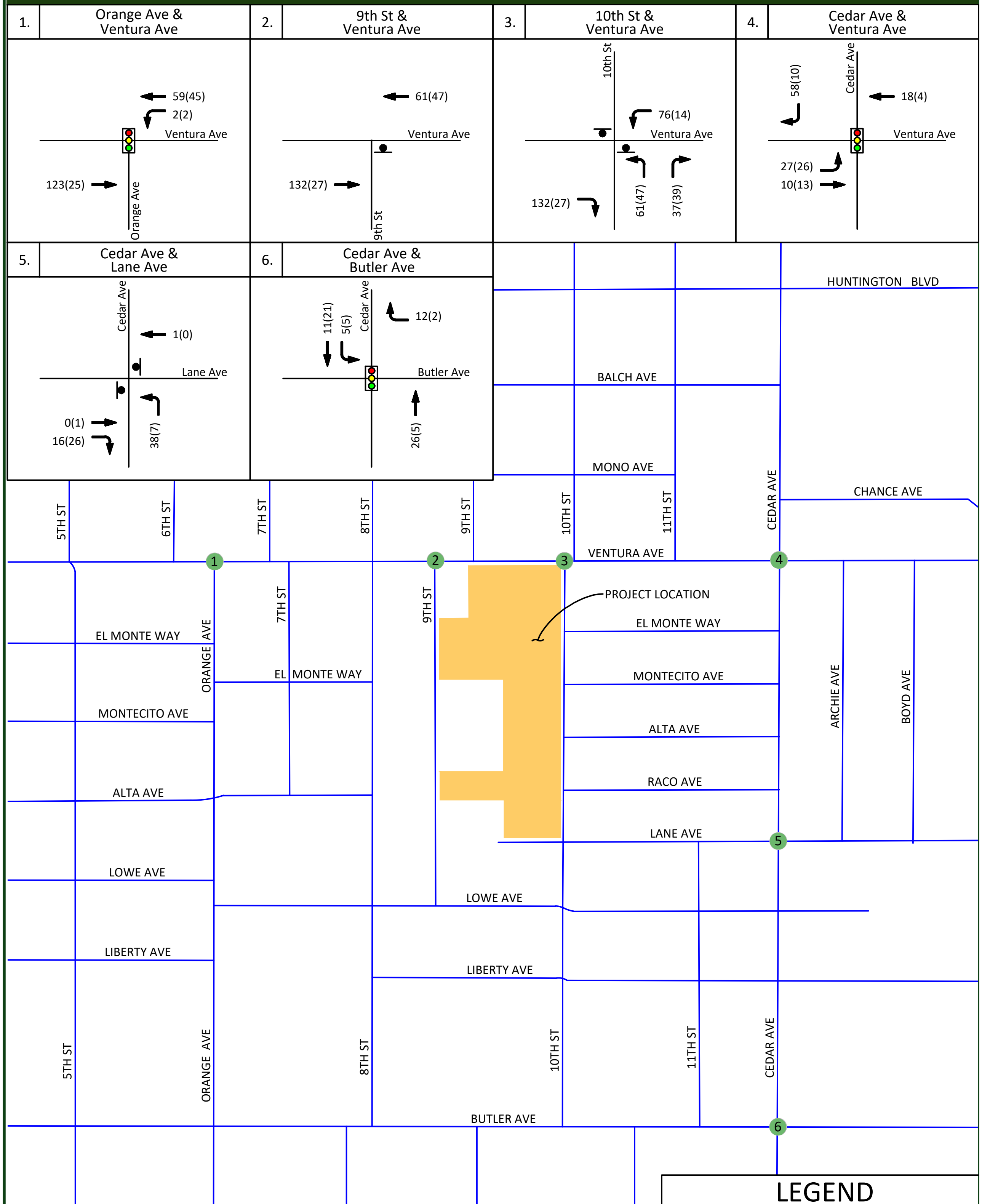
Table IV: Existing plus Project Intersection LOS Results

ID	*Intersection*	*Intersection Control*	*AM (7-9) Peak Hour*		*PM (4-6) Peak Hour*	
			Average Delay (sec/veh)	*LOS*	*Average Delay (sec/veh)*	*LOS*
1	Orange Avenue / Ventura Avenue	Signalized	8.4	A	9.2	A
2	Ninth Street / Ventura Avenue	One-Way Stop	17.1	C	25.4	D
3	Tenth Street / Ventura Avenue	Two-Way Stop	86.4	F	69.1	F
		Signalized (Improved)	16.7	B	11.6	B
4	Cedar Avenue / Ventura Avenue	Signalized	30.2	C	29.1	C
5	Cedar Avenue / Lane Avenue	Two-Way Stop	14.6	B	13.8	B
6	Cedar Avenue / Butler Avenue	Signalized	11.6	B	9.0	A

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

FUSD Alternative Education Campus - City of Fresno
Project Only Trips

Figure 3



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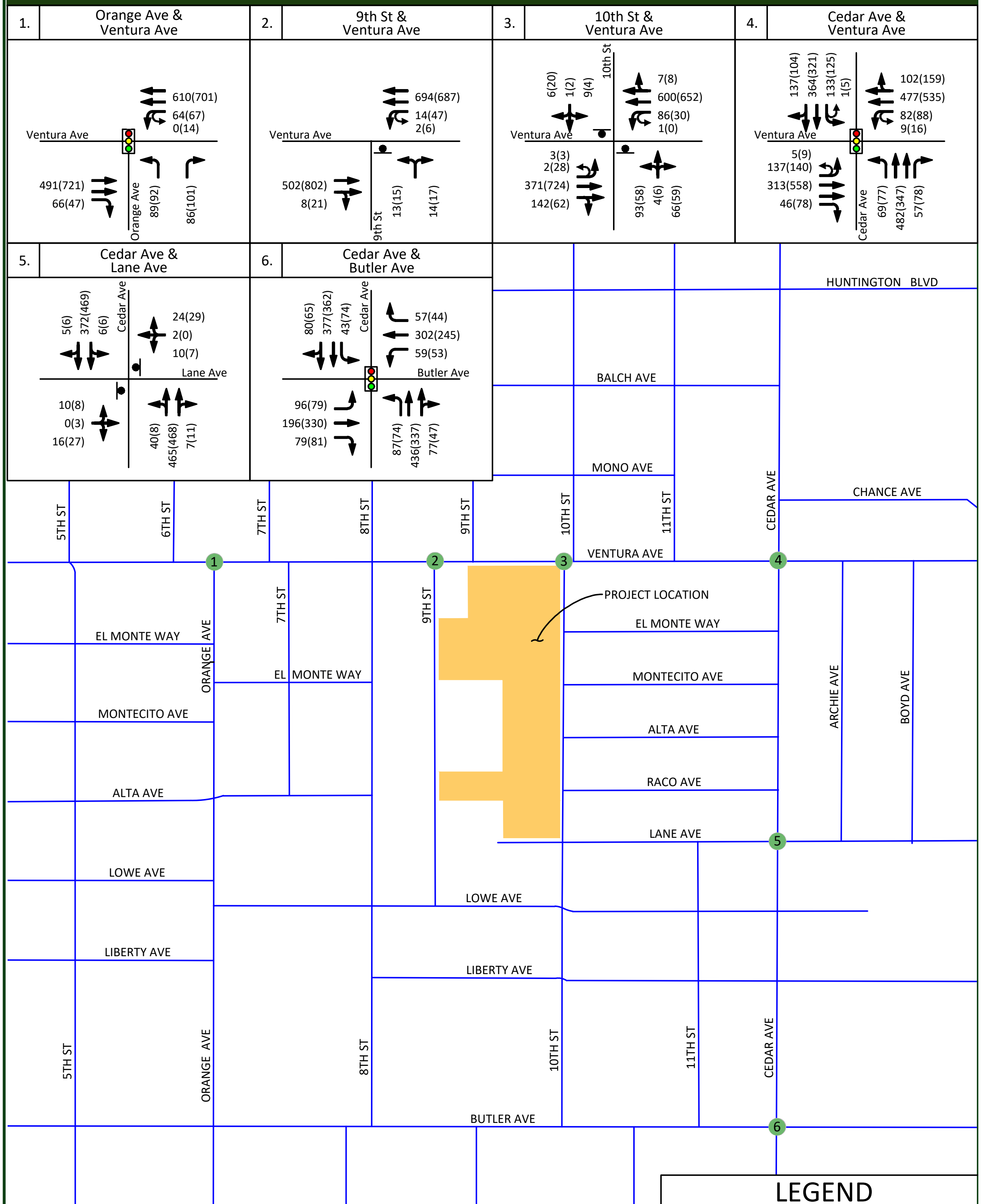
FUSD Alternative Education Campus - City of Fresno
Existing plus Project - Traffic Volumes, Geometrics and Controls

Figure 4



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Near Term plus Project Traffic Conditions

Description of Approved and Pipeline Projects

Approved and Pipeline Projects consist of developments that are either under construction, built but not fully occupied, are not built but have final site development review (SDR) approval, or for which the lead agency or responsible agencies have knowledge of. The City of Fresno, County of Fresno and Caltrans staff were consulted throughout the preparation of this TIA regarding approved and/or known projects that could potentially impact the study intersections. JLB staff conducted a reconnaissance of the surrounding area to confirm the Near Term Projects. Subsequently, it was agreed that the project listed in Table V was approved, near approval, or in the pipeline within the proximity of the proposed Project.

The trip generation listed in Table V is that which is anticipated to be added to the streets and highways by this project between the time of the preparation of this report and five years from 2019. As shown in Table V, the total trip generation for the Near Term Project is 1,130 daily trips, 96 AM peak hour trips and 78 PM peak hour trips. Figure 5 illustrates the location of the approved, near approval, or pipeline project and their combined trip assignment to the study intersections and segments under the Near Term plus Project Traffic Conditions scenario.

Table V: Near Term Projects' Trip Generation

Approved Project Location	*Approved or Pipeline Project Name*	*Daily Trips*	*AM Peak Hour*	*PM Peak Hour*
A	Taco Bell[1]	1,130	96	78
Total Approved and Pipeline Project Trips		**1,130**	**96**	**78**

Note: 1 = Trip Generation prepared by JLB Traffic Engineering, Inc. based on readily available information

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Near Term plus Project Traffic Conditions scenario. These warrants are found in Appendix K. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized study intersections are projected to satisfy the peak hour signal warrant during either peak period.

Results of Near Term plus Project Level of Service Analysis

The Near Term plus Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figure 6 illustrates the Near Term plus Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Near Term plus Project Traffic Conditions scenario are provided in Appendix H. Table VI presents a summary of the Near Term plus Project peak hour LOS at the study intersections.

Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the Project coupled with the Near Term Project is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 97.9 sec/veh (LOS F) during the AM peak period and 72.9 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five (5) seconds would be considered a cumulative impact. Therefore, to improve the LOS at this intersection, it is recommended that the following improvements be implemented.

- Tenth Street / Ventura Avenue
  - Signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.
  - Include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg.

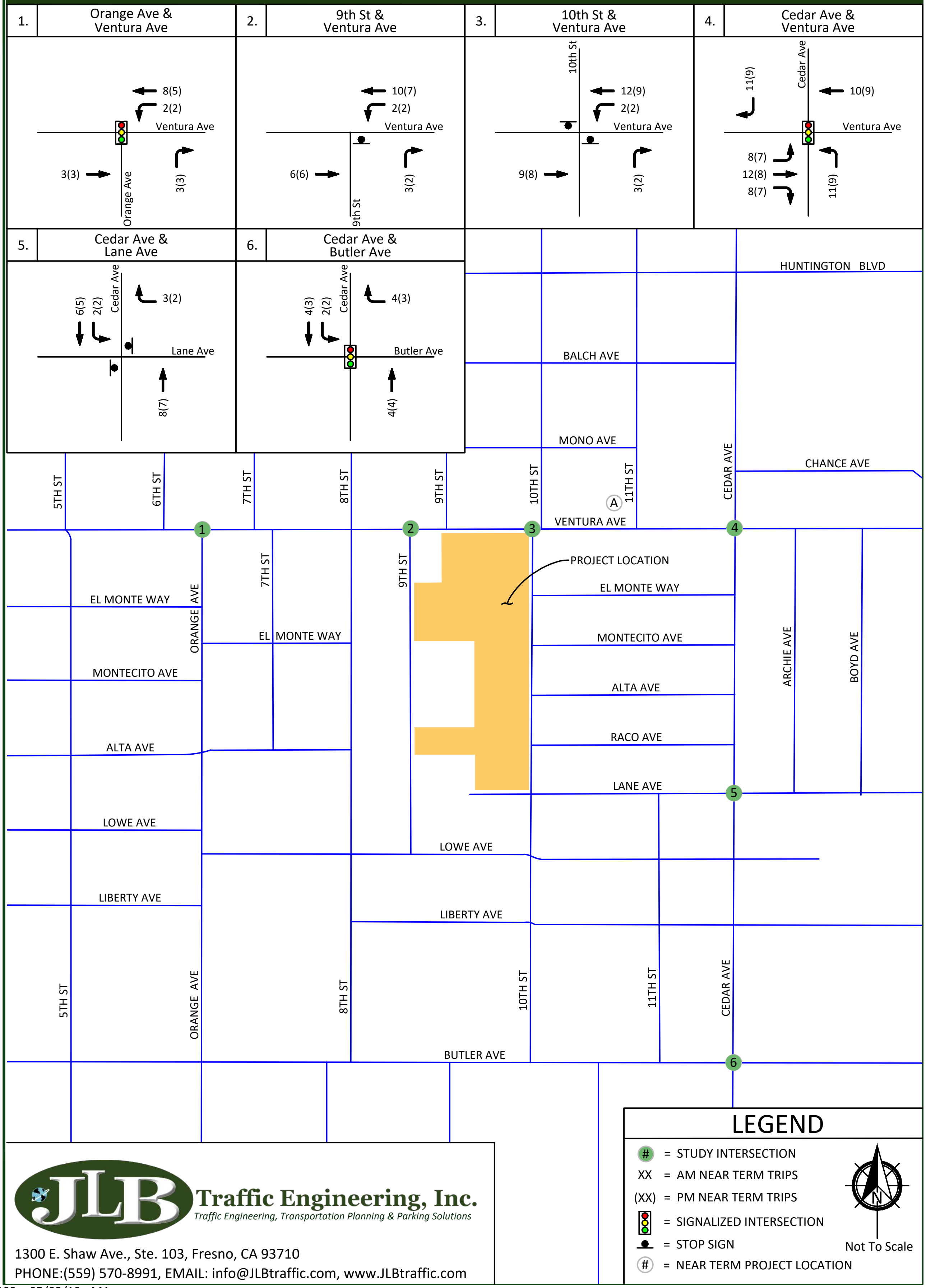
Table VI: Near Term plus Project Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Orange Avenue / Ventura Avenue	Signalized	8.5	A	9.2	A
2	Ninth Street / Ventura Avenue	One-Way Stop	16.8	C	25.3	D
3	Tenth Street / Ventura Avenue	Two-Way Stop	97.9	F	72.9	F
		Signalized (Improved)	17.2	B	11.9	B
4	Cedar Avenue / Ventura Avenue	Signalized	30.8	C	30.5	C
5	Cedar Avenue / Lane Avenue	Two-Way Stop	14.6	B	13.9	B
6	Cedar Avenue / Butler Avenue	Signalized	9.4	A	8.5	A

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

FUSD Alternative Education Campus - City of Fresno
Near Term Projects' Trip Assignment

Figure 5



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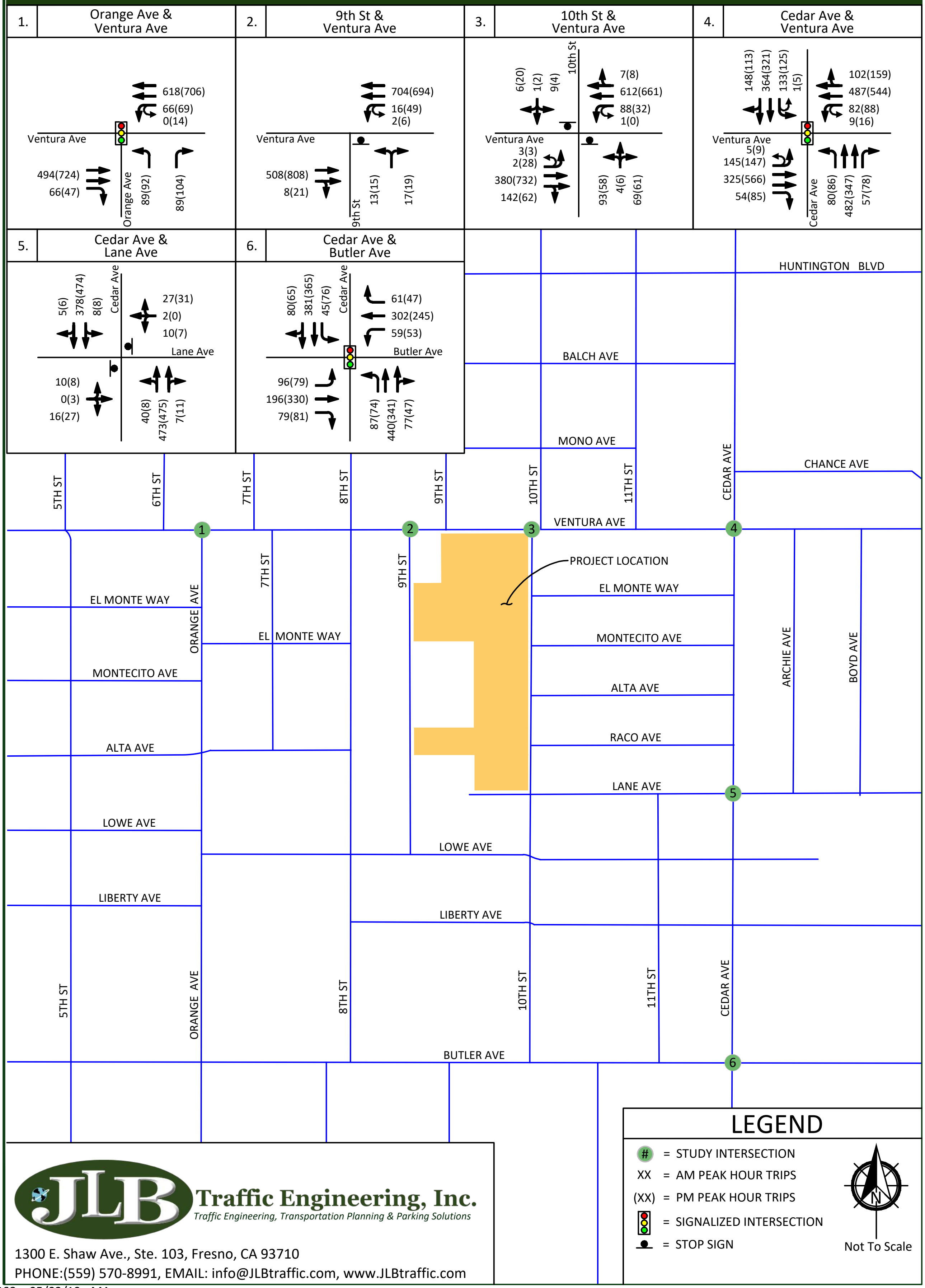
FUSD Alternative Education Campus - City of Fresno
Near Term plus Project - Traffic Volumes, Geometrics and Controls

Figure 6



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Cumulative Year 2035 No Project Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2035 No Project Traffic Conditions scenario. These warrants are found in Appendix K. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized study intersections are projected to satisfy the peak hour signal warrant during either peak period.

Results of Cumulative Year 2035 No Project Level of Service Analysis

The Cumulative Year 2035 No Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figure 7 illustrates the Cumulative Year 2035 No Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Cumulative Year 2035 plus Project Traffic Conditions scenario are provided in Appendix I. Table VII presents a summary of the Cumulative Year 2035 No Project peak hour LOS at the study intersections.

Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, background growth in traffic is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 27.8 sec/veh (LOS D) during the PM peak period to 60.3 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, it may want to consider changing the traffic controls of this intersection to improve traffic operations and LOS. One option for the City's consideration to improve LOS at this intersection is to signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.

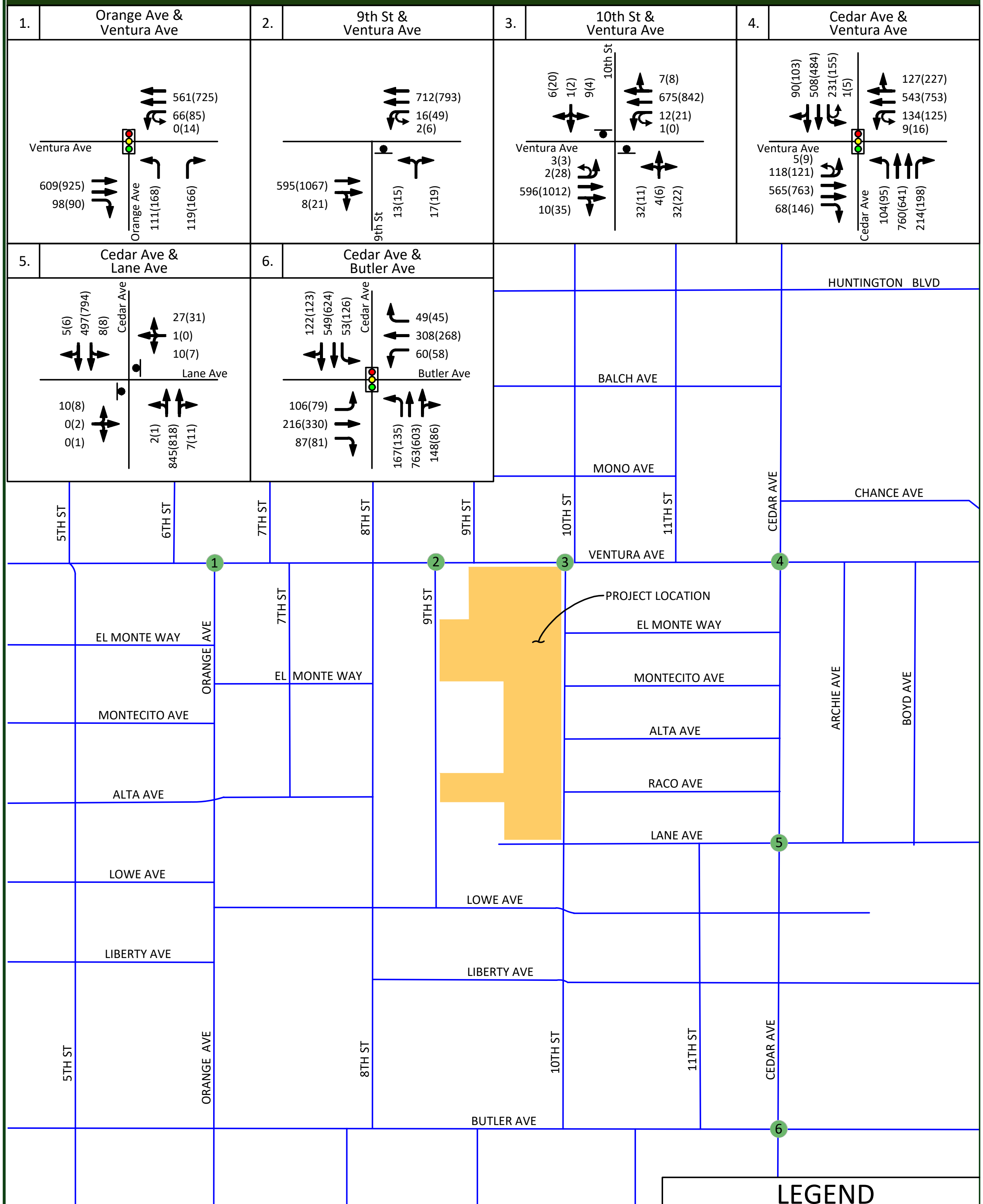
Table VII: Cumulative Year 2035 No Project Intersection LOS Results

ID	*Intersection*	*Intersection Control*	*AM (7-9) Peak Hour*		*PM (4-6) Peak Hour*	
			Average Delay (sec/veh)	*LOS*	*Average Delay (sec/veh)*	*LOS*
1	Orange Avenue / Ventura Avenue	Signalized	9.3	A	12.5	B
2	Ninth Street / Ventura Avenue	One-Way Stop	17.8	C	41.7	E
3	Tenth Street / Ventura Avenue	Two-Way Stop	28.4	D	60.3	F
		Signalized (Improved)	9.0	A	10.9	B
4	Cedar Avenue / Ventura Avenue	Signalized	47.4	D	49.0	D
5	Cedar Avenue / Lane Avenue	Two-Way Stop	29.0	D	44.9	E
6	Cedar Avenue / Butler Avenue	Signalized	11.3	B	10.4	B

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls.
LOS for two-way STOP controlled intersections are based on the worst approach/movement of the minor street.

FUSD Alternative Education Campus - City of Fresno — Figure 7

Cumulative Year 2035 No Project - Traffic Volumes, Geometrics and Controls



LEGEND

- # = STUDY INTERSECTION
- XX = AM PEAK HOUR TRIPS
- (XX) = PM PEAK HOUR TRIPS
- = SIGNALIZED INTERSECTION
- = STOP SIGN

Not To Scale

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Cumulative Year 2035 plus Project Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2035 plus Project Traffic Conditions scenario. These warrants are found in Appendix K. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized study intersections are projected to satisfy the peak hour signal warrant during either peak period.

Results of Cumulative Year 2035 plus Project Level of Service Analysis

The Cumulative Year 2035 plus Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figure 8 illustrates the Cumulative Year 2035 plus Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Cumulative Year 2035 plus Project Traffic Conditions scenario are provided in Appendix J. Table VIII presents a summary of the Cumulative Year 2035 plus Project peak hour LOS at the study intersections.

Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the Project coupled with background growth in traffic is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 269.3 sec/veh (LOS F) during the AM peak period and 359.0 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five (5) seconds would be considered a cumulative impact. Therefore, to improve the LOS at this intersection, it is recommended that the following improvements be implemented.

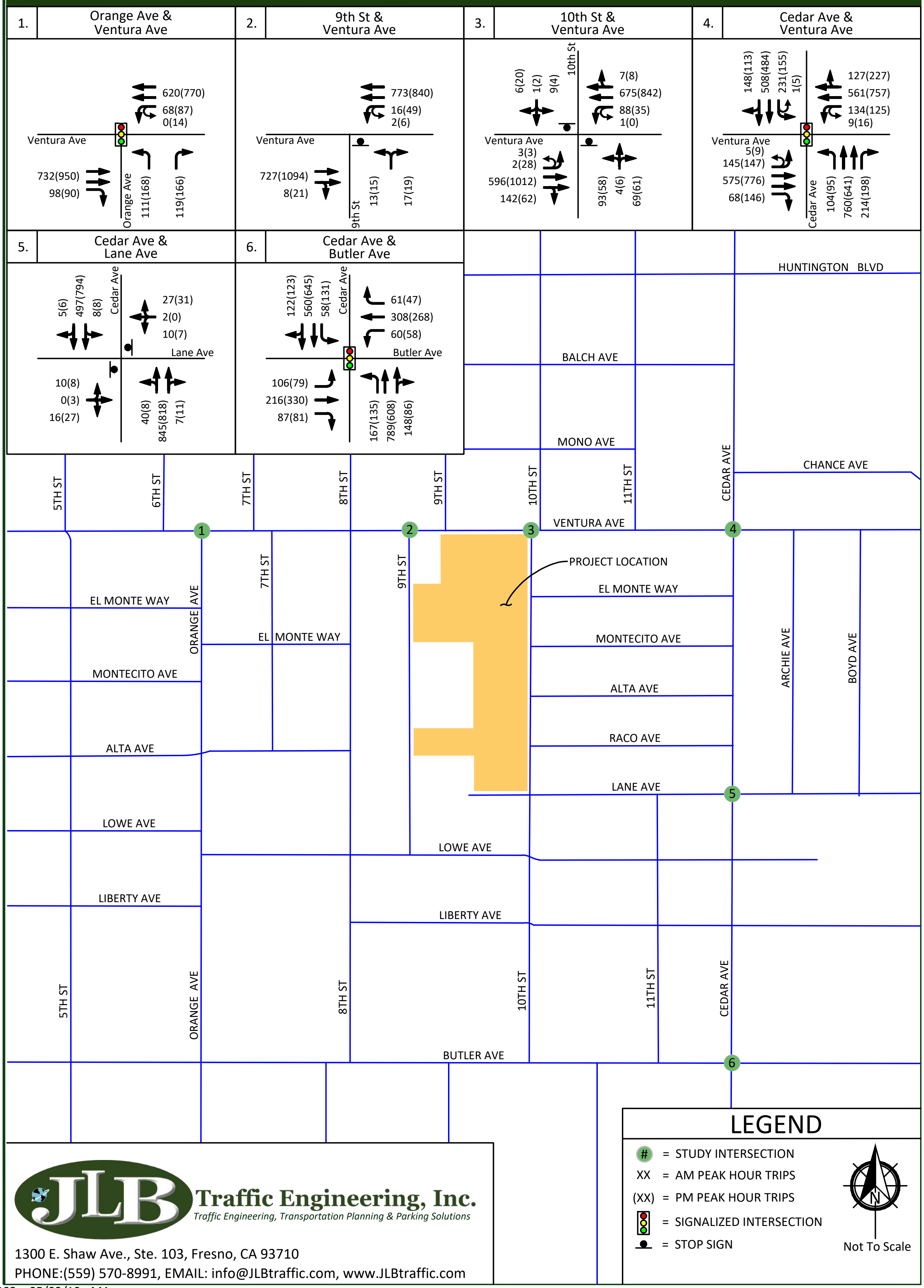
- Tenth Street / Ventura Avenue
    - Signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.
    - Include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg.

Table VIII: Cumulative Year 2035 plus Project Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Orange Avenue / Ventura Avenue	Signalized	9.9	A	12.9	B
2	Ninth Street / Ventura Avenue	One-Way Stop	21.7	C	45.7	E
3	Tenth Street / Ventura Avenue	Two-Way Stop	269.3	F	359.0	F
		Signalized (Improved)	17.9	B	14.6	B
4	Cedar Avenue / Ventura Avenue	Signalized	44.7	D	37.6	D
5	Cedar Avenue / Lane Avenue	Two-Way Stop	25.9	D	25.1	D
6	Cedar Avenue / Butler Avenue	Signalized	11.4	B	10.5	B

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls.
LOS for two-way STOP controlled intersections are based on the worst approach/movement of the minor street.

FUSD Alternative Education Campus - City of Fresno — Figure 8
Cumulative Year 2035 plus Project - Traffic Volumes, Geometrics and Controls



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004-068 - 05/02/19 - MA

Queuing Analysis

Table IX provides a queue length summary for left-turn and right-turn lanes at the study intersections under all study scenarios. The queuing analyses for the study intersections are contained in the LOS worksheets for the respective scenarios. Appendix D contains the methodologies used to evaluate these intersections. Queuing analyses were completed using Sim Traffic output information. Synchro provides both 50th and 95th percentile maximum queue lengths (in feet). According to the Synchro manual, "the 50th percentile maximum queue is the maximum back of queue on a typical cycle and the 95th percentile queue is the maximum back of queue with 95th percentile volumes." The queues shown on Table IX are the 95th percentile queue lengths for the respective lane movements.

The *Highway Design Manual* (HDM) provides guidance for determining deceleration lengths for the left-turn and right-turn lanes based on design speeds. Per the HDM criteria, "tapers for right-turn lanes are usually un-necessary since the main line traffic need not be shifted laterally to provide space for the right-turn lane. If, in some rare instances, a lateral shift were needed, the approach taper would use the same formula as for a left-turn lane." Therefore, a bay taper length pursuant to the Caltrans HDM would need to be added, as necessary, to the recommended storage lengths presented in Table IX.

Based on the SimTraffic output files and engineering judgement, it is recommended that the storage capacity for the following be considered for the Cumulative Year 2035 plus Project Traffic Conditions. At the remaining approaches of the study intersections, the existing storage capacity will be sufficient to accommodate the maximum queue.

- Orange Avenue / Ventura Avenue
  - Consider increasing the storage capacity of the eastbound right-turn lane to 125 feet.
  - Consider increasing the storage capacity of the northbound right-turn lane to 150 feet.
- Cedar Avenue / Ventura Avenue
  - The existing storage capacity of the eastbound left-turn lane is projected to exceed that available for both peak periods in the Cumulative Year 2035 plus Project Traffic Conditions scenario. However, increasing the storage capacity of this movement is not possible without impacting the westbound left-turn lane immediately to the west at the intersection of Eleventh Street and Ventura Avenue. Therefore, this cumulative impact is considered adverse but not significant.
  - Consider increasing the storage capacity of the eastbound right-turn lane to 225 feet.
  - The existing storage capacity of the northbound left-turn lane is projected to exceed that available for both peak periods in the Cumulative Year 2035 plus Project Traffic Conditions scenario. However, increasing the storage capacity of this movement is not possible without prohibiting curbside parking along the east side of Cedar Avenue and eliminating the Class II bike lane along the west side of Cedar Avenue adjacent to the left-turn pocket and transition thereof. Therefore, it is recommended that this movement be monitored before increasing the storage capacity of this movement.

  - The existing storage capacity of the northbound right-turn lane is projected to exceed that available for both peaks in the Cumulative Year 2035 plus Project Traffic Conditions scenario. However, increasing the storage capacity of this movement is not possible without prohibiting curbside parking along the east side of Cedar Avenue adjacent to the right-turn lane. Therefore, it is recommended that this movement be monitored before increasing the storage capacity of this movement.
  - The existing storage capacity of the southbound left-turn lane is projected to exceed that available for both peaks in the Cumulative Year 2035 plus Project Traffic Conditions scenario. However, increasing the storage capacity of this movement is not possible without impacting the southbound left-turn lane immediately to the north at the intersection of Cedar Avenue and Chance Avenue. Therefore, this cumulative impact is considered adverse but not significant.
- Cedar Avenue / Butler Avenue
  - Consider increasing the storage capacity of the eastbound left-turn lane to 150 feet.
  - Consider increasing the storage capacity of the eastbound right-turn lane to 150 feet. Doing so requires that curbside parking along the south side of Butler Avenue adjacent to the right-turn lane be prohibited.
  - Consider increasing the storage capacity of the westbound left-turn lane to 150 feet.
  - The existing storage capacity of the westbound right-turn lane is projected to exceed that available for the PM peak in the Cumulative Year 2035 No Project Traffic Conditions scenario by approximately 30 feet. While there are no constraints to increasing the storage capacity of this movement, it is recommended that this movement be monitored.
  - The existing storage capacity of the northbound left-turn lane is projected to exceed that available for both peak periods in the Cumulative Year 2035 plus Project Traffic Conditions scenario. However, increasing the storage capacity of this movement is not possible without prohibiting curbside parking along the east and west sides of Cedar Avenue adjacent to the left-turn pocket and transition thereof. Therefore, it is recommended that this movement be monitored before increasing the storage capacity of this movement.
  - The existing storage capacity of the southbound left-turn lane is projected to exceed that available for both peak periods in the Cumulative Year 2035 plus Project Traffic Conditions scenario. However, increasing the storage capacity of this movement is not possible without prohibiting curbside parking along the east and west sides of Cedar Avenue adjacent to the left-turn pocket and transition thereof. Therefore, it is recommended that this movement be monitored before increasing the storage capacity of this movement.

Table IX: Queuing Analysis

ID	Intersection	Existing Queue Storage Length (ft.)		Existing		Existing plus Project		Near Term plus Project		Cumulative Year 2035 No Project		Cumulative Year 2035 plus Project	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	Orange Avenue / Ventura Avenue	EB Thru	>150	77	115	94	120	81	146	133	208	123	186
		EB Thru	>150	72	130	115	128	86	153	155	228	134	212
		EB Right	80	51	53	52	39	47	37	99	138	73	113
		WB U-Left	50	84	84	94	97	81	115	94	139	88	129
		WB Thru	>300	118	107	140	108	77	149	71	209	80	142
		WB Thru	>300	140	106	151	127	100	136	95	202	113	149
		NB Left	>300	72	77	69	129	71	108	125	189	63	192
		NB Right	75	44	57	47	86	39	67	61	137	71	143
2	Ninth Street / Ventura Avenue	EB Thru	>300	0	0	0	0	0	0	0	18	0	0
		EB Thru-Right	>300	0	0	0	0	0	0	0	0	0	10
		WB U-Left	125	9	45	26	55	26	44	30	51	23	59
		NB Left-Right	>300	45	61	51	46	47	60	50	57	58	58
3	Tenth Street / Ventura Avenue	EB U-Left	110	11	33	7	52	16	64	27	90	14	68
		EB Thru	>300	24	27	152	254	146	267	116	302	208	273
		EB Thru-Right	>300	0	25	188	257	165	301	136	340	220	309
		WB U-Left	110	6	15	79	25	79	47	11	27	110	83
		WB Thru	>300	6	24	148	74	176	205	133	270	192	210
		WB Thru-Right	>300	9	16	178	88	209	239	124	278	192	237
		NB Left-Thru-Right	>300	51	71	139	123	144	139	96	67	102	173
		SB Left-Thru-Right	>300	40	47	57	49	36	51	57	59	37	45

Note: * = Does not exist or is not projected to exist

Table IX: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Existing		Existing plus Project		Near Term plus Project		Cumulative Year 2035 No Project		Cumulative Year 2035 plus Project	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
4	Cedar Avenue / Ventura Avenue	EB U-Left	200	188	315	181	175	166	193	170	234	216	231
		EB Thru	>300	134	363	140	196	149	195	232	329	258	338
		EB Thru	>300	121	256	144	243	155	208	247	348	249	341
		EB Right	100	59	64	63	124	51	129	159	219	95	210
		WB U-Left	430	104	120	144	126	111	128	209	201	201	183
		WB Thru	>500	151	194	227	230	215	227	247	287	242	326
		WB Thru-Right	>500	173	227	231	242	229	254	257	338	281	361
		NB Left	100	121	92	111	100	86	135	185	153	204	127
		NB Thru	>500	187	95	158	137	156	150	241	231	275	201
		NB Thru	>500	186	124	148	147	152	144	294	218	296	188
		NB Right	55	70	40	34	79	29	53	220	140	232	130
		SB U-Left	175	298	249	150	141	184	165	229	200	320	194
		SB Thru	>500	362	188	154	178	164	180	254	240	409	207
		SB Thru-Right	>500	278	153	164	183	210	219	268	242	314	210
5	Cedar Avenue / Lane Avenue	EB Left-Thru-Right	>300	36	33	44	55	43	50	33	35	49	51
		WB Left-Thru-Right	>300	53	52	45	43	47	51	45	52	51	53
		NB Left-Thru	>300	0	10	30	23	18	27	25	10	34	51
		NB Thru-Right	>300	0	0	7	0	0	14	14	18	28	20
		SB Left-Thru	>300	27	8	10	11	12	29	28	25	17	25
		SB Thru-Right	>300	7	0	22	7	14	0	16	0	27	16
6	Cedar Avenue / Butler Avenue	EB Left	60	98	89	95	82	91	81	146	143	105	147
		EB Thru	>300	100	183	133	178	120	194	207	320	110	353
		EB Right	60	51	91	94	69	48	101	122	139	77	144
		WB Left	100	72	65	72	71	72	67	147	117	69	76
		WB Thru	>300	173	141	154	132	151	100	290	195	177	262
		WB Right	140	81	47	54	46	50	52	169	105	86	117
		NB Left	100	78	78	79	70	98	86	178	139	141	130
		NB Thru	>300	81	73	91	54	86	68	232	159	154	123
		NB Thru-Right	>300	92	82	116	77	93	92	275	195	182	146
		SB Left	75	36	62	49	71	55	84	76	103	102	127
		SB Thru	>300	102	86	95	96	88	125	126	85	153	120
		SB Thru-Right	>300	127	108	125	124	118	147	127	101	176	138

Note: * = Does not exist or is not projected to exist

Project's Pro-Rata Fair Share of Future Transportation Improvements

The Project's fair share percentage impacts 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 X. The Project's fair share percentage impacts were calculated pursuant to the Caltrans Guide for the Preparation of Traffic Impact Studies. The Project's pro-rata fair shares were calculated utilizing the Existing volumes, Project Only Trips, and Cumulative Year 2035 plus Project volumes. Figure 2 illustrates the Existing traffic volumes, Figure 3 illustrates the Project Only Trips, and Figure 8 illustrates the Cumulative Year 2035 plus Project traffic volumes. Since the critical peak period for the study facilities was determined to be during the PM peak, the PM peak volumes are utilized to determine the Project's pro-rata fair share.

It is recommended that the Project contribute its equitable fair share as listed in Table X for 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 satisfy the Project's traffic mitigation measures.

This study does not provide construction costs for the recommended mitigation measures; therefore, if the recommended mitigation measures are implemented, it is recommended that the District work with the City of Fresno to develop the estimated construction cost.

Table X: Project's Fair Share of Future Roadway Improvements

ID	*Intersection*	*Existing Traffic Volumes (PM Peak)*	*Cumulative Year 2035 plus Project Traffic Volumes (PM Peak)*	*Project Only Trips (PM Peak)*	*Project's Fair Share (%)*
2	Tenth Street / Ventura Avenue	1,529	2,141	127	20.75

Note: Project Fair Share = ((Project Only Trips) / (Cumulative Year 2035 + Project Traffic Volumes - Existing Traffic Volumes)) x 100

Conclusions and Recommendations

Conclusions and recommendations regarding the proposed Project are presented below.

Existing Traffic Conditions

- JLB conducted a search of SWITRS and TIMS to review collision reports for the most recent three-year period (January 1, 2015 to December 31, 2017). In the three-year period, a total of six (6) collisions were reported within the influence zone of the existing study intersections. JLB was able to determine that the implementation of protective left-turn phasing at the signalized intersection of Cedar Avenue and Butler Avenue could reduce the number of broadside collisions associated with eastbound and westbound left-turn movements at this intersection. Therefore, it is recommended that the City of Fresno conduct further studies to determine if the implementation of protective left-turn phasing of the intersection of Cedar Avenue and Butler Avenue meets the City's criteria for protective left-turn phasing.
- At present, all study intersections operate at an acceptable LOS during both peak periods.

Existing plus Project Traffic Conditions

- It is recommended that proposed Project driveway(s) be placed in line with existing roadways connected to the east, or be offset by at least 125 feet from the roadways connecting to the east side of Tenth Street. By implementing this recommendation, the Project driveway(s) will be located at points that minimize traffic operational impacts to the existing roadway network.
- At buildout, the proposed Project is estimated to generate a maximum of 2,459 daily trips, 580 AM peak hour trips and 221 PM peak hour trips.
- It is recommended that the Project retain the Class II Bike Lane along its frontage to Ventura Avenue.
- It is recommended that the Project retain the existing walkways that are in a good state and ADA compliant along its frontages to Ventura Avenue, Ninth Street, Lane Avenue and Tenth Street. Any gaps shall be filled and the Project shall reconstruct walkways where needed to conform to current ADA guidelines.
- As the Project will be used to serve an expanding student population, it is likely that the Project would not add VMT per capita, or service population to the surrounding area. Additionally, the Project site is located near transit service and pedestrian and bicycle networks. Moreover, the Project will provide transit passes to students and include bicycle parking.
- It is recommended that the District work with the City of Fresno to implement a Safe Routes to School plan and seek grant funding to help build walkways where they are lacking within a one-mile radius of the proposed Project site.
- It is recommended that the Project prepare a school signage and striping plan in the vicinity of the Project, that these be reviewed and approved by the City of Fresno, and subsequently implemented prior to opening day of the school component of the Project.

- Soil on the site was tested and analyzed under the oversite of the Department of Toxic Substances Control as required by the California Education Code. This process determined that approximately 6,600 cubic yards of contaminated soil will need to be removed from the site. It is estimated that up to 500 truck trips will be required to transport the contaminated soil to a disposal facility, which will require 25 trucks making two (2) trips per day for 10 working days. The removal of the soil is planned to occur during the fall of 2019.
- Since the existing PM peak hour traffic at Tenth Street and Ventura Avenue is operating at LOS D, it is recommended that the trucks not run during the period between 4 to 6 PM and that working days do not coincide with the Big Fresno Fair located approximately 0.4 miles to the east of the proposed Project and scheduled from October 2-14, 2019.
- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the Project is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 86.4 sec/veh (LOS F) during the AM peak period and 69.1 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five (5) seconds would be considered a direct impact. Therefore, to improve the LOS at this intersection, it is recommended that the following improvements be implemented.
  - Tenth Street / Ventura Avenue
    - Signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.
    - Include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg.

Near Term plus Project Traffic Conditions

- The total trip generation for the Near Term Projects is 1,130 daily trips, 96 AM peak hour trips and 78 PM peak hour trips.
- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the Project coupled with the Near Term Project are anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 97.9 sec/veh (LOS F) during the AM peak period and 72.9 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five (5) seconds would be considered a cumulative impact. Therefore, to improve the LOS at this intersection, it is recommended that the following improvements be implemented.
  - Tenth Street / Ventura Avenue
    - Signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.
    - Include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg.

Cumulative Year 2035 No Project Traffic Conditions

- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, background growth in traffic is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 27.8 sec/veh (LOS D) during the PM peak period to 60.3 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, it may want to consider changing the traffic controls of this intersection to improve traffic operations and LOS. One option for the City's consideration to improve LOS at this intersection is to signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.

Cumulative Year 2035 plus Project Traffic Conditions

- Under this scenario, all study intersections are projected to operate at an acceptable LOS during both peak periods. However, the Project coupled with background growth in traffic is anticipated to increase the average delay at the intersection of Tenth Street and Ventura Avenue from 20.7 sec/veh (LOS C) during the AM peak period and 27.8 sec/veh (LOS D) during the PM peak period to 269.3 sec/veh (LOS F) during the AM peak period and 359.0 sec/veh (LOS F) during the PM peak period. While the City of Fresno has accepted LOS F to evaluate the potential significance of LOS impacts to intersections within TIZ I, an increase in delay of more than five (5) seconds would be considered a cumulative impact. Therefore, to improve the LOS at this intersection, it is recommended that the following improvements be implemented.
  - Tenth Street / Ventura Avenue
    - Signalize the intersection with protective left-turn phasing in the eastbound and westbound approaches and split phasing on the northbound and southbound approaches.
    - Include high visibility school crosswalks across the north, west and south legs of the intersection, while prohibiting pedestrians across the east leg.

Queuing Analysis

- It is recommended that the City consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.

Project's Equitable Fair Share

- It is recommended that the Project contribute its equitable fair share as listed in Table X for the existing funding shortfall, if any, to future improvements necessary to maintain an acceptable LOS.

Study Participants

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David Padilla	Caltrans
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3. *Guide for the Preparation of Traffic Impact Studies*, Caltrans, dated December 2002.
4. *Trip Generation,* 10th Edition, Washington D.C., Institute of Transportation Engineers, 2017.
5. *2014 California Manual on Uniform Traffic Control Devices*, Caltrans, November 7, 2014.
6. City of Fresno, *Active Transportation Plan*, December 2016, adopted March 2, 2017.
7. *Technical Advisory on Evaluating Transportation Impacts in CEQA*. Governor's Office of Planning and Research, 2017, *Technical Advisory on Evaluating Transportation Impacts in CEQA*.

Appendix A: Scope of Work

December 14, 2018

Mr. Harmanjit Dhaliwal, P.E.
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Via Email Only: Harmanjit.Dhaliwal@fresno.gov

Subject: Draft Scope of Work for the Preparation of a Traffic Impact Analysis for the proposed Fresno Unified School District Ventura Alternative Education Campus and Administrative Office Project in the City of Fresno (JLB Project 004-068)

Dear Mr. Dhaliwal,

JLB Traffic Engineering, Inc. (JLB) hereby submits this Draft Scope of Work for the preparation of a Traffic Impact Analysis (TIA) for the Fresno Unified School District Ventura Alternative Education Campus and Administrative Office (Project). The Project will be located at the southwest corner of Ventura Avenue and 10th Street in the City of Fresno. An aerial of the project vicinity and the project site is shown in Figure 1. At this point in the planning process for the schools a site plan is not available. The project includes a High School, Preschool and Administrative offices.

The proposed project includes the acquisition of a 12.65-acre project site located on the south side Ventura Avenue between Ninth Street and Tenth Street within the City of Fresno. The northern portion of the site previously housed the former Fresno County Juvenile Hall and Court, and the southern portion of the site housed County offices. The existing site includes nine buildings (total of 182,005 square feet), a fenced athletic/recreation yard, asphalt-paved parking areas, a vacant unpaved area at the southwest portion of the site, and landscaping.

The project entails the demolition of five existing buildings at the site, predominately the Juvenile Hall and Juvenile Court buildings located on the northern portion of the property. The project also includes the development and operation of a new alternative education campus, as well as operation of District-level administrative offices in existing office buildings, which would function separately from the proposed campus. Figure 1 displays which buildings would be demolished and which buildings would be maintained as part of the project.

The proposed alternative education campus includes construction of eight new buildings (67,850 square feet) within the northern portion of the site. The proposed facilities and programs at the campus include a career technical education program (CTE), a continuation school, independent study, Educational Resource Center (ERC), E-Learn academy, a health building, a cafeteria/student union building, an early learning center, hardcourt recreation areas, and parking areas. The entire campus is anticipated to include 44 classrooms.

The alternative education campus would serve up to 1,180 students in grades 9-12 and include an early learning center which is expected to serve 60 pre-K students. Not all students would be on the site at one time as student instruction would be provided through a combination of conventional classroom settings and alternative settings where students spend less time physically present at the campus (e.g. independent study and E-Learn). The campus would have up to 103 employees, including administrators, faculty, and support staff. The maximum number of students and employees on the campus at one time is estimated to be 930. Therefore, for purposes of this study the maximum number of students assumed to be on campus at one time is (930 total - 103 staff = 827 students) 827 students. Most of the activity on the campus would take place during the day with some limited evening activities.

The proposed Fresno Unified administrative offices would utilize four existing buildings (total of 46,400 square feet) located in the southern portion of the project site. The administrative buildings would house up to 165 employees and operate year-round.

Scope of Work

- Request a Fresno Council of Governments (Fresno COG) traffic forecast model run for the project study scenarios. The Fresno COG traffic forecasting model will be used to forecast traffic volumes for the Base Year and Cumulative Year 2035 plus Project scenarios.
- JLB will evaluate existing and forecast levels of service (LOS) at the study intersection(s). JLB will use HCM 6 or HCM 2000 methodologies (as appropriate) within Synchro to perform this analysis for the a.m. and p.m. peak hours. JLB will identify the causes of poor LOS.
- As necessary, obtain recent or schedule and conduct new traffic counts at the study facility (ies).
- Peak hour signal warrants will be prepared for any unsignalized study intersections.
- Perform a site visit to observe existing traffic conditions, especially during the a.m. and p.m. peak hours. Existing roadway conditions, including geometrics and traffic controls, will be verified.
- Forecast trip distribution based on turn count information, input from Fresno COG model, proposed school boundaries, and knowledge of the circulation network in the vicinity of the project.
- JLB will qualitatively analyze existing and planned transit routes in the project's vicinity.
- JLB will qualitatively analyze existing and planned bikeways in the project's vicinity.
- JLB in consultation with Odell Planning & Research will identify the non-busing service boundaries for the elementary and high school students. Using the no busing boundaries, JLB will conduct a qualitative safe routes to school evaluation. The safe routes to school evaluation will be prepared based on information to be provided by the School District, and field surveys to be conducted by JLB. Based on the above information, JLB will provide suggested Safe Routes to School recommendations.
- Prepare the Project's equitable percent fair share of the mitigation measures (if any)

Study Scenarios:

1. Existing traffic conditions with proposed improvement measures (if any);
2. Existing plus Project traffic conditions with proposed mitigation measures (if any);
3. Near Term plus Project (include pending and approved projects) traffic conditions with mitigation measures (if any);
4. Cumulative Year 2035 No Project traffic conditions with proposed improvement measures (if any); and
5. Cumulative Year 2035 plus Project traffic conditions with mitigation measures (if any).

Weekday peak hours to be analyzed:

1. 7-9 a.m. peak hour
2. 4-6 p.m. peak hour

Study Intersections:

1. Ventura Avenue / Orange Avenue
2. Ventura Avenue / 9th Street
3. Ventura Avenue / 10th Street
4. Ventura Avenue / Cedar Avenue

analysis is included in the proposed scope of work for the study intersection(s) listed above under all study scenarios. This analysis will be utilized to recommend minimum storage lengths for left and right turn lanes at all study intersections.

Study Segments:

1. None

Trip Generation

Table 1 provides the trip generation for the proposed Project pursuant to the 10th Edition of the Trip Generation Manual. At build-out the Project is estimated to generate a maximum of 2,459 daily trips, 580 a.m. peak hour trips and 221 p.m. peak hour trips.

Tables 1: Project Only Trip Generation

			Daily		*AM Peak Hour*						*PM Peak Hour*					
Land Use (ITE Code)	*Size*	*Unit*	*Rate*	*Total*	*Trip Rate*	*In %*	*Out %*	*In*	*Out*	*Total*	*Trip Rate*	*In %*	*Out %*	*In*	*Out*	*Total*
Elementary School (520)	60	students	1.89	113	0.67	54	46	22	18	40	0.17	48	52	5	5	10
High School (530)	827	students	2.03	1,679	0.52	67	33	288	142	430	0.14	48	52	56	60	116
School District Office (538)	46.400	k.s.f.	14.37	667	2.36	76	24	84	26	110	2.04	17	83	16	79	95
Total Project Trips				**2,459**				**394**	**186**	**580**				**77**	**144**	**221**

Near Term Projects to be Included

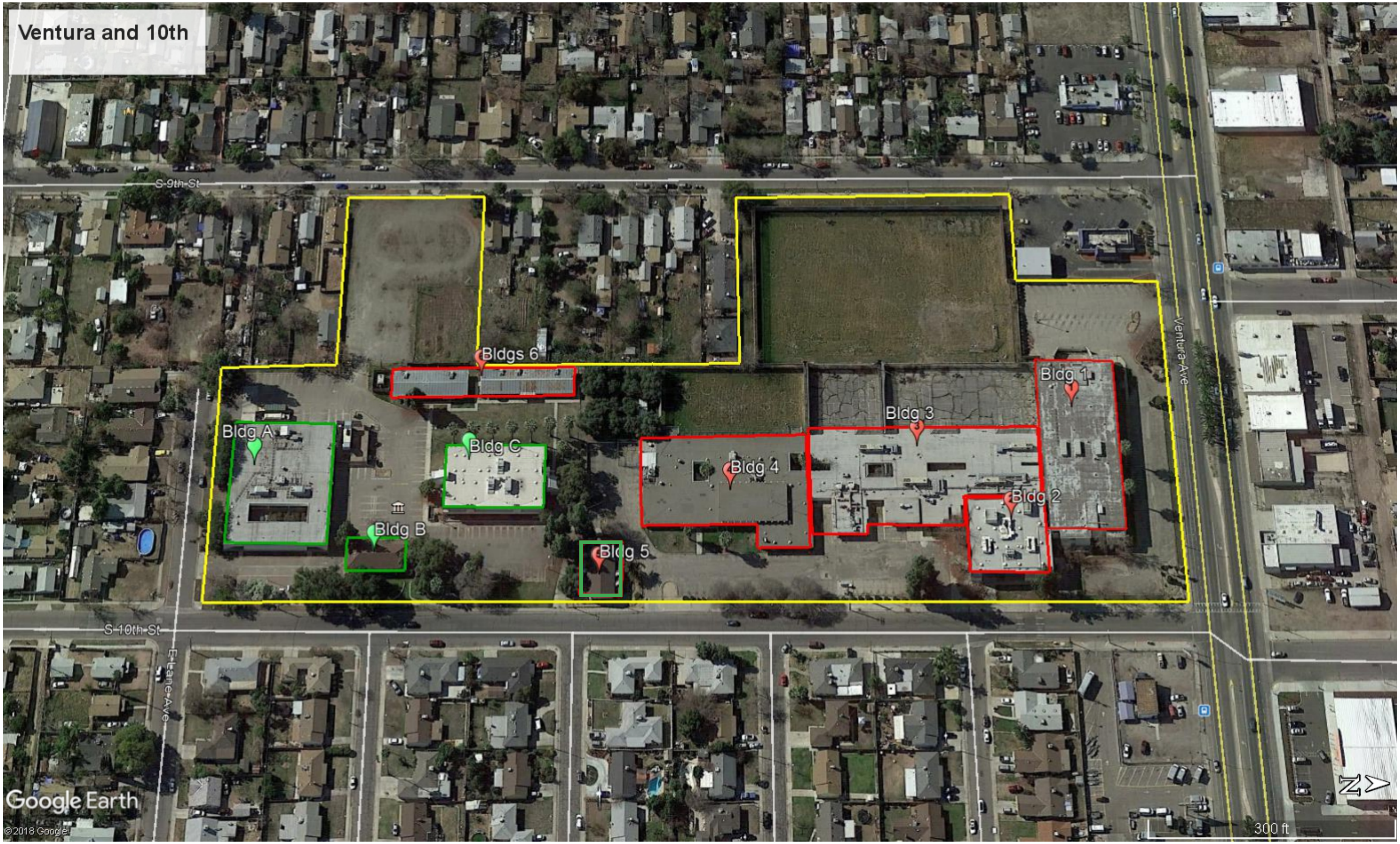
JLB is unaware of other projects in the vicinity of the proposed Project which have the ability to impact traffic operations in the near term and long term plus project scenarios. However, JLB will include in the Near Term plus Project scenario near term projects provided to us by other responsible agencies. These would include Near Term Projects the City, County of Fresno or Caltrans has knowledge of and for which it is anticipated that said project(s) is/are projected to be whole or partially built by the Near Term Project Year 2025 and for which the City of Fresno, County of Fresno or Caltrans as appropriate provides JLB with near term project details. Near term project details include project description, location, proposed land uses with breakdowns and type of residential units and amount of square footages for non-residential uses.

The above scope of work is based on our understanding of this project and our experience with similar Traffic Impact Analysis projects. In the absence of comments by January 4, 2019, it will be assumed that the above scope of work is acceptable to the agency (ies) that have not submitted any comments to the proposed TIA scope of work. If you have any questions or require additional information, please contact me at (559) 570-8991 or by email at jbenavides@JLBtraffic.com.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

cc: Harpreet Kooner, County of Fresno
David Padilla, Caltrans District 6



Existing Buildings on Project Site

Figure 3

Ventura Avenue Alternative Education Campus Project
Fresno Unified School District

ODELL Planning & Research, Inc.
Environmental Planning • School Facility Planning • Demographics

- Project Site Boundary
- Buildings to be maintained as administrative offices
- Buildings to be demolished

N

Jose Benavides

From: Spaunhurst, Brian <bspaunhurst@fresnocountyca.gov>
Sent: Thursday, January 3, 2019 11:05 AM
To: Jose Benavides
Subject: RE: FUSD Alternative Education

Good Morning Jose,

With the combined factors of students using an existing bussing system and your trip distribution showing minimal traffic from the closest County roadway segment I have no other concerns. I appreciate your supplemental information and your patience in answering all of my questions.

Respectfully,

Brian Spaunhurst | **Planner II**
Department of Public Works and Planning | Design Division
2220 Tulare St. 6th Floor Fresno, CA 93721
Main Office: (559) 600-4532 | Direct: (559) 600-4532
Email: bspaunhurst@FresnoCountyCa.gov
Your input matters! Customer Service Survey

From: Jose Benavides <jbenavides@jlbtraffic.com>
Sent: Thursday, January 3, 2019 9:33 AM
To: Spaunhurst, Brian <bspaunhurst@fresnocountyca.gov>
Cc: Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Hi Brian,

Based on information provided by the FUSD, the plan is for High School students, to use the City bus system as they do now at Cambridge. Preschool students must be signed in by a parent so bussing is not an option.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

JLB Traffic Engineering, Inc.

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Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

1300 E. Shaw Ave., Ste. 103
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Main: (559) 570-8991
Cell: (559) 694-6000

Fax: (559) 317-6854
www.JLBtraffic.com

From: Spaunhurst, Brian <bspaunhurst@fresnocountyca.gov>
Sent: Wednesday, January 2, 2019 1:15 PM
To: Jose Benavides <jbenavides@jlbtraffic.com>
Cc: Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Sounds good Jose,

I look forward to your update. Unfortunately Harpreet is no longer with the County. For the time being all of her Transportation Planning responsibilities have been re-assigned to me.

Thanks,

Brian Spaunhurst | **Planner II**
Department of Public Works and Planning | Design Division
2220 Tulare St. 6th Floor Fresno, CA 93721
Main Office: (559) 600-4532 | Direct: (559) 600-4532
Email: bspaunhurst@FresnoCountyCa.gov
Your input matters! Customer Service Survey

From: Jose Benavides <jbenavides@jlbtraffic.com>
Sent: Wednesday, January 2, 2019 12:20 PM
To: Spaunhurst, Brian <bspaunhurst@fresnocountyca.gov>
Cc: Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Hi Brian,

Attached you will find the proposed scope of work as requested.

We will inquire with the school district on the anticipated busing boundaries and get back to you ASAP.

Is Harpreet no longer involved on these components?

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

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Fax: (559) 317-6854
www.JLBtraffic.com

From: Spaunhurst, Brian <bspaunhurst@fresnocountyca.gov>
Sent: Wednesday, January 2, 2019 11:49 AM
To: Jose Benavides <jbenavides@jlbtraffic.com>
Cc: Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Good Morning Jose,

Will this site operate similar to other educational facilities where any student outside of a certain radius will be offered bus service? Harpreet did not forward the attachment with the original e-mail form you, do you mind re-sending that to me? I don't want to split hairs over a handful of students, however if we are expecting a large number of students from across the entire district boundaries then we want to promote bus service outside of a certain radius to reduce traffic impacts.

Brian Spaunhurst | **Planner II**
Department of Public Works and Planning | Design Division
2220 Tulare St. 6th Floor Fresno, CA 93721
Main Office: (559) 600-4532 | Direct: (559) 600-4532
Email: bspaunhurst@FresnoCountyCa.gov
Your input matters! Customer Service Survey

From: Jose Benavides <jbenavides@jlbtraffic.com>
Sent: Thursday, December 27, 2018 2:32 PM
To: Spaunhurst, Brian <bspaunhurst@fresnocountyca.gov>
Cc: Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

County of Fresno

Internal Services Department (ISD) - IT Services

Service Desk 600-5900 (Help Desk)

Good afternoon Brain,

The school component of the Project will draw students within the entire Fresno Unified School District; however, the large percentage of its students are projected to reside in central and SE Fresno. Attached you will find the Fresno COG Select Zone.

Let us know if you have any further questions or comments.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

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From: Spaunhurst, Brian <bspaunhurst@fresnocountyca.gov>
Sent: Monday, December 17, 2018 10:12 AM
To: Jose Benavides <jbenavides@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Good Morning Jose,

As this is an alternative school, would it follow the same boundary lines as what is posted on the FUSD website? I am trying to get an idea of where students would be drawn from. In addition could you please provide the trip distribution?

Respectfully,

Brian Spaunhurst | **Planner II**
Department of Public Works and Planning | Design Division
2220 Tulare St. 6th Floor Fresno, CA 93721

Main Office: (559) 600-4532 | Direct: (559) 600-4532
Email: bspaunhurst@FresnoCountyCa.gov
Your input matters! Customer Service Survey

From: Jose Benavides <jbenavides@jlbtraffic.com>
Sent: Friday, December 14, 2018 4:35 PM
To: Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Cc: Kooner, Harpreet <HKooner@fresnocountyca.gov>; 'David Padilla' <dave_padilla@dot.ca.gov>; Jill Gormley (Jill.Gormley@fresno.gov) <Jill.Gormley@fresno.gov>; Susana Maciel <smaciel@jlbtraffic.com>
Subject: FUSD Alternative Education

Good afternoon,

Attached you will find a draft scope of work for the preparation of a TIA in support of the Fresno Unified Ventura Educational Campus in the City of Fresno. We kindly ask that you review the attached scope of work and provide comments if any by January 4th, 2019.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

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Jose Benavides

From: Padilla, Dave@DOT <dave.padilla@dot.ca.gov>
Sent: Tuesday, January 29, 2019 8:58 AM
To: Jose Benavides; Harmanjit Dhaliwal
Cc: Jill Gormley; Susana Maciel; Navarro, Michael@DOT
Subject: RE: FUSD Alternative Education

Good Morning Jose,

From an intersection (ramp termini) analysis stand point, we have no concerns. However, because this is district wide project distribution, a discussion on VMT reduction and possible mitigation measures, if needed, should be provided. Possible mitigation measure may be multimodal improvements, parking and/or TDM.

Thank you

DAVID PADILLA
Associate Transportation Planner
Office of Planning & Local Assistance
1352 W. Olive Avenue
Fresno, CA 93778-2616
Office: (559) 444-2493, Fax: (559) 445-5875

From: Jose Benavides <jbenavides@jlbtraffic.com>
Sent: Monday, January 28, 2019 4:15 PM
To: Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Cc: Padilla, Dave@DOT <dave.padilla@dot.ca.gov>; Jill Gormley <Jill.Gormley@fresno.gov>; Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Good afternoon Harman and David,

Have your respective agencies had a chance to review the draft scope of work that we originally sent to you on December 14th. We previously received comments from the County so that is why I am not copying them.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

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Cell: (559) 694-6000
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www.JLBtraffic.com

From: Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Sent: Thursday, December 27, 2018 3:30 PM
To: Jose Benavides <jbenavides@jlbtraffic.com>
Cc: 'David Padilla' <dave_padilla@dot.ca.gov>; Jill Gormley <Jill.Gormley@fresno.gov>; Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Good Afternoon Jose,

We should have our comments by early next week.

Thanks,

Harmanjit Dhaliwal, PE

City of FRESNO
Public Works Department
Traffic Operations & Planning Division
2600 Fresno Street, Room 4064
Fresno, CA 93721
Ph: (559) 621-8694
Harmanjit.Dhaliwal@fresno.gov

From: Jose Benavides [mailto:jbenavides@jlbtraffic.com]
Sent: Thursday, December 27, 2018 2:35 PM
To: Harmanjit Dhaliwal
Cc: 'David Padilla'; Jill Gormley; Susana Maciel
Subject: FUSD Alternative Education

Good afternoon,

I am just following up with the City of Fresno and Caltrans to inquire when we can anticipate receipt of comments on the attached draft scope of work that was originally sent out on 12/14/18?

We kindly ask that you review the attached scope of work and provide comments if any by January 4th, 2019.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

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Susana Maciel

From: Jill Gormley <Jill.Gormley@fresno.gov>
Sent: Wednesday, February 27, 2019 4:43 PM
To: Susana Maciel; Harmanjit Dhaliwal
Cc: Jose Benavides
Subject: RE: FUSD Alternative Education

Thanks for the explanation.

jmg

From: Susana Maciel [mailto:smaciel@jlbtraffic.com]
Sent: Tuesday, February 26, 2019 9:34 AM
To: Jill Gormley; Harmanjit Dhaliwal
Cc: Jose Benavides
Subject: RE: FUSD Alternative Education

Good morning Jill,

You are right in that some SR 41 traffic will use the Tulare Avenue exit. However, I did look at the Fresno COG model outputs for the Select Zone and this showed that most of the traffic used the McKinley Avenue exit. This is most likely due to SR 41 traffic wishing to bypass congestion near the SR 41 and SR 180 interchanges during the AM and PM peaks. I could have assumed that some traffic used the Tulare Avenue exit as opposed to the McKinley Avenue exit, however, this would not change where they ultimately end up (on Ventura Avenue west of the proposed Project). Since we are not including any of these intersections in the TIA, I don't see a need for us to adjust the distribution in this area.

I appreciate your response. Have a great day!

Best,

Susana Maciel, EIT
Engineer I/II

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www.JLBtraffic.com

From: Jill Gormley <Jill.Gormley@fresno.gov>
Sent: Tuesday, February 26, 2019 9:04 AM
To: Susana Maciel <smaciel@jlbtraffic.com>; Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Cc: Jose Benavides <jbenavides@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Hi Susana,

Why does the trip generation show SR 41 traffic using the McKinley exit rather than the Tulare Avenue exit?

Please add the intersections of Cedar/Butler and Cedar/Lane to the list of study intersections and include pedestrian and bicycle volumes in the count data. Also include a collision analysis using SWITRS/TIMS data at all study locations and 4-hour and 8-hour warrant studies at unsignalized intersections.

Jill Gormley, TE
City Traffic Engineer / Traffic Operations & Planning Manager
City of Fresno, Public Works Department
2600 Fresno Street, 4th Floor
Fresno, CA 93721-3623
www.fresno.gov/publicworks/traffic-engineering

P: 559/621-8792
F: 559/457-1107

From: Susana Maciel [mailto:smaciel@jlbtraffic.com]
Sent: Thursday, February 21, 2019 8:55 AM
To: Jill Gormley; Harmanjit Dhaliwal
Cc: Jose Benavides
Subject: RE: FUSD Alternative Education

Good morning Mrs. Gormley,

I hope your day is off to a great start!

Can you tell me when we can expect to receive your comments?

We look forward to finalizing our list of study locations soon.

Best,

Susana Maciel, EIT

Engineer I/II

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Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

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Fresno, CA 93710
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www.JLBtraffic.com

From: Susana Maciel
Sent: Wednesday, February 13, 2019 2:06 PM
To: 'Jill Gormley' <Jill.Gormley@fresno.gov>; 'Harmanjit Dhaliwal' <Harmanjit.Dhaliwal@fresno.gov>
Cc: Jose Benavides <jbenavides@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Good afternoon Mrs. Gormley,

I hope you're having a great day.

I just wanted to follow up with regarding the trip distribution that that was presented for this Project and let you know that I am available to help answer any questions you may have.

I look forward to hearing from you soon!

Best,

Susana Maciel, EIT
Engineer I/II

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Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

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From: Susana Maciel
Sent: Wednesday, February 06, 2019 8:26 AM
To: 'Jill Gormley' <Jill.Gormley@fresno.gov>; Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Cc: Jose Benavides <jbenavides@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Good morning Mrs. Gormley,

I have attached a of PDF containing the Trip Distribution for the FUSD Alternative Educational Complex Project for your review along with the Trip Distribution Percentages for the High School land use.

The Trip Distribution Percentages for the High School land use were developed based on the existing student attendance to Cambridge, DeWolf and J.E. Young schools. In addition, trip generation for the High School was reduced to account for the fact that nearly 51 percent of currently enrolled students at Cambridge, DeWolf and J.E. Young use public transit as their primary source of transportation to and from school. Trip Distribution for the Elementary School and School District Office were based on the Fresno COG Select Zone Model.

Please feel welcome to contact me if I can provide you with any additional materials to support your review.

Best,

Susana Maciel, EIT
Engineer I/II

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Fresno, CA 93710
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From: Jill Gormley <Jill.Gormley@fresno.gov>
Sent: Tuesday, January 29, 2019 2:47 PM
To: Jose Benavides <jbenavides@jlbtraffic.com>; Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Cc: 'David Padilla' <dave_padilla@dot.ca.gov>; Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

I would like to see the trip distribution before finalizing the list of study locations.

jmg

From: Jose Benavides [mailto:jbenavides@jlbtraffic.com]
Sent: Monday, January 28, 2019 9:11 PM
To: Jill Gormley; Harmanjit Dhaliwal
Cc: 'David Padilla'; Susana Maciel
Subject: RE: FUSD Alternative Education

To the north most students generally live south of Shaw Avenue.

From: Jill Gormley [mailto:Jill.Gormley@fresno.gov]
Sent: Monday, January 28, 2019 9:06 PM
To: Jose Benavides <jbenavides@jlbtraffic.com>; Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Cc: 'David Padilla' <dave_padilla@dot.ca.gov>; Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

South of 180?

From: Jose Benavides [mailto:jbenavides@jlbtraffic.com]
Sent: Monday, January 28, 2019 9:02 PM
To: Jill Gormley; Harmanjit Dhaliwal
Cc: 'David Padilla'; Susana Maciel
Subject: RE: FUSD Alternative Education

The high school is a different version of a typical continuation HS so for that reason the boundary will be district wide.

for the distribution of traffic, we plan to use the model for the District Administrative Staff. For the HS Students we plan to use GIS maps to be provided by the FUSD of where current continuation HS students live. We will then breakdown that data to percentages and subsequently convert that data to a trip distribution pattern. We don't have all of these steps completed, but its my recollection that the majority of potential HS students live east of SR 99 and west of SR 168 and north of Ventura-Kings Canyon.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

JLB Traffic Engineering, Inc.
Traffic Engineering, Transportation Planning and Parking Solutions

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Office: (559) 570-8991
Cell: (559) 694-6000
www.JLBtraffic.com

From: Jill Gormley [mailto:Jill.Gormley@fresno.gov]
Sent: Monday, January 28, 2019 8:44 PM
To: Jose Benavides <jbenavides@jlbtraffic.com>; Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Cc: 'David Padilla' <dave_padilla@dot.ca.gov>; Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Jose,

What are the boundaries for the schools? How are the trips being distributed?

From: Jose Benavides [mailto:jbenavides@jlbtraffic.com]
Sent: Monday, January 28, 2019 4:15 PM
To: Harmanjit Dhaliwal
Cc: 'David Padilla'; Jill Gormley; Susana Maciel
Subject: RE: FUSD Alternative Education

Good afternoon Harman and David,

Have your respective agencies had a chance to review the draft scope of work that we originally sent to you on December 14th. We previously received comments from the County so that is why I am not copying them.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

Traffic Engineering, Inc.

Traffic Engineering, Transportation Planning and Parking Solutions
Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
Direct: (559) 317-6249
Main: (559) 570-8991
Cell: (559) 694-6000
Fax: (559) 317-6854
www.JLBtraffic.com

From: Harmanjit Dhaliwal <Harmanjit.Dhaliwal@fresno.gov>
Sent: Thursday, December 27, 2018 3:30 PM
To: Jose Benavides <jbenavides@jlbtraffic.com>
Cc: 'David Padilla' <dave_padilla@dot.ca.gov>; Jill Gormley <Jill.Gormley@fresno.gov>; Susana Maciel <smaciel@jlbtraffic.com>
Subject: RE: FUSD Alternative Education

Good Afternoon Jose,

We should have our comments by early next week.

Thanks,

Harmanjit Dhaliwal, PE

City of FRESNO
Public Works Department
Traffic Operations & Planning Division
2600 Fresno Street, Room 4064
Fresno, CA 93721
Ph: (559) 621-8694
Harmanjit.Dhaliwal@fresno.gov

From: Jose Benavides [mailto:jbenavides@jlbtraffic.com]
Sent: Thursday, December 27, 2018 2:35 PM
To: Harmanjit Dhaliwal
Cc: 'David Padilla'; Jill Gormley; Susana Maciel
Subject: FUSD Alternative Education

Good afternoon,

I am just following up with the City of Fresno and Caltrans to inquire when we can anticipate receipt of comments on the attached draft scope of work that was originally sent out on 12/14/18?

We kindly ask that you review the attached scope of work and provide comments if any by January 4th, 2019.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

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Appendix B: Traffic Counts

JLB Traffic Engineering, Inc.

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File Name : Ventura at Orange
Site Code : 00031219
Start Date : 3/12/2019
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	Orange Ave Southbound	Ventura Ave Westbound			Orange Ave Northbound			Ventura Ave Eastbound			
Start Time	Peds	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds	Int. Total
07:00 AM	0	1	71	0	13	8	0	45	5	0	143
07:15 AM	1	8	102	1	11	9	1	63	10	0	206
07:30 AM	0	9	134	0	24	28	2	98	16	0	311
07:45 AM	0	15	145	0	33	20	1	100	25	0	339
Total	1	33	452	1	81	65	4	306	56	0	999
08:00 AM	1	26	140	0	18	21	0	98	20	0	324
08:15 AM	0	12	133	0	14	17	1	72	5	1	255
08:30 AM	0	9	130	0	24	15	0	89	14	0	281
08:45 AM	0	8	113	0	19	14	2	67	2	1	226
Total	1	55	516	0	75	67	3	326	41	2	1086
******											
04:00 PM	0	7	133	0	23	28	1	132	18	2	344
04:15 PM	0	23	166	0	29	22	0	145	14	1	400
04:30 PM	0	24	149	0	22	23	0	168	14	0	400
04:45 PM	0	22	162	0	25	27	0	158	7	1	402
Total	0	76	610	0	99	100	1	603	53	4	1546
05:00 PM	0	15	187	0	23	25	0	187	16	1	454
05:15 PM	2	18	163	1	22	27	0	184	10	2	429
05:30 PM	4	11	143	1	28	13	0	133	11	0	344
05:45 PM	0	12	132	0	21	25	1	129	24	1	345
Total	6	56	625	2	94	90	1	633	61	4	1572
Grand Total	8	220	2203	3	349	322	9	1868	211	10	5203
Apprch %	100	9.1	90.8	0.1	51.3	47.4	1.3	89.4	10.1	0.5	
Total %	0.2	4.2	42.3	0.1	6.7	6.2	0.2	35.9	4.1	0.2	
Unshifted	4	198	2190	3	349	321	9	1860	211	10	5155
% Unshifted	50	90	99.4	100	100	99.7	100	99.6	100	100	99.1
Bank 1	0	22	0	0	0	0	0	0	0	0	22
% Bank 1	0	10	0	0	0	0	0	0	0	0	0.4
Bank 2	4	0	13	0	0	1	0	8	0	0	26
% Bank 2	50	0	0.6	0	0	0.3	0	0.4	0	0	0.5

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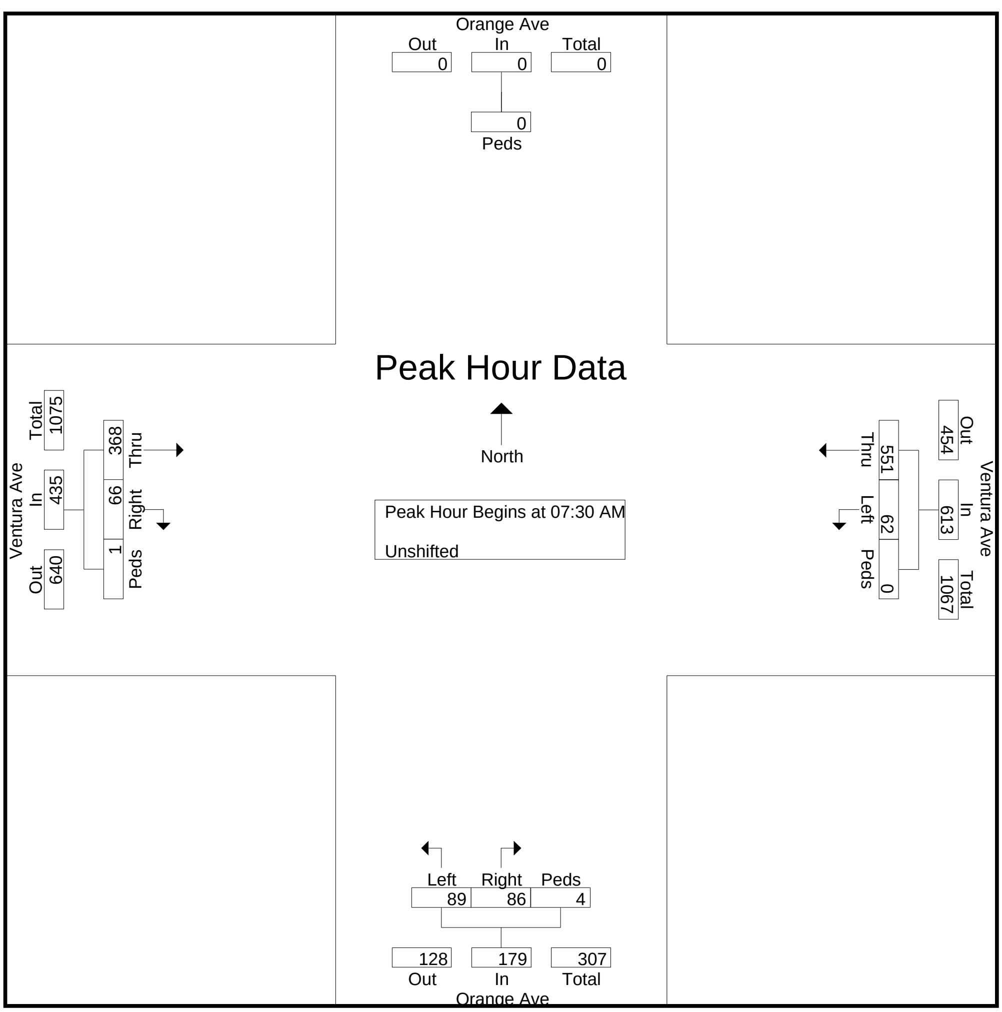
File Name : Ventura at Orange
Site Code : 00031219
Start Date : 3/12/2019
Page No : 2

	Orange Ave Southbound		Ventura Ave Westbound				Orange Ave Northbound				Ventura Ave Eastbound				
Start Time	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1															
Peak Hour for Entire Intersection Begins at 07:30 AM															
07:30 AM	0	0	9	134	0	143	24	**28**	**2**	**54**	98	16	0	114	311
07:45 AM	0	0	15	**145**	0	160	**33**	20	1	54	**100**	**25**	0	**125**	**339**
08:00 AM	0	0	**26**	140	0	**166**	18	21	0	39	98	20	0	118	323
08:15 AM	0	0	12	132	0	144	14	17	1	32	72	5	**1**	78	254
Total Volume	0	0	62	551	0	613	89	86	4	179	368	66	1	435	1227
% App. Total	0		10.1	89.9	0		49.7	48	2.2		84.6	15.2	0.2		
PHF	.000	.000	.596	.950	.000	.923	.674	.768	.500	.829	.920	.660	.250	.870	.905



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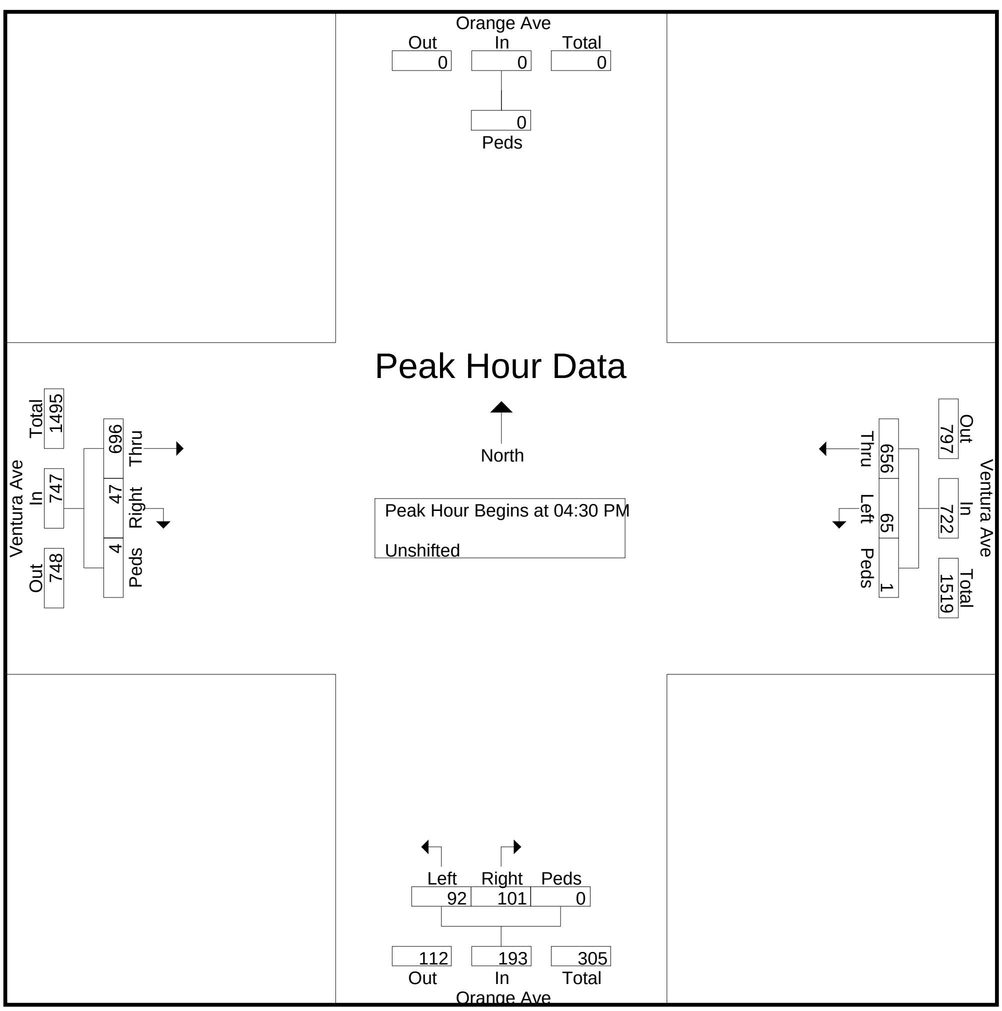
File Name : Ventura at Orange
Site Code : 00031219
Start Date : 3/12/2019
Page No : 3

	Orange Ave Southbound		Ventura Ave Westbound				Orange Ave Northbound				Ventura Ave Eastbound				
Start Time	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1															
Peak Hour for Entire Intersection Begins at 04:30 PM															
04:30 PM	0	0	19	148	0	167	22	22	0	44	167	14	0	181	392
04:45 PM	0	0	**20**	161	0	181	**25**	**27**	0	**52**	158	7	1	166	399
05:00 PM	0	0	13	**185**	0	**198**	23	25	0	48	**187**	**16**	1	**204**	**450**
05:15 PM	0	0	13	162	**1**	176	22	27	0	49	184	10	**2**	196	421
Total Volume	0	0	65	656	1	722	92	101	0	193	696	47	4	747	1662
% App. Total	0		9	90.9	0.1		47.7	52.3	0		93.2	6.3	0.5		
PHF	.000	.000	.813	.886	.250	.912	.920	.935	.000	.928	.930	.734	.500	.915	.923



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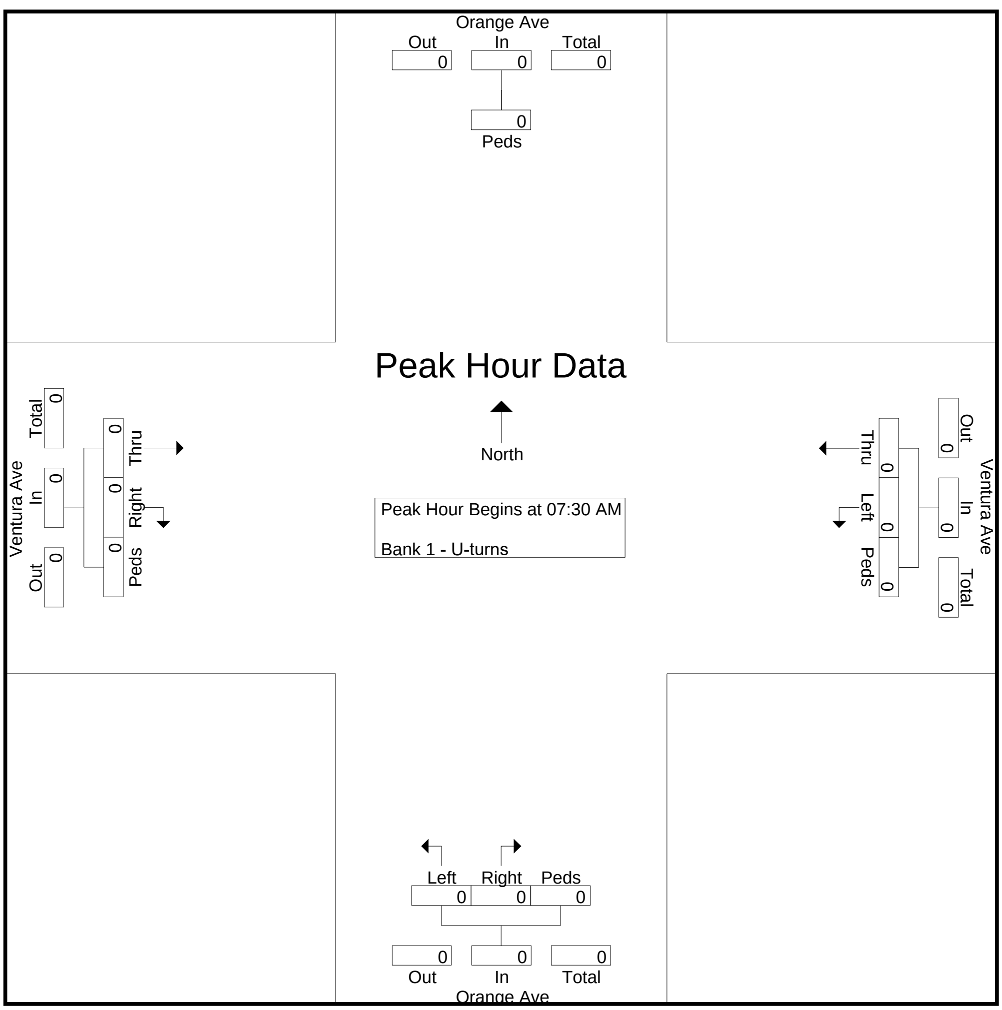
	Orange Ave Southbound		Ventura Ave Westbound				Orange Ave Northbound				Ventura Ave Eastbound				
Start Time	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1															
Peak Hour for Entire Intersection Begins at 07:30 AM															
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0		0	0	0		0	0	0		0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000



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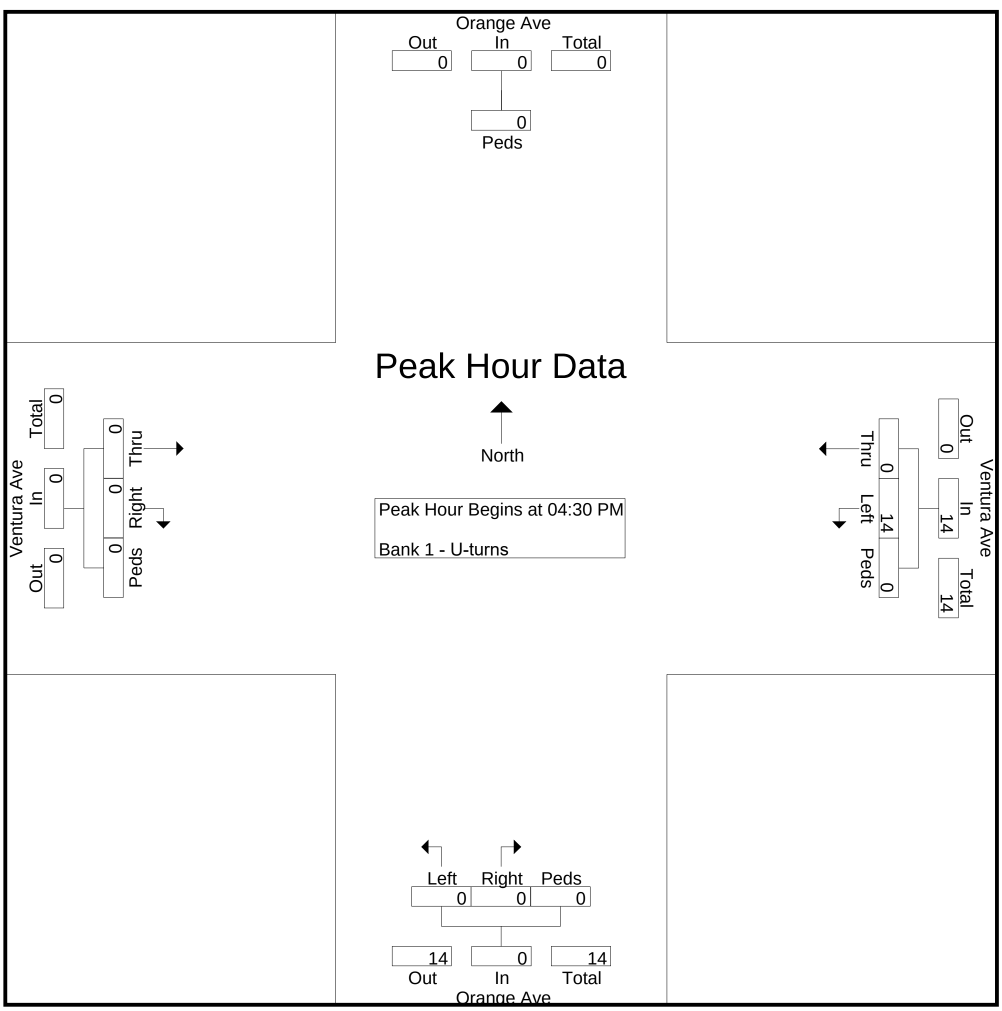
	Orange Ave Southbound		Ventura Ave Westbound				Orange Ave Northbound				Ventura Ave Eastbound				
Start Time	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1															
Peak Hour for Entire Intersection Begins at 04:30 PM															
04:30 PM	0	0	**5**	0	0	**5**	0	0	0	0	0	0	0	0	**5**
04:45 PM	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2
05:15 PM	0	0	5	0	0	5	0	0	0	0	0	0	0	0	5
Total Volume	0	0	14	0	0	14	0	0	0	0	0	0	0	0	14
% App. Total	0		100	0	0		0	0	0		0	0	0		
PHF	.000	.000	.700	.000	.000	.700	.000	.000	.000	.000	.000	.000	.000	.000	.700



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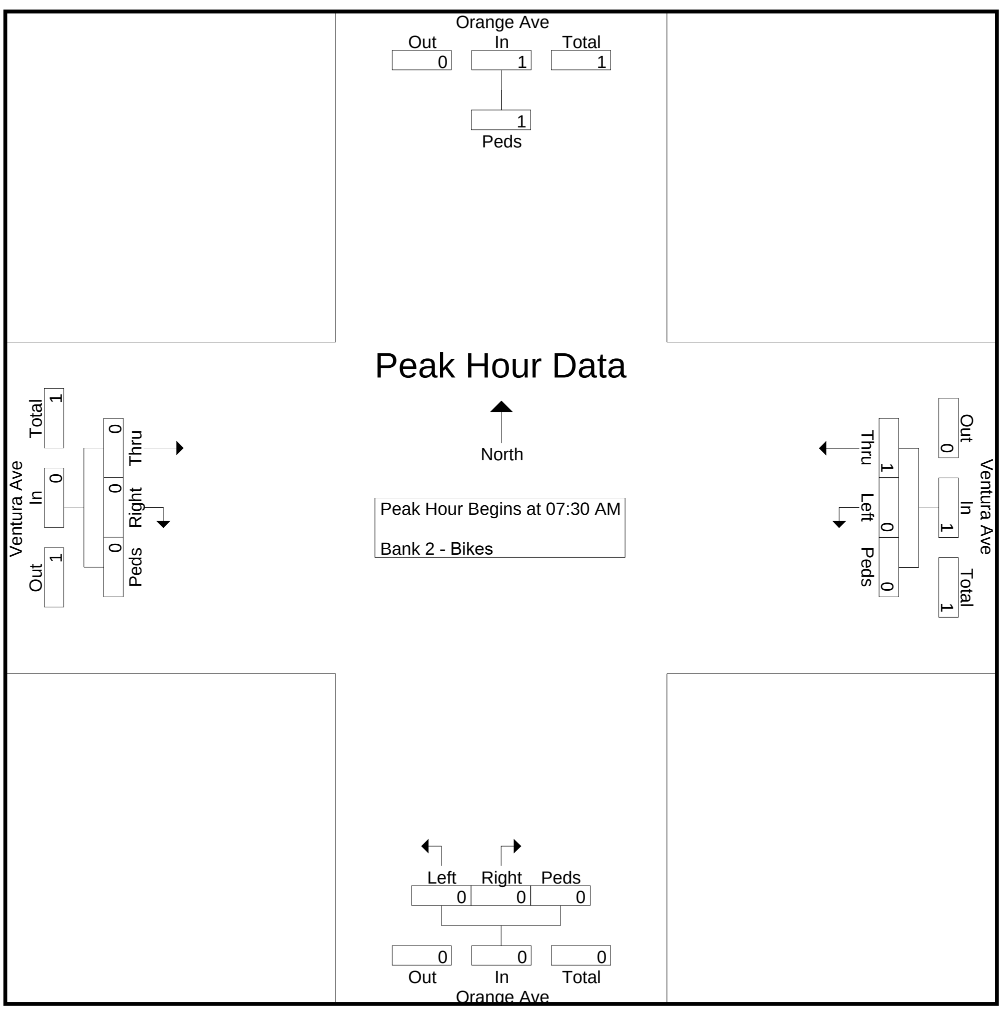
Page No : 2

	Orange Ave Southbound		**Ventura Ave Westbound**				**Orange Ave Northbound**				**Ventura Ave Eastbound**				
Start Time	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1															
Peak Hour for Entire Intersection Begins at 07:30 AM															
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	**1**	**1**	0	0	0	0	0	0	0	0	0	0	0	0	**1**
08:15 AM	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	1
Total Volume	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
% App. Total	100		0	100	0		0	0	0		0	0	0		
PHF	.250	.250	.000	.250	.000	.250	.000	.000	.000	.000	.000	.000	.000	.000	.500



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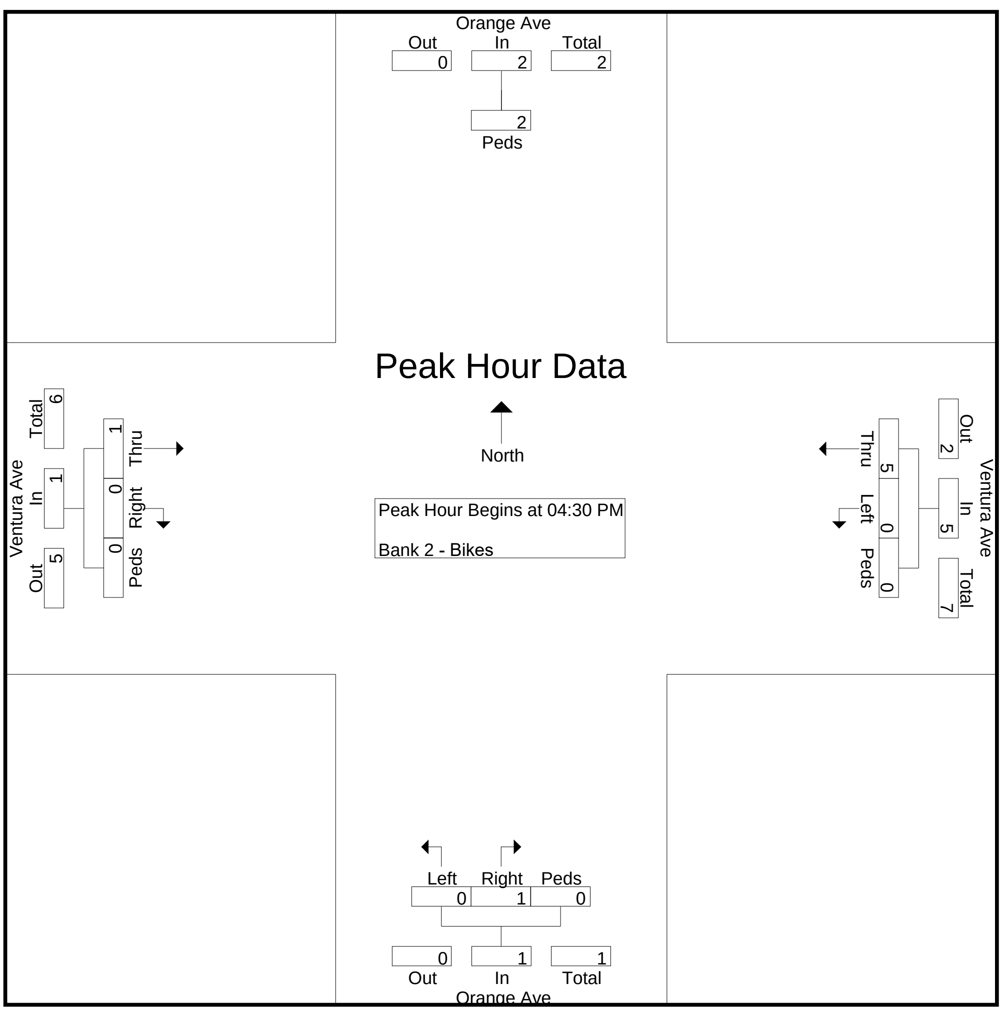
	Orange Ave Southbound		Ventura Ave Westbound				Orange Ave Northbound				Ventura Ave Eastbound				
Start Time	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1															
Peak Hour for Entire Intersection Begins at 04:30 PM															
04:30 PM	0	0	0	1	0	1	0	**1**	0	**1**	**1**	0	0	**1**	**3**
04:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	**2**	0	**2**	0	0	0	0	0	0	0	0	2
05:15 PM	**2**	**2**	0	1	0	1	0	0	0	0	0	0	0	0	3
Total Volume	2	2	0	5	0	5	0	1	0	1	1	0	0	1	9
% App. Total	100		0	100	0		0	100	0		100	0	0		
PHF	.250	.250	.000	.625	.000	.625	.000	.250	.000	.250	.250	.000	.000	.250	.750



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File Name : Ventura at 9th
Site Code : 00031319
Start Date : 3/13/2019
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	9th Street Southbound	**Ventura Ave Westbound**		**9th Street Northbound**			**Ventura Ave Eastbound**			
Start Time	Peds	Left	Thru	Left	Right	Peds	Thru	Right	Peds	Int. Total
07:00 AM	0	2	53	2	1	0	44	0	1	103
07:15 AM	0	4	114	5	0	0	75	2	0	200
07:30 AM	0	2	148	4	3	0	98	1	0	256
07:45 AM	0	6	196	1	6	0	106	2	0	317
Total	0	14	511	12	10	0	323	5	1	876
08:00 AM	0	3	164	2	6	0	92	4	2	273
08:15 AM	0	5	126	6	0	0	75	1	3	216
08:30 AM	0	2	115	4	4	0	116	4	1	246
08:45 AM	0	4	115	4	1	0	89	0	0	213
Total	0	14	520	16	11	0	372	9	6	948
******										
04:00 PM	0	9	151	1	3	0	193	0	6	363
04:15 PM	0	7	162	1	6	0	153	3	4	336
04:30 PM	0	15	165	0	5	0	198	4	3	390
04:45 PM	0	8	147	0	4	0	189	7	3	358
Total	0	39	625	2	18	0	733	14	16	1447
05:00 PM	0	9	181	4	3	0	205	7	1	410
05:15 PM	0	21	151	11	5	0	184	3	1	376
05:30 PM	0	9	167	3	7	0	155	2	0	343
05:45 PM	0	8	119	1	5	0	134	6	0	273
Total	0	47	618	19	20	0	678	18	2	1402
Grand Total	0	114	2274	49	59	0	2106	46	25	4673
Apprch %	0	4.8	95.2	45.4	54.6	0	96.7	2.1	1.1	
Total %	0	2.4	48.7	1	1.3	0	45.1	1	0.5	
Unshifted	0	98	2265	49	58	0	2096	46	25	4637
% Unshifted	0	86	99.6	100	98.3	0	99.5	100	100	99.2
Bank 1	0	16	0	0	0	0	0	0	0	16
% Bank 1	0	14	0	0	0	0	0	0	0	0.3
Bank 2	0	0	9	0	1	0	10	0	0	20
% Bank 2	0	0	0.4	0	1.7	0	0.5	0	0	0.4

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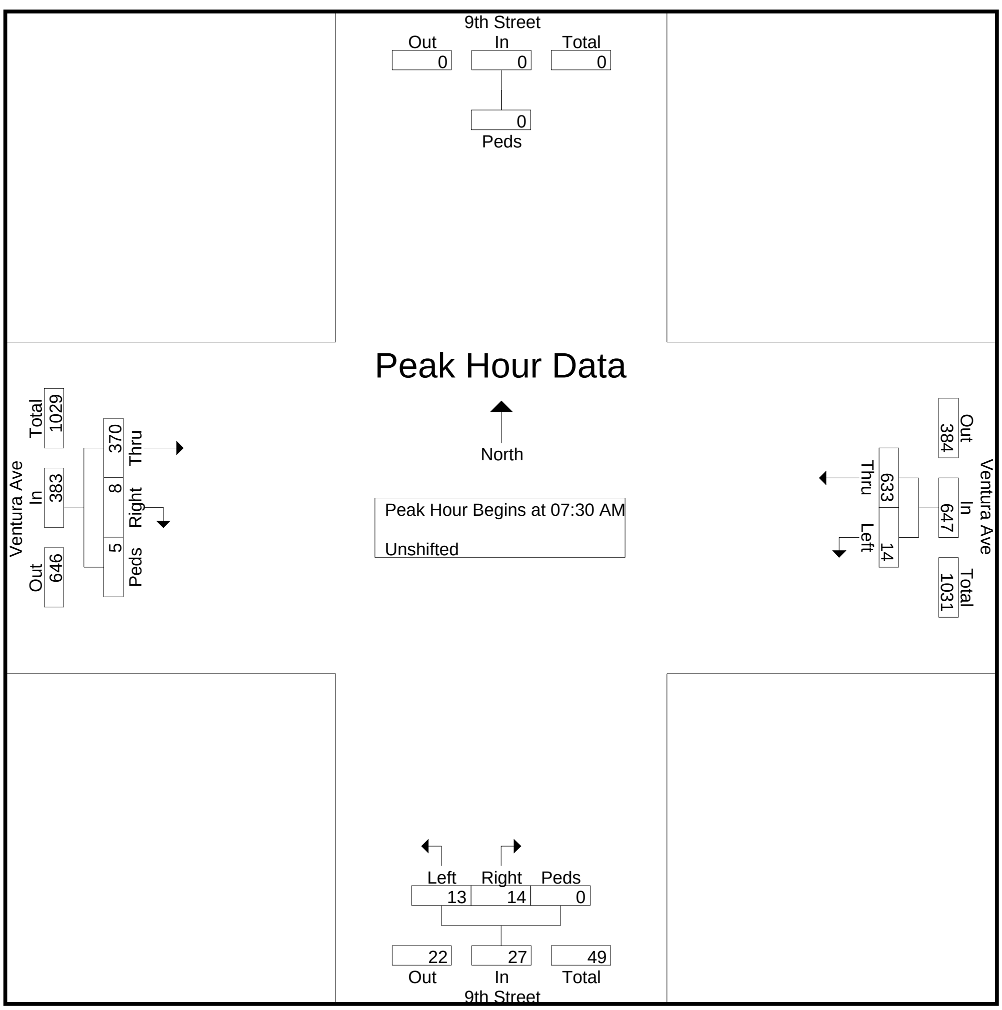
File Name : Ventura at 9th
Site Code : 00031319
Start Date : 3/13/2019

	9th Street Southbound		Ventura Ave Westbound			9th Street Northbound				Ventura Ave Eastbound				
Start Time	Peds	App. Total	Left	Thru	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 07:30 AM														
07:30 AM	0	0	2	148	150	4	3	0	7	97	1	0	98	255
07:45 AM	0	0	**5**	**196**	**201**	1	5	0	6	**106**	2	0	**108**	**315**
08:00 AM	0	0	2	163	165	2	**6**	0	**8**	92	**4**	2	98	271
08:15 AM	0	0	5	126	131	**6**	0	0	6	75	1	**3**	79	216
Total Volume	0	0	14	633	647	13	14	0	27	370	8	5	383	1057
% App. Total	0		2.2	97.8		48.1	51.9	0		96.6	2.1	1.3		
PHF	.000	.000	.700	.807	.805	.542	.583	.000	.844	.873	.500	.417	.887	.839



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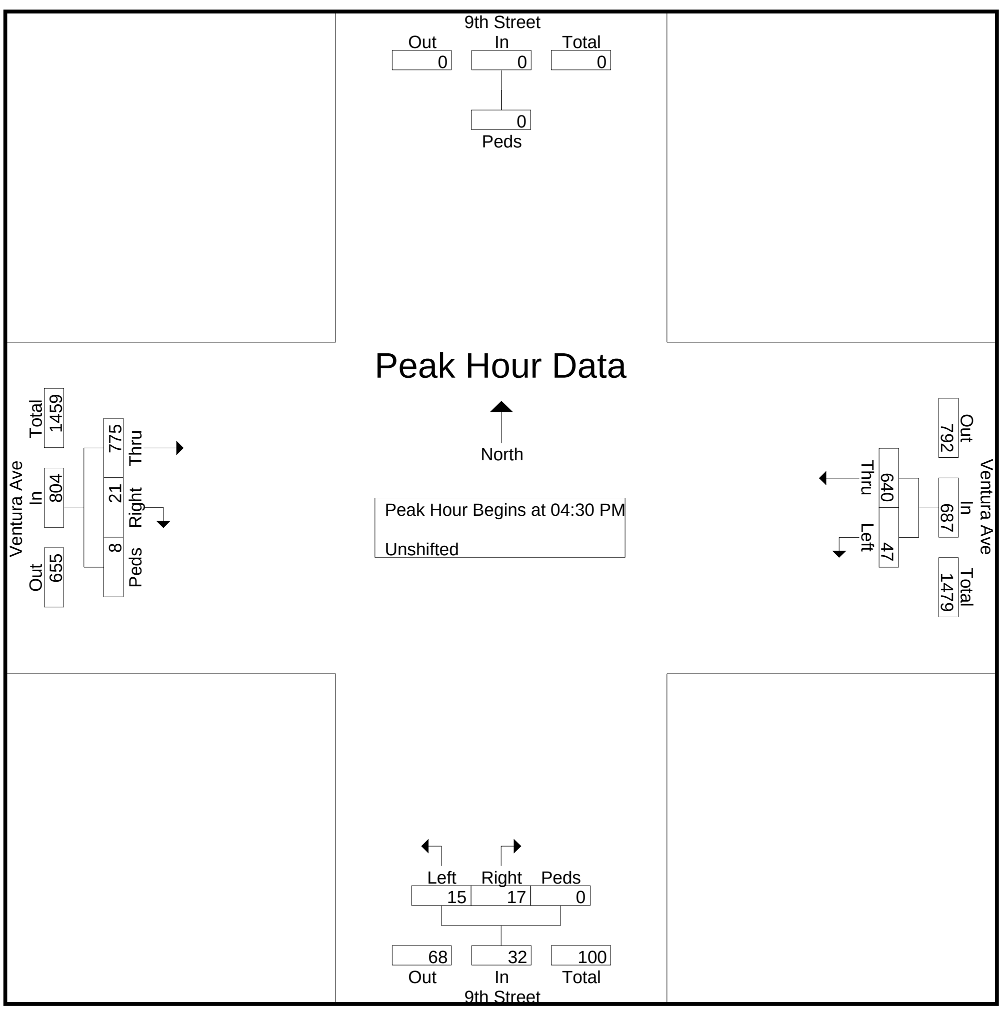
File Name : Ventura at 9th
Site Code : 00031319
Start Date : 3/13/2019

	9th Street Southbound		Ventura Ave Westbound			9th Street Northbound				Ventura Ave Eastbound				
Start Time	Peds	App. Total	Left	Thru	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 04:30 PM														
04:30 PM	0	0	14	165	179	0	**5**	0	5	198	4	**3**	205	389
04:45 PM	0	0	7	145	152	0	4	0	4	189	**7**	3	199	355
05:00 PM	0	0	8	**181**	**189**	4	3	0	7	**205**	7	1	**213**	**409**
05:15 PM	0	0	**18**	149	167	**11**	5	0	**16**	183	3	1	187	370
Total Volume	0	0	47	640	687	15	17	0	32	775	21	8	804	1523
% App. Total	0		6.8	93.2		46.9	53.1	0		96.4	2.6	1		
PHF	.000	.000	.653	.884	.909	.341	.850	.000	.500	.945	.750	.667	.944	.931



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File Name : Ventura at 9th
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Start Date : 3/13/2019
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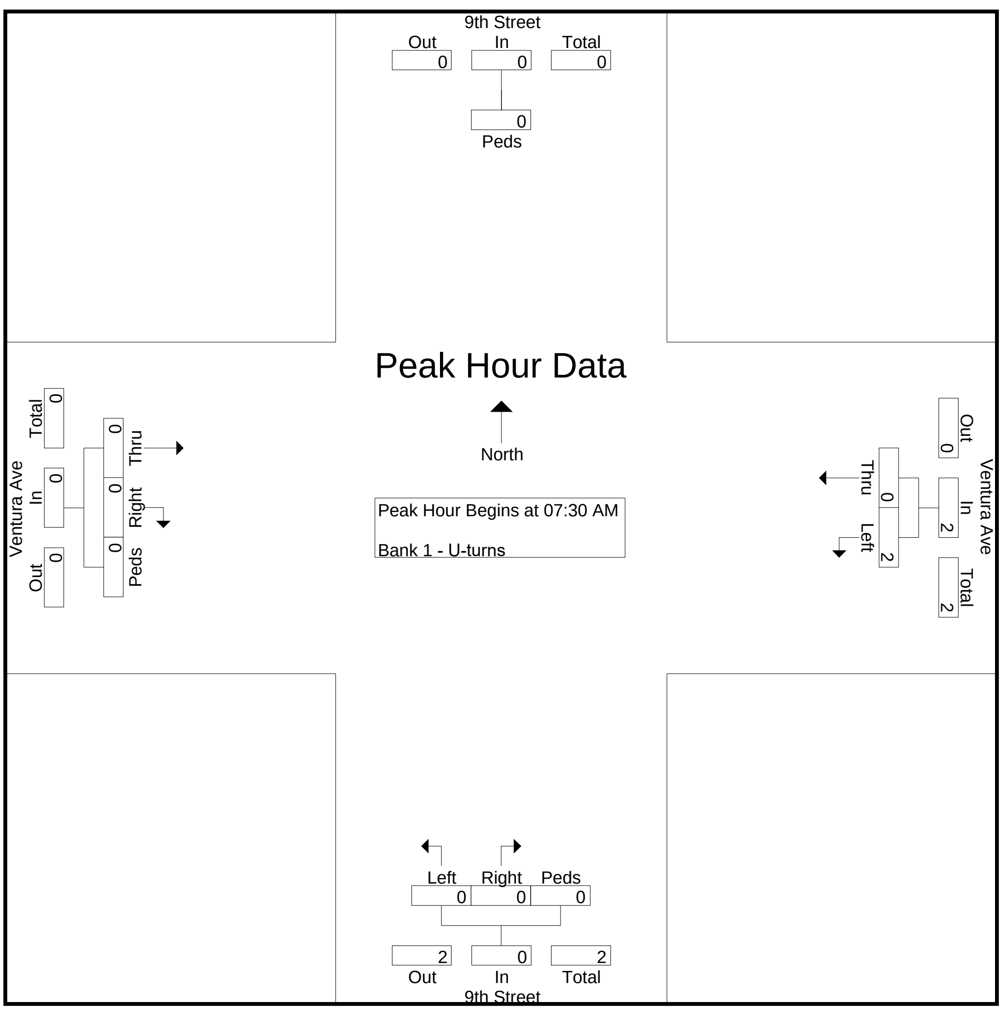
	9th Street Southbound		Ventura Ave Westbound			9th Street Northbound				Ventura Ave Eastbound				
Start Time	Peds	App. Total	Left	Thru	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 07:30 AM														
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	**1**
08:00 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	2	0	2	0	0	0	0	0	0	0	0	2
% App. Total	0		100	0		0	0	0		0	0	0		
PHF	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.500



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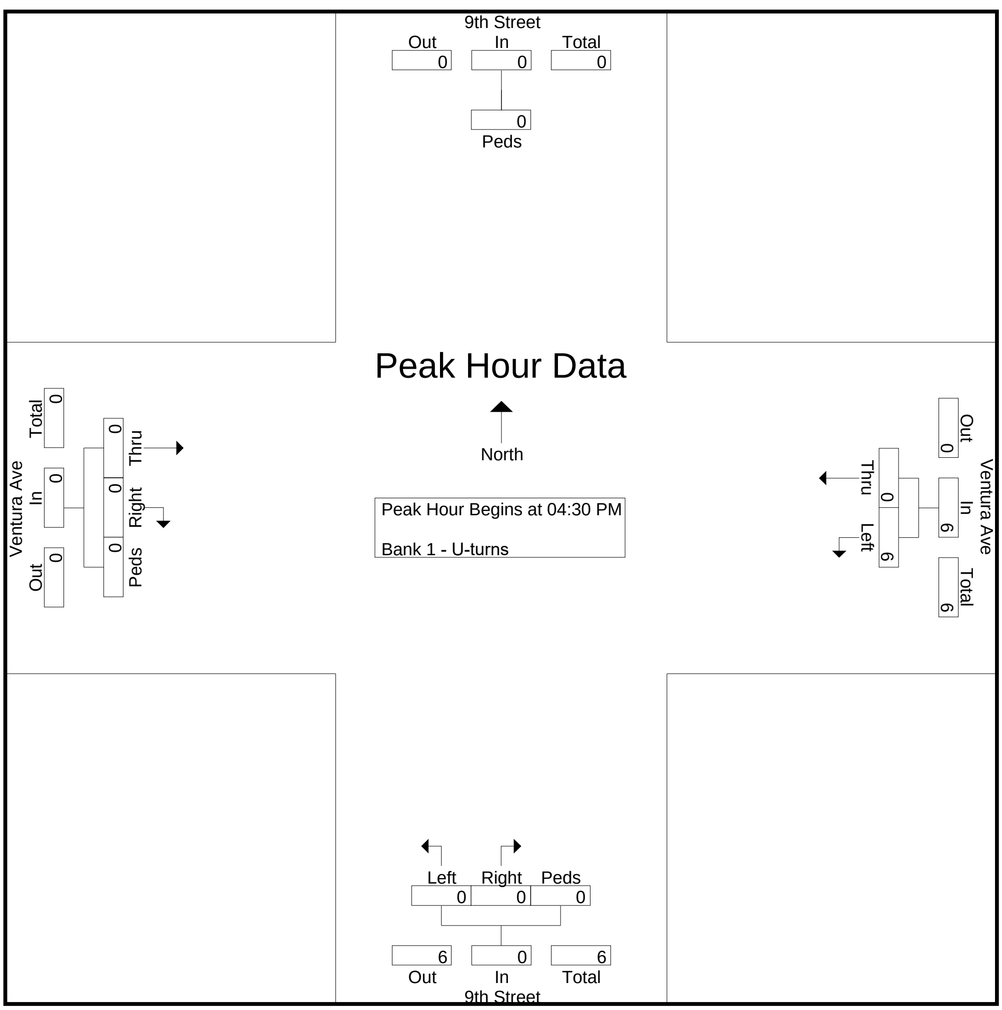
File Name : Ventura at 9th
Site Code : 00031319
Start Date : 3/13/2019
Page No : 3

	9th Street Southbound		Ventura Ave Westbound			9th Street Northbound				Ventura Ave Eastbound				
Start Time	Peds	App. Total	Left	Thru	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 04:30 PM														
04:30 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	1
04:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	1
05:15 PM	0	0	**3**	0	**3**	0	0	0	0	0	0	0	0	**3**
Total Volume	0	0	6	0	6	0	0	0	0	0	0	0	0	6
% App. Total	0		100	0		0	0	0		0	0	0		
PHF	.000	.000	.500	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.500



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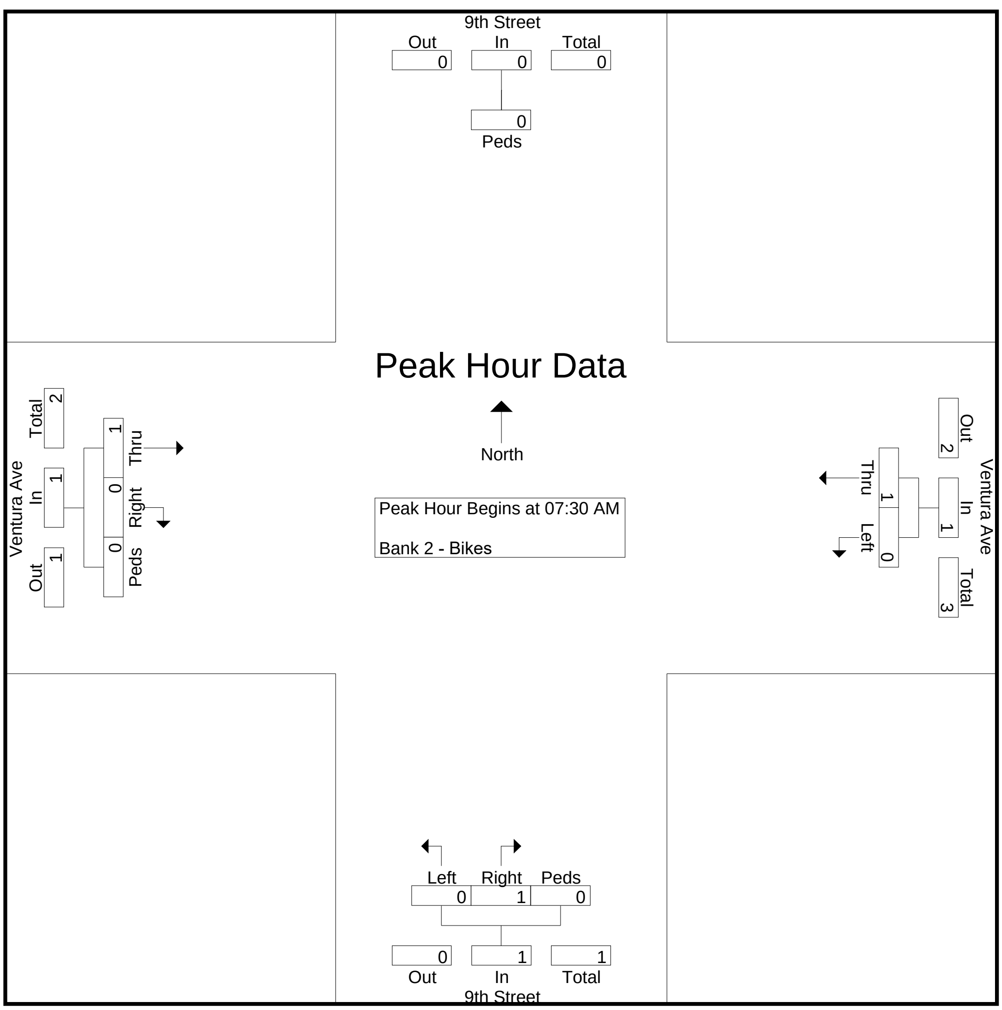
File Name : Ventura at 9th
Site Code : 00031319
Start Date : 3/13/2019

	9th Street Southbound		Ventura Ave Westbound			9th Street Northbound				Ventura Ave Eastbound				
Start Time	Peds	App. Total	Left	Thru	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 07:30 AM														
07:30 AM	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**1**
07:45 AM	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	1
08:00 AM	0	0	0	**1**	**1**	0	0	0	0	0	0	0	0	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	1	1	0	1	0	1	1	0	0	1	3
% App. Total	0		0	100		0	100	0		100	0	0		
PHF	.000	.000	.000	.250	.250	.000	.250	.000	.250	.250	.000	.000	.250	.750



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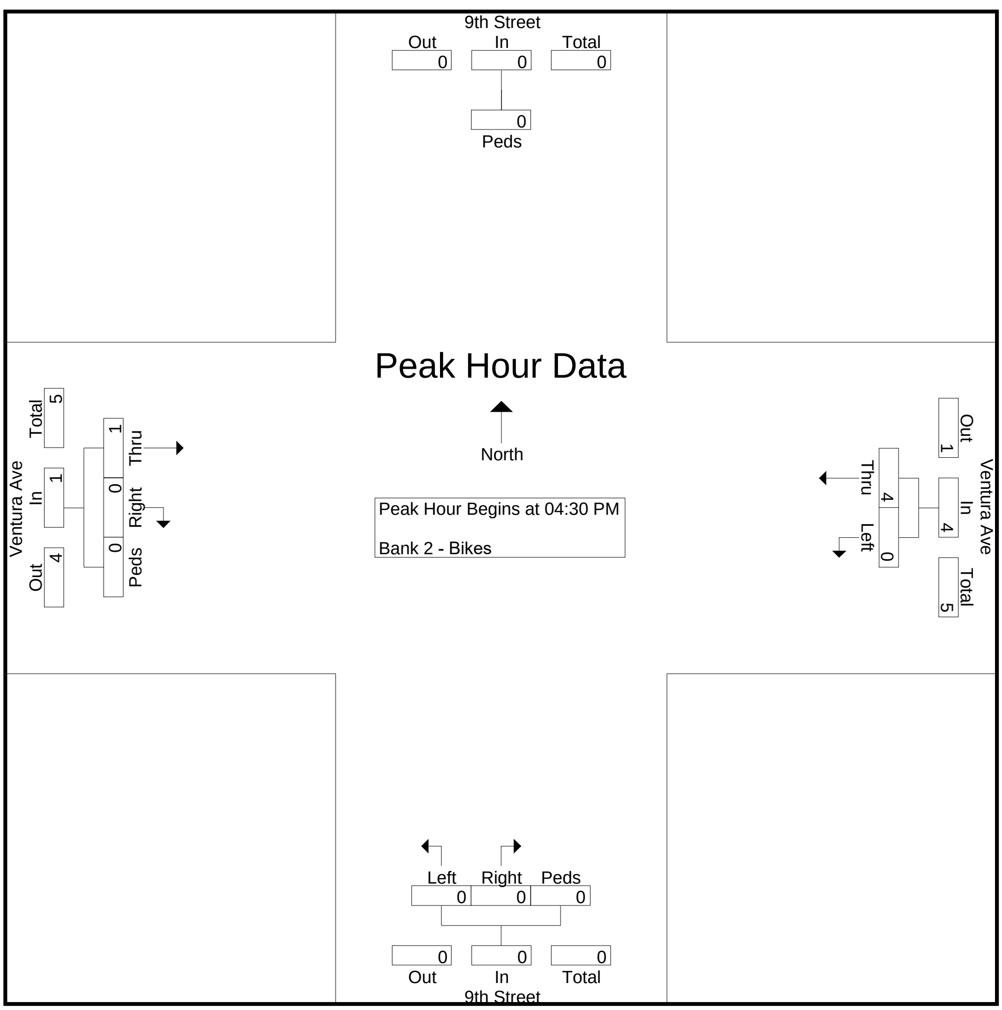
File Name : Ventura at 9th
Site Code : 00031319
Start Date : 3/13/2019
Page No : 3

	9th Street Southbound		Ventura Ave Westbound			9th Street Northbound				Ventura Ave Eastbound				
Start Time	Peds	App. Total	Left	Thru	App. Total	Left	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 04:30 PM														
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	**2**	**2**	0	0	0	0	0	0	0	0	2
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	2	2	0	0	0	0	**1**	0	0	**1**	**3**
Total Volume	0	0	0	4	4	0	0	0	0	1	0	0	1	5
% App. Total	0		0	100		0	0	0		100	0	0		
PHF	.000	.000	.000	.500	.500	.000	.000	.000	.000	.250	.000	.000	.250	.417



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File Name : Ventura at 10th
Site Code : 00000000
Start Date : 3/13/2019
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	TENTH Southbound				VENTURA Westbound				TENTH Northbound				VENTURA Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	0	2	0	1	46	1	0	4	0	0	0	4	37	3	2	101
07:15 AM	0	1	3	0	5	99	0	0	6	2	4	0	1	73	3	1	198
07:30 AM	2	1	0	5	0	144	2	4	14	0	13	0	0	95	2	0	282
07:45 AM	3	0	2	0	4	183	1	0	7	3	7	0	2	114	2	0	328
Total	6	2	7	5	10	472	4	4	31	5	24	0	7	319	10	3	909
08:00 AM	2	0	1	0	7	158	1	0	4	0	6	0	3	88	4	0	274
08:15 AM	3	1	3	3	0	115	3	7	7	1	3	1	1	76	2	3	229
08:30 AM	0	0	3	1	7	113	3	1	4	1	6	0	4	102	6	0	251
08:45 AM	0	1	5	1	9	105	1	0	5	1	6	0	5	93	1	0	233
Total	5	2	12	5	23	491	8	8	20	3	21	1	13	359	13	3	987
******																	
04:00 PM	2	1	9	4	5	149	1	7	6	2	1	0	13	171	4	2	377
04:15 PM	2	1	5	1	7	157	3	1	2	1	10	0	7	150	7	2	356
04:30 PM	0	1	4	3	4	158	2	2	4	1	6	0	11	179	12	3	390
04:45 PM	1	2	4	9	6	156	2	7	2	2	4	0	4	166	6	2	373
Total	5	5	22	17	22	620	8	17	14	6	21	0	35	666	29	9	1496
05:00 PM	2	1	3	1	2	184	0	2	1	1	6	0	10	187	6	2	408
05:15 PM	1	0	9	1	9	156	4	1	6	5	4	0	10	193	12	2	413
05:30 PM	2	3	5	4	3	154	2	1	10	2	10	0	9	144	6	3	358
05:45 PM	7	2	4	0	5	115	5	0	7	2	12	0	7	131	8	0	305
Total	12	6	21	6	19	609	11	4	24	10	32	0	36	655	32	7	1484
Grand Total	28	15	62	33	74	2192	31	33	89	24	98	1	91	1999	84	22	4876
Apprch %	20.3	10.9	44.9	23.9	3.2	94.1	1.3	1.4	42	11.3	46.2	0.5	4.1	91	3.8	1	
Total %	0.6	0.3	1.3	0.7	1.5	45	0.6	0.7	1.8	0.5	2	0	1.9	41	1.7	0.5	
Unshifted	27	12	62	33	60	2185	31	33	87	18	98	1	70	1993	83	22	4815
% Unshifted	96.4	80	100	100	81.1	99.7	100	100	97.8	75	100	100	76.9	99.7	98.8	100	98.7
Bank 1	0	0	0	0	6	0	0	0	0	0	0	0	13	0	0	0	19
% Bank 1	0	0	0	0	8.1	0	0	0	0	0	0	0	14.3	0	0	0	0.4
Bank 2	1	3	0	0	8	7	0	0	2	6	0	0	8	6	1	0	42
% Bank 2	3.6	20	0	0	10.8	0.3	0	0	2.2	25	0	0	8.8	0.3	1.2	0	0.9

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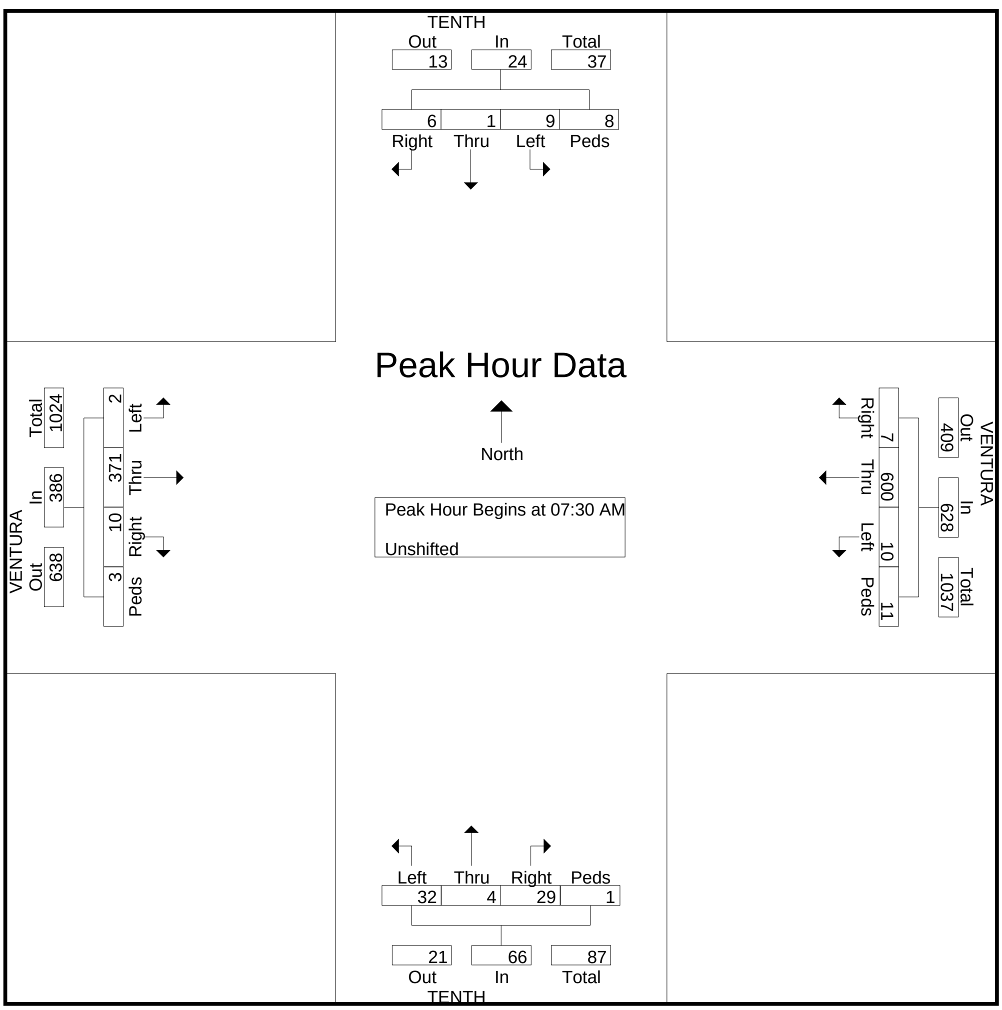
File Name : Ventura at 10th
Site Code : 00000000
Start Date : 3/13/2019
Page No : 2

	TENTH Southbound					VENTURA Westbound					TENTH Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	2	0	0	**5**	7	0	144	2	4	150	**14**	0	**13**	0	**27**	0	94	2	0	96	280
07:45 AM	2	0	2	0	4	4	**183**	1	0	**188**	7	**3**	7	0	17	0	**114**	2	0	**116**	**325**
08:00 AM	2	0	1	0	3	**6**	158	1	0	165	4	0	6	0	10	**1**	87	**4**	0	92	270
08:15 AM	**3**	**1**	**3**	3	**10**	0	115	**3**	**7**	125	7	1	3	**1**	12	1	76	2	**3**	82	229
Total Volume	9	1	6	8	24	10	600	7	11	628	32	4	29	1	66	2	371	10	3	386	1104
% App. Total	37.5	4.2	25	33.3		1.6	95.5	1.1	1.8		48.5	6.1	43.9	1.5		0.5	96.1	2.6	0.8		
PHF	.750	.250	.500	.400	.600	.417	.820	.583	.393	.835	.571	.333	.558	.250	.611	.500	.814	.625	.250	.832	.849



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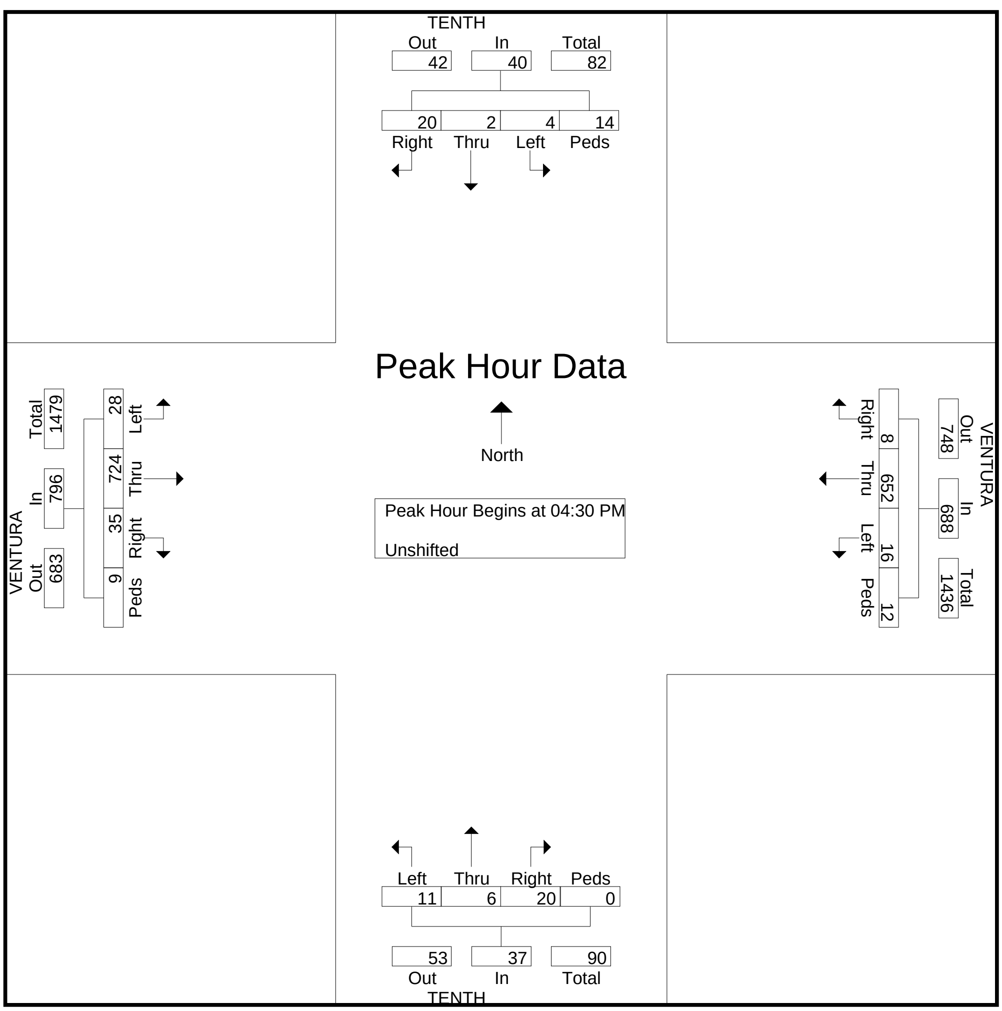
File Name : Ventura at 10th
Site Code : 00000000
Start Date : 3/13/2019
Page No : 3

	TENTH Southbound					VENTURA Westbound					TENTH Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	**1**	4	3	8	3	158	2	2	165	**4**	1	**6**	0	**11**	**9**	179	**12**	**3**	203	387
04:45 PM	1	1	4	**9**	**15**	5	154	2	**7**	168	2	**2**	4	0	8	2	166	6	2	176	367
05:00 PM	**2**	0	3	1	6	2	**184**	0	2	**188**	1	1	6	0	8	8	187	6	2	203	**405**
05:15 PM	1	0	**9**	1	11	**6**	156	**4**	1	167	4	2	4	0	10	9	**192**	11	2	**214**	402
Total Volume	4	2	20	14	40	16	652	8	12	688	11	6	20	0	37	28	724	35	9	796	1561
% App. Total	10	5	50	35		2.3	94.8	1.2	1.7		29.7	16.2	54.1	0		3.5	91	4.4	1.1		
PHF	.500	.500	.556	.389	.667	.667	.886	.500	.429	.915	.688	.750	.833	.000	.841	.778	.943	.729	.750	.930	.964



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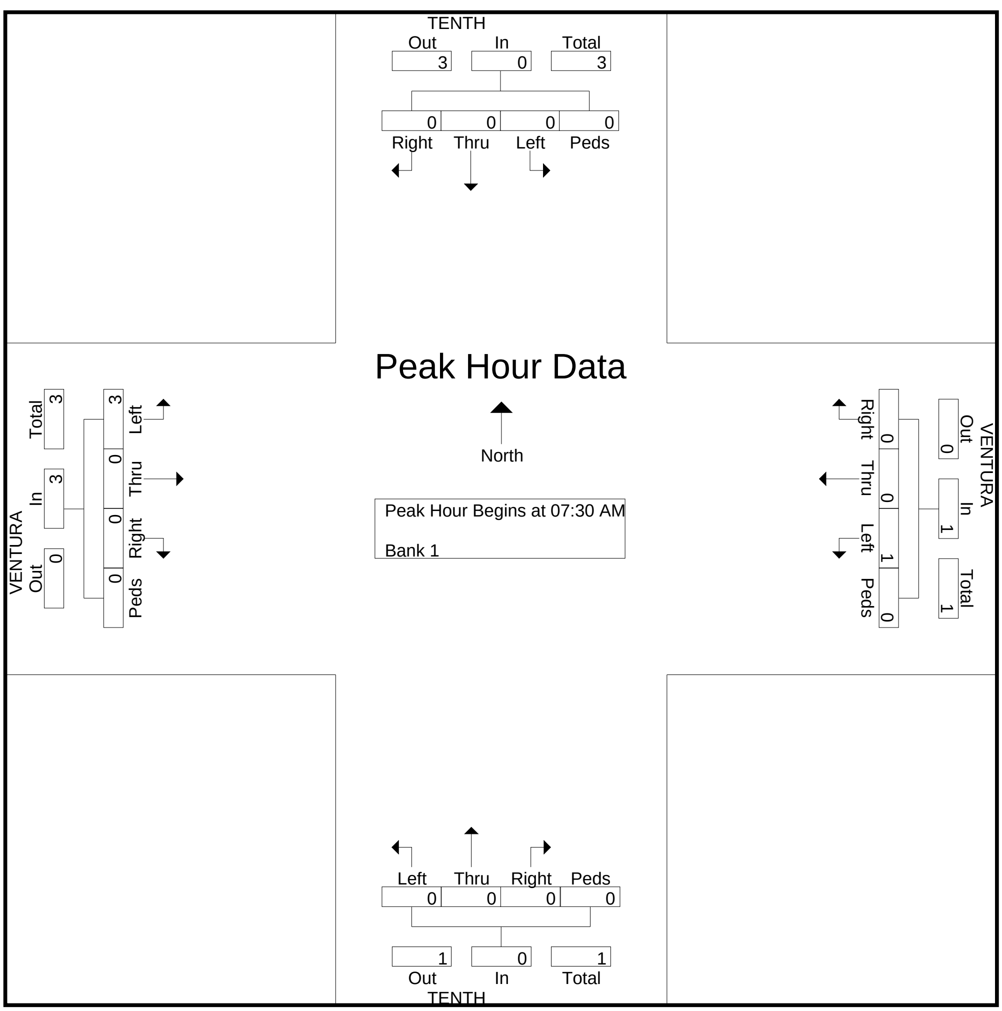
File Name : Ventura at 10th
Site Code : 00000000
Start Date : 3/13/2019

	TENTH Southbound					VENTURA Westbound					TENTH Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
08:00 AM	0	0	0	0	0	**1**	0	0	0	**1**	0	0	0	0	0	**2**	0	0	0	**2**	**3**
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	3	0	0	0	3	4
% App. Total	0	0	0	0		100	0	0	0		0	0	0	0		100	0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.000	.000	.000	.250	.000	.000	.000	.000	.000	.375	.000	.000	.000	.375	.333



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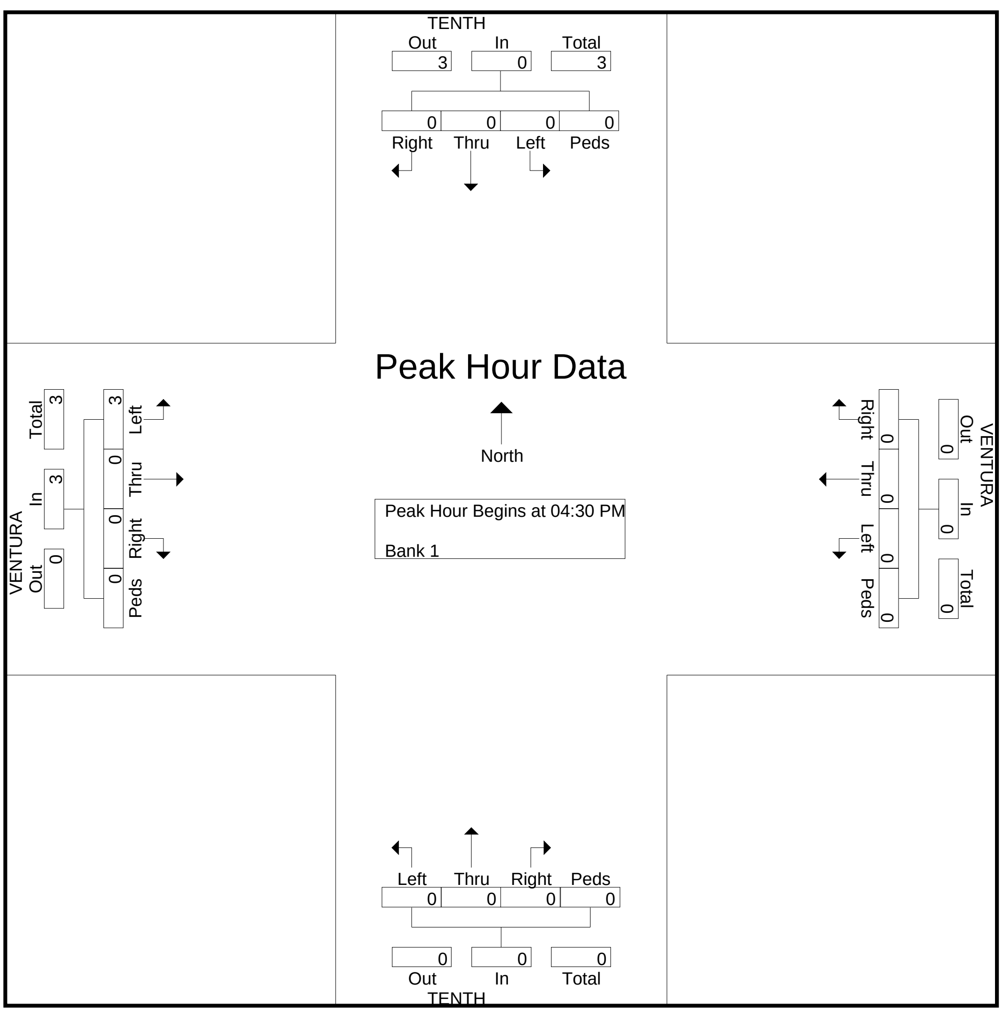
File Name : Ventura at 10th
Site Code : 00000000
Start Date : 3/13/2019
Page No : 3

	TENTH Southbound					VENTURA Westbound					TENTH Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	0	0	**2**	**2**
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
% App. Total	0	0	0	0		0	0	0	0		0	0	0	0		100	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.375	.000	.000	.000	.375	.375



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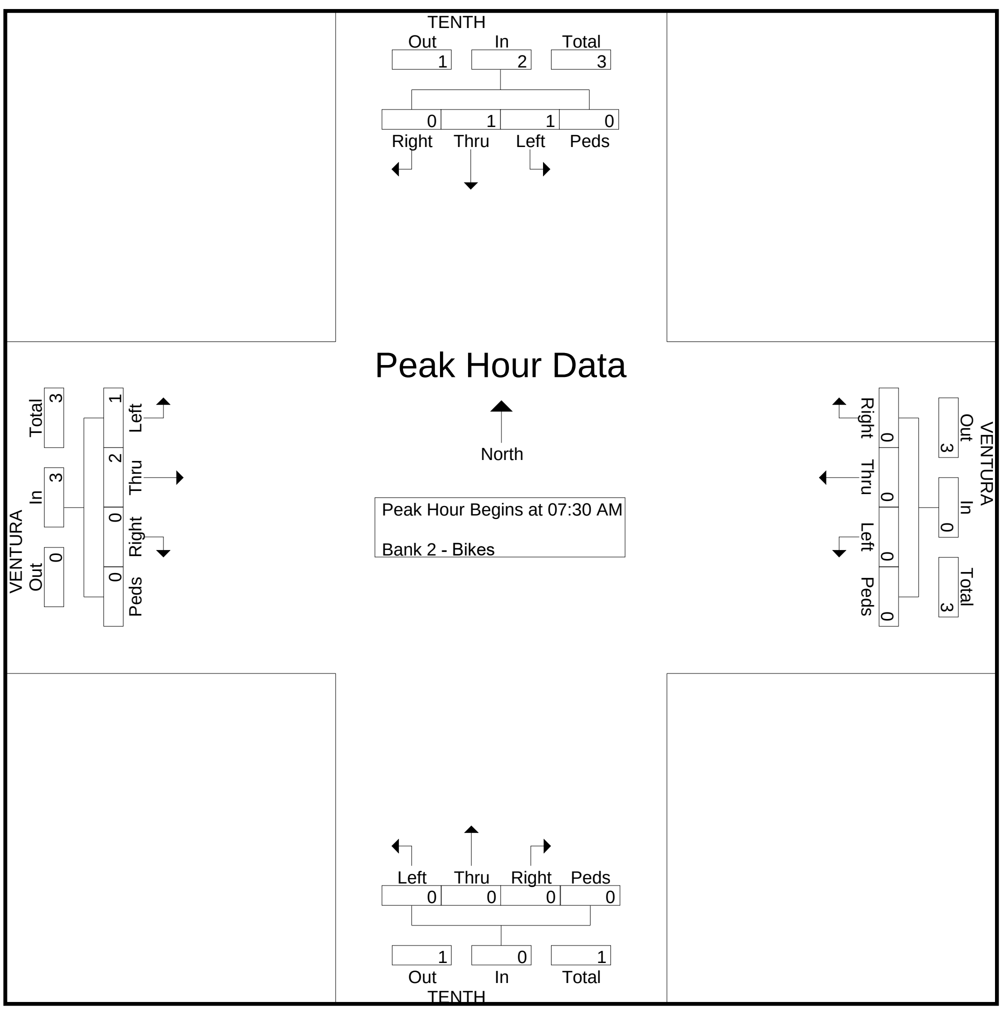
File Name : Ventura at 10th
Site Code : 00000000
Start Date : 3/13/2019

	TENTH Southbound					VENTURA Westbound					TENTH Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	**2**
07:45 AM	**1**	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	1	2
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	5
% App. Total	50	50	0	0		0	0	0	0		0	0	0	0		33.3	66.7	0	0		
PHF	.250	.250	.000	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.500	.000	.000	.750	.625



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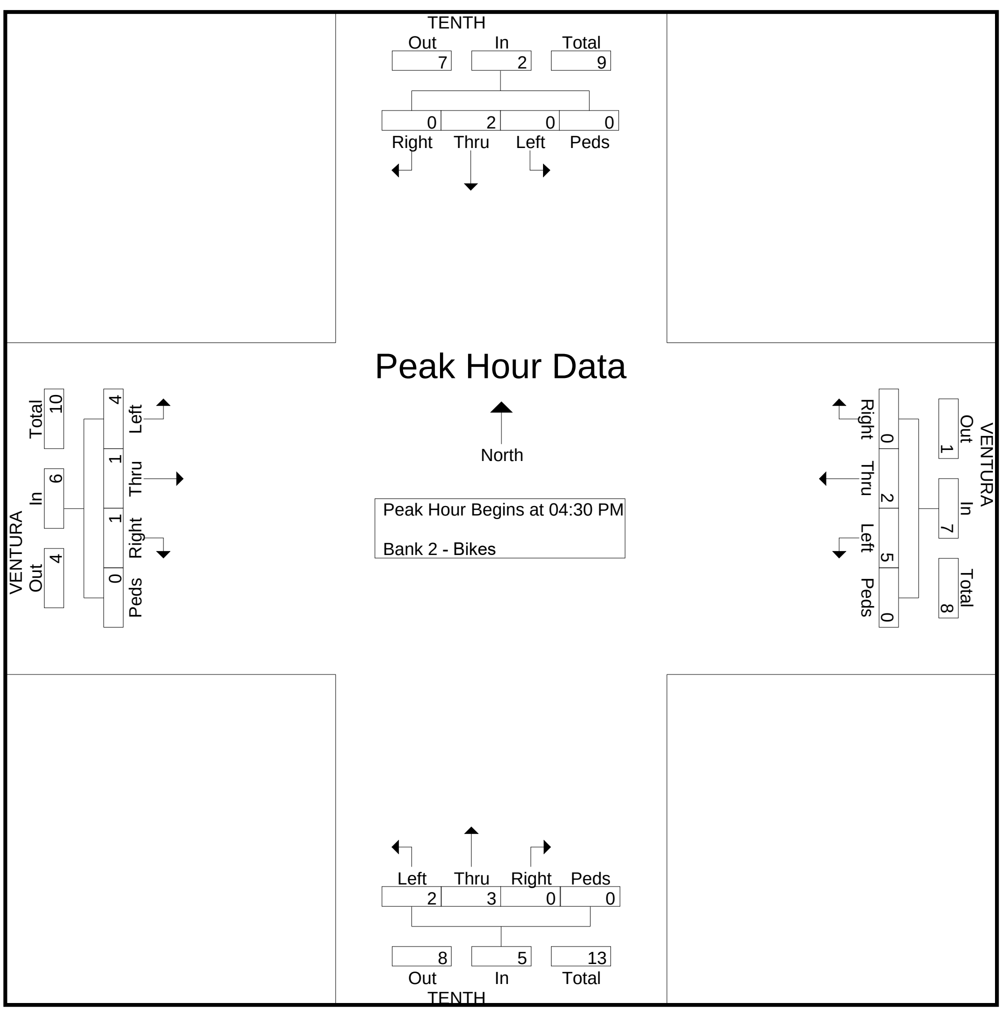
File Name : Ventura at 10th
Site Code : 00000000
Start Date : 3/13/2019

	TENTH Southbound					VENTURA Westbound					TENTH Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	**2**	0	0	0	2	3
04:45 PM	0	**1**	0	0	**1**	1	**2**	0	0	**3**	0	0	0	0	0	0	0	0	0	0	4
05:00 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2
05:15 PM	0	0	0	0	0	**3**	0	0	0	3	**2**	**3**	0	0	**5**	1	**1**	**1**	0	**3**	**11**
Total Volume	0	2	0	0	2	5	2	0	0	7	2	3	0	0	5	4	1	1	0	6	20
% App. Total	0	100	0	0		71.4	28.6	0	0		40	60	0	0		66.7	16.7	16.7	0		
PHF	.000	.500	.000	.000	.500	.417	.250	.000	.000	.583	.250	.250	.000	.000	.250	.500	.250	.250	.000	.500	.455



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File Name : Cedar at Ventura
Site Code : 00000000
Start Date : 3/14/2019
Page No : 1

Groups Printed- Unshifted - Bank 1 - Bank 2

	CEDAR Southbound				VENTURA Westbound				CEDAR Northbound				VENTURA Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	17	57	5	0	18	37	12	1	2	41	8	8	10	31	8	12	267
07:15 AM	20	82	8	1	16	73	16	5	9	86	14	11	17	51	5	12	426
07:30 AM	24	110	22	8	20	106	29	3	9	152	10	13	38	81	6	3	634
07:45 AM	32	100	25	2	23	136	27	4	25	158	17	7	43	82	19	10	710
Total	93	349	60	11	77	352	84	13	45	437	49	39	108	245	38	37	2037
08:00 AM	35	83	21	2	29	130	22	0	14	93	13	12	26	77	13	8	578
08:15 AM	43	72	11	4	19	88	24	2	21	79	17	7	9	63	8	3	470
08:30 AM	29	79	16	4	17	82	28	4	17	63	18	6	20	59	9	6	457
08:45 AM	25	41	9	1	17	73	20	6	10	51	9	8	13	64	18	1	366
Total	132	275	57	11	82	373	94	12	62	286	57	33	68	263	48	18	1871
******																	
04:00 PM	37	58	26	6	35	121	35	2	14	98	23	9	27	115	18	3	627
04:15 PM	33	89	17	5	21	125	39	5	15	93	14	11	29	95	18	0	609
04:30 PM	23	67	23	18	26	114	59	6	19	95	23	11	27	134	21	9	675
04:45 PM	32	94	27	3	23	129	38	5	24	97	21	7	26	124	21	6	677
Total	125	308	93	32	105	489	171	18	72	383	81	38	109	468	78	18	2588
05:00 PM	40	70	24	2	30	157	40	2	18	83	21	5	33	123	10	3	661
05:15 PM	35	97	20	1	25	134	24	6	16	78	13	4	37	165	26	8	689
05:30 PM	46	101	13	1	14	93	28	1	14	85	23	0	27	139	12	1	598
05:45 PM	39	92	19	3	20	89	22	1	17	76	7	4	31	97	23	6	546
Total	160	360	76	7	89	473	114	10	65	322	64	13	128	524	71	18	2494
Grand Total	510	1292	286	61	353	1687	463	53	244	1428	251	123	413	1500	235	91	8990
Apprch %	23.7	60.1	13.3	2.8	13.8	66	18.1	2.1	11.9	69.8	12.3	6	18.4	67	10.5	4.1	
Total %	5.7	14.4	3.2	0.7	3.9	18.8	5.2	0.6	2.7	15.9	2.8	1.4	4.6	16.7	2.6	1	
Unshifted	498	1281	285	61	311	1680	460	53	244	1418	251	123	377	1494	233	91	8860
% Unshifted	97.6	99.1	99.7	100	88.1	99.6	99.4	100	100	99.3	100	100	91.3	99.6	99.1	100	98.6
Bank 1	12	0	1	0	41	0	1	0	0	0	0	0	33	0	0	0	88
% Bank 1	2.4	0	0.3	0	11.6	0	0.2	0	0	0	0	0	8	0	0	0	1
Bank 2	0	11	0	0	1	7	2	0	0	10	0	0	3	6	2	0	42
% Bank 2	0	0.9	0	0	0.3	0.4	0.4	0	0	0.7	0	0	0.7	0.4	0.9	0	0.5

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File Name : Cedar at Ventura
Site Code : 00000000
Start Date : 3/14/2019
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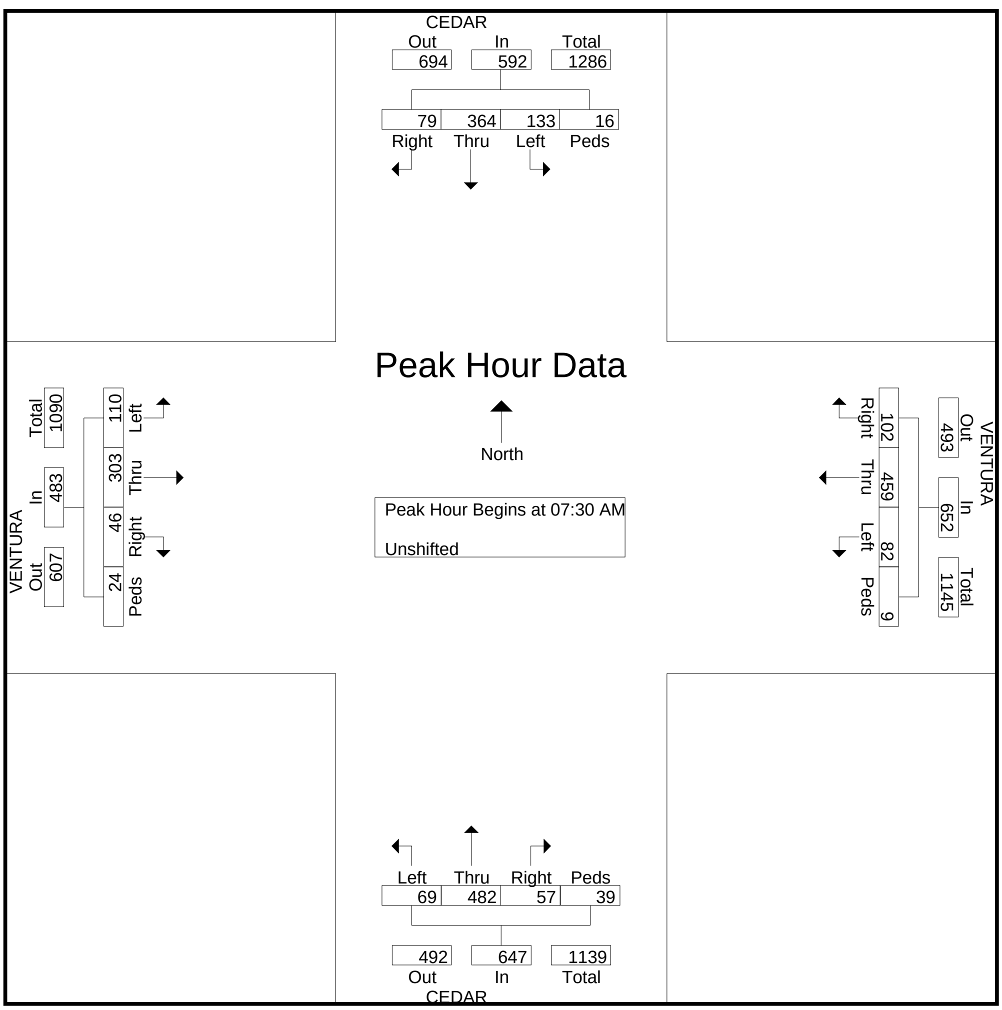
	CEDAR Southbound					VENTURA Westbound					CEDAR Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	23	**110**	22	**8**	**163**	18	106	**29**	3	156	9	152	10	**13**	184	37	81	6	3	127	630
07:45 AM	32	100	**25**	2	159	22	**136**	27	**4**	**189**	**25**	**158**	**17**	7	**207**	**40**	**82**	**19**	**10**	**151**	**706**
08:00 AM	35	83	21	2	141	**25**	130	22	0	177	14	93	13	12	132	25	77	13	8	123	573
08:15 AM	**43**	71	11	4	129	17	87	24	2	130	21	79	17	7	124	8	63	8	3	82	465
Total Volume	133	364	79	16	592	82	459	102	9	652	69	482	57	39	647	110	303	46	24	483	2374
% App. Total	22.5	61.5	13.3	2.7		12.6	70.4	15.6	1.4		10.7	74.5	8.8	6		22.8	62.7	9.5	5		
PHF	.773	.827	.790	.500	.908	.820	.844	.879	.563	.862	.690	.763	.838	.750	.781	.688	.924	.605	.600	.800	.841



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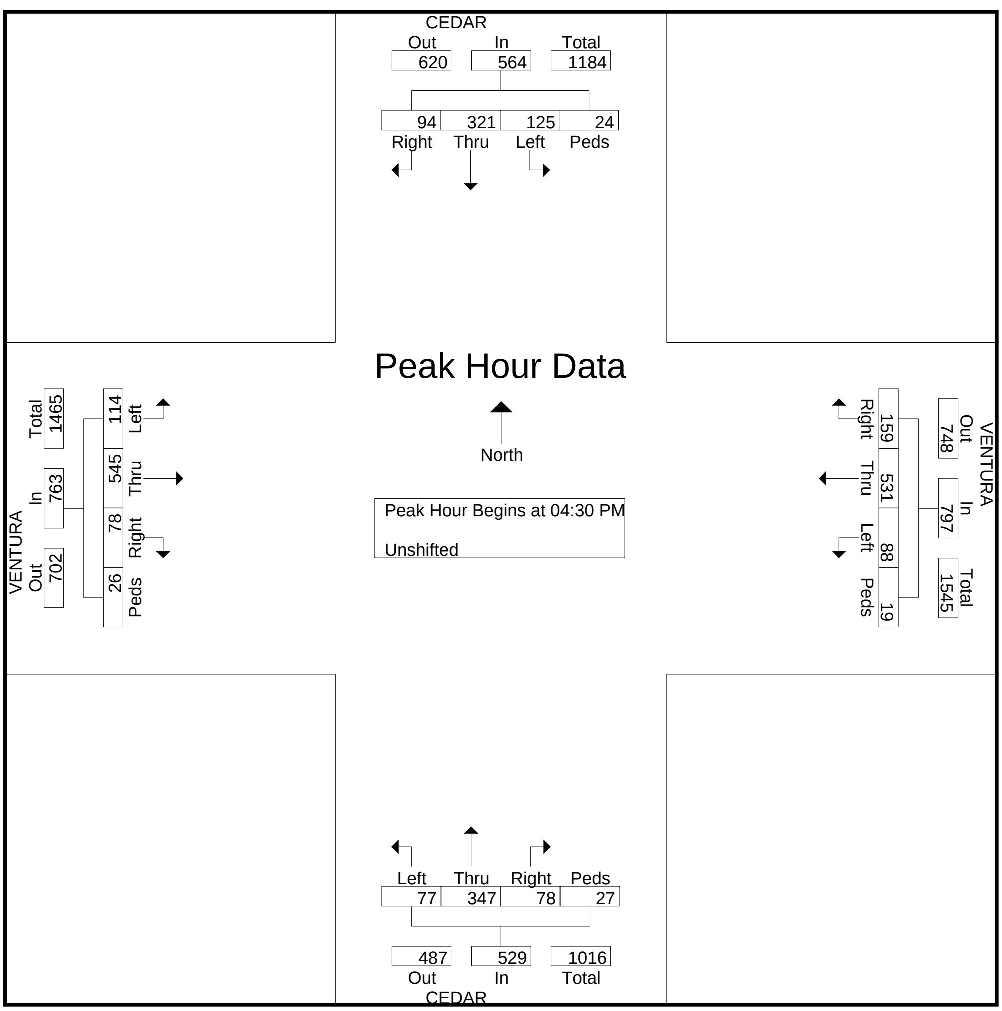
	CEDAR Southbound					VENTURA Westbound					CEDAR Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	22	66	23	**18**	129	**24**	114	**58**	**6**	202	19	94	**23**	**11**	**147**	26	133	21	**9**	189	667
04:45 PM	31	89	**27**	3	150	21	127	38	5	191	**24**	**95**	21	7	147	23	124	21	6	174	662
05:00 PM	**38**	70	24	2	134	22	**157**	39	2	**220**	18	81	21	5	125	31	123	10	3	167	646
05:15 PM	34	**96**	20	1	**151**	21	133	24	6	184	16	77	13	4	110	**34**	**165**	**26**	8	**233**	**678**
Total Volume	125	321	94	24	564	88	531	159	19	797	77	347	78	27	529	114	545	78	26	763	2653
% App. Total	22.2	56.9	16.7	4.3		11	66.6	19.9	2.4		14.6	65.6	14.7	5.1		14.9	71.4	10.2	3.4		
PHF	.822	.836	.870	.333	.934	.917	.846	.685	.792	.906	.802	.913	.848	.614	.900	.838	.826	.750	.722	.819	.978



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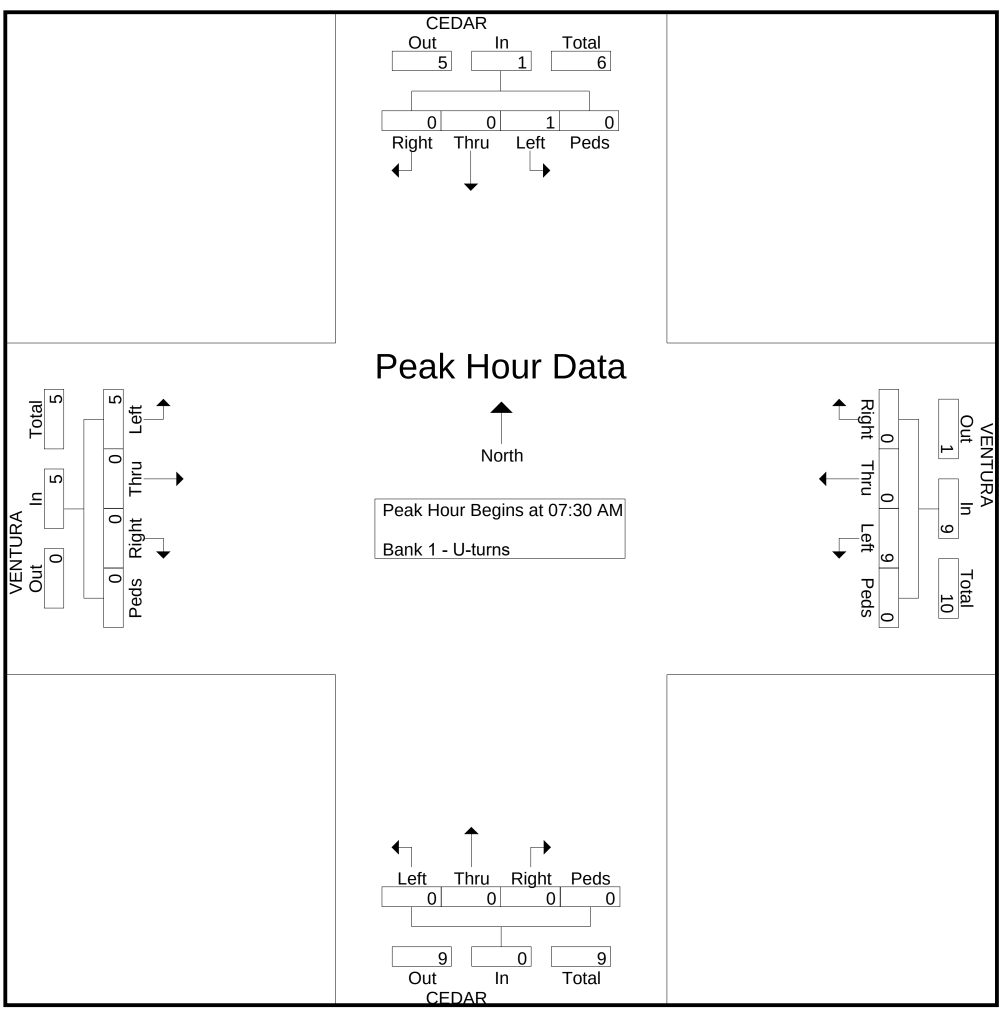
Site Code : 00000000
Start Date : 3/14/2019

	CEDAR Southbound					VENTURA Westbound					CEDAR Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	**1**	0	0	0	**1**	2	0	0	0	2	0	0	0	0	0	1	0	0	0	1	4
07:45 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	**2**	0	0	0	**2**	3
08:00 AM	0	0	0	0	0	**4**	0	0	0	**4**	0	0	0	0	0	1	0	0	0	1	**5**
08:15 AM	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	1	0	0	0	1	3
Total Volume	1	0	0	0	1	9	0	0	0	9	0	0	0	0	0	5	0	0	0	5	15
% App. Total	100	0	0	0		100	0	0	0		0	0	0	0		100	0	0	0		
PHF	.250	.000	.000	.000	.250	.563	.000	.000	.000	.563	.000	.000	.000	.000	.000	.625	.000	.000	.000	.625	.750



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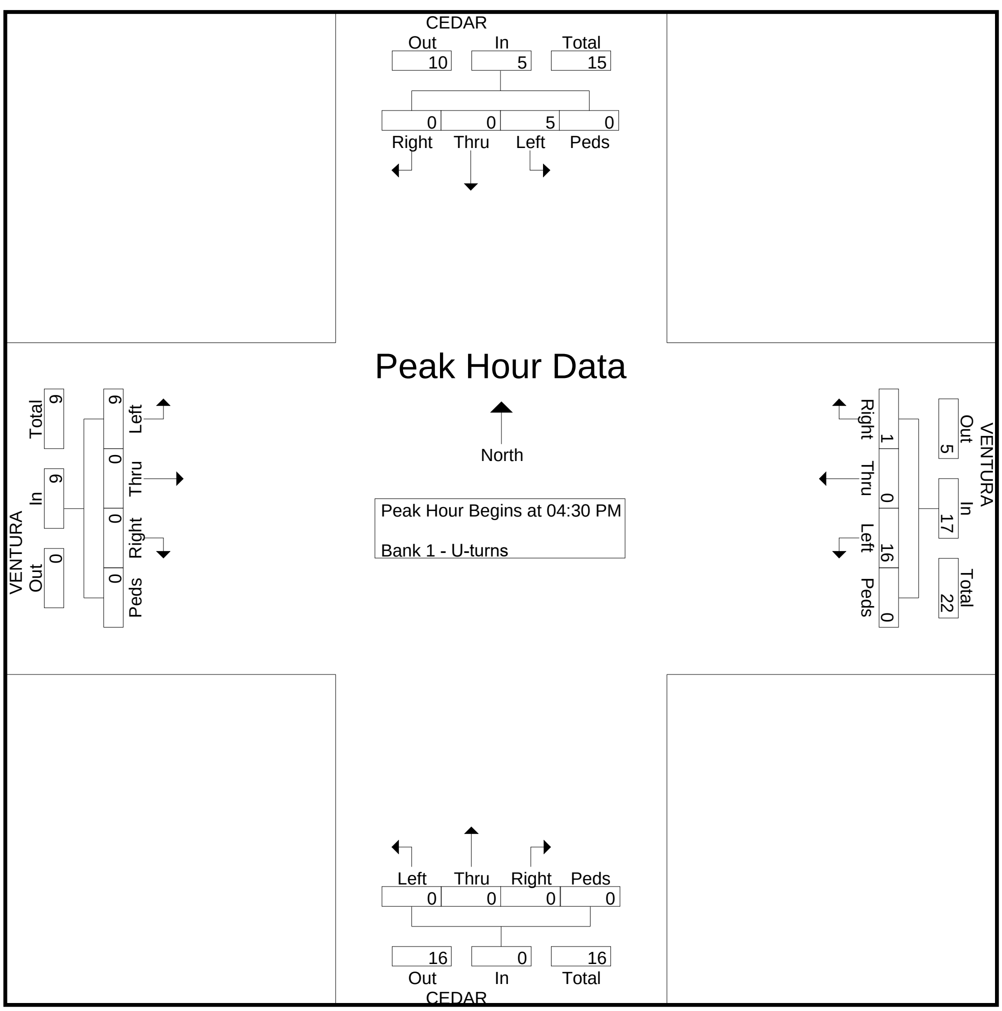
Site Code : 00000000
Start Date : 3/14/2019

	CEDAR Southbound					VENTURA Westbound					CEDAR Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	1	0	0	0	1	2	0	0	0	2	0	0	0	0	0	1	0	0	0	1	4
04:45 PM	1	0	0	0	1	2	0	0	0	2	0	0	0	0	0	**3**	0	0	0	**3**	6
05:00 PM	**2**	0	0	0	**2**	**8**	0	**1**	0	**9**	0	0	0	0	0	2	0	0	0	2	**13**
05:15 PM	1	0	0	0	1	4	0	0	0	4	0	0	0	0	0	3	0	0	0	3	8
Total Volume	5	0	0	0	5	16	0	1	0	17	0	0	0	0	0	9	0	0	0	9	31
% App. Total	100	0	0	0		94.1	0	5.9	0		0	0	0	0		100	0	0	0		
PHF	.625	.000	.000	.000	.625	.500	.000	.250	.000	.472	.000	.000	.000	.000	.000	.750	.000	.000	.000	.750	.596



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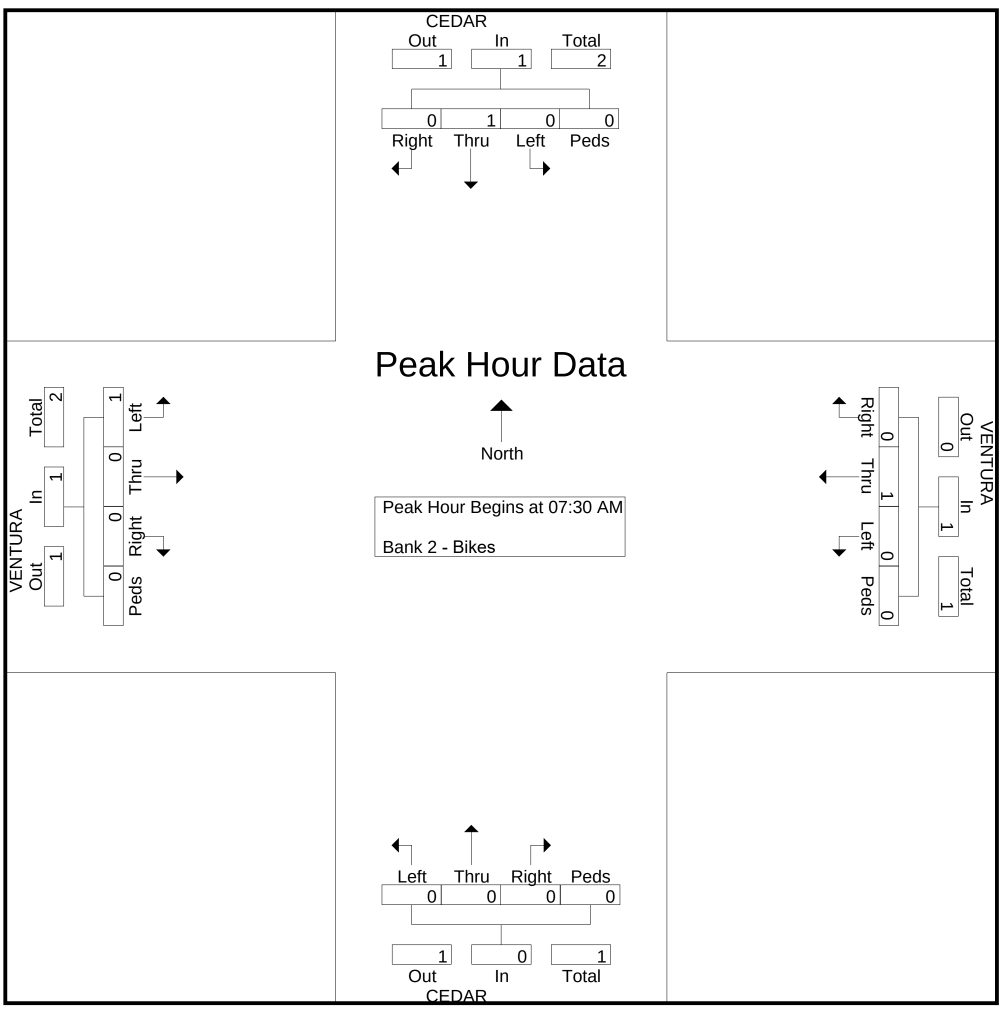
	CEDAR Southbound					VENTURA Westbound					CEDAR Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	**1**	1
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	**1**	0	0	**1**	0	**1**	0	0	**1**	0	0	0	0	0	0	0	0	0	0	**2**
Total Volume	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	1	0	0	0	1	3
% App. Total	0	100	0	0		0	100	0	0		0	0	0	0		100	0	0	0		
PHF	.000	.250	.000	.000	.250	.000	.250	.000	.000	.250	.000	.000	.000	.000	.000	.250	.000	.000	.000	.250	.375



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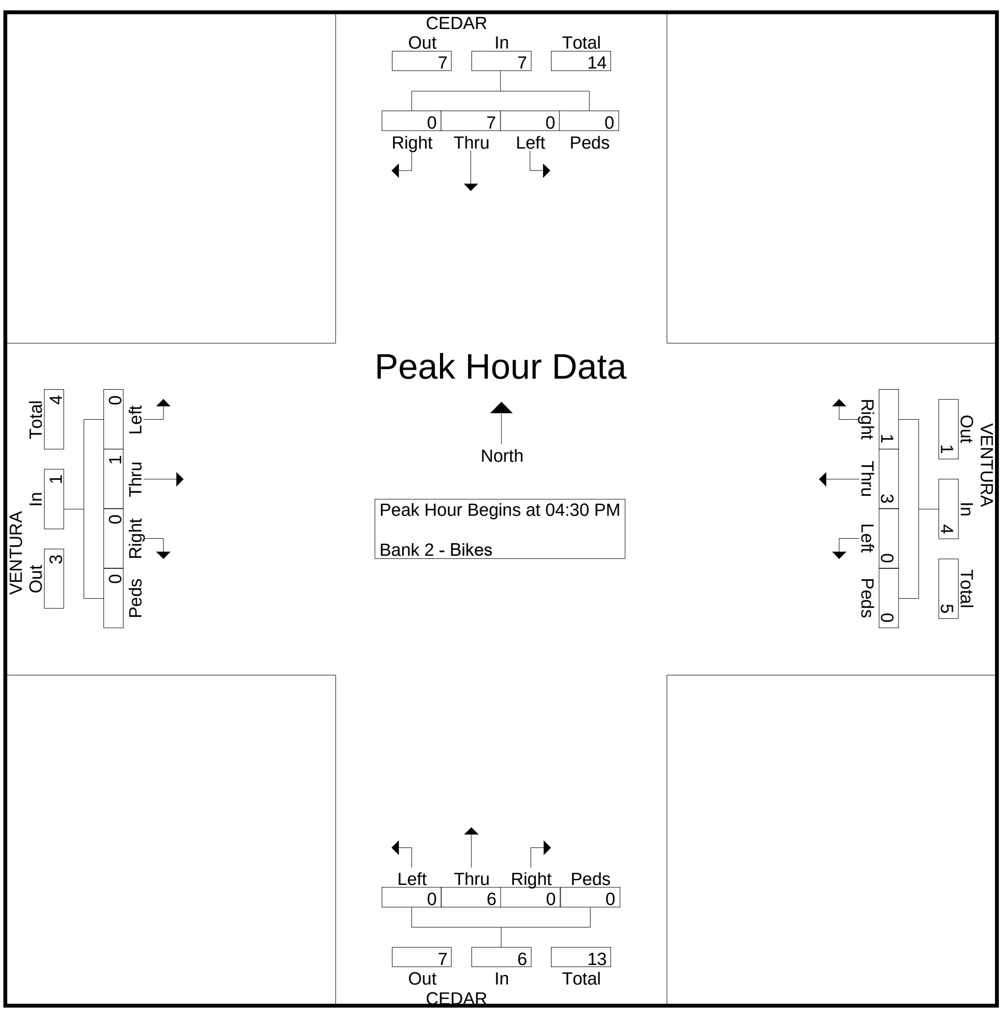
File Name : Cedar at Ventura
Site Code : 00000000
Start Date : 3/14/2019

	CEDAR Southbound					VENTURA Westbound					CEDAR Northbound					VENTURA Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	1	0	0	1	0	0	**1**	0	1	0	1	0	0	1	0	**1**	0	0	**1**	4
04:45 PM	0	**5**	0	0	**5**	0	**2**	0	0	**2**	0	**2**	0	0	**2**	0	0	0	0	0	**9**
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2
05:15 PM	0	1	0	0	1	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	3
Total Volume	0	7	0	0	7	0	3	1	0	4	0	6	0	0	6	0	1	0	0	1	18
% App. Total	0	100	0	0		0	75	25	0		0	100	0	0		0	100	0	0		
PHF	.000	.350	.000	.000	.350	.000	.375	.250	.000	.500	.000	.750	.000	.000	.750	.000	.250	.000	.000	.250	.500



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File Name : Lane at Cedar
Site Code : 00000000
Start Date : 3/13/2019
Page No : 1

Groups Printed- Unshifted - Bank 2

	CEDAR Southbound				LANE Westbound				CEDAR Northbound				LANE Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	61	0	0	0	1	1	0	0	45	1	0	1	0	0	2	113
07:15 AM	3	81	0	1	2	0	5	0	0	65	1	0	2	0	0	2	162
07:30 AM	0	90	2	4	7	1	8	1	1	119	4	0	2	0	0	0	239
07:45 AM	1	115	1	1	1	0	6	0	0	127	1	0	5	0	0	0	258
Total	5	347	3	6	10	2	20	1	1	356	7	0	10	0	0	4	772
08:00 AM	3	83	1	0	1	0	4	0	1	107	1	1	3	0	0	3	208
08:15 AM	2	84	1	1	1	0	6	0	0	112	1	6	0	0	0	3	217
08:30 AM	0	80	0	1	0	0	8	0	0	118	3	7	0	0	1	3	221
08:45 AM	4	98	0	0	2	0	3	0	0	112	2	2	2	0	0	0	225
Total	9	345	2	2	4	0	21	0	1	449	7	16	5	0	1	9	871
******																	
04:00 PM	5	108	3	1	3	15	2	0	0	113	6	1	7	6	0	2	272
04:15 PM	7	102	1	1	1	0	7	3	2	108	3	2	0	0	2	2	241
04:30 PM	5	114	2	0	2	1	7	3	2	89	4	3	3	0	1	0	236
04:45 PM	2	122	4	2	1	0	7	0	0	121	2	1	4	0	0	2	268
Total	19	446	10	4	7	16	23	6	4	431	15	7	14	6	3	6	1017
05:00 PM	2	98	2	2	1	0	5	0	0	105	3	0	0	0	0	1	219
05:15 PM	1	117	0	0	5	0	7	1	0	120	3	1	2	1	0	0	258
05:30 PM	1	132	0	4	0	0	10	3	1	122	3	2	2	1	1	2	284
05:45 PM	2	125	2	0	0	0	3	1	0	109	4	1	0	1	1	0	249
Total	6	472	4	6	6	0	25	5	1	456	13	4	4	3	2	3	1010
Grand Total	39	1610	19	18	27	18	89	12	7	1692	42	27	33	9	6	22	3670
Apprch %	2.3	95.5	1.1	1.1	18.5	12.3	61	8.2	0.4	95.7	2.4	1.5	47.1	12.9	8.6	31.4	
Total %	1.1	43.9	0.5	0.5	0.7	0.5	2.4	0.3	0.2	46.1	1.1	0.7	0.9	0.2	0.2	0.6	
Unshifted	39	1610	19	11	27	18	89	10	7	1692	42	24	33	9	6	14	3650
% Unshifted	100	100	100	61.1	100	100	100	83.3	100	100	100	88.9	100	100	100	63.6	99.5
Bank 2	0	0	0	7	0	0	0	2	0	0	0	3	0	0	0	8	20
% Bank 2	0	0	0	38.9	0	0	0	16.7	0	0	0	11.1	0	0	0	36.4	0.5

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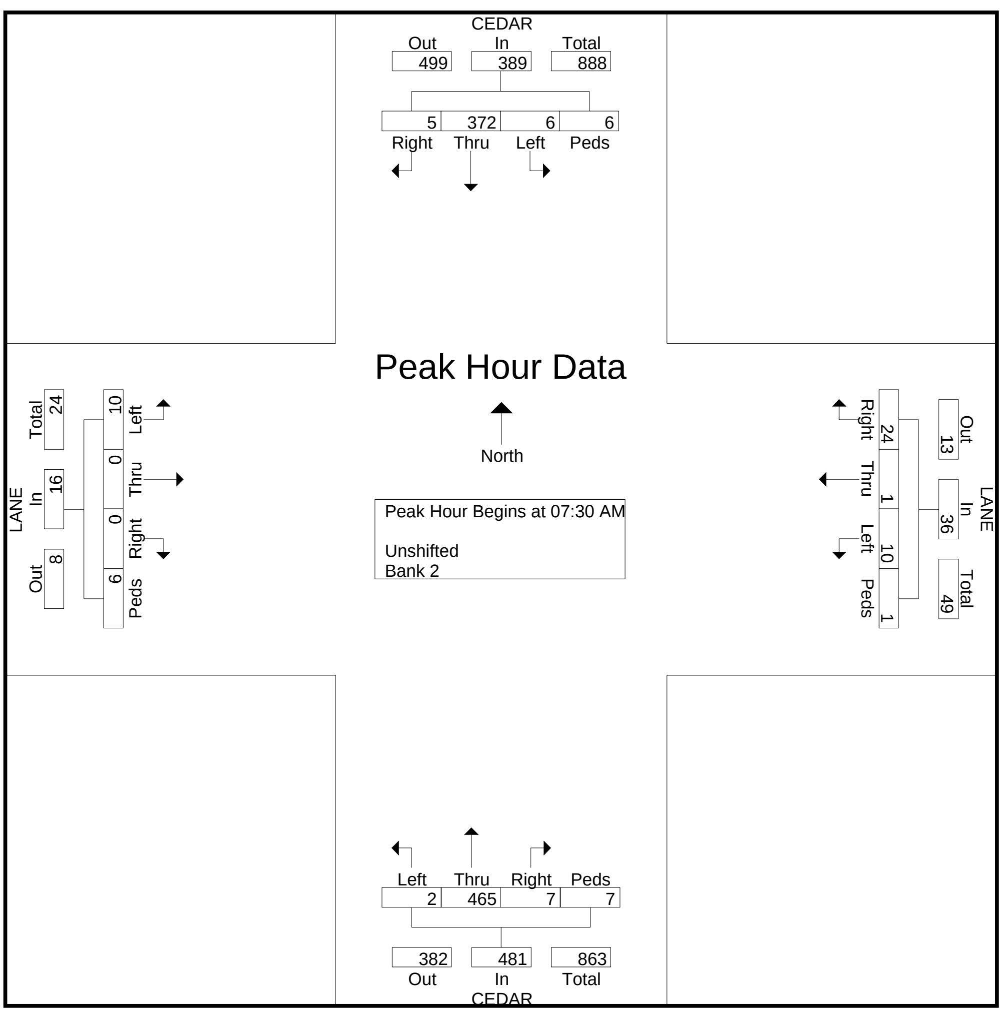
	CEDAR Southbound					LANE Westbound					CEDAR Northbound					LANE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	90	**2**	**4**	96	**7**	**1**	**8**	**1**	**17**	**1**	119	**4**	0	124	2	0	0	0	2	239
07:45 AM	1	**115**	1	1	**118**	1	0	6	0	7	0	**127**	1	0	**128**	**5**	0	0	0	5	**258**
08:00 AM	**3**	83	1	0	87	1	0	4	0	5	1	107	1	1	110	3	0	0	**3**	**6**	208
08:15 AM	2	84	1	1	88	1	0	6	0	7	0	112	1	**6**	119	0	0	0	3	3	217
Total Volume	6	372	5	6	389	10	1	24	1	36	2	465	7	7	481	10	0	0	6	16	922
% App. Total	1.5	95.6	1.3	1.5		27.8	2.8	66.7	2.8		0.4	96.7	1.5	1.5		62.5	0	0	37.5		
PHF	.500	.809	.625	.375	.824	.357	.250	.750	.250	.529	.500	.915	.438	.292	.939	.500	.000	.000	.500	.667	.893



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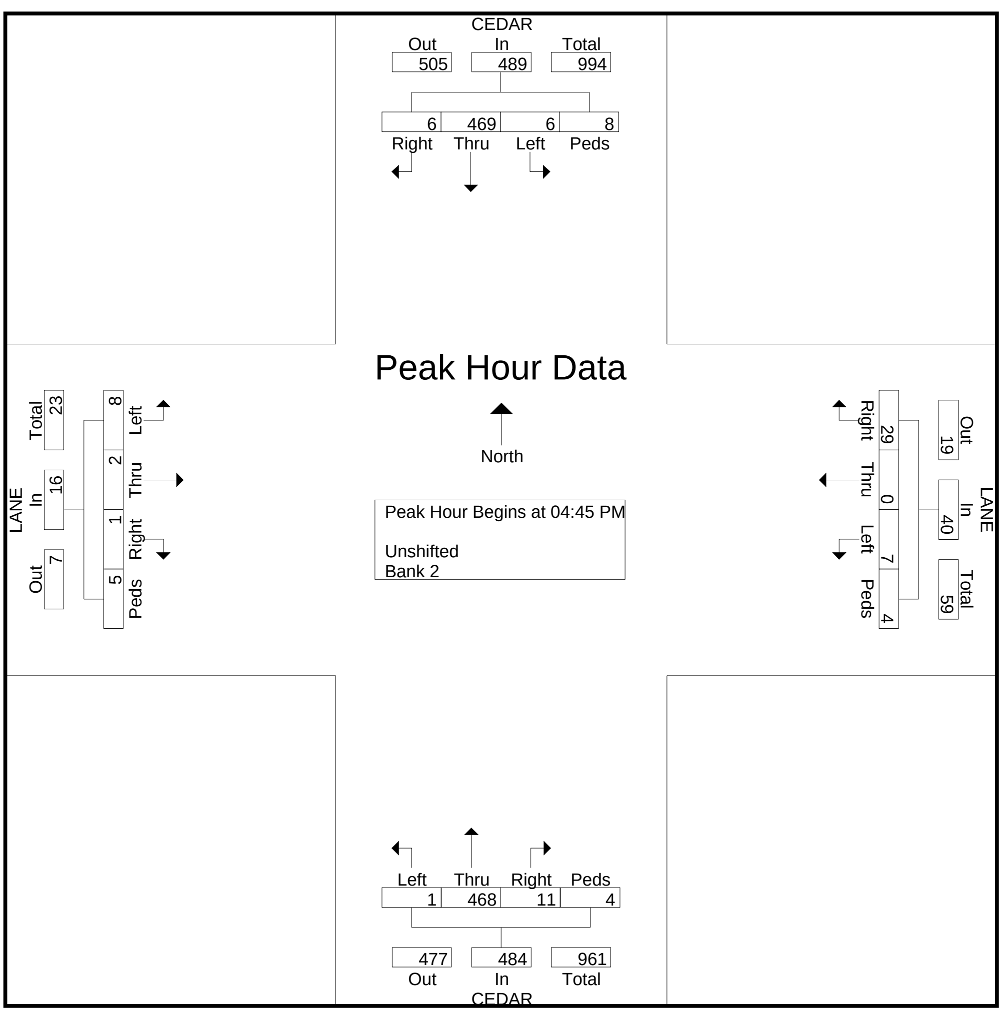
	CEDAR Southbound					LANE Westbound					CEDAR Northbound					LANE Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**2**	122	**4**	2	130	1	0	7	0	8	0	121	2	1	124	**4**	0	0	**2**	**6**	268
05:00 PM	2	98	2	2	104	1	0	5	0	6	0	105	**3**	0	108	0	0	0	1	1	219
05:15 PM	1	117	0	0	118	**5**	0	7	1	**13**	0	120	3	1	124	2	**1**	0	0	3	258
05:30 PM	1	**132**	0	**4**	**137**	0	0	**10**	**3**	13	**1**	**122**	3	**2**	**128**	2	1	**1**	2	6	**284**
Total Volume	6	469	6	8	489	7	0	29	4	40	1	468	11	4	484	8	2	1	5	16	1029
% App. Total	1.2	95.9	1.2	1.6		17.5	0	72.5	10		0.2	96.7	2.3	0.8		50	12.5	6.2	31.2		
PHF	.750	.888	.375	.500	.892	.350	.000	.725	.333	.769	.250	.959	.917	.500	.945	.500	.500	.250	.625	.667	.906



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File Name : Cedar at Butler
Site Code : 00000000
Start Date : 3/19/2019
Page No : 1

Groups Printed- Unshifted

	CEDAR Southbound				BUTLER Westbound				CEDAR Northbound				BUTLER Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	2	44	10	0	4	33	4	4	15	44	2	0	7	31	7	1	208
07:15 AM	11	61	9	1	7	53	7	0	10	62	9	11	18	39	17	3	318
07:30 AM	5	119	20	5	12	78	9	0	24	138	28	18	24	36	22	0	538
07:45 AM	10	111	29	3	26	100	17	0	26	110	20	6	39	73	18	4	592
Total	28	335	68	9	49	264	37	4	75	354	59	35	88	179	64	8	1656
08:00 AM	12	75	22	3	14	71	12	3	27	100	20	11	15	48	22	2	457
08:15 AM	9	69	8	0	12	58	6	0	24	60	6	0	10	32	13	0	307
08:30 AM	4	60	12	2	3	37	9	0	12	49	4	0	16	34	15	0	257
08:45 AM	16	49	10	2	2	54	7	1	14	41	9	4	12	33	11	0	265
Total	41	253	52	7	31	220	34	4	77	250	39	15	53	147	61	2	1286
******																	
04:00 PM	24	89	11	1	12	65	12	6	29	86	12	0	13	72	16	2	450
04:15 PM	14	81	20	5	10	43	15	3	18	75	18	2	17	80	18	0	419
04:30 PM	20	82	15	1	13	59	8	5	16	78	10	4	19	83	29	2	444
04:45 PM	14	86	16	2	11	60	7	1	23	94	13	4	19	74	17	0	441
Total	72	338	62	9	46	227	42	15	86	333	53	10	68	309	80	4	1754
05:00 PM	13	93	18	0	13	68	13	1	21	84	13	4	25	97	16	3	482
05:15 PM	22	80	16	3	16	58	14	3	14	76	11	3	16	76	19	2	429
05:30 PM	18	79	8	0	7	66	16	3	22	94	19	2	19	50	23	1	427
05:45 PM	14	85	12	0	10	57	11	6	20	63	8	0	14	59	11	2	372
Total	67	337	54	3	46	249	54	13	77	317	51	9	74	282	69	8	1710
Grand Total	208	1263	236	28	172	960	167	36	315	1254	202	69	283	917	274	22	6406
Apprch %	12	72.8	13.6	1.6	12.9	71.9	12.5	2.7	17.1	68.2	11	3.8	18.9	61.3	18.3	1.5	
Total %	3.2	19.7	3.7	0.4	2.7	15	2.6	0.6	4.9	19.6	3.2	1.1	4.4	14.3	4.3	0.3	

JLB Traffic Engineering, Inc.

1300 E. Shaw Ave., Ste. 103

Fresno, CA 93710

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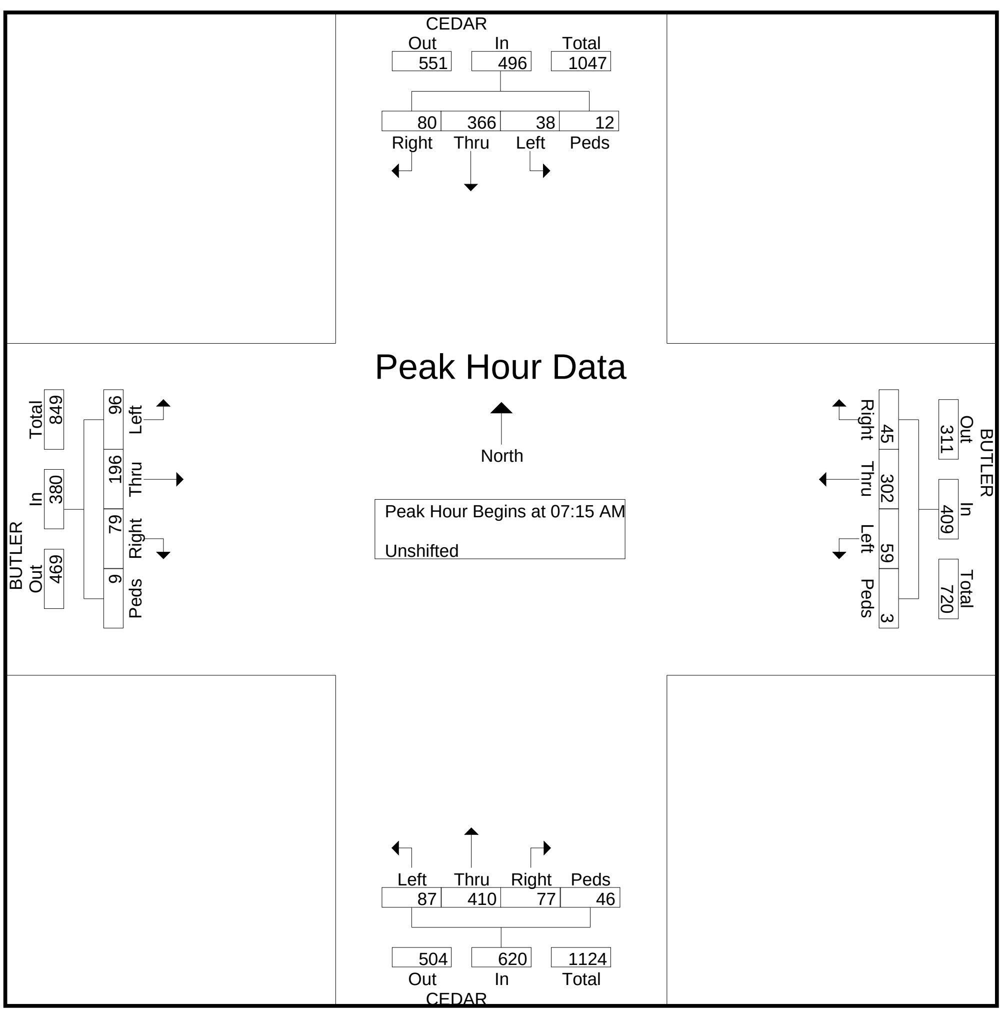
File Name : Cedar at Butler
Site Code : 00000000
Start Date : 3/19/2019
Page No : 2

	CEDAR Southbound					BUTLER Westbound					CEDAR Northbound					BUTLER Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	11	61	9	1	82	7	53	7	0	67	10	62	9	11	92	18	39	17	3	77	318
07:30 AM	5	**119**	20	**5**	149	12	78	9	0	99	24	**138**	**28**	**18**	**208**	24	36	**22**	0	82	538
07:45 AM	10	111	**29**	3	**153**	**26**	**100**	**17**	0	**143**	26	110	20	6	162	**39**	**73**	18	**4**	**134**	**592**
08:00 AM	**12**	75	22	3	112	14	71	12	**3**	100	**27**	100	20	11	158	15	48	22	2	87	457
Total Volume	38	366	80	12	496	59	302	45	3	409	87	410	77	46	620	96	196	79	9	380	1905
% App. Total	7.7	73.8	16.1	2.4		14.4	73.8	11	0.7		14	66.1	12.4	7.4		25.3	51.6	20.8	2.4		
PHF	.792	.769	.690	.600	.810	.567	.755	.662	.250	.715	.806	.743	.688	.639	.745	.615	.671	.898	.563	.709	.804



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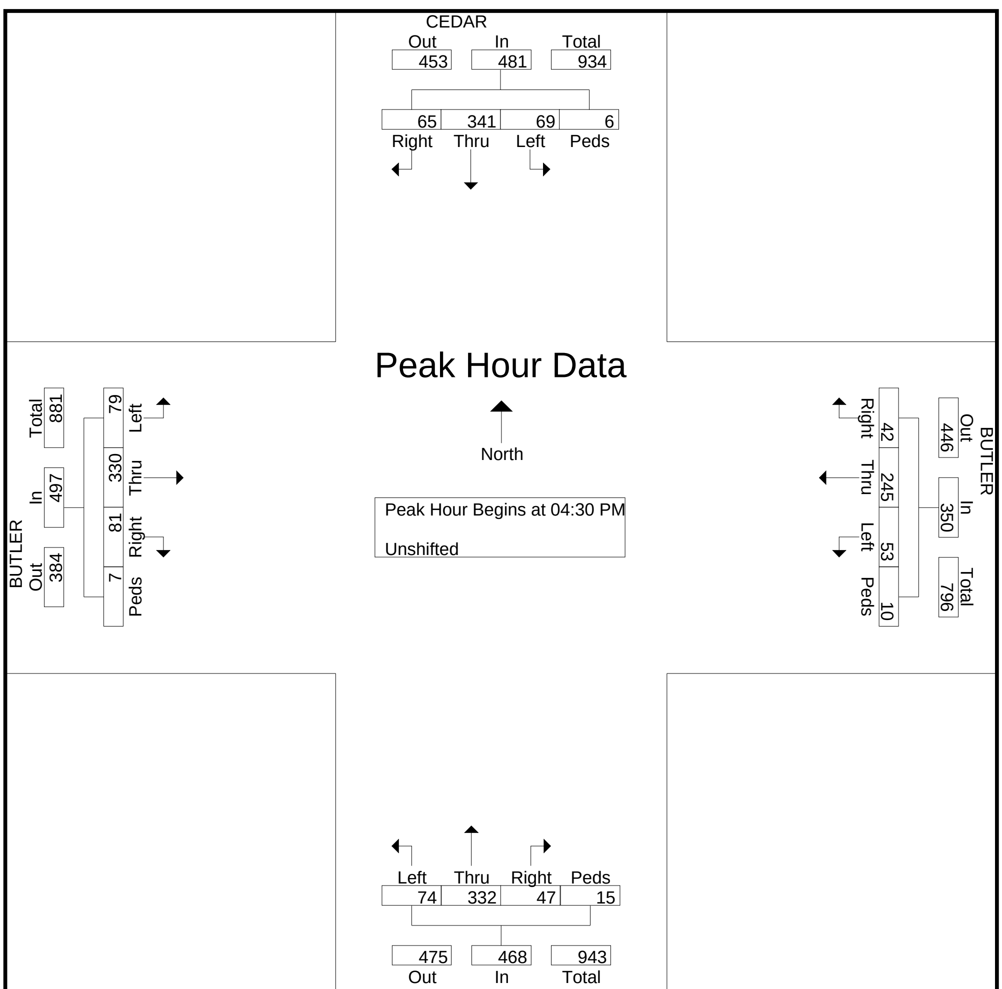
Site Code : 00000000
Start Date : 3/19/2019

	CEDAR Southbound					BUTLER Westbound					CEDAR Northbound					BUTLER Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	20	82	15	1	118	13	59	8	**5**	85	16	78	10	**4**	108	19	83	**29**	2	133	444
04:45 PM	14	86	16	2	118	11	60	7	1	79	**23**	**94**	**13**	4	**134**	19	74	17	0	110	441
05:00 PM	13	**93**	**18**	0	**124**	13	**68**	13	1	**95**	21	84	13	4	122	**25**	**97**	16	**3**	**141**	**482**
05:15 PM	**22**	80	16	**3**	121	**16**	58	**14**	3	91	14	76	11	3	104	16	76	19	2	113	429
Total Volume	69	341	65	6	481	53	245	42	10	350	74	332	47	15	468	79	330	81	7	497	1796
% App. Total	14.3	70.9	13.5	1.2		15.1	70	12	2.9		15.8	70.9	10	3.2		15.9	66.4	16.3	1.4		
PHF	.784	.917	.903	.500	.970	.828	.901	.750	.500	.921	.804	.883	.904	.938	.873	.790	.851	.698	.583	.881	.932



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File Name : Cedar at Butler
Site Code : 00000000
Start Date : 3/19/2019

Groups Printed- Bank 2

	CEDAR Southbound				BUTLER Westbound				CEDAR Northbound				BUTLER Eastbound				
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Int. Total
07:00 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
07:15 AM	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	4
******																	
Total	1	0	0	2	0	1	0	0	0	2	0	0	0	0	0	0	6
08:00 AM	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	3
08:15 AM	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	4
08:30 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	2	1	0	0	1	2	0	0	0	2	0	0	0	2	0	0	10
******																	
04:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
04:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	3
05:00 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	2
******																	
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Total	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	3
Grand Total	3	1	0	2	1	3	2	0	1	5	0	0	0	4	0	0	22
Apprch %	50	16.7	0	33.3	16.7	50	33.3	0	16.7	83.3	0	0	0	100	0	0	
Total %	13.6	4.5	0	9.1	4.5	13.6	9.1	0	4.5	22.7	0	0	0	18.2	0	0	

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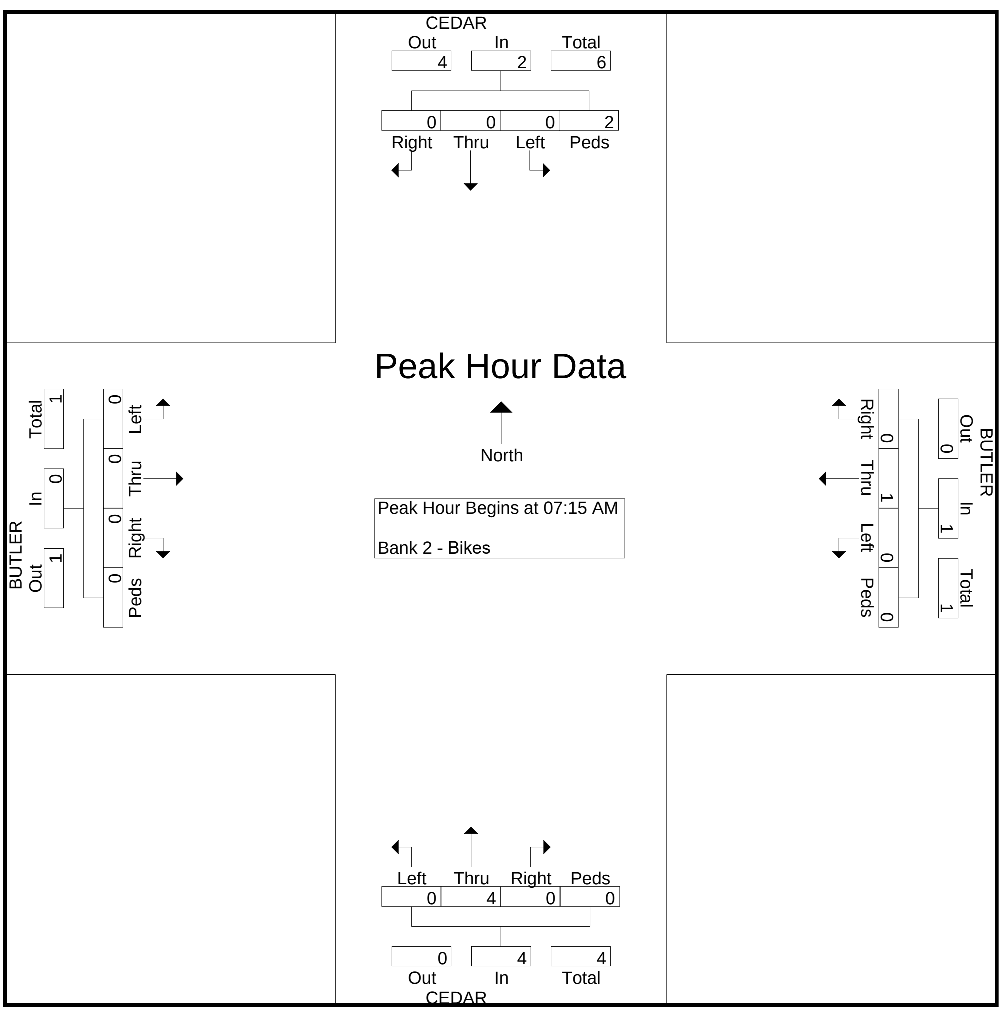
File Name : Cedar at Butler
Site Code : 00000000
Start Date : 3/19/2019
Page No : 2

	CEDAR Southbound					BUTLER Westbound					CEDAR Northbound					BUTLER Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	**2**	**2**	0	0	0	0	0	0	**2**	0	0	**2**	0	0	0	0	0	**4**
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	**1**	0	0	**1**	0	2	0	0	2	0	0	0	0	0	3
Total Volume	0	0	0	2	2	0	1	0	0	1	0	4	0	0	4	0	0	0	0	0	7
% App. Total	0	0	0	100		0	100	0	0		0	100	0	0		0	0	0	0		
PHF	.000	.000	.000	.250	.250	.000	.250	.000	.000	.250	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.438



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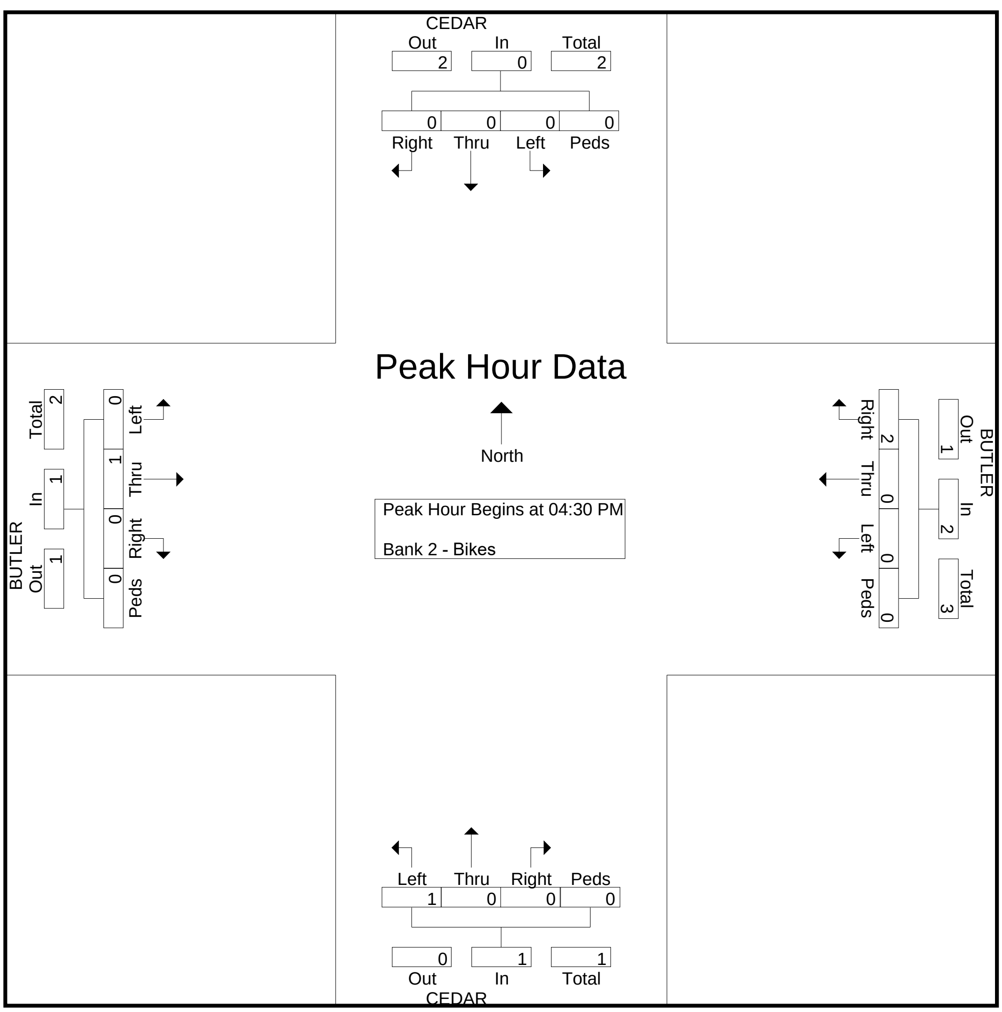
File Name : Cedar at Butler
Site Code : 00000000
Start Date : 3/19/2019
Page No : 3

	CEDAR Southbound					BUTLER Westbound					CEDAR Northbound					BUTLER Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	**1**	1
04:45 PM	0	0	0	0	0	0	0	**1**	0	**1**	0	0	0	0	0	0	0	0	0	0	1
05:00 PM	0	0	0	0	0	0	0	1	0	1	**1**	0	0	0	**1**	0	0	0	0	0	**2**
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	2	0	2	1	0	0	0	1	0	1	0	0	1	4
% App. Total	0	0	0	0		0	0	100	0		100	0	0	0		0	100	0	0		
PHF	.000	.000	.000	.000	.000	.000	.000	.500	.000	.500	.250	.000	.000	.000	.250	.000	.250	.000	.000	.250	.500



Prepared by NDS/ATD

VOLUME

Ventura Ave Bet. 8th St & 9th St

Day: Wednesday
Date: 5/29/2019

City: Fresno
Project #: CA19_7204_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,775	8,276	16,051

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00					13		18		31		12:00					157		157		314	
00:15					11		19		30		12:15					121		158		279	
00:30					23		18		41		12:30					141		123		264	
00:45					3	50	18	73	21	123	12:45					121	540	125	563	246	1103
01:00					7		11		18		13:00					118		121		239	
01:15					6		11		17		13:15					113		128		241	
01:30					4		11		15		13:30					111		155		266	
01:45					7	24	4	37	11	61	13:45					151	493	114	518	265	1011
02:00					7		9		16		14:00					130		132		262	
02:15					7		6		13		14:15					130		156		286	
02:30					8		9		17		14:30					140		120		260	
02:45					5	27	2	26	7	53	14:45					150	550	152	560	302	1110
03:00					4		9		13		15:00					147		187		334	
03:15					7		12		19		15:15					169		170		339	
03:30					6		9		15		15:30					156		144		300	
03:45					8	25	14	44	22	69	15:45					151	623	147	648	298	1271
04:00					3		12		15		16:00					164		156		320	
04:15					12		13		25		16:15					170		161		331	
04:30					13		28		41		16:30					153		146		299	
04:45					26	54	27	80	53	134	16:45					189	676	139	602	328	1278
05:00					21		40		61		17:00					191		177		368	
05:15					32		33		65		17:15					209		173		382	
05:30					32		43		75		17:30					169		117		286	
05:45					32	117	45	161	77	278	17:45					143	712	136	603	279	1315
06:00					24		33		57		18:00					106		132		238	
06:15					43		44		87		18:15					123		116		239	
06:30					43		56		99		18:30					101		98		199	
06:45					41	151	72	205	113	356	18:45					116	446	121	467	237	913
07:00					57		80		137		19:00					108		113		221	
07:15					78		88		166		19:15					109		95		204	
07:30					126		183		309		19:30					91		98		189	
07:45					136	397	188	539	324	936	19:45					106	414	99	405	205	819
08:00					108		138		246		20:00					78		94		172	
08:15					97		129		226		20:15					96		80		176	
08:30					87		126		213		20:30					80		102		182	
08:45					76	368	112	505	188	873	20:45					89	343	84	360	173	703
09:00					85		98		183		21:00					82		90		172	
09:15					89		105		194		21:15					73		65		138	
09:30					109		105		214		21:30					60		66		126	
09:45					90	373	104	412	194	785	21:45					55	270	55	276	110	546
10:00					89		111		200		22:00					53		67		120	
10:15					102		121		223		22:15					41		36		77	
10:30					107		100		207		22:30					30		45		75	
10:45					113	411	114	446	227	857	22:45					26	150	25	173	51	323
11:00					106		121		227		23:00					40		16		56	
11:15					116		120		236		23:15					20		19		39	
11:30					116		123		239		23:30					34		28		62	
11:45					112	450	136	500	248	950	23:45					17	111	10	73	27	184
TOTALS						2447		3028		**5475**	**TOTALS**						5328		5248		**10576**
SPLIT %						44.7%		55.3%		**34.1%**	**SPLIT %**						50.4%		49.6%		**65.9%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,775	8,276	16,051

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
AM Peak Hour			11:45	07:30	**07:30**	**PM Peak Hour**			16:45	14:45	**16:30**
AM Pk Volume			531	638	**1105**	**PM Pk Volume**			758	653	**1377**
Pk Hr Factor			0.846	0.848	**0.853**	**Pk Hr Factor**			0.907	0.873	**0.901**
7 - 9 Volume	0	0	765	1044	**1809**	**4 - 6 Volume**	0	0	1388	1205	**2593**
7 - 9 Peak Hour			07:30	07:30	**07:30**	**4 - 6 Peak Hour**			16:45	16:30	**16:30**
7 - 9 Pk Volume	0	0	467	638	**1105**	**4 - 6 Pk Volume**	0	0	758	635	**1377**
Pk Hr Factor	0.000	0.000	0.858	0.848	**0.853**	**Pk Hr Factor**	0.000	0.000	0.907	0.897	**0.901**

Prepared by NDS/ATD

VOLUME

Ventura Ave Bet. 9th St & 10th St

Day: Wednesday
Date: 5/29/2019

City: Fresno
Project #: CA19_7204_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,557	8,626	16,183

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00					14		16		30		**12:00**					152		170		322	
00:15					13		20		33		**12:15**					119		170		289	
00:30					25		16		41		**12:30**					136		128		264	
00:45					10	62	19	71	29	133	**12:45**					117	524	141	609	258	1133
01:00					7		12		19		**13:00**					120		120		240	
01:15					6		10		16		**13:15**					113		138		251	
01:30					4		11		15		**13:30**					111		158		269	
01:45					7	24	7	40	14	64	**13:45**					134	478	137	553	271	1031
02:00					7		11		18		**14:00**					132		146		278	
02:15					7		3		10		**14:15**					121		169		290	
02:30					7		7		14		**14:30**					141		140		281	
02:45					6	27	2	23	8	50	**14:45**					144	538	170	625	314	1163
03:00					4		8		12		**15:00**					146		205		351	
03:15					7		12		19		**15:15**					165		190		355	
03:30					9		9		18		**15:30**					151		159		310	
03:45					7	27	13	42	20	69	**15:45**					148	610	154	708	302	1318
04:00					5		12		17		**16:00**					157		167		324	
04:15					12		14		26		**16:15**					167		179		346	
04:30					14		24		38		**16:30**					135		166		301	
04:45					25	56	25	75	50	131	**16:45**					175	634	150	662	325	1296
05:00					26		40		66		**17:00**					188		188		376	
05:15					30		32		62		**17:15**					209		179		388	
05:30					31		39		70		**17:30**					168		116		284	
05:45					31	118	43	154	74	272	**17:45**					128	693	134	617	262	1310
06:00					22		30		52		**18:00**					106		132		238	
06:15					43		42		85		**18:15**					116		114		230	
06:30					43		59		102		**18:30**					91		103		194	
06:45					42	150	75	206	117	356	**18:45**					119	432	129	478	248	910
07:00					54		75		129		**19:00**					106		122		228	
07:15					77		90		167		**19:15**					94		106		200	
07:30					120		192		312		**19:30**					93		93		186	
07:45					133	384	185	542	318	926	**19:45**					104	397	99	420	203	817
08:00					109		144		253		**20:00**					79		99		178	
08:15					99		123		222		**20:15**					94		77		171	
08:30					87		131		218		**20:30**					81		103		184	
08:45					78	373	116	514	194	887	**20:45**					93	347	91	370	184	717
09:00					81		98		179		**21:00**					74		91		165	
09:15					86		105		191		**21:15**					73		63		136	
09:30					103		106		209		**21:30**					60		70		130	
09:45					91	361	108	417	199	778	**21:45**					50	257	60	284	110	541
10:00					84		115		199		**22:00**					53		63		116	
10:15					99		125		224		**22:15**					35		36		71	
10:30					100		106		206		**22:30**					26		41		67	
10:45					110	393	115	461	225	854	**22:45**					25	139	25	165	50	304
11:00					100		122		222		**23:00**					35		17		52	
11:15					118		131		249		**23:15**					24		17		41	
11:30					104		125		229		**23:30**					32		26		58	
11:45					104	426	141	519	245	945	**23:45**					16	107	11	71	27	178
TOTALS						2401		3064		**5465**	**TOTALS**						5156		5562		**10718**
SPLIT %						43.9%		56.1%		**33.8%**	**SPLIT %**						48.1%		51.9%		**66.2%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,557	8,626	16,183

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
AM Peak Hour			11:45	07:30	**11:45**	**PM Peak Hour**			16:45	14:45	**16:30**
AM Pk Volume			511	644	**1120**	**PM Pk Volume**			740	724	**1390**
Pk Hr Factor			0.840	0.839	**0.870**	**Pk Hr Factor**			0.885	0.883	**0.896**
7 - 9 Volume	0	0	757	1056	**1813**	**4 - 6 Volume**	0	0	1327	1279	**2606**
7 - 9 Peak Hour			07:30	07:30	**07:30**	**4 - 6 Peak Hour**			16:45	16:15	**16:30**
7 - 9 Pk Volume	0	0	461	644	**1105**	**4 - 6 Pk Volume**	0	0	740	683	**1390**
Pk Hr Factor	0.000	0.000	0.867	0.839	**0.869**	**Pk Hr Factor**	0.000	0.000	0.885	0.908	**0.896**

Prepared by NDS/ATD

VOLUME

Ventura Ave Bet. 10th St & 11th St

Day: Wednesday
Date: 5/29/2019

City: Fresno
Project #: CA19_7204_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,981	9,376	17,357

AM Period	NB	SB	EB		WB		TOTAL	
00:00			15		20		35	
00:15			11		21		32	
00:30			26		21		47	
00:45			5	57	20	82	25	139
01:00			8		8		16	
01:15			6		9		15	
01:30			5		11		16	
01:45			7	26	5	33	12	59
02:00			4		12		16	
02:15			7		2		9	
02:30			8		12		20	
02:45			6	25	2	28	8	53
03:00			4		9		13	
03:15			8		11		19	
03:30			8		7		15	
03:45			8	28	13	40	21	68
04:00			4		11		15	
04:15			11		13		24	
04:30			14		23		37	
04:45			23	52	28	75	51	127
05:00			30		40		70	
05:15			30		31		61	
05:30			31		37		68	
05:45			32	123	40	148	72	271
06:00			22		25		47	
06:15			48		41		89	
06:30			43		54		97	
06:45			40	153	75	195	115	348
07:00			57		74		131	
07:15			78		92		170	
07:30			132		193		325	
07:45			143	410	192	551	335	961
08:00			113		159		272	
08:15			103		126		229	
08:30			84		124		208	
08:45			80	380	120	529	200	909
09:00			87		104		191	
09:15			90		114		204	
09:30			107		107		214	
09:45			96	380	124	449	220	829
10:00			88		119		207	
10:15			110		139		249	
10:30			111		113		224	
10:45			122	431	126	497	248	928
11:00			111		134		245	
11:15			116		145		261	
11:30			126		148		274	
11:45			123	476	171	598	294	1074
TOTALS				2541		3225		5766
SPLIT %				44.1%		55.9%		33.2%

PM Period	NB	SB	EB		WB		TOTAL	
12:00			152		180		332	
12:15			133		195		328	
12:30			151		146		297	
12:45			136	572	165	686	301	1258
13:00			126		135		261	
13:15			113		149		262	
13:30			118		179		297	
13:45			146	503	157	620	303	1123
14:00			142		168		310	
14:15			142		195		337	
14:30			147		149		296	
14:45			159	590	202	714	361	1304
15:00			162		227		389	
15:15			178		207		385	
15:30			161		178		339	
15:45			153	654	180	792	333	1446
16:00			178		194		372	
16:15			193		206		399	
16:30			148		187		335	
16:45			182	701	171	758	353	1459
17:00			203		207		410	
17:15			221		204		425	
17:30			179		128		307	
17:45			149	752	151	690	300	1442
18:00			117		154		271	
18:15			131		140		271	
18:30			104		131		235	
18:45			110	462	134	559	244	1021
19:00			108		128		236	
19:15			91		107		198	
19:30			87		90		177	
19:45			107	393	106	431	213	824
20:00			73		98		171	
20:15			100		84		184	
20:30			77		106		183	
20:45			89	339	87	375	176	714
21:00			72		93		165	
21:15			72		72		144	
21:30			57		61		118	
21:45			44	245	57	283	101	528
22:00			52		62		114	
22:15			31		42		73	
22:30			27		43		70	
22:45			22	132	28	175	50	307
23:00			30		16		46	
23:15			21		17		38	
23:30			26		24		50	
23:45			20	97	11	68	31	165
TOTALS				5440		6151		11591
SPLIT %				46.9%		53.1%		66.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,981	9,376	17,357

	NB	SB	EB	WB	Total
AM Peak Hour			11:45	11:30	11:45
AM Pk Volume			559	694	1251
Pk Hr Factor			0.919	0.890	0.942
7 - 9 Volume	0	0	790	1080	1870
7 - 9 Peak Hour			07:30	07:30	07:30
7 - 9 Pk Volume	0	0	491	670	1161
Pk Hr Factor	0.000	0.000	0.858	0.868	0.866

	NB	SB	EB	WB	Total
PM Peak Hour			16:45	14:45	16:30
PM Pk Volume			785	814	1523
Pk Hr Factor			0.888	0.896	0.896
4 - 6 Volume	0	0	1453	1448	2901
4 - 6 Peak Hour			16:45	16:15	16:30
4 - 6 Pk Volume	0	0	785	771	1523
Pk Hr Factor	0.000	0.000	0.888	0.931	0.896

Prepared by NDS/ATD

VOLUME

Lane Ave Bet. 11th St & Cedar Ave

Day: Wednesday
Date: 5/29/2019

City: Fresno
Project #: CA19_7204_004

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	130	123	253

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			2		1		3	
00:15			1		1		2		12:15			1		2		3	
00:30			1		0		1		12:30			2		3		5	
00:45			0	2	0	1	0	3	12:45			2	7	2	8	4	15
01:00			0		0		0		13:00			4		0		4	
01:15			0		1		1		13:15			2		0		2	
01:30			0		0		0		13:30			3		2		5	
01:45			0		1	2	1	2	13:45			3	12	1	3	4	15
02:00			1		0		1		14:00			1		1		2	
02:15			1		0		1		14:15			3		5		8	
02:30			0		0		0		14:30			0		0		0	
02:45			0	2	0		0	2	14:45			1	5	4	10	5	15
03:00			0		0		0		15:00			1		0		1	
03:15			0		0		0		15:15			1		1		2	
03:30			0		0		0		15:30			0		1		1	
03:45			0		0		0		15:45			2	4	3	5	5	9
04:00			1		1		2		16:00			2		1		3	
04:15			1		0		1		16:15			1		2		3	
04:30			0		0		0		16:30			2		1		3	
04:45			0	2	2	3	2	5	16:45			5	10	0	4	5	14
05:00			0		1		1		17:00			2		1		3	
05:15			2		2		4		17:15			0		1		1	
05:30			1		0		1		17:30			0		2		2	
05:45			0	3	0	3	0	6	17:45			2	4	3	7	5	11
06:00			0		0		0		18:00			2		1		3	
06:15			1		0		1		18:15			1		4		5	
06:30			2		0		2		18:30			2		2		4	
06:45			1	4	1	1	2	5	18:45			3	8	5	12	8	20
07:00			0		0		0		19:00			5		3		8	
07:15			4		1		5		19:15			5		2		7	
07:30			1		0		1		19:30			1		3		4	
07:45			1	6	3	4	4	10	19:45			2	13	1	9	3	22
08:00			1		0		1		20:00			2		3		5	
08:15			1		2		3		20:15			2		2		4	
08:30			2		3		5		20:30			0		3		3	
08:45			4	8	1	6	5	14	20:45			1	5	2	10	3	15
09:00			0		0		0		21:00			4		6		10	
09:15			1		1		2		21:15			1		4		5	
09:30			4		0		4		21:30			1		1		2	
09:45			2	7	1	2	3	9	21:45			0	6	2	13	2	19
10:00			3		1		4		22:00			2		1		3	
10:15			1		1		2		22:15			3		1		4	
10:30			0		2		2		22:30			1		0		1	
10:45			2	6	1	5	3	11	22:45			1	7	1	3	2	10
11:00			0		4		4		23:00			1		3		4	
11:15			3		0		3		23:15			1		1		2	
11:30			2		2		4		23:30			0		1		1	
11:45			2	7	0	6	2	13	23:45			0	2	1	6	1	8
TOTALS				47		33		80	TOTALS				83		90		173
SPLIT %				58.8%		41.3%		31.6%	SPLIT %				48.0%		52.0%		68.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	130	123	253

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour			09:15	07:45	08:00	PM Peak Hour			18:30	20:30	18:30
AM Pk Volume			10	8	14	PM Pk Volume			15	15	27
Pk Hr Factor			0.625	0.667	0.700	Pk Hr Factor			0.750	0.625	0.844
7 - 9 Volume	0	0	14	10	24	4 - 6 Volume	0	0	14	11	25
7 - 9 Peak Hour			08:00	07:45	08:00	4 - 6 Peak Hour			16:00	17:00	16:00
7 - 9 Pk Volume	0	0	8	8	14	4 - 6 Pk Volume	0	0	10	7	14
Pk Hr Factor	0.000	0.000	0.500	0.667	0.700	Pk Hr Factor	0.000	0.000	0.500	0.583	0.700

Prepared by NDS/ATD

VOLUME

Lane Ave Bet. Cedar Ave & Archie Ave

Day: Wednesday **City:** Fresno

Date: 5/29/2019 **Project #:** CA19_7204_005

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	272	436	708

AM Period	NB		SB		EB		WB		TOTAL	
00:00					0		1		1	
00:15					1		1		2	
00:30					0		0		0	
00:45					0	1	1	3	1	4
01:00					1		0		1	
01:15					0		1		1	
01:30					1		0		1	
01:45					0	2	1	2	1	4
02:00					1		0		1	
02:15					1		0		1	
02:30					1		0		1	
02:45					0	3	1	1	1	4
03:00					1		0		1	
03:15					0		1		1	
03:30					0		0		0	
03:45					0	1	0	1	0	2
04:00					0		3		3	
04:15					1		3		4	
04:30					1		1		2	
04:45					0	2	5	12	5	14
05:00					2		6		8	
05:15					1		5		6	
05:30					0		2		2	
05:45					2	5	3	16	5	21
06:00					4		4		8	
06:15					0		2		2	
06:30					4		6		10	
06:45					4	12	1	13	5	25
07:00					2		6		8	
07:15					2		8		10	
07:30					3		9		12	
07:45					3	10	9	32	12	42
08:00					5		9		14	
08:15					2		3		5	
08:30					5		11		16	
08:45					4	16	6	29	10	45
09:00					1		7		8	
09:15					2		4		6	
09:30					4		7		11	
09:45					3	10	7	25	10	35
10:00					3		3		6	
10:15					1		2		3	
10:30					5		5		10	
10:45					1	10	7	17	8	27
11:00					2		7		9	
11:15					1		3		4	
11:30					4		7		11	
11:45					1	8	3	20	4	28
TOTALS						80		171		251
SPLIT %						31.9%		68.1%		35.5%

PM Period	NB		SB		EB		WB		TOTAL	
12:00					4		8		12	
12:15					2		6		8	
12:30					3		4		7	
12:45					2	11	6	24	8	35
13:00					5		8		13	
13:15					4		10		14	
13:30					6		5		11	
13:45					5	20	4	27	9	47
14:00					2		4		6	
14:15					7		8		15	
14:30					7		7		14	
14:45					5	21	8	27	13	48
15:00					2		5		7	
15:15					1		4		5	
15:30					6		5		11	
15:45					4	13	4	18	8	31
16:00					7		7		14	
16:15					11		11		22	
16:30					8		7		15	
16:45					4	30	8	33	12	63
17:00					3		7		10	
17:15					4		6		10	
17:30					7		10		17	
17:45					4	18	9	32	13	50
18:00					8		9		17	
18:15					1		5		6	
18:30					7		7		14	
18:45					5	21	6	27	11	48
19:00					2		6		8	
19:15					2		3		5	
19:30					3		7		10	
19:45					5	12	3	19	8	31
20:00					7		3		10	
20:15					2		6		8	
20:30					5		5		10	
20:45					1	15	5	19	6	34
21:00					1		3		4	
21:15					1		5		6	
21:30					1		6		7	
21:45					7	10	8	22	15	32
22:00					1		5		6	
22:15					4		1		5	
22:30					1		3		4	
22:45					2	8	3	12	5	20
23:00					5		3		8	
23:15					5		2		7	
23:30					1		0		1	
23:45					2	13	0	5	2	18
TOTALS						192		265		457
SPLIT %						42.0%		58.0%		64.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	272	436	708

	NB	SB	EB	WB	TOTAL
AM Peak Hour			08:00	07:15	07:15
AM Pk Volume			16	35	48
Pk Hr Factor			0.800	0.972	0.857
7 - 9 Volume	0	0	26	61	87
7 - 9 Peak Hour			08:00	07:15	07:15
7 - 9 Pk Volume	0	0	16	35	48
Pk Hr Factor	0.000	0.000	0.800	0.972	0.857

	NB	SB	EB	WB	TOTAL
PM Peak Hour			15:45	17:15	16:00
PM Pk Volume			30	34	63
Pk Hr Factor			0.682	0.850	0.716
4 - 6 Volume	0	0	48	65	113
4 - 6 Peak Hour			16:00	16:00	16:00
4 - 6 Pk Volume	0	0	30	33	63
Pk Hr Factor	0.000	0.000	0.682	0.750	0.716

Prepared by NDS/ATD

VOLUME

9th St 100' S/O Ventura Ave

Day: Wednesday
Date: 5/29/2019

City: Fresno
Project #: CA19_7204_006

DAILY TOTALS	NB	SB	EB	WB	Total
	338	440	0	0	778

AM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0				0	
00:15	1		1				2	
00:30	1		1				2	
00:45	0	2	1	3			1	5
01:00	0		0				0	
01:15	0		0				0	
01:30	0		0				0	
01:45	0		1	1			1	1
02:00	1		2				3	
02:15	0		0				0	
02:30	2		0				2	
02:45	1	4	0	2			1	6
03:00	1		0				1	
03:15	0		0				0	
03:30	1		1				2	
03:45	1	3	0	1			1	4
04:00	0		0				0	
04:15	0		0				0	
04:30	2		0				2	
04:45	1	3	0				1	3
05:00	4		2				6	
05:15	3		2				5	
05:30	4		1				5	
05:45	1	12	0	5			1	17
06:00	3		1				4	
06:15	2		0				2	
06:30	1		1				2	
06:45	1	7	2	4			3	11
07:00	3		2				5	
07:15	2		4				6	
07:30	4		6				10	
07:45	5	14	7	19			12	33
08:00	5		4				9	
08:15	6		4				10	
08:30	3		6				9	
08:45	3	17	4	18			7	35
09:00	1		3				4	
09:15	3		1				4	
09:30	3		7				10	
09:45	3	10	3	14			6	24
10:00	2		4				6	
10:15	1		1				2	
10:30	3		1				4	
10:45	4	10	7	13			11	23
11:00	5		4				9	
11:15	4		6				10	
11:30	6		11				17	
11:45	8	23	8	29			16	52
TOTALS		105		109				214
SPLIT %		49.1%		50.9%				27.5%

PM Period	NB		SB		EB	WB	TOTAL	
12:00	4		11				15	
12:15	5		6				11	
12:30	5		5				10	
12:45	3	17	7	29			10	46
13:00	5		5				10	
13:15	4		7				11	
13:30	10		5				15	
13:45	5	24	13	30			18	54
14:00	4		4				8	
14:15	5		5				10	
14:30	7		6				13	
14:45	8	24	6	21			14	45
15:00	10		10				20	
15:15	7		7				14	
15:30	7		7				14	
15:45	4	28	8	32			12	60
16:00	5		5				10	
16:15	6		12				18	
16:30	3		14				17	
16:45	5	19	13	44			18	63
17:00	4		8				12	
17:15	9		7				16	
17:30	6		9				15	
17:45	9	28	8	32			17	60
18:00	7		5				12	
18:15	5		7				12	
18:30	4		11				15	
18:45	6	22	4	27			10	49
19:00	3		13				16	
19:15	8		15				23	
19:30	6		5				11	
19:45	3	20	8	41			11	61
20:00	5		11				16	
20:15	4		8				12	
20:30	6		5				11	
20:45	2	17	4	28			6	45
21:00	4		5				9	
21:15	6		6				12	
21:30	4		10				14	
21:45	2	16	8	29			10	45
22:00	4		2				6	
22:15	1		3				4	
22:30	2		4				6	
22:45	0	7	1	10			1	17
23:00	2		2				4	
23:15	5		2				7	
23:30	3		4				7	
23:45	1	11	0	8			1	19
TOTALS		233		331				564
SPLIT %		41.3%		58.7%				72.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	338	440	0	0	778

	NB	SB	EB	WB	Total
AM Peak Hour	11:00	11:15			11:30
AM Pk Volume	23	36			59
Pk Hr Factor	0.719	0.818			0.868
7 - 9 Volume	31	37	0	0	68
7 - 9 Peak Hour	07:30	07:15			07:30
7 - 9 Pk Volume	20	21	0	0	41
Pk Hr Factor	0.833	0.750	0.000	0.000	0.854

	NB	SB	EB	WB	Total
PM Peak Hour	14:30	16:15			16:15
PM Pk Volume	32	47			65
Pk Hr Factor	0.800	0.839			0.903
4 - 6 Volume	47	76	0	0	123
4 - 6 Peak Hour	17:00	16:15			16:15
4 - 6 Pk Volume	28	47	0	0	65
Pk Hr Factor	0.778	0.839	0.000	0.000	0.903

Prepared by NDS/ATD

VOLUME

10th St Bet. Ventura Ave & El Monte Way

Day: Wednesday
Date: 5/29/2019

City: Fresno
Project #: CA19_7204_007

DAILY TOTALS	NB	SB	EB	WB	Total
	575	570	0	0	1,145

AM Period	NB		SB		EB	WB	TOTAL	
00:00	1		0				1	
00:15	2		1				3	
00:30	2		3				5	
00:45	1	6	1	5			2	11
01:00	2		0				2	
01:15	2		0				2	
01:30	1		0				1	
01:45	0	5	0				0	5
02:00	0		3				3	
02:15	1		0				1	
02:30	1		3				4	
02:45	0	2	1	7			1	9
03:00	0		2				2	
03:15	2		0				2	
03:30	0		0				0	
03:45	0	2	1	3			1	5
04:00	2		0				2	
04:15	2		1				3	
04:30	3		1				4	
04:45	1	8	2	4			3	12
05:00	2		3				5	
05:15	2		0				2	
05:30	3		1				4	
05:45	4	11	0	4			4	15
06:00	4		0				4	
06:15	2		0				2	
06:30	8		5				13	
06:45	4	18	4	9			8	27
07:00	9		3				12	
07:15	7		5				12	
07:30	25		14				39	
07:45	13	54	11	33			24	87
08:00	12		14				26	
08:15	8		5				13	
08:30	8		8				16	
08:45	6	34	6	33			12	67
09:00	2		3				5	
09:15	2		2				4	
09:30	6		1				7	
09:45	1	11	4	10			5	21
10:00	4		5				9	
10:15	2		6				8	
10:30	7		5				12	
10:45	4	17	4	20			8	37
11:00	7		2				9	
11:15	9		11				20	
11:30	7		6				13	
11:45	13	36	9	28			22	64
TOTALS		204		156				**360**
SPLIT %		56.7%		43.3%				**31.4%**

PM Period	NB		SB		EB	WB	TOTAL	
12:00	7		11				18	
12:15	9		10				19	
12:30	6		5				11	
12:45	6	28	8	34			14	62
13:00	10		12				22	
13:15	5		9				14	
13:30	8		9				17	
13:45	9	32	9	39			18	71
14:00	5		7				12	
14:15	7		9				16	
14:30	13		13				26	
14:45	10	35	14	43			24	78
15:00	17		11				28	
15:15	13		8				21	
15:30	12		11				23	
15:45	4	46	12	42			16	88
16:00	6		7				13	
16:15	20		13				33	
16:30	13		9				22	
16:45	5	44	15	44			20	88
17:00	11		7				18	
17:15	14		14				28	
17:30	8		13				21	
17:45	13	46	8	42			21	88
18:00	6		10				16	
18:15	13		12				25	
18:30	10		13				23	
18:45	9	38	11	46			20	84
19:00	12		11				23	
19:15	7		8				15	
19:30	6		7				13	
19:45	10	35	9	35			19	70
20:00	7		5				12	
20:15	7		9				16	
20:30	5		7				12	
20:45	10	29	8	29			18	58
21:00	4		6				10	
21:15	9		7				16	
21:30	5		6				11	
21:45	5	23	8	27			13	50
22:00	2		3				5	
22:15	2		7				9	
22:30	1		5				6	
22:45	2	7	5	20			7	27
23:00	3		6				9	
23:15	1		1				2	
23:30	1		4				5	
23:45	3	8	2	13			5	21
TOTALS		371		414				**785**
SPLIT %		47.3%		52.7%				**68.6%**

DAILY TOTALS	NB	SB	EB	WB	Total
	575	570	0	0	1,145

	NB	SB	EB	WB	Total
AM Peak Hour	07:30	07:15			**07:30**
AM Pk Volume	58	44			**102**
Pk Hr Factor	0.580	0.786			**0.654**
7 - 9 Volume	88	66	0	0	**154**
7 - 9 Peak Hour	07:30	07:15			**07:30**
7 - 9 Pk Volume	58	44	0	0	**102**
Pk Hr Factor	0.580	0.786	0.000	0.000	**0.654**

	NB	SB	EB	WB	Total
PM Peak Hour	14:30	16:45			**14:30**
PM Pk Volume	53	49			**99**
Pk Hr Factor	0.779	0.817			**0.884**
4 - 6 Volume	90	86	0	0	**176**
4 - 6 Peak Hour	16:15	16:45			**16:15**
4 - 6 Pk Volume	49	49	0	0	**93**
Pk Hr Factor	0.613	0.817	0.000	0.000	**0.705**

Prepared by NDS/ATD

VOLUME

10th St 100' N/O Ventura Ave

Day: Wednesday
Date: 5/29/2019

City: Fresno
Project #: CA19_7204_008

DAILY TOTALS	NB	SB	EB	WB	Total
	349	254	0	0	603

AM Period	NB		SB		EB	WB	TOTAL	
00:00	0		0				0	
00:15	2		0				2	
00:30	2		0				2	
00:45	0	4	0				0	4
01:00	0		1				1	
01:15	1		0				1	
01:30	0		0				0	
01:45	0	1	0	1			0	2
02:00	1		0				1	
02:15	0		0				0	
02:30	1		0				1	
02:45	0	2	1	1			1	3
03:00	0		1				1	
03:15	0		0				0	
03:30	0		1				1	
03:45	0		0	2			0	2
04:00	0		0				0	
04:15	1		0				1	
04:30	0		0				0	
04:45	1	2	1	1			2	3
05:00	1		4				5	
05:15	2		1				3	
05:30	1		1				2	
05:45	0	4	1	7			1	11
06:00	0		0				0	
06:15	0		2				2	
06:30	2		0				2	
06:45	3	5	3	5			6	10
07:00	2		0				2	
07:15	1		2				3	
07:30	4		5				9	
07:45	6	13	10	17			16	30
08:00	4		3				7	
08:15	3		2				5	
08:30	3		2				5	
08:45	4	14	2	9			6	23
09:00	4		2				6	
09:15	1		1				2	
09:30	1		1				2	
09:45	3	9	3	7			6	16
10:00	3		2				5	
10:15	2		3				5	
10:30	1		5				6	
10:45	1	7	4	14			5	21
11:00	2		2				4	
11:15	8		1				9	
11:30	5		4				9	
11:45	2	17	1	8			3	25
TOTALS		78		72				**150**
SPLIT %		52.0%		48.0%				**24.9%**

PM Period	NB		SB		EB	WB	TOTAL	
12:00	3		6				9	
12:15	5		3				8	
12:30	4		2				6	
12:45	3	15	5	16			8	31
13:00	3		1				4	
13:15	7		3				10	
13:30	4		4				8	
13:45	5	19	4	12			9	31
14:00	7		2				9	
14:15	2		6				8	
14:30	4		4				8	
14:45	9	22	4	16			13	38
15:00	8		4				12	
15:15	8		3				11	
15:30	12		5				17	
15:45	12	40	5	17			17	57
16:00	6		7				13	
16:15	6		2				8	
16:30	6		4				10	
16:45	6	24	7	20			13	44
17:00	8		5				13	
17:15	9		7				16	
17:30	2		2				4	
17:45	6	25	8	22			14	47
18:00	8		3				11	
18:15	10		1				11	
18:30	7		2				9	
18:45	11	36	5	11			16	47
19:00	8		7				15	
19:15	9		7				16	
19:30	7		8				15	
19:45	2	26	1	23			3	49
20:00	3		3				6	
20:15	10		4				14	
20:30	7		4				11	
20:45	7	27	6	17			13	44
21:00	4		3				7	
21:15	10		2				12	
21:30	5		5				10	
21:45	3	22	2	12			5	34
22:00	1		3				4	
22:15	3		2				5	
22:30	0		1				1	
22:45	1	5	3	9			4	14
23:00	5		4				9	
23:15	2		0				2	
23:30	3		1				4	
23:45	0	10	2	7			2	17
TOTALS		271		182				**453**
SPLIT %		59.8%		40.2%				**75.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	349	254	0	0	603

	NB	SB	EB	WB	Total
AM Peak Hour	11:15	07:15			**07:30**
AM Pk Volume	18	20			**37**
Pk Hr Factor	0.563	0.500			**0.578**
7 - 9 Volume	27	26	0	0	**53**
7 - 9 Peak Hour	07:30	07:15			**07:30**
7 - 9 Pk Volume	17	20	0	0	**37**
Pk Hr Factor	0.708	0.500	0.000	0.000	**0.578**

	NB	SB	EB	WB	Total
PM Peak Hour	15:00	18:45			**18:45**
PM Pk Volume	40	27			**62**
Pk Hr Factor	0.833	0.844			**0.969**
4 - 6 Volume	49	42	0	0	**91**
4 - 6 Peak Hour	16:30	16:30			**16:30**
4 - 6 Pk Volume	29	23	0	0	**52**
Pk Hr Factor	0.806	0.821	0.000	0.000	**0.813**

Prepared by NDS/ATD

VOLUME

Cedar Ave Bet. Raco Ave & Lane Ave

Day: Wednesday
Date: 5/29/2019

City: Fresno
Project #: CA19_7204_009

DAILY TOTALS	NB	SB	EB	WB	Total
	6,544	6,033	0	0	12,577

AM Period	NB		SB		EB	WB	TOTAL	
00:00	18		16				34	
00:15	11		13				24	
00:30	11		16				27	
00:45	10	50	6	51			16	101
01:00	6		5				11	
01:15	11		8				19	
01:30	3		12				15	
01:45	5	25	4	29			9	54
02:00	11		8				19	
02:15	7		9				16	
02:30	6		9				15	
02:45	3	27	4	30			7	57
03:00	10		4				14	
03:15	9		9				18	
03:30	7		12				19	
03:45	12	38	13	38			25	76
04:00	11		7				18	
04:15	13		13				26	
04:30	15		26				41	
04:45	32	71	43	89			75	160
05:00	51		46				97	
05:15	22		48				70	
05:30	33		38				71	
05:45	52	158	40	172			92	330
06:00	19		40				59	
06:15	43		47				90	
06:30	69		61				130	
06:45	51	182	84	232			135	414
07:00	67		47				114	
07:15	96		112				208	
07:30	181		130				311	
07:45	185	529	144	433			329	962
08:00	116		99				215	
08:15	79		73				152	
08:30	85		59				144	
08:45	89	369	67	298			156	667
09:00	58		64				122	
09:15	86		50				136	
09:30	90		63				153	
09:45	99	333	50	227			149	560
10:00	82		68				150	
10:15	76		63				139	
10:30	61		74				135	
10:45	83	302	75	280			158	582
11:00	67		72				139	
11:15	80		73				153	
11:30	69		69				138	
11:45	81	297	73	287			154	584
TOTALS	2381		2166					**4547**
SPLIT %	52.4%		47.6%					**36.2%**

PM Period	NB		SB		EB	WB	TOTAL	
12:00	109		79				188	
12:15	69		87				156	
12:30	85		90				175	
12:45	94	357	85	341			179	698
13:00	85		97				182	
13:15	76		97				173	
13:30	93		80				173	
13:45	94	348	93	367			187	715
14:00	85		92				177	
14:15	94		111				205	
14:30	149		105				254	
14:45	194	522	108	416			302	938
15:00	135		141				276	
15:15	124		118				242	
15:30	140		129				269	
15:45	137	536	123	511			260	1047
16:00	138		110				248	
16:15	138		113				251	
16:30	152		112				264	
16:45	137	565	109	444			246	1009
17:00	122		101				223	
17:15	120		101				221	
17:30	128		106				234	
17:45	104	474	112	420			216	894
18:00	123		71				194	
18:15	89		92				181	
18:30	111		84				195	
18:45	82	405	86	333			168	738
19:00	76		74				150	
19:15	59		73				132	
19:30	66		70				136	
19:45	67	268	72	289			139	557
20:00	59		82				141	
20:15	85		70				155	
20:30	74		69				143	
20:45	51	269	66	287			117	556
21:00	55		56				111	
21:15	43		48				91	
21:30	55		65				120	
21:45	36	189	46	215			82	404
22:00	47		49				96	
22:15	43		31				74	
22:30	30		35				65	
22:45	36	156	28	143			64	299
23:00	26		35				61	
23:15	17		24				41	
23:30	17		17				34	
23:45	14	74	25	101			39	175
TOTALS	4163		3867					**8030**
SPLIT %	51.8%		48.2%					**63.8%**

DAILY TOTALS	NB	SB	EB	WB	Total
	6,544	6,033	0	0	12,577

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	07:15	07:15			**07:15**	**PM Peak Hour**	14:30	15:00			**14:45**
AM Pk Volume	578	485			**1063**	**PM Pk Volume**	602	511			**1089**
Pk Hr Factor	0.781	0.842			**0.808**	**Pk Hr Factor**	0.776	0.906			**0.901**
7 - 9 Volume	898	731	0	0	**1629**	**4 - 6 Volume**	1039	864	0	0	**1903**
7 - 9 Peak Hour	07:15	07:15			**07:15**	**4 - 6 Peak Hour**	16:00	16:00			**16:00**
7 - 9 Pk Volume	578	485	0	0	**1063**	**4 - 6 Pk Volume**	565	444	0	0	**1009**
Pk Hr Factor	0.781	0.842	0.000	0.000	**0.808**	**Pk Hr Factor**	0.929	0.982	0.000	0.000	**0.955**

Prepared by NDS/ATD

VOLUME

Cedar Ave Bet. Lane Ave & Lowe Ave

Day: Wednesday
Date: 5/29/2019

City: Fresno
Project #: CA19_7204_010

DAILY TOTALS	NB	SB	EB	WB	Total
	5,869	5,994	0	0	11,863

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	17		14				31		12:00	100		79				179	
00:15	11		13				24		12:15	63		91				154	
00:30	11		16				27		12:30	80		86				166	
00:45	11	50	8	51			19	101	12:45	82	325	81	337			163	662
01:00	4		4				8		13:00	81		99				180	
01:15	9		7				16		13:15	68		96				164	
01:30	4		10				14		13:30	83		82				165	
01:45	5	22	5	26			10	48	13:45	87	319	91	368			178	687
02:00	12		9				21		14:00	72		90				162	
02:15	7		9				16		14:15	88		107				195	
02:30	7		7				14		14:30	132		101				233	
02:45	4	30	5	30			9	60	14:45	171	463	105	403			276	866
03:00	10		4				14		15:00	116		136				252	
03:15	8		9				17		15:15	109		113				222	
03:30	7		10				17		15:30	122		127				249	
03:45	11	36	14	37			25	73	15:45	119	466	122	498			241	964
04:00	9		9				18		16:00	121		107				228	
04:15	12		14				26		16:15	122		112				234	
04:30	15		27				42		16:30	132		110				242	
04:45	29	65	44	94			73	159	16:45	120	495	107	436			227	931
05:00	42		43				85		17:00	95		100				195	
05:15	19		48				67		17:15	104		102				206	
05:30	31		44				75		17:30	111		101				212	
05:45	45	137	39	174			84	311	17:45	92	402	108	411			200	813
06:00	19		40				59		18:00	102		66				168	
06:15	40		48				88		18:15	76		91				167	
06:30	66		65				131		18:30	102		80				182	
06:45	50	175	81	234			131	409	18:45	75	355	85	322			160	677
07:00	62		49				111		19:00	65		79				144	
07:15	87		120				207		19:15	54		75				129	
07:30	160		137				297		19:30	54		69				123	
07:45	169	478	144	450			313	928	19:45	61	234	72	295			133	529
08:00	99		99				198		20:00	57		75				132	
08:15	71		69				140		20:15	78		74				152	
08:30	74		60				134		20:30	71		66				137	
08:45	70	314	68	296			138	610	20:45	47	253	67	282			114	535
09:00	50		63				113		21:00	51		52				103	
09:15	79		54				133		21:15	39		46				85	
09:30	75		64				139		21:30	54		66				120	
09:45	89	293	48	229			137	522	21:45	37	181	48	212			85	393
10:00	74		70				144		22:00	46		49				95	
10:15	69		63				132		22:15	43		31				74	
10:30	58		75				133		22:30	28		34				62	
10:45	69	270	76	284			145	554	22:45	35	152	26	140			61	292
11:00	64		75				139		23:00	27		34				61	
11:15	76		72				148		23:15	19		22				41	
11:30	61		69				130		23:30	16		15				31	
11:45	76	277	74	290			150	567	23:45	15	77	24	95			39	172
TOTALS		2147		2195				4342	TOTALS		3722		3799				7521
SPLIT %		49.4%		50.6%				36.6%	SPLIT %		49.5%		50.5%				63.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	5,869	5,994	0	0	11,863

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	07:15	07:15			07:15	PM Peak Hour	14:30	15:00			14:45
AM Pk Volume	515	500			1015	PM Pk Volume	528	498			999
Pk Hr Factor	0.762	0.868			0.811	Pk Hr Factor	0.772	0.915			0.905
7 - 9 Volume	792	746	0	0	1538	4 - 6 Volume	897	847	0	0	1744
7 - 9 Peak Hour	07:15	07:15			07:15	4 - 6 Peak Hour	16:00	16:00			16:00
7 - 9 Pk Volume	515	500	0	0	1015	4 - 6 Pk Volume	495	436	0	0	931
Pk Hr Factor	0.762	0.868	0.000	0.000	0.811	Pk Hr Factor	0.938	0.973	0.000	0.000	0.962

Appendix C: Traffic Modeling

December 17, 2018

Kai Han, TE
Council of Fresno County Governments
2035 Tulare Street, Suite 201
Fresno, CA 93721

Via E-mail Only: khan@fresnocog.org

Subject: ***Traffic Modeling Request for the Preparation of a Traffic Impact Analysis for the Fresno Unified School District Ventura Avenue Alternative Education Campus in the City of Fresno (JLB Project 004-068)***

Dear Mr. Han,

JLB Traffic Engineering, Inc. (JLB) hereby requests traffic modeling for the Fresno Unified School District Ventura Avenue Alternative Education Campus (Project) described below. While a Project Site Plan is not available at this time, the Project will include a High School, Pre-School and Administrative Offices located on the southwest corner of 10th Street and Ventura Avenue in the City of Fresno. Furthermore, the proposed facilities and programs at the campus include 44 classrooms, a career technical education program (CTE), a continuation school, independent study, Educational Resource Center (ERC), E-Learn academy, a health building, a cafeteria/student union building, an early learning center, hardcourt recreation areas and parking areas.

The Project is estimated to serve up to 1,180 students in grades 9 through 12 and up to 60 pre-kindergarten students. Since student instruction is to be provided through a combination of conventional classroom and alternative settings, i.e. independent study and E-Learn, not all students are expected to be on the site at one time. Additionally, the Project would have 103 employees including administrators, faculty and staff support. The maximum number of combined students and employees on the campus at one time is estimated to be 930. Therefore, the maximum number of students assumed to be on the campus at one time is 827 (930 students and employees – 103 employees = 827 students). The administrative offices would occupy a total of 46,400 square feet. An aerial of the Project vicinity is shown in Exhibit A.

The purpose of this TIA is to evaluate the potential on-site and off-site traffic impacts, identify short-term roadway and circulation needs, determine potential mitigation measures and identify any critical traffic issues that should be addressed in the on-going planning process.

Scenarios:

The following scenarios are requested:

1. Base Year 2019 (with Link and TAZ modifications)
2. Cumulative Year 2035 plus Project Select Zone (with Link and TAZ modifications)
3. Differences between model runs 2 and 1 above

Changes and/or additions to the Model Network or TAZ's

JLB reviewed the Fresno COG model network for the Base Year 2019 and Cumulative Year 2035. Based on this review, JLB requests the following link and TAZ Network modifications. Details on the requested Link and TAZ modifications for Base Year 2019 and Cumulative Year 2035 are illustrated in Exhibit B.

LINK and TAZ MODIFICATIONS (For Base Year 2019 and Cumulative Year 2035 plus Project Select Zone Scenarios):

1. Modify Ventura Avenue/Kings Canyon Avenue to decrease the number of lanes west of Temperance Avenue to two (2) lanes in each direction.

LINK and TAZ MODIFICATIONS (For Cumulative Year 2035 plus Project Select Zone Scenario Only):

1. Modify Orange Avenue to decrease the number of lanes between Ventura Avenue and Church Avenue to one (1) lane in each direction.
2. Modify Butler Avenue to decrease the number of lanes east of East Avenue to one (1) lane in each direction.
3. Modify California Avenue to decrease the number of lanes east of Van Ness Avenue to one (1) lane in each direction.
4. Create Project TAZ A generally located southwest of Cedar Avenue and Ventura Avenue (see Exhibit B). TAZ A shall have TAZ Connectors to Ventura Avenue (north) and Cedar Avenue (east).

TAZ A Project Only Trip Generation (For Cumulative Year 2035 plus Project Select Zone Scenario Only)

Table I presents the trip generation for the proposed TAZ A Project pursuant to the 10th Edition of the Trip Generation Manual with trip generation rates for Elementary School, High School and School District Office. At build-out, the Project is estimated to generate a maximum of 2,459 daily trips, 580 AM peak hour trips and 221 PM peak hour trips.

Table I: TAZ A Project Only Trip Generation

Land Use (ITE Code)	*Size*	*Unit*	*Daily*		*AM Peak Hour*						*PM Peak Hour*					
			Rate	*Total*	*Trip Rate*	*In %*	*Out %*	*In*	*Out*	*Total*	*Trip Rate*	*In %*	*Out %*	*In*	*Out*	*Total*
Elementary School (520)	60	students	1.89	113	0.67	54	46	22	18	40	0.17	48	52	5	5	10
High School (530)	827	students	2.03	1,679	0.52	67	33	288	142	430	0.14	48	52	56	60	116
School District Office (538)	46.400	k.s.f.	14.37	667	2.36	76	24	84	26	110	2.04	17	83	16	79	95
Total Project Trips				**2,459**				**394**	**186**	**580**				**77**	**144**	**221**

Note: d.u. = Dwelling Units

Please invoice JLB Traffic Engineering, Inc. and reference JLB Project No. 004-068 on the invoice. If you have any questions or require additional information, please do not hesitate to contact me by phone at (559) 317-6273 or by e-mail at smaciel@JLBtraffic.com.

Sincerely,

Susana Maciel

Susana Maciel, EIT
Engineer I/II

cc: Lang Yu. Fresno COG
Jose Benavides, JLB Traffic Engineering, Inc.

Z:\01 Projects\004 Fresno\004-068 FUSD Alt Ed Complex TIA\Traffic Modeling\Modeling Request\L12172018 Model Request.docx

Exhibit A – Aerial

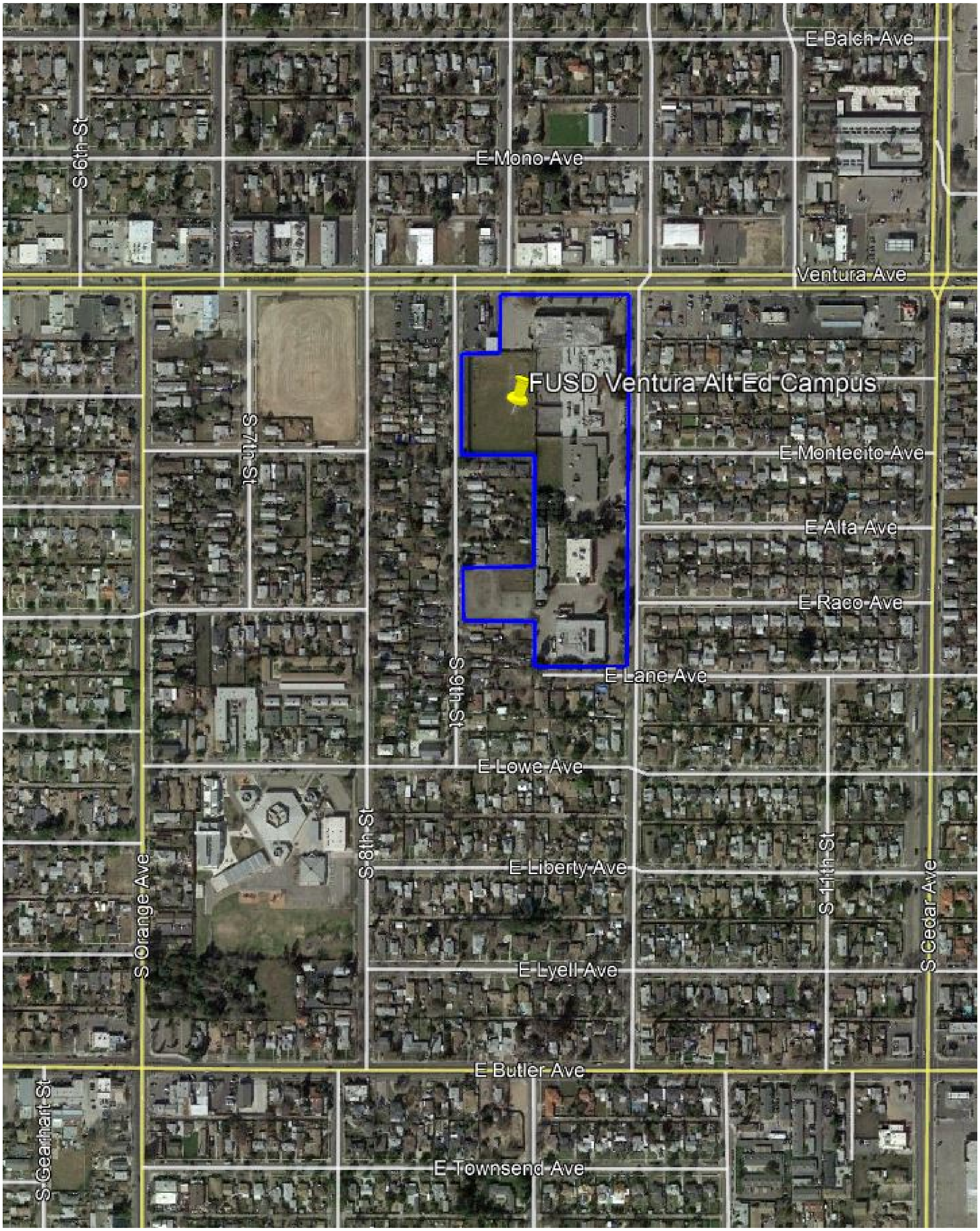
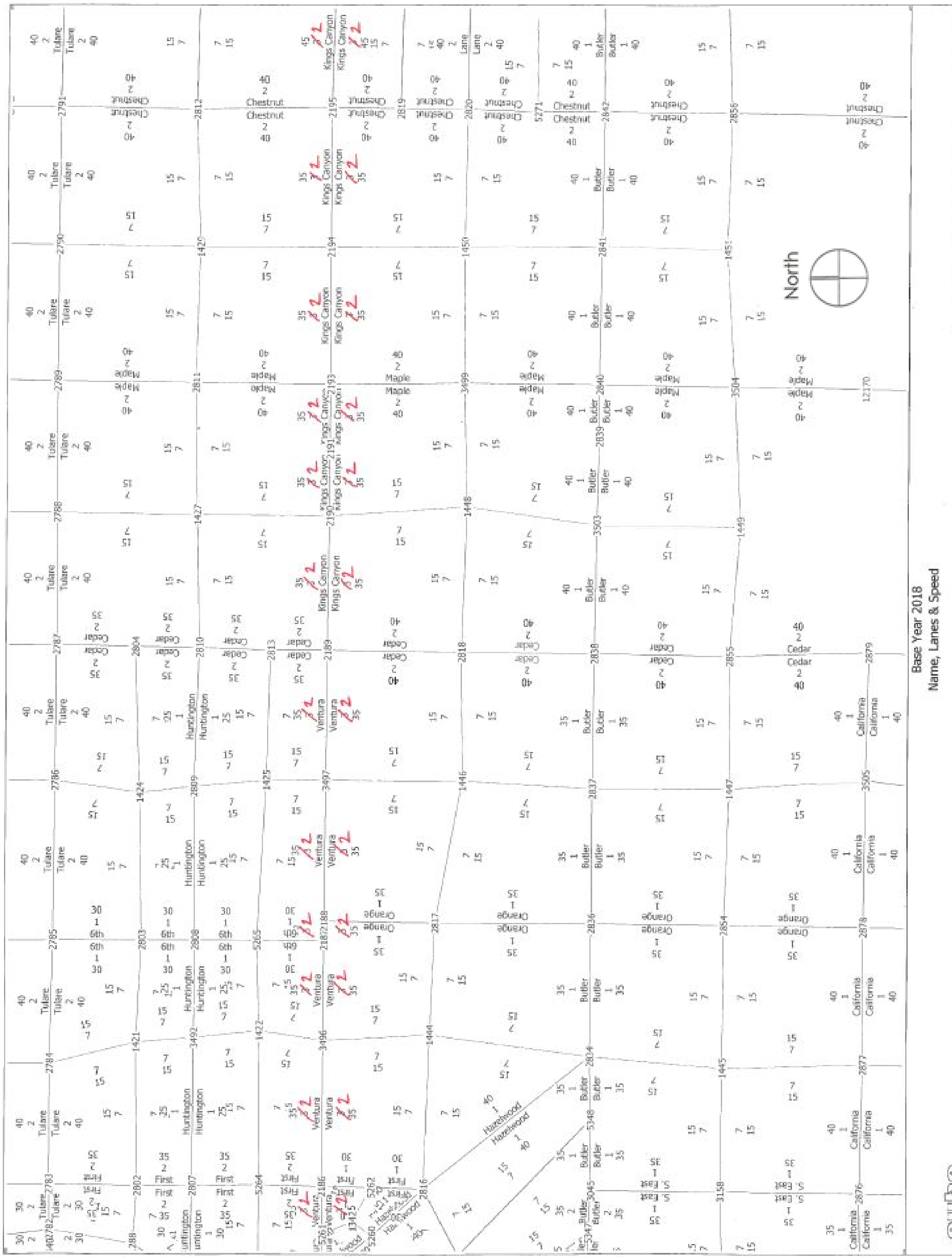
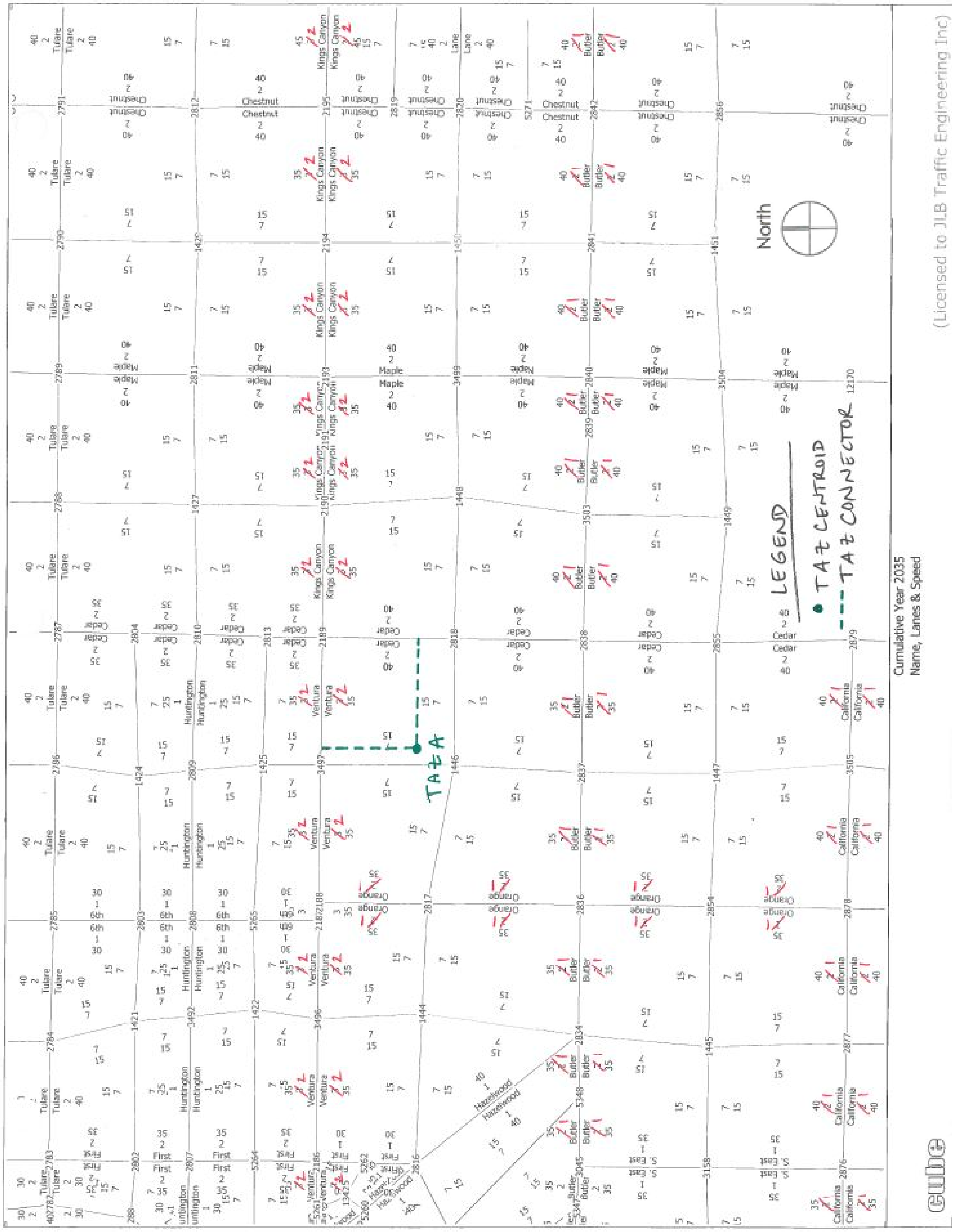
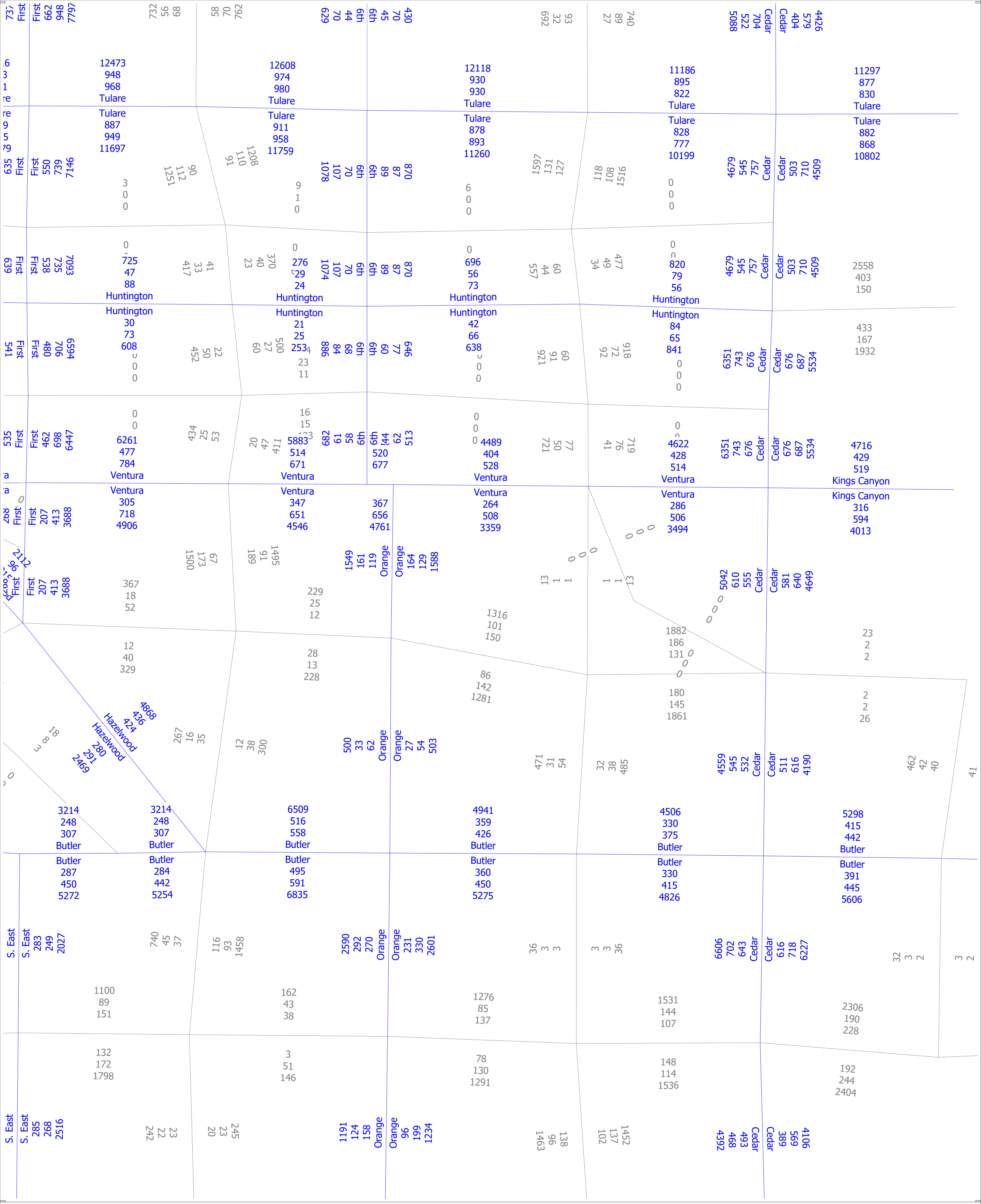


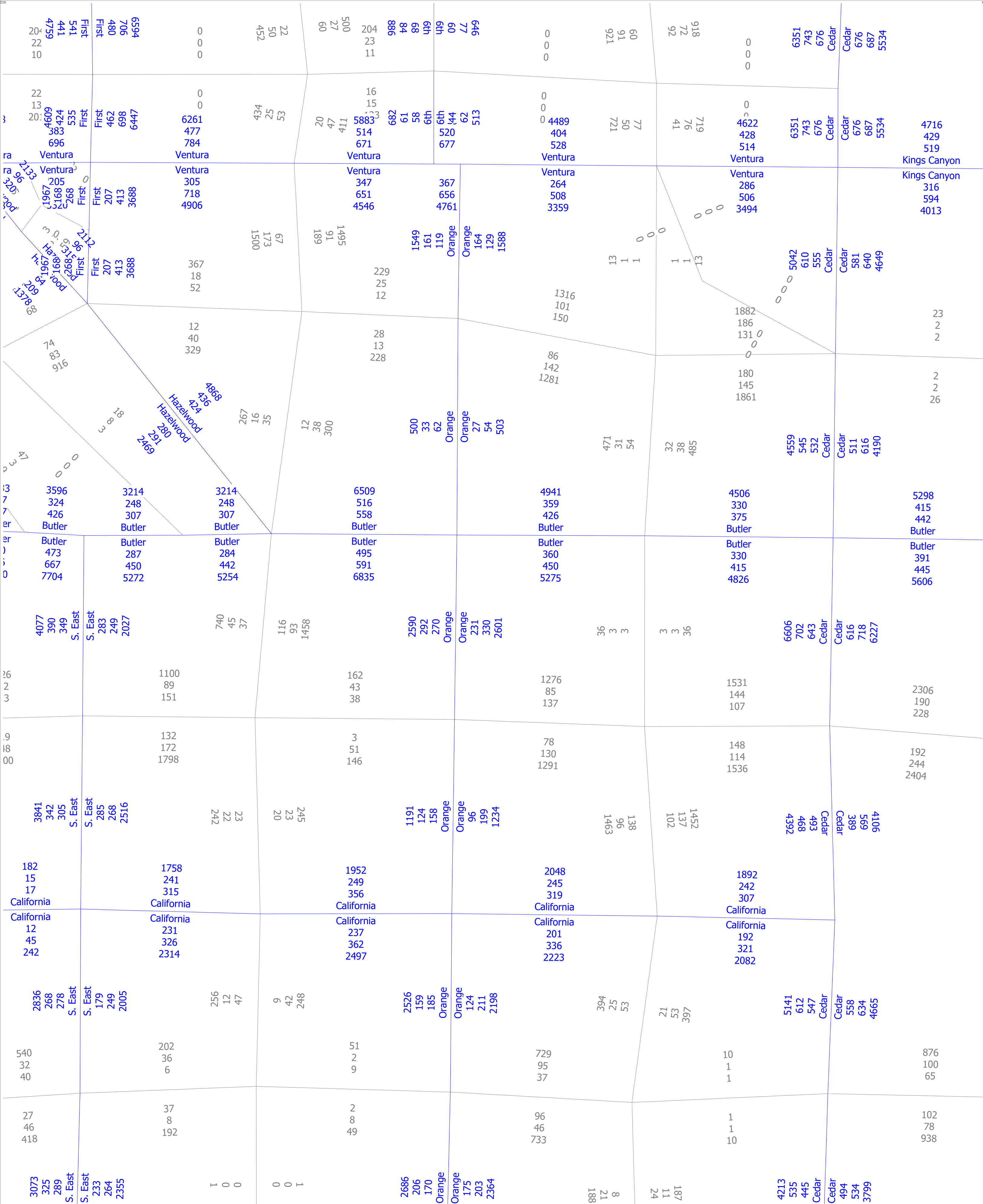
Exhibit B – Model TAZ Modifications



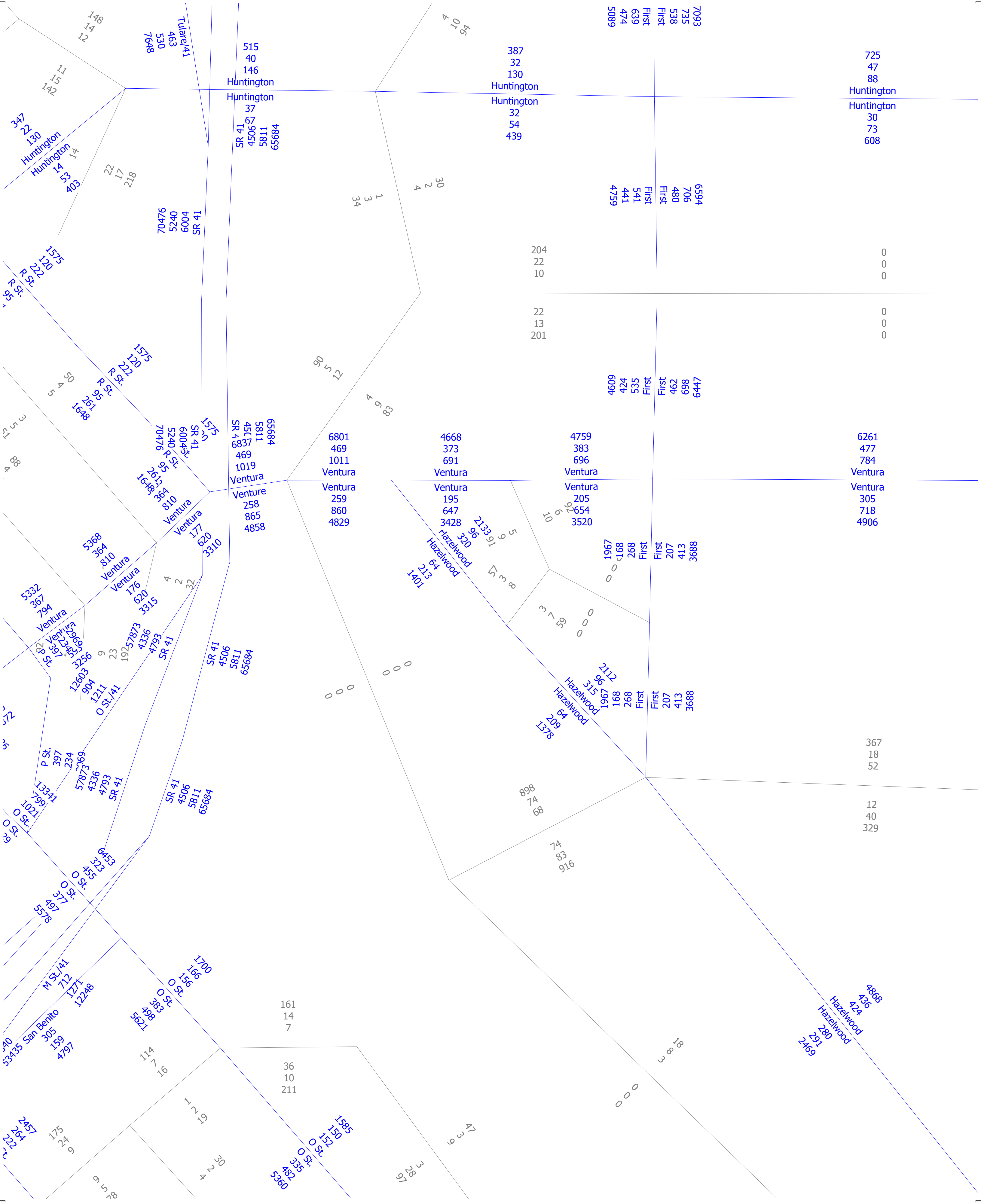

LEGEND
TAZ CENTROID
TAZ CONNECTOR
TAZ A
North
Cumulative Year 2035
Name, Lanes & Speed
(Licensed to JLB Traffic Engineering Inc)



Base Year 2019
AM, PM, and Daily Volumes

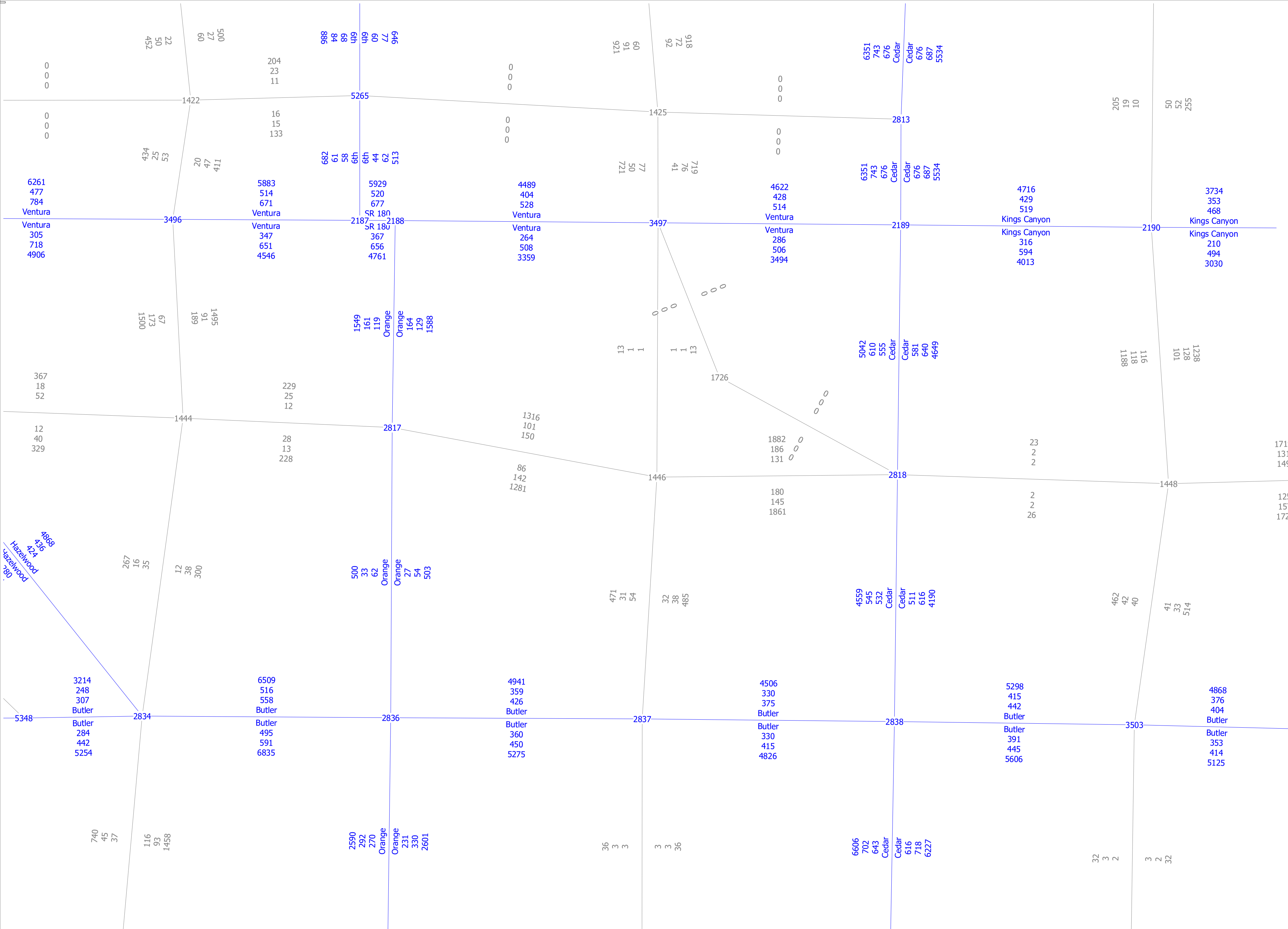


Base Year 2019
AM, PM, and Daily Volumes

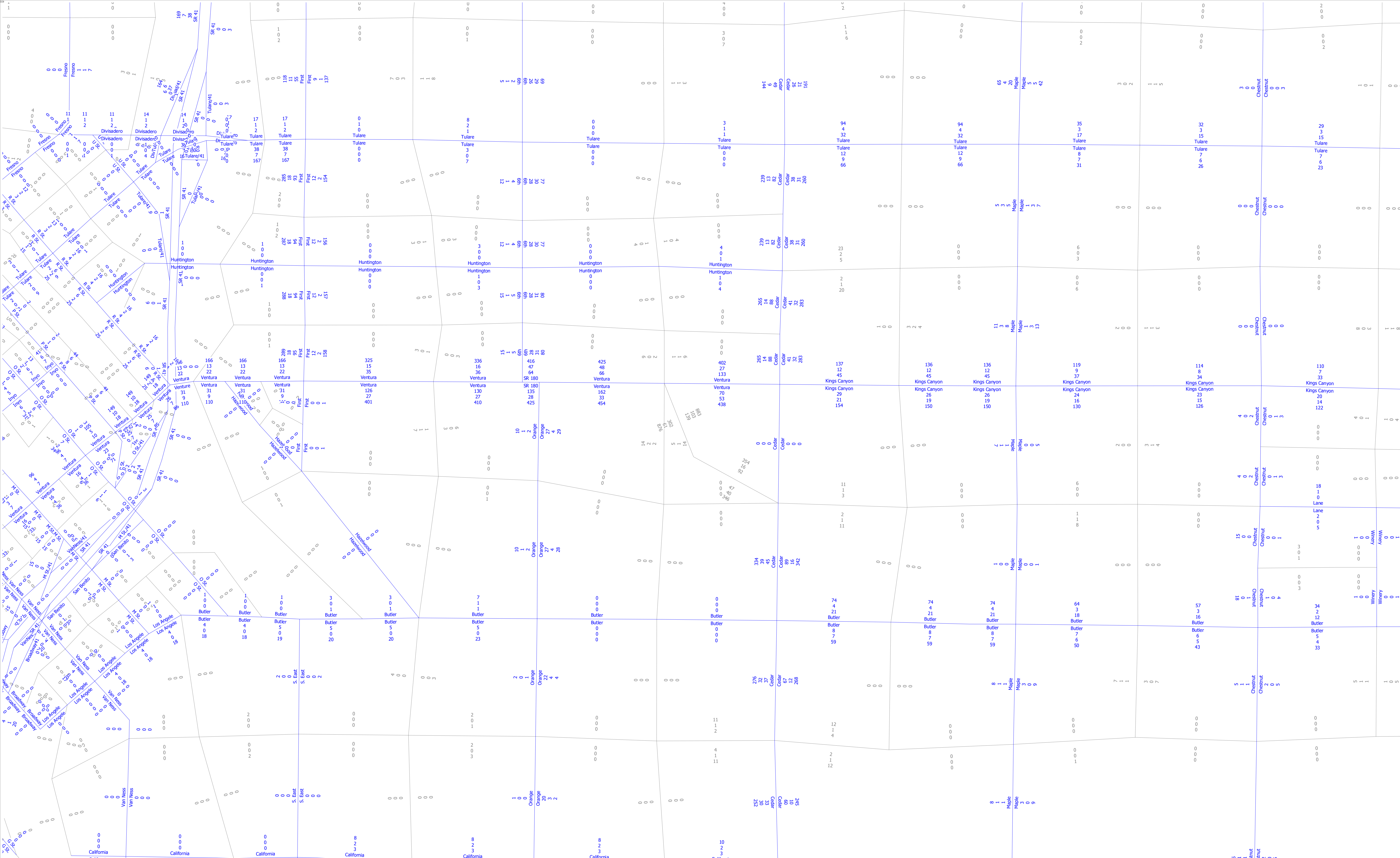


Base Year 2019
AM, PM, and Daily Volumes

cube

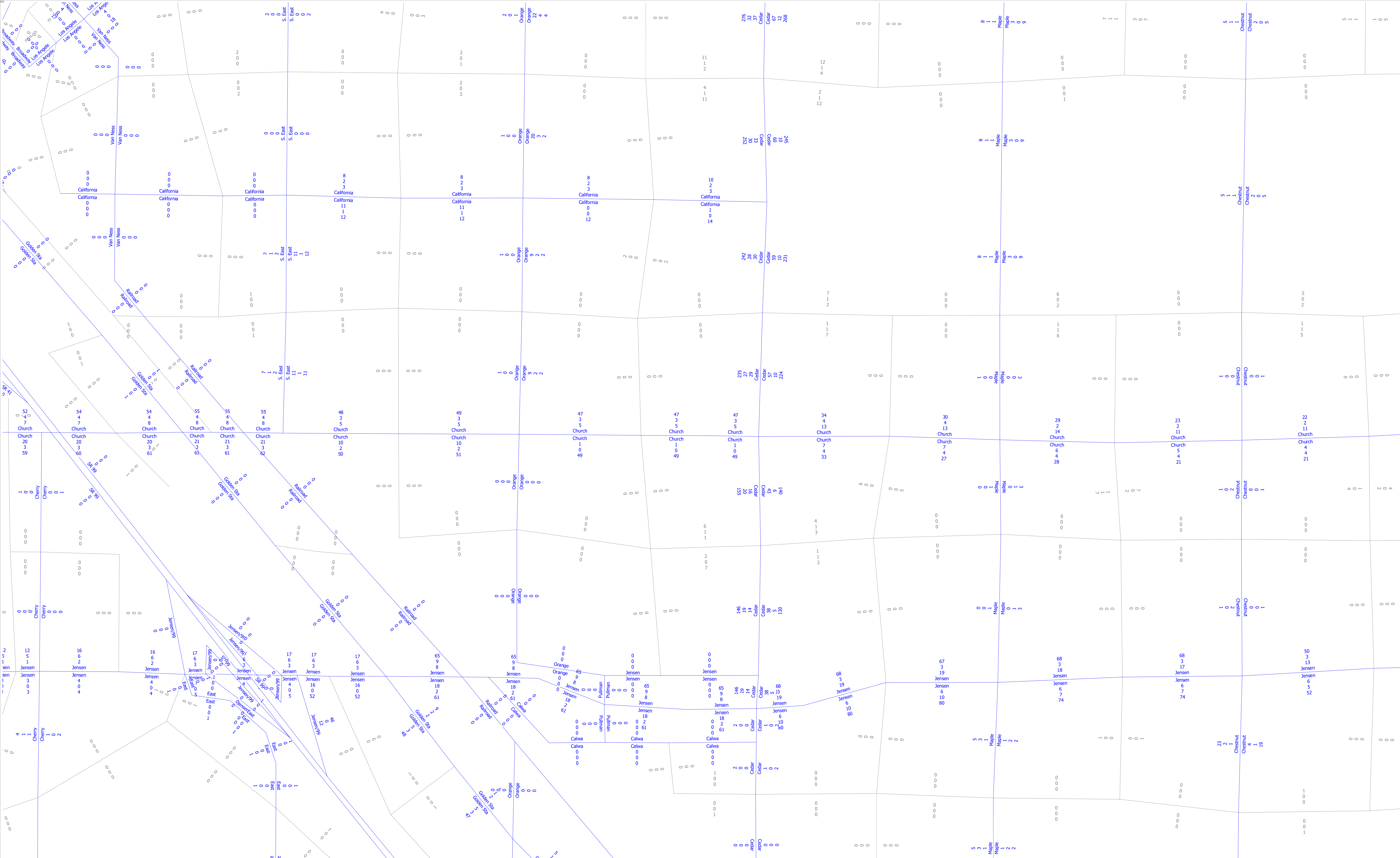


Base Year 2019
AM, PM, and Daily Volumes



Project Select Zone
AM, PM and Daily

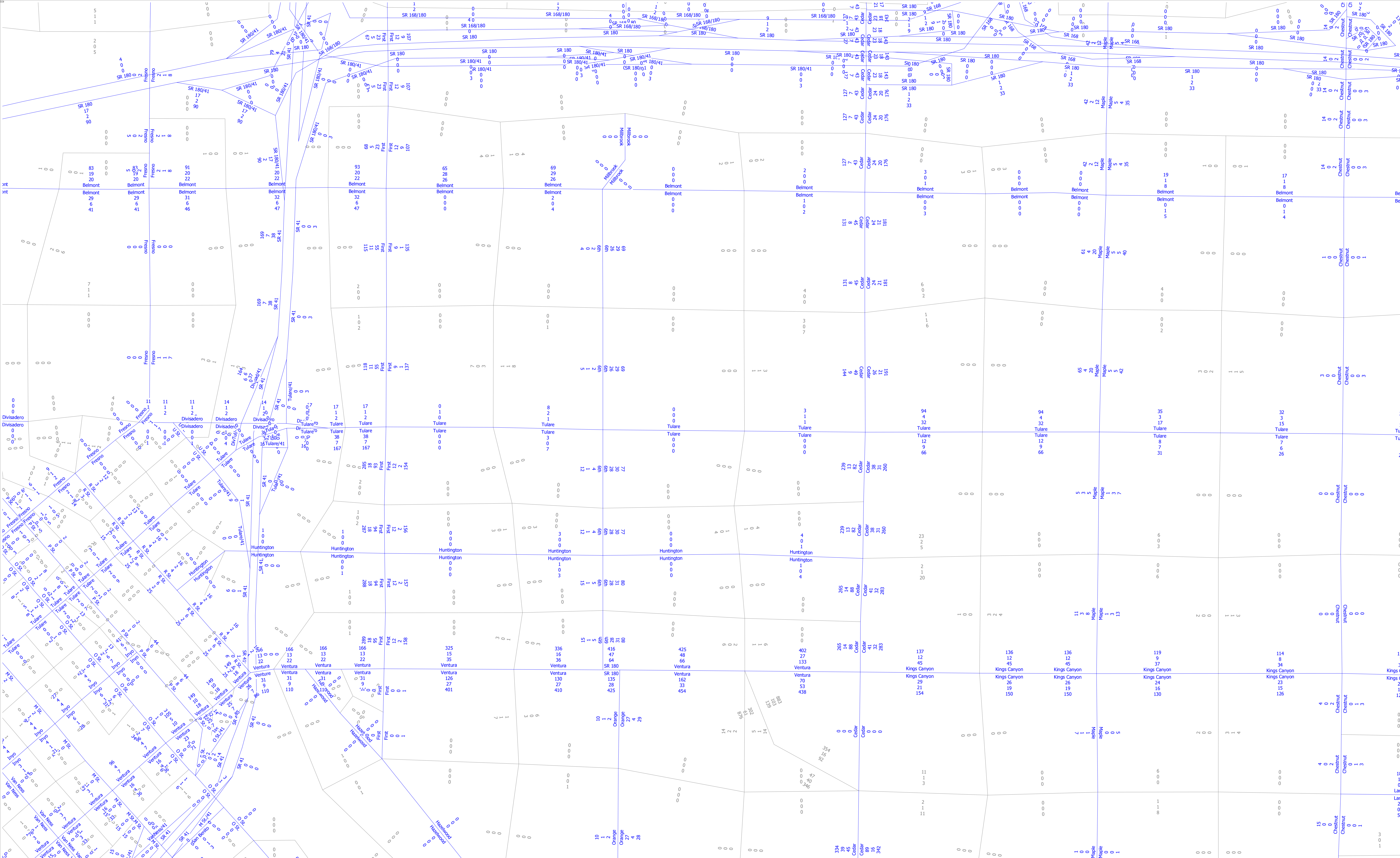
cube



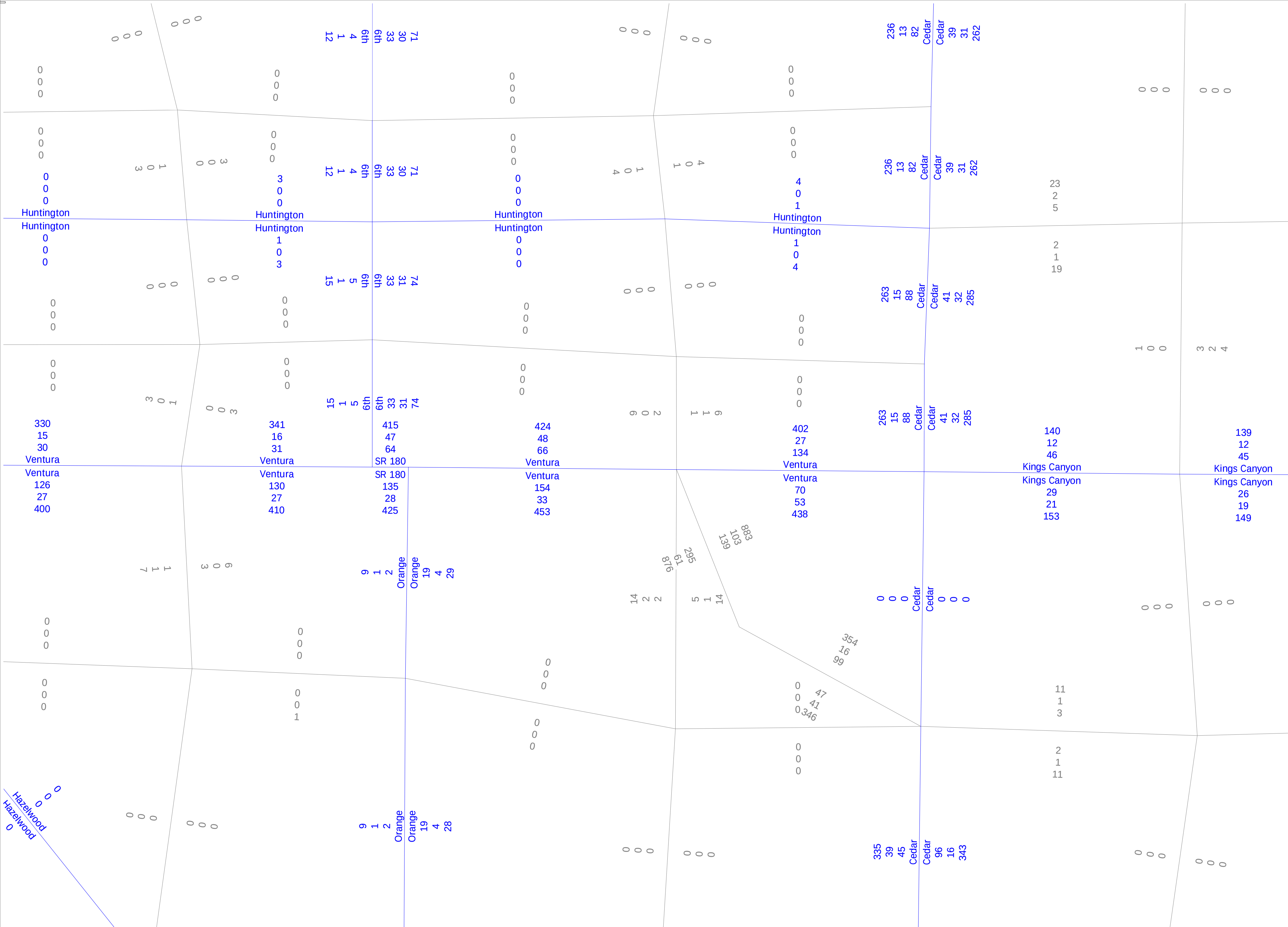
Project Select Zone
AM, PM and Daily

cube

(Licensed to JLB Traffic Engineering Inc)

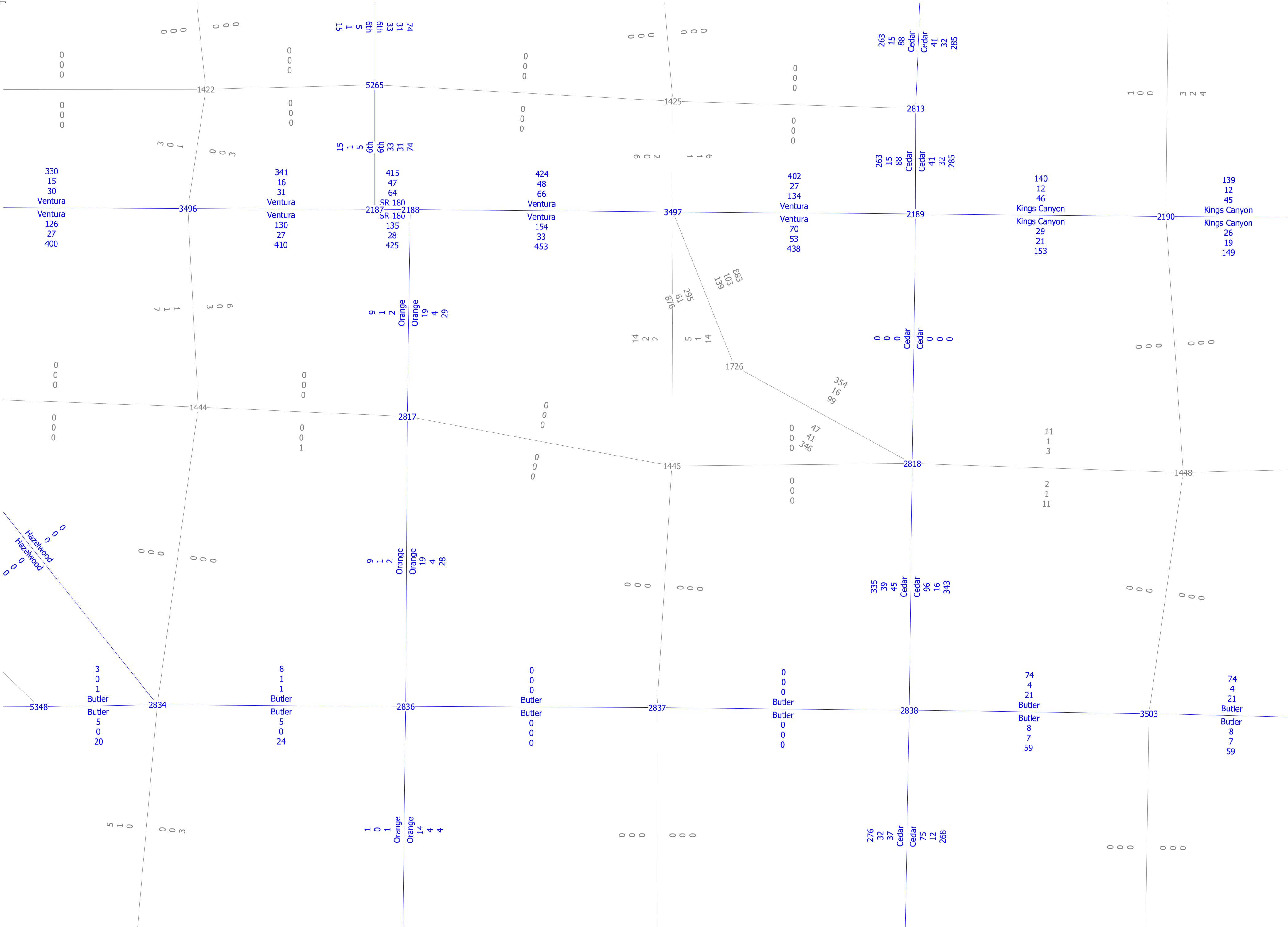


Project Select Zone
AM, PM and Daily



Project Select Zone
AM, PM and Daily

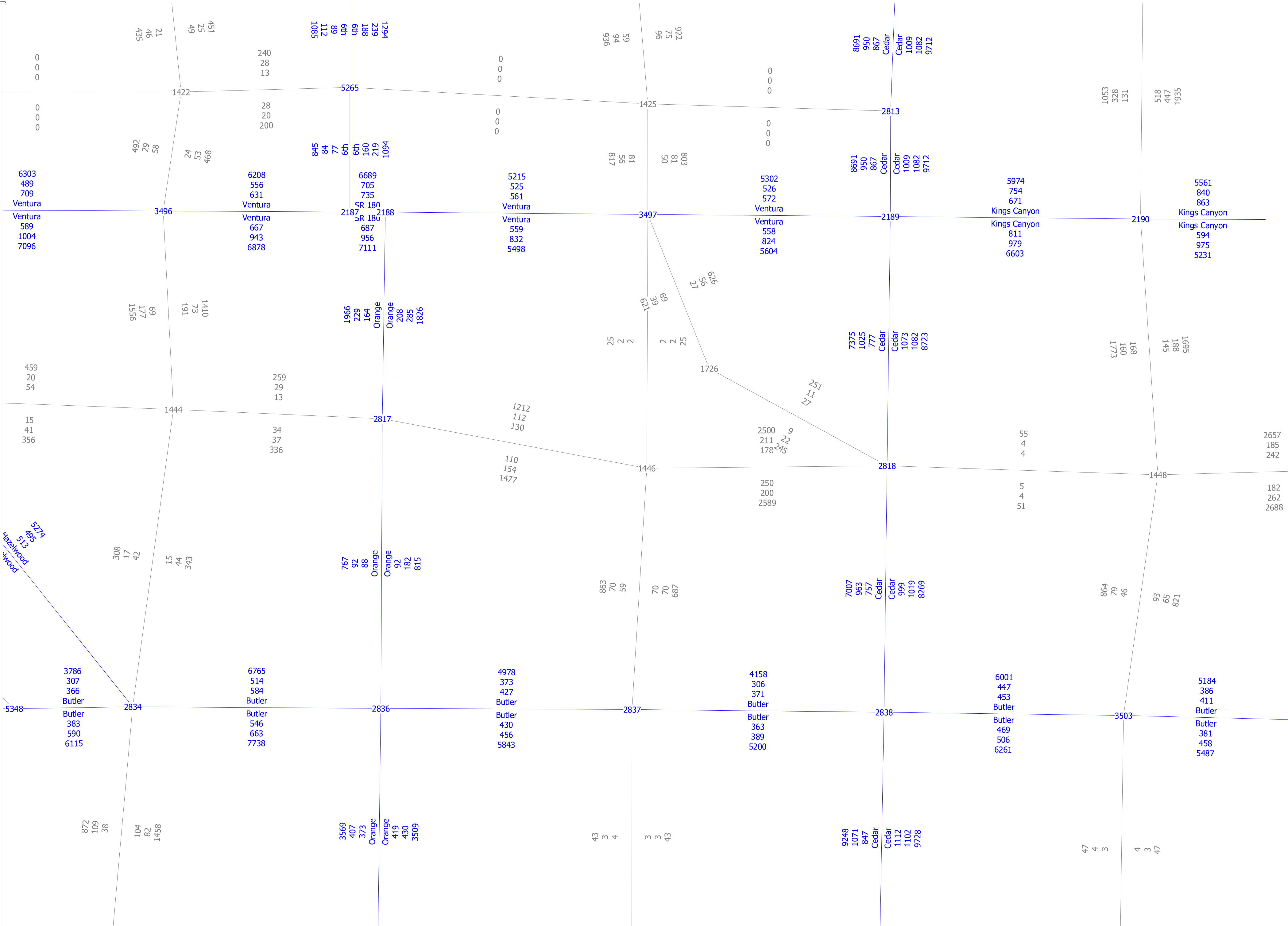
cube



Project Select Zone
AM, PM and Daily

cube

(Licensed to JLB Traffic Engineering Inc)



Cumulative Year 2035
AM, PM and Daily Volumes

Appendix D: Methodology

Levels of Service Methodology

The description and procedures for calculating capacity and level of service (LOS) are found in the Transportation Research Board, Highway Capacity Manual (HCM). The HCM 2010 represents the research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level of service (LOS), from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish a LOS.

Urban Streets (Automobile Mode)

The term "urban streets" refers to urban arterials and collectors, including those in downtown areas. Arterial streets are roads that primarily serve longer through trips. However, providing access to abutting commercial and residential land uses is also an important function of arterials. Collector streets provide both land access and traffic circulation within residential, commercial and industrial areas. Their access function is more important than that of arterials, and unlike arterials their operation is not always dominated by traffic signals. Downtown streets are signalized facilities that often resemble arterials. They not only move through traffic but also provide access to local businesses for passenger cars, transit buses, and trucks. Pedestrian conflicts and lane obstructions created by stopping or standing taxicabs, buses, trucks and parking vehicles that cause turbulence in the traffic flow are typical of downtown streets.

Flow Characteristics

The speed of vehicles on urban streets is influenced by three main factors, street environment, interaction among vehicles and traffic control.

The street environment includes the geometric characteristics of the facility, the character of roadside activity, and adjacent land uses. Thus, the environment reflects the number and width of lanes, type of median, driveway/access point density, spacing between signalized intersections, existence of parking, level of pedestrian and bicyclist activity and speed limit.

The interaction among vehicles is determined by traffic density, the proportion of trucks and buses, and turning movements. This interaction affects the operation of vehicles at intersections and, to a lesser extent, between signals.

Traffic controls (including signals and signs) forces a portion of all vehicles to slow or stop. The delays and speed changes caused by traffic control devices reduce vehicle speeds; however, such controls are needed to establish right-of-way.

Levels of Service (automobile Mode)

The average travel speed for through vehicles along an urban street is the determinant of the operating level of service (LOS). The travel speed along a segment, section or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections.

LOS A describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal. Travel speeds exceed 85 of the base free flow speed (FFS).

LOS B describes reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67 and 85 percent of the base FFS.

LOS C describes stable operations. The ability to maneuver and change lanes in midblock location may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50 and 67 percent of the base FFS.

LOS D indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volumes, inappropriate signal timing, at the boundary intersections. The travel speed is between 40 and 50 percent of the base FFS.

LOS E is characterized unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30 and 40 percent of the base FFS.

LOS F is characterized by street flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30 percent or less of the base FFS.

Table A-1: Urban Street Levels of Service (Automobile Mode)

Travel Speed as a Percentage of Base Free-Flow Speed (%)	LOS by Critical Volume-to-Capacity Ratio[a]	
	≤1.0	>1.0
>85	A	F
>67 to 85	B	F
>50 to 67	C	F
>40 to 50	D	F
>30 to 40	E	F
≤30	F	F

a = The Critical volume-to-capacity ratio is based on consideration of the through movement-to-capacity ratio at each boundary intersection in the subject direction of travel. The critical volume-to-capacity ratio is the largest ratio of those considered.
Source: Highway Capacity Manual 2010, Exhibit 16-4. Urban Street LOS Criteria (Automobile Mode)

Intersection Levels of Service

One of the more important elements limiting, and often interrupting the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals, stop and yield signs.

Signalized Intersections – Performance Measures

For signalized intersections the performance measures include automobile volume-to-capacity ratio, automobile delay, queue storage length, ratio of pedestrian delay, pedestrian circulation area, pedestrian perception score, bicycle delay, and bicycle perception score. LOS is also considered a performance measure. For the automobile mode average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A LOS designation is given to the weighted average control delay to better describe the level of operation. A description of LOS for signalized intersections is found in Table A-2.

Table A-2: Signalized Intersection Level of Service Description (Automobile Mode)

Level of Service	Description	Average Control Delay (seconds per vehicle)
A	Operations with a control delay of 10 seconds/vehicle or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when volume-to-capacity ratio is and either progression is exceptionally favorable or the cycle length is very short. If it's due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.	≤10
B	Operations with control delay between 10.1 to 20.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.	>10.0 to 20.0
C	Operations with average control delays between 20.1 to 35.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	>20 to 35
D	Operations with control delay between 35.1 to 55.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop, and i ndividual cycle failures are noticeable.	>35 to 55
E	Operations with control delay between 55.1 to 80.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.	>55 to 80
F	Operations with unacceptable control delay exceeding 80.0 seconds/vehicle and a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	>80

Source: Highway Capacity Manual 2010

Unsignalized Intersections

The HCM 2010 procedures use control delay as a measure of effectiveness to determine level of service. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, i. e., in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

All-Way Stop Controlled Intersections

All-way stop controlled intersections is a form of traffic controls in which all approaches to an intersection are required to stop. Similar to signalized intersections, at all-way stop controlled intersections the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection as a whole. In other words the delay measured for all-way stop controlled intersections is a measure of the average delay for all vehicles passing through the intersection during the peak hour. A LOS designation is given to the weighted average control delay to better describe the level of operation.

Two-Way Stop Controlled Intersections

Two-way stop controlled (TWSC) intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At TWSC intersections the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay are determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A LOS for TWSC intersection is determined by the computed or measured control delay for each minor movement. LOS is not defined for the intersection as a whole for three main reasons: (a) major-street through vehicles are assumed to experience zero delay; (b) the disproportionate number of major-street through vehicles at the typical TWSC intersection skews the weighted average of all movements, resulting in a very low overall average delay from all vehicles; and (c) the resulting low delay can mask important LOS deficiencies for minor movements. Table A-3 provides a description of LOS at unsignalized intersections.

Table A-3: Unsignalized Intersection Level of Service Description (Automobile Mode)

Control Delay (seconds per vehicle)	**LOS by Volume-to-Capacity Ratio**	
	v/c ≤ 1.0	**v/c > 1.0**
≤10	A	F
>10 to 15	B	F
>15 to 25	C	F
>25 to 35	D	F
>35 to 50	E	F
>50	F	F

Source: HCM 2010 Exhibit 19-1.

Appendix E: Collision Data

Primary Rd E UNIVERSITY AV Distance (ft) 35 Direction N Secondary Rd NORTH CHESTNUT NCIC 1005 State Hwy? N Route Postmile Prefix Postmile Side of Hwy
City Fresno County Fresno Population 7 Rpt Dist NE226 Beat 00H Type 0 CalTrans Badge P1513 Collision Date 20150405 Time 1910 Day SUN
Primary Collision Factor DRVR ALC|DRG Violation 23152B Collision Type REAR END Severity PDO #Killed 0 #Injured 0 Tow Away? Y Process Date 20160205
Weather1 CLEAR Weather2 Rdwy Surface DRY Rdwy Cond1 NO UNUSL CND Rdwy Cond2 Spec Cond 0
Hit and Run Motor Vehicle Involved With OTHER MV Lighting DAYLIGHT Ped Action Cntrl Dev NT PRS/FCTR Loc Type Ramp/Int

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety	Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	DRVR	24	M	H	HBD-UI		PROC ST	N	A	0100	DODGE	2004	- -	A	21703	-	M	B								
2	DRVR	16	M		HNBD		PROC ST	E	A	0100	TOYOT	2013	- 3	N		-	M	B								

Primary Rd E VENTURA AV Distance (ft) 0 Direction Secondary Rd S 5TH ST NCIC 1005 State Hwy? N Route Postmile Prefix Postmile Side of Hwy
City Fresno County Fresno Population 7 Rpt Dist SE275 Beat 00F Type 0 CalTrans Badge P1422 Collision Date 20150823 Time 2025 Day SUN
Primary Collision Factor R-O-W AUTO Violation 21802A Collision Type BROADSIDE Severity INJURY #Killed 0 #Injured 1 Tow Away? N Process Date 20160126
Weather1 CLEAR Weather2 Rdwy Surface DRY Rdwy Cond1 NO UNUSL CND Rdwy Cond2 Spec Cond 0
Hit and Run Motor Vehicle Involved With BICYCLE Lighting DARK - ST Ped Action Cntrl Dev FNCTNG Loc Type Ramp/Int

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety	Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	BICY	69	M	H	HBD-UI		PROC ST	S	L	0400	-		- -	N		-	-	-	BICY	COMP PN	69	M	9	0	-	V
2	DRVR	21	F	H	HNBD		PROC ST	E	A	0100	NISSA	2014	- 3	-		-	M	G								

Primary Rd E VENTURA AV Distance (ft) 78 Direction W Secondary Rd S 8TH ST NCIC 1005 State Hwy? N Route Postmile Prefix Postmile Side of Hwy
City Fresno County Fresno Population 7 Rpt Dist SE275 Beat 00F Type 0 CalTrans Badge P1605 Collision Date 20150112 Time 0640 Day MON
Primary Collision Factor UNSAFE SPEED Violation 22350 Collision Type REAR END Severity INJURY #Killed 0 #Injured 1 Tow Away? Y Process Date 20160127
Weather1 FOG Weather2 Rdwy Surface DRY Rdwy Cond1 NO UNUSL CND Rdwy Cond2 Spec Cond 0
Hit and Run Motor Vehicle Involved With PKD MV Lighting DAYLIGHT Ped Action Cntrl Dev NT PRS/FCTR Loc Type Ramp/Int

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety	Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	DRVR	52	F	W	HNBD		PROC ST	W	C	0300	OTHER	2011	- 3	-		-	P	-	DRVR	COMP PN	52	F	1	1	P	-
2	PRKD	998	-				PARKED	W	D	2200	FORD	2002	- 3	N		-	-	-								

Primary Rd E VENTURA AV Distance (ft) 18 Direction Secondary Rd S ORCHARD ST NCIC 1005 State Hwy? N Route Postmile Prefix Postmile Side of Hwy
City Fresno County Fresno Population 7 Rpt Dist SW275 Beat 00G Type 0 CalTrans Badge P1638 Collision Date 20150204 Time 2215 Day WED
Primary Collision Factor PED VIOL Violation 21950B Collision Type AUTO/PED Severity INJURY #Killed 0 #Injured 1 Tow Away? N Process Date 20160216
Weather1 CLEAR Weather2 Rdwy Surface DRY Rdwy Cond1 NO UNUSL CND Rdwy Cond2 Spec Cond 0
Hit and Run Motor Vehicle Involved With PED Lighting DARK - ST Ped Action NOT IN X- Cntrl Dev NT PRS/FCTR Loc Type Ramp/Int

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety	Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	PED	54	M	H	IMP UNK	IMP UNK	OTHER	N	N	6000	-		- 3	N		-	-	-	PED	SEVERE	54	M	9	3	-	-
2	DRVR	28	M	H	HNBD		PROC ST	W	A	0100	HYUND	2011	- 3	N		-	M	G								

Primary Rd E VENTURA AV Distance (ft) 0 Direction Secondary Rd SOUTH CEDAR AV NCIC 1005 State Hwy? N Route Postmile Prefix Postmile Side of Hwy
City Fresno County Fresno Population 7 Rpt Dist SE275 Beat 00F Type 0 CalTrans Badge P973 Collision Date 20150205 Time 1727 Day THU
Primary Collision Factor STOP SGN|SIG Violation 21453A Collision Type BROADSIDE Severity INJURY #Killed 0 #Injured 1 Tow Away? N Process Date 20160216
Weather1 CLEAR Weather2 Rdwy Surface DRY Rdwy Cond1 NO UNUSL CND Rdwy Cond2 Spec Cond 0
Hit and Run MSDMNR Motor Vehicle Involved With BICYCLE Lighting DAYLIGHT Ped Action Cntrl Dev FNCTNG Loc Type Ramp/Int

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety	Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	BICY	998	M	W	IMP UNK	IMP UNK	PROC ST	W	L	0400	-		- -	N		-	-	-	BICY	OTH VIS	998	-	9	1	-	V
2	DRVR	39	F	H	HNBD		PROC ST	S	A	0100	CHEVR	1999	- 3	N		-	M	G	PASS		15	-	3	0	M	G
																			PASS		2	F	4	0	M	G

Primary Rd EAST BUTLER AV | Distance (ft) 0 | Direction | Secondary Rd S CHANCE AV | NCIC 1005 | State Hwy? N | Route | Postmile Prefix | Postmile | Side of Hwy
City Fresno | County Fresno | Population 7 | Rpt Dist SE276 | Beat 00G | Type 0 | CalTrans | Badge P960 | Collision Date 20150921 | Time 2034 | Day MON
Primary Collision Factor DRVR ALC|DRG | Violation 23153A | Collision Type BROADSIDE | Severity INJURY | #Killed 0 | #Injured 2 | Tow Away? Y | Process Date 20160516
Weather1 CLEAR | Weather2 | Rdwy Surface DRY | Rdwy Cond1 NO UNUSL CND | Rdwy Cond2 | Spec Cond 0
Hit and Run | Motor Vehicle Involved With OTHER MV | Lighting DARK - ST | Ped Action | Cntrl Dev FNCTNG | Loc Type | Ramp/Int

Party Info

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip
1F	DRVR	49	M	H	HBD-UI		LFT TURN	N	A	0100	NISSA	2009	- 3	A	22100	-	L B
2	DRVR	27	M	A	HNBD		PROC ST	W	A	0100	HONDA	2008	- 3	N		-	L G

Victim Info

ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
PASS	SEVERE	44	F	3	0	L	B
DRVR	SEVERE	27	M	1	0	L	G

Primary Rd EAST BUTLER AV | Distance (ft) 120 | Direction S | Secondary Rd S RECREATION AV | NCIC 1005 | State Hwy? N | Route | Postmile Prefix | Postmile | Side of Hwy
City Fresno | County Fresno | Population 7 | Rpt Dist SE286 | Beat 00H | Type 0 | CalTrans | Badge P960 | Collision Date 20150429 | Time 1543 | Day WED
Primary Collision Factor DRVR ALC|DRG | Violation 23152B | Collision Type | Severity PDO | #Killed 0 | #Injured 0 | Tow Away? Y | Process Date 20160206
Weather1 CLEAR | Weather2 | Rdwy Surface | Rdwy Cond1 | Rdwy Cond2 | Spec Cond 0
Hit and Run | Motor Vehicle Involved With | Lighting | Ped Action | Cntrl Dev | Loc Type | Ramp/Int

Party Info

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip
1F	DRVR	22	M	H	HBD-UI		PROC ST	N	A	0100	HONDA	1991	- 3	N		-	M G
2	PRKD	998	-				PARKED	-	D	2200	CHEVR	2010	- -	M		-	- -

Victim Info

ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected

Primary Rd EAST BUTLER AV | Distance (ft) 0 | Direction | Secondary Rd SOUTH CEDAR AV | NCIC 1005 | State Hwy? N | Route | Postmile Prefix | Postmile | Side of Hwy
City Fresno | County Fresno | Population 7 | Rpt Dist 2860 | Beat 00H | Type 0 | CalTrans | Badge 1416 | Collision Date 20150413 | Time 1805 | Day MON
Primary Collision Factor OTHER HAZ | Violation 21451A | Collision Type BROADSIDE | Severity INJURY | #Killed 0 | #Injured 2 | Tow Away? Y | Process Date 20160223
Weather1 CLEAR | Weather2 | Rdwy Surface DRY | Rdwy Cond1 NO UNUSL CND | Rdwy Cond2 | Spec Cond 0
Hit and Run | Motor Vehicle Involved With OTHER MV | Lighting DAYLIGHT | Ped Action | Cntrl Dev FNCTNG | Loc Type | Ramp/Int

Party Info

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip
1	DRVR	28	F	H	HNBD		PROC ST	W	A	0700	HYUND	2004	- 3	N		-	M G
2F	DRVR	35	M	H	HNBD		LFT TURN	E	A	0800	GMC	1998	- 3	N		-	M G
3	DRVR	34	F	W	HNBD		STOPPED	S	A	0700	TOYOT	2007	- 3	N		-	M G

Victim Info

ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
DRVR	COMP PN	28	F	1	0	M	G
PASS	COMP PN	13	F	4	0	M	G
PASS		6	F	6	0	M	G

Primary Rd EAST BUTLER AV | Distance (ft) 0 | Direction | Secondary Rd SOUTH CEDAR AV | NCIC 1005 | State Hwy? N | Route | Postmile Prefix | Postmile | Side of Hwy
City Fresno | County Fresno | Population 7 | Rpt Dist 2860 | Beat 00H | Type 0 | CalTrans | Badge 1669 | Collision Date 20150921 | Time 1130 | Day MON
Primary Collision Factor R-O-W AUTO | Violation 21801A | Collision Type SIDESWIPE | Severity PDO | #Killed 0 | #Injured 0 | Tow Away? N | Process Date 20160210
Weather1 CLEAR | Weather2 | Rdwy Surface DRY | Rdwy Cond1 NO UNUSL CND | Rdwy Cond2 | Spec Cond 0
Hit and Run | Motor Vehicle Involved With OTHER MV | Lighting DAYLIGHT | Ped Action | Cntrl Dev FNCTNG | Loc Type | Ramp/Int

Party Info

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip
1F	DRVR	26	M	H	HNBD		LFT TURN	W	A	0100	TOYOT	2008	- 3	N		-	M G
2	DRVR	29	F	H	HNBD		PROC ST	E	A	0100	CHEVR	2001	- 3	N		-	M G

Victim Info

ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected

Primary Rd EAST BUTLER AV | Distance (ft) 0 | Direction | Secondary Rd SOUTH MAPLE AV | NCIC 1005 | State Hwy? N | Route | Postmile Prefix | Postmile | Side of Hwy
City Fresno | County Fresno | Population 7 | Rpt Dist SE286 | Beat 00H | Type 0 | CalTrans | Badge P994 | Collision Date 20150705 | Time 2119 | Day SUN
Primary Collision Factor R-O-W AUTO | Violation 21801A | Collision Type BROADSIDE | Severity INJURY | #Killed 0 | #Injured 2 | Tow Away? N | Process Date 20160414
Weather1 CLEAR | Weather2 | Rdwy Surface DRY | Rdwy Cond1 NO UNUSL CND | Rdwy Cond2 | Spec Cond 0
Hit and Run | Motor Vehicle Involved With OTHER MV | Lighting DARK - ST | Ped Action | Cntrl Dev FNCTNG | Loc Type | Ramp/Int

Party Info

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip
1F	DRVR	20	M	B	HNBD		LFT TURN	-	A	0100	CHRYS	2012	- 3	-		-	- -
2	DRVR	19	M	H	HNBD		PROC ST	-	A	0100	NISSA	1996	- 3	-		-	G -

Victim Info

ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
DRVR	COMP PN	20	M	1	0	L	G

Primary Rd **SOUTH AVENUE** *Distance (ft)* **0** *Direction* *Secondary Rd* **ENGLEHART AVE** *NCIC* **9435** *State Hwy?* **N** *Route* *Postmile Prefix* *Postmile* *Side of Hwy*
City **Fresno** *County* **Fresno** *Population* **7** *Rpt Dist* *Beat* **060** *Type* **3** *CalTrans* *Badge* **016507** *Collision Date* **20151019** *Time* **0727** *Day* **MON**
Primary Collision Factor **R-O-W AUTO** *Violation* **21802A** *Collision Type* **BROADSIDE** *Severity* **INJURY** *#Killed* **0** *#Injured* **2** *Tow Away?* **Y** *Process Date* **20151027**
Weather1 **CLEAR** *Weather2* *Rdwy Surface* **DRY** *Rdwy Cond1* **NO UNUSL CND** *Rdwy Cond2* *Spec Cond* **0**
Hit and Run *Motor Vehicle Involved With* **OTHER MV** *Lighting* **DAYLIGHT** *Ped Action* *Cntrl Dev* **FNCTNG** *Loc Type* *Ramp/Int*

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	DRVR	62	M	H	HNBD		PROC ST	E	A	0800	FORD	1978	- 3	N		-	M G	DRVR	COMP PN	62	M	1	0	M	G
2	DRVR	47	M	H	HNBD		PROC ST	N	D	2200	CHEV	2004	- 3	N		-	M G	DRVR	COMP PN	47	M	1	0	M	G

Primary Rd **SOUTH CEDAR AV** *Distance (ft)* **30** *Direction* **S** *Secondary Rd* **BUTLER AV** *NCIC* **1005** *State Hwy?* **N** *Route* *Postmile Prefix* *Postmile* *Side of Hwy*
City **Fresno** *County* **Fresno** *Population* **7** *Rpt Dist* **SE285** *Beat* **00F** *Type* **0** *CalTrans* *Badge* **P1293** *Collision Date* **20150913** *Time* **0031** *Day* **SUN**
Primary Collision Factor **DRVR ALC|DRG** *Violation* **23152B** *Collision Type* **REAR END** *Severity* **PDO** *#Killed* **0** *#Injured* **0** *Tow Away?* **Y** *Process Date* **20160203**
Weather1 **CLEAR** *Weather2* *Rdwy Surface* **DRY** *Rdwy Cond1* **NO UNUSL CND** *Rdwy Cond2* *Spec Cond* **0**
Hit and Run *Motor Vehicle Involved With* **OTHER MV** *Lighting* **DARK - ST** *Ped Action* *Cntrl Dev* **FNCTNG** *Loc Type* *Ramp/Int*

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	DRVR	73	M		HBD-UI		SLOWING	N	-	0000	CHEVR	2005	- D	A	23152	N	M G	PASS		79	M	3	0	M	G
2	DRVR	51	M	H	HNBD		STOPPED	N	-	0000	FORD	2007	- D	N		-	M G								

Primary Rd **SOUTH CEDAR AV** *Distance (ft)* **0** *Direction* *Secondary Rd* **E CALIFORNIA AV** *NCIC* **1005** *State Hwy?* **N** *Route* *Postmile Prefix* *Postmile* *Side of Hwy*
City **Fresno** *County* **Fresno** *Population* **7** *Rpt Dist* **SE285** *Beat* **00F** *Type* **0** *CalTrans* *Badge* **P1602** *Collision Date* **20150311** *Time* **2302** *Day* **WED**
Primary Collision Factor **IMPROP TURN** *Violation* **22107** *Collision Type* **HIT OBJECT** *Severity* **PDO** *#Killed* **0** *#Injured* **0** *Tow Away?* **N** *Process Date* **20160831**
Weather1 **CLEAR** *Weather2* *Rdwy Surface* **DRY** *Rdwy Cond1* **NO UNUSL CND** *Rdwy Cond2* *Spec Cond* **0**
Hit and Run *Motor Vehicle Involved With* **FIXED OBJ** *Lighting* **DARK - ST** *Ped Action* *Cntrl Dev* **NT PRS/FCTR** *Loc Type* *Ramp/Int*

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	DRVR	39	M	W			RGT TURN	E	J	4800	DODGE	2011	- 3	N		-	M G	PASS		43	M	3	0	M	G

Primary Rd **SOUTH CEDAR AV** *Distance (ft)* **90** *Direction* **N** *Secondary Rd* **E LANE AV** *NCIC* **1005** *State Hwy?* **N** *Route* *Postmile Prefix* *Postmile* *Side of Hwy*
City **Fresno** *County* **Fresno** *Population* **7** *Rpt Dist* **2759** *Beat* **00F** *Type* **0** *CalTrans* *Badge* **P1671** *Collision Date* **20151015** *Time* **2135** *Day* **THU**
Primary Collision Factor **DRVR ALC|DRG** *Violation* **23152B** *Collision Type* **REAR END** *Severity* **PDO** *#Killed* **0** *#Injured* **0** *Tow Away?* **Y** *Process Date* **20160218**
Weather1 **RAINING** *Weather2* *Rdwy Surface* **WET** *Rdwy Cond1* **NO UNUSL CND** *Rdwy Cond2* *Spec Cond* **0**
Hit and Run **MSDMNR** *Motor Vehicle Involved With* **OTHER MV** *Lighting* **DARK - ST** *Ped Action* *Cntrl Dev* **NT PRS/FCTR** *Loc Type* *Ramp/Int*

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	DRVR	33	M	H	HBD-UI		PROC ST	N	D	2200	TOYOT	2006	- -	A	22350	-	L B								
2	PRKD	998	-				PARKED	N	D	2200	CHEVR	1992	- 3	N		-	- -								
3	PRKD	998	-				PARKED	N	D	2200	FORD	2006	- 3	N		-	- -								

Primary Rd **SOUTH CEDAR AV** *Distance (ft)* **0** *Direction* *Secondary Rd* **E TULARE ST** *NCIC* **1005** *State Hwy?* **N** *Route* *Postmile Prefix* *Postmile* *Side of Hwy*
City **Fresno** *County* **Fresno** *Population* **7** *Rpt Dist* **SE265** *Beat* **00F** *Type* **0** *CalTrans* *Badge* **P1411** *Collision Date* **20150109** *Time* **1744** *Day* **FRI**
Primary Collision Factor **UNKNOWN** *Violation* *Collision Type* **SIDESWIPE** *Severity* **PDO** *#Killed* **0** *#Injured* **0** *Tow Away?* **N** *Process Date* **20160220**
Weather1 **CLEAR** *Weather2* *Rdwy Surface* **DRY** *Rdwy Cond1* **NO UNUSL CND** *Rdwy Cond2* *Spec Cond* **0**
Hit and Run **MSDMNR** *Motor Vehicle Involved With* **BICYCLE** *Lighting* **DARK - ST** *Ped Action* *Cntrl Dev* **FNCTNG** *Loc Type* *Ramp/Int*

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1	DRVR	998	-				RGT TURN	-	-	0000	CHEVR		- -	N		-	N B								
2	BICY	53	F	W	HNBD		RGT TURN	-	L	0400	-		- 3	M		-	- -								

Primary Rd SOUTH CEDAR AV | Distance (ft) 0 | Direction | Secondary Rd EAST BUTLER AV | NCIC 1005 | State Hwy? N | Route | Postmile Prefix | Postmile | Side of Hwy
City Fresno | County Fresno | Population 7 | Rpt Dist 2859 | Beat 00F | Type 0 | CalTrans | Badge 1389 | Collision Date 20150407 | Time 2035 | Day TUE
Primary Collision Factor STOP SGN|SIG | Violation 22451A | Collision Type BROADSIDE | Severity INJURY | #Killed 0 | #Injured 1 | Tow Away? Y | Process Date 20160212
Weather1 CLOUDY | Weather2 | Rdwy Surface DRY | Rdwy Cond1 NO UNUSL CND | Rdwy Cond2 | Spec Cond 0
Hit and Run | Motor Vehicle Involved With OTHER MV | Lighting DARK - ST | Ped Action | Cntrl Dev FNCTNG | Loc Type | Ramp/Int

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	DRVR	31	M	H			STOPPED	W	D	2200	CHEVR	1997	- 3	A	22350	F	M G								
2	DRVR	23	F		HNBD		PROC ST	N	A	0100	NISSA	2009	- 3	N		-	L G	PASS	COMP PN	57	M	3	0	L	G

Primary Rd SOUTH CHESTNUT | Distance (ft) 0 | Direction | Secondary Rd BALCH | NCIC 1005 | State Hwy? N | Route | Postmile Prefix | Postmile | Side of Hwy
City Fresno AV | County Fresno | Population 7 | Rpt Dist SE266 | Beat 00D | Type 0 | CalTrans | Badge P1160 | Collision Date 20150717 | Time 0102 | Day FRI
Primary Collision Factor UNKNOWN | Violation 23103A | Collision Type HIT OBJECT | Severity PDO | #Killed 0 | #Injured 0 | Tow Away? N | Process Date 20160204
Weather1 CLEAR | Weather2 | Rdwy Surface DRY | Rdwy Cond1 NO UNUSL CND | Rdwy Cond2 | Spec Cond 0
Hit and Run MSDMNR | Motor Vehicle Involved With FIXED OBJ | Lighting DARK - ST | Ped Action | Cntrl Dev NT PRS/FCTR | Loc Type | Ramp/Int

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	DRVR	998	M		IMP UNK	IMP UNK	PROC ST	-	D	2200	CHEVR	1996	- -	N		-	- B								

Primary Rd SOUTH CHESTNUT | Distance (ft) 130 | Direction N | Secondary Rd E BALCH AV | NCIC 1005 | State Hwy? N | Route | Postmile Prefix | Postmile | Side of Hwy
City Fresno AV | County Fresno | Population 7 | Rpt Dist SE266 | Beat 00D | Type 0 | CalTrans | Badge P689 | Collision Date 20150310 | Time 0640 | Day TUE
Primary Collision Factor PED VIOL | Violation 21954A | Collision Type BROADSIDE | Severity INJURY | #Killed 0 | #Injured 1 | Tow Away? N | Process Date 20160125
Weather1 CLEAR | Weather2 | Rdwy Surface DRY | Rdwy Cond1 NO UNUSL CND | Rdwy Cond2 | Spec Cond 0
Hit and Run | Motor Vehicle Involved With PED | Lighting DUSK/DAWN | Ped Action NOT IN X- | Cntrl Dev FNCTNG | Loc Type | Ramp/Int

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1	DRVR	33	M	H	HNBD		PROC ST	N	A	0100	MITSU	2001	- 3	N		-	G -								
2F	PED	14	M	H	HNBD			E	N	6000	-		- 3	N		-	- -	PED	SEVERE	14	M	9	3	N	P

Primary Rd SOUTH CHESTNUT | Distance (ft) 0 | Direction | Secondary Rd E BRALY AV | NCIC 1005 | State Hwy? N | Route | Postmile Prefix | Postmile | Side of Hwy
City Fresno AV | County Fresno | Population 7 | Rpt Dist SE286 | Beat 00H | Type 0 | CalTrans | Badge P1642 | Collision Date 20150129 | Time 0353 | Day THU
Primary Collision Factor UNSAFE SPEED | Violation 22350 | Collision Type HIT OBJECT | Severity PDO | #Killed 0 | #Injured 0 | Tow Away? Y | Process Date 20160322
Weather1 FOG | Weather2 | Rdwy Surface WET | Rdwy Cond1 NO UNUSL CND | Rdwy Cond2 | Spec Cond 0
Hit and Run | Motor Vehicle Involved With FIXED OBJ | Lighting DARK - ST | Ped Action | Cntrl Dev FNCTNG | Loc Type | Ramp/Int

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	DRVR	20	M	H	HNBD		PROC ST	S	A	0100	MAZDA	1999	- 3	-		-	L G	PASS		17	M	3	0	L	G

Primary Rd SOUTH CHESTNUT | Distance (ft) 1 | Direction W | Secondary Rd E LAUREL AV | NCIC 1005 | State Hwy? N | Route | Postmile Prefix | Postmile | Side of Hwy
City Fresno AV | County Fresno | Population 7 | Rpt Dist 2661 | Beat 00D | Type 0 | CalTrans | Badge P1308 | Collision Date 20150614 | Time 2057 | Day SUN
Primary Collision Factor DRVR ALC|DRG | Violation 23152A | Collision Type HIT OBJECT | Severity PDO | #Killed 0 | #Injured 0 | Tow Away? Y | Process Date 20160206
Weather1 CLEAR | Weather2 | Rdwy Surface DRY | Rdwy Cond1 NO UNUSL CND | Rdwy Cond2 | Spec Cond 0
Hit and Run MSDMNR | Motor Vehicle Involved With FIXED OBJ | Lighting DARK - ST | Ped Action | Cntrl Dev NT PRS/FCTR | Loc Type | Ramp/Int

Party	Type	Age	Sex	Race	Sobriety1	Sobriety2	Move Pre	Dir	SW Veh	CHP Veh	Make	Year	SP Info	OAF1	Viol	OAF2	Safety Equip	ROLE	Ext Of Inj	AGE	Sex	Seat Pos	Safety	EQUIP	Ejected
1F	DRVR	28	M	H	HBD-UI		PROC ST	S	A	0100	GMC	2004	- 3	N		-	L G								

Appendix F: Existing Traffic Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	368	66	62	551	89	86
Future Volume (veh/h)	368	66	62	551	89	86
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	404	73	68	605	98	95
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	948	422	132	1777	255	227
Arrive On Green	0.27	0.27	0.07	0.50	0.14	0.14
Sat Flow, veh/h	3618	1570	1767	3618	1767	1572
Grp Volume(v), veh/h	404	73	68	605	98	95
Grp Sat Flow(s),veh/h/ln	1763	1570	1767	1763	1767	1572
Q Serve(g_s), s	2.5	0.9	1.0	2.7	1.3	1.4
Cycle Q Clear(g_c), s	2.5	0.9	1.0	2.7	1.3	1.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	948	422	132	1777	255	227
V/C Ratio(X)	0.43	0.17	0.52	0.34	0.38	0.42
Avail Cap(c_a), veh/h	2804	1248	392	4152	2027	1804
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.9	7.3	11.6	3.9	10.1	10.2
Incr Delay (d2), s/veh	0.3	0.2	3.1	0.1	1.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.2	0.4	0.2	0.4	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.2	7.5	14.8	4.0	11.1	11.4
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	477			673	193	
Approach Delay, s/veh	8.1			5.1	11.3	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.4	6.1	11.6				17.8
Change Period (Y+Rc), s		4.6	* 4.2	4.6				4.6
Max Green Setting (Gmax), s		30.0	* 5.8	20.8				30.8
Max Q Clear Time (g_c+I1), s		3.4	3.0	4.5				4.7
Green Ext Time (p_c), s		0.6	0.0	2.5				4.2

Intersection Summary	
HCM 6th Ctrl Delay	7.0
HCM 6th LOS	A

Notes

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

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	370	8	2	14	633	13	14
Future Vol, veh/h	370	8	2	14	633	13	14
Conflicting Peds, #/hr	0	5	0	5	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84	84
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	440	10	2	17	754	15	17

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	450	455	0	865	230
Stage 1	-	-	-	-	-	450	-
Stage 2	-	-	-	-	-	415	-
Critical Hdwy	-	-	6.46	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.53	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	740	1095	-	291	769
Stage 1	-	-	-	-	-	606	-
Stage 2	-	-	-	-	-	632	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	1026	1026	-	284	765
Mov Cap-2 Maneuver	-	-	-	-	-	284	-
Stage 1	-	-	-	-	-	591	-
Stage 2	-	-	-	-	-	632	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	14.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	421	-	-	1026	-
HCM Lane V/C Ratio	0.076	-	-	0.019	-
HCM Control Delay (s)	14.3	-	-	8.6	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	3	2	371	10	1	10	600	7	32	4	29	9	1	6
Future Vol, veh/h	3	2	371	10	1	10	600	7	32	4	29	9	1	6
Conflicting Peds, #/hr	0	11	0	3	0	3	0	11	8	0	1	1	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	110	-	-	-	110	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	4	2	436	12	1	12	706	8	38	5	34	11	1	7

Major/Minor	Major1				Major2				Minor1			Minor2		
Conflicting Flow All	714	725	0	0	448	451	0	0	845	1208	228	981	1210	376
Stage 1	-	-	-	-	-	-	-	-	457	457	-	747	747	-
Stage 2	-	-	-	-	-	-	-	-	388	751	-	234	463	-
Critical Hdwy	6.46	4.16	-	-	6.46	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.53	2.23	-	-	2.53	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	503	867	-	-	742	1099	-	-	254	180	772	202	180	619
Stage 1	-	-	-	-	-	-	-	-	550	563	-	369	416	-
Stage 2	-	-	-	-	-	-	-	-	605	414	-	745	560	-
Platoon blocked, %			-	-			-	-						
Mov Cap-1 Maneuver	598	598	-	-	1045	1045	-	-	243	174	769	184	174	608
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	243	174	-	184	174	-
Stage 1	-	-	-	-	-	-	-	-	543	556	-	362	407	-
Stage 2	-	-	-	-	-	-	-	-	584	405	-	698	553	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	18.7	20.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	338	598	-	-	1045	-	-	248
HCM Lane V/C Ratio	0.226	0.01	-	-	0.012	-	-	0.076
HCM Control Delay (s)	18.7	11.1	-	-	8.5	-	-	20.7
HCM Lane LOS	C	B	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.9	0	-	-	0	-	-	0.2

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	5	110	303	46	9	82	459	102	69	482	57	1
Future Volume (vph)	5	110	303	46	9	82	459	102	69	482	57	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97		1.00	1.00		1.00	1.00	0.97	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.97		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1525		1752	3398		1752	3505	1514	
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1525		1752	3398		1752	3505	1514	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	6	131	361	55	11	98	546	121	82	574	68	1
RTOR Reduction (vph)	0	0	0	41	0	0	22	0	0	0	49	0
Lane Group Flow (vph)	0	137	361	14	0	109	645	0	82	574	19	0
Confl. Peds. (#/hr)				24				9			39	
Confl. Bikes (#/hr)								1				
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	3	8		5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		5.2	17.5	17.5		7.2	19.5		5.4	18.6	18.6	
Effective Green, g (s)		5.2	17.5	17.5		7.2	19.5		5.4	18.6	18.6	
Actuated g/C Ratio		0.08	0.26	0.26		0.11	0.29		0.08	0.28	0.28	
Clearance Time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		137	923	401		189	997		142	981	424	
v/s Ratio Prot		c0.08	0.10			0.06	c0.19		0.05	c0.16		
v/s Ratio Perm				0.01							0.01	
v/c Ratio		1.00	0.39	0.04		0.58	0.65		0.58	0.59	0.04	
Uniform Delay, d1		30.6	20.1	18.2		28.2	20.4		29.4	20.6	17.4	
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		76.9	0.3	0.0		4.2	1.5		5.6	0.9	0.0	
Delay (s)		107.5	20.4	18.2		32.4	21.9		35.0	21.5	17.5	
Level of Service		F	C	B		C	C		C	C	B	
Approach Delay (s)			41.7				23.4			22.6		
Approach LOS			D				C			C		

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	66.4	Sum of lost time (s)	17.9
Intersection Capacity Utilization	72.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	133	364	79
Future Volume (vph)	133	364	79
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.6	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.97	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1752	3398	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1752	3398	
Peak-hour factor, PHF	0.84	0.84	0.84
Adj. Flow (vph)	158	433	94
RTOR Reduction (vph)	0	22	0
Lane Group Flow (vph)	159	505	0
Confl. Peds. (#/hr)			16
Confl. Bikes (#/hr)			1
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	5.2	18.7	
Effective Green, g (s)	5.2	18.7	
Actuated g/C Ratio	0.08	0.28	
Clearance Time (s)	4.2	4.6	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	137	956	
v/s Ratio Prot	c0.09	0.15	
v/s Ratio Perm			
v/c Ratio	1.16	0.53	
Uniform Delay, d1	30.6	20.1	
Progression Factor	1.00	1.00	
Incremental Delay, d2	126.5	0.5	
Delay (s)	157.1	20.7	
Level of Service	F	C	
Approach Delay (s)		52.3	
Approach LOS		D	

Intersection Summary

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	0	10	1	24	2	465	7	6	372	5
Future Vol, veh/h	10	0	0	10	1	24	2	465	7	6	372	5
Conflicting Peds, #/hr	1	0	5	5	0	1	3	0	7	7	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	0	0	11	1	27	2	522	8	7	418	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	705	979	220	765	978	273	427	0	0	537	0	0
Stage 1	438	438	-	537	537	-	-	-	-	-	-	-
Stage 2	267	541	-	228	441	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	321	247	781	291	247	722	1122	-	-	1020	-	-
Stage 1	565	575	-	493	519	-	-	-	-	-	-	-
Stage 2	713	516	-	751	573	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	304	242	775	285	242	717	1119	-	-	1013	-	-
Mov Cap-2 Maneuver	304	242	-	285	242	-	-	-	-	-	-	-
Stage 1	562	568	-	488	514	-	-	-	-	-	-	-
Stage 2	682	511	-	741	566	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.3	13.2	0	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1119	-	-	304	481	1013	-	-
HCM Lane V/C Ratio	0.002	-	-	0.037	0.082	0.007	-	-
HCM Control Delay (s)	8.2	0	-	17.3	13.2	8.6	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	196	79	59	302	45	87	410	77	38	366	80
Future Volume (veh/h)	96	196	79	59	302	45	87	410	77	38	366	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	0.98		0.92	0.98		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	120	245	99	74	378	56	109	512	96	48	458	100
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	344	691	581	428	691	574	410	1260	235	389	1228	266
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	944	1856	1561	1024	1856	1542	826	2923	544	790	2850	616
Grp Volume(v), veh/h	120	245	99	74	378	56	109	307	301	48	282	276
Grp Sat Flow(s),veh/h/ln	944	1856	1561	1024	1856	1542	826	1763	1705	790	1763	1704
Q Serve(g_s), s	5.7	4.8	2.1	2.8	8.0	1.2	5.1	6.0	6.1	2.2	5.4	5.5
Cycle Q Clear(g_c), s	13.7	4.8	2.1	7.6	8.0	1.2	10.6	6.0	6.1	8.3	5.4	5.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.32	1.00		0.36
Lane Grp Cap(c), veh/h	344	691	581	428	691	574	410	760	735	389	760	734
V/C Ratio(X)	0.35	0.35	0.17	0.17	0.55	0.10	0.27	0.40	0.41	0.12	0.37	0.38
Avail Cap(c_a), veh/h	512	1021	859	604	1010	839	520	994	962	494	994	961
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	17.7	11.3	10.5	14.0	12.3	10.2	13.2	9.8	9.8	12.7	9.6	9.6
Incr Delay (d2), s/veh	0.6	0.3	0.1	0.2	0.7	0.1	0.3	0.3	0.4	0.1	0.3	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	1.1	1.6	0.6	0.6	2.7	0.3	0.8	1.8	1.7	0.3	1.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.3	11.6	10.6	14.2	13.0	10.3	13.6	10.1	10.2	12.8	9.9	9.9
LnGrp LOS	B	B	B	B	B	B	B	B	B	B	A	A
Approach Vol, veh/h		464			508			717			606	
Approach Delay, s/veh		13.1			12.9			10.7			10.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		26.4		23.4		26.4		23.4				
Change Period (Y+Rc), s		4.9		* 4.9		4.9		4.9				
Max Green Setting (Gmax), s		28.1		* 27		28.1		27.1				
Max Q Clear Time (g_c+I1), s		12.6		15.7		10.3		10.0				
Green Ext Time (p_c), s		3.8		1.8		3.3		2.4				

Intersection Summary			
HCM 6th Ctrl Delay			11.5
HCM 6th LOS			B

Notes

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

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	696	47	14	65	656	92	101
Future Volume (vph)	696	47	14	65	656	92	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.2	4.6	4.6	4.6
Lane Util. Factor	0.95	1.00		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1529		1752	3505	1752	1568
Flt Permitted	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1529		1752	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	757	51	15	71	713	100	110
RTOR Reduction (vph)	0	21	0	0	0	0	89
Lane Group Flow (vph)	757	30	0	86	713	100	21
Confl. Peds. (#/hr)		4		4			
Turn Type	NA	Perm	Prot	Prot	NA	Prot	Perm
Protected Phases	4		3	3	8	2	
Permitted Phases		4					2
Actuated Green, G (s)	21.2	21.2		3.2	28.6	8.9	8.9
Effective Green, g (s)	21.2	21.2		3.2	28.6	8.9	8.9
Actuated g/C Ratio	0.45	0.45		0.07	0.61	0.19	0.19
Clearance Time (s)	4.6	4.6		4.2	4.6	4.6	4.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1591	694		120	2146	333	298
v/s Ratio Prot	c0.22			c0.05	0.20	c0.06	
v/s Ratio Perm		0.02					0.01
v/c Ratio	0.48	0.04		0.72	0.33	0.30	0.07
Uniform Delay, d1	8.9	7.1		21.3	4.4	16.2	15.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0		18.4	0.1	0.5	0.1
Delay (s)	9.1	7.1		39.7	4.5	16.7	15.6
Level of Service	A	A		D	A	B	B
Approach Delay (s)	9.0				8.3	16.1	
Approach LOS	A				A	B	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	46.7	Sum of lost time (s)	13.4
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	775	21	6	47	640	15	17
Future Vol, veh/h	775	21	6	47	640	15	17
Conflicting Peds, #/hr	0	8	0	8	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	833	23	6	51	688	16	18

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	856	864	0	1311	436
Stage 1	-	-	-	-	-	853	-
Stage 2	-	-	-	-	-	458	-
Critical Hdwy	-	-	6.46	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.53	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	408	768	-	149	565
Stage 1	-	-	-	-	-	375	-
Stage 2	-	-	-	-	-	601	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	690	690	-	136	561
Mov Cap-2 Maneuver	-	-	-	-	-	136	-
Stage 1	-	-	-	-	-	341	-
Stage 2	-	-	-	-	-	601	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	23.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	228	-	-	690	-
HCM Lane V/C Ratio	0.151	-	-	0.083	-
HCM Control Delay (s)	23.6	-	-	10.7	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.5	-	-	0.3	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	3	28	724	35	16	652	8	11	6	20	4	2	20
Future Vol, veh/h	3	28	724	35	16	652	8	11	6	20	4	2	20
Conflicting Peds, #/hr	0	12	0	9	9	0	12	14	0	0	0	0	14
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	110	-	-	110	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	29	754	36	17	679	8	11	6	21	4	2	21

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	688	699	0	0	799	0	0	1234	1578	404	1173	1592	370
Stage 1	-	-	-	-	-	-	-	845	845	-	729	729	-
Stage 2	-	-	-	-	-	-	-	389	733	-	444	863	-
Critical Hdwy	6.46	4.16	-	-	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.53	2.23	-	-	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	522	887	-	-	813	-	-	132	107	593	146	105	624
Stage 1	-	-	-	-	-	-	-	322	375	-	378	424	-
Stage 2	-	-	-	-	-	-	-	604	422	-	560	367	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	819	819	-	-	806	-	-	117	99	588	127	97	609
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	117	99	-	127	97	-
Stage 1	-	-	-	-	-	-	-	307	357	-	359	410	-
Stage 2	-	-	-	-	-	-	-	561	408	-	510	349	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	27.8	17.9
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	196	819	-	-	806	-	-	306
HCM Lane V/C Ratio	0.197	0.039	-	-	0.021	-	-	0.089
HCM Control Delay (s)	27.8	9.6	-	-	9.6	-	-	17.9
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0.1	-	-	0.3

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	9	114	545	78	16	88	531	159	77	347	78	5
Future Volume (vph)	9	114	545	78	16	88	531	159	77	347	78	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97		1.00	0.99		1.00	1.00	0.97	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.97		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1525		1752	3366		1752	3505	1526	
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1525		1752	3366		1752	3505	1526	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	9	116	556	80	16	90	542	162	79	354	80	5
RTOR Reduction (vph)	0	0	0	58	0	0	31	0	0	0	61	0
Lane Group Flow (vph)	0	125	556	22	0	106	673	0	79	354	19	0
Confl. Peds. (#/hr)				26				19			27	
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	3	8		5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		5.3	17.6	17.6		7.1	19.4		5.6	15.0	15.0	
Effective Green, g (s)		5.3	17.6	17.6		7.1	19.4		5.6	15.0	15.0	
Actuated g/C Ratio		0.08	0.28	0.28		0.11	0.31		0.09	0.24	0.24	
Clearance Time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		147	980	426		197	1038		155	835	363	
v/s Ratio Prot		c0.07	0.16			0.06	c0.20		0.05	0.10		
v/s Ratio Perm				0.01							0.01	
v/c Ratio		0.85	0.57	0.05		0.54	0.65		0.51	0.42	0.05	
Uniform Delay, d1		28.4	19.4	16.6		26.4	18.8		27.3	20.3	18.5	
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		34.8	0.8	0.1		2.8	1.4		2.6	0.3	0.1	
Delay (s)		63.3	20.1	16.6		29.2	20.2		30.0	20.6	18.5	
Level of Service		E	C	B		C	C		C	C	B	
Approach Delay (s)			26.9				21.4			21.7		
Approach LOS			C				C			C		

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	62.9	Sum of lost time (s)	17.9
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	125	321	94
Future Volume (vph)	125	321	94
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.6	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.97	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1752	3367	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1752	3367	
Peak-hour factor, PHF	0.98	0.98	0.98
Adj. Flow (vph)	128	328	96
RTOR Reduction (vph)	0	34	0
Lane Group Flow (vph)	133	390	0
Confl. Peds. (#/hr)			24
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	5.3	15.0	
Effective Green, g (s)	5.3	15.0	
Actuated g/C Ratio	0.08	0.24	
Clearance Time (s)	4.2	4.6	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	147	802	
v/s Ratio Prot	c0.08	c0.12	
v/s Ratio Perm			
v/c Ratio	0.90	0.49	
Uniform Delay, d1	28.5	20.6	
Progression Factor	1.00	1.00	
Incremental Delay, d2	46.7	0.5	
Delay (s)	75.3	21.1	
Level of Service	E	C	
Approach Delay (s)		34.0	
Approach LOS		C	

Intersection Summary

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	2	1	7	0	29	1	468	11	6	469	6
Future Vol, veh/h	8	2	1	7	0	29	1	468	11	6	469	6
Conflicting Peds, #/hr	2	0	2	2	0	2	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	9	2	1	8	0	32	1	514	12	7	515	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	800	1069	269	799	1066	267	528	0	0	528	0	0
Stage 1	539	539	-	524	524	-	-	-	-	-	-	-
Stage 2	261	530	-	275	542	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	274	218	726	275	219	728	1028	-	-	1028	-	-
Stage 1	492	518	-	502	526	-	-	-	-	-	-	-
Stage 2	718	522	-	705	516	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	258	214	720	269	215	725	1022	-	-	1026	-	-
Mov Cap-2 Maneuver	258	214	-	269	215	-	-	-	-	-	-	-
Stage 1	489	510	-	500	524	-	-	-	-	-	-	-
Stage 2	684	520	-	693	508	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.3	12.1	0	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1022	-	-	264	545	1026	-	-
HCM Lane V/C Ratio	0.001	-	-	0.046	0.073	0.006	-	-
HCM Control Delay (s)	8.5	0	-	19.3	12.1	8.5	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	330	81	53	245	42	74	332	47	69	341	65
Future Volume (veh/h)	79	330	81	53	245	42	74	332	47	69	341	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	85	355	87	57	263	45	80	357	51	74	367	70
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	471	656	552	398	656	552	461	1115	158	475	1064	201
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1058	1856	1559	937	1856	1559	935	3091	437	960	2948	556
Grp Volume(v), veh/h	85	355	87	57	263	45	80	202	206	74	218	219
Grp Sat Flow(s),veh/h/ln	1058	1856	1559	937	1856	1559	935	1763	1766	960	1763	1742
Q Serve(g_s), s	2.3	5.2	1.3	1.8	3.7	0.7	2.3	2.8	2.9	2.1	3.1	3.2
Cycle Q Clear(g_c), s	5.9	5.2	1.3	7.0	3.7	0.7	5.5	2.8	2.9	5.0	3.1	3.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.25	1.00		0.32
Lane Grp Cap(c), veh/h	471	656	552	398	656	552	461	636	637	475	636	628
V/C Ratio(X)	0.18	0.54	0.16	0.14	0.40	0.08	0.17	0.32	0.32	0.16	0.34	0.35
Avail Cap(c_a), veh/h	941	1481	1244	806	1465	1231	889	1443	1445	914	1443	1426
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	10.6	8.9	7.6	11.7	8.4	7.4	10.0	7.9	7.9	9.7	8.0	8.0
Incr Delay (d2), s/veh	0.2	0.7	0.1	0.2	0.4	0.1	0.2	0.3	0.3	0.2	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.5	0.3	0.3	0.9	0.1	0.3	0.7	0.7	0.3	0.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.8	9.6	7.7	11.8	8.7	7.4	10.2	8.2	8.2	9.9	8.3	8.4
LnGrp LOS	B	A	A	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		527			365			488			511	
Approach Delay, s/veh		9.5			9.1			8.5			8.6	
Approach LOS		A			A			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		17.3		17.0		17.3		17.0				
Change Period (Y+Rc), s		4.9		* 4.9		4.9		4.9				
Max Green Setting (Gmax), s		28.1		* 27		28.1		27.1				
Max Q Clear Time (g_c+I1), s		7.5		7.9		7.0		9.0				
Green Ext Time (p_c), s		2.6		2.6		2.7		1.7				
Intersection Summary												
HCM 6th Ctrl Delay			8.9									
HCM 6th LOS			A									
Notes												

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

Intersection: 1: Orange Avenue & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	118	72	55	139	142	176	88	46
Average Queue (ft)	39	36	20	44	54	66	36	23
95th Queue (ft)	77	72	51	84	118	140	72	44
Link Distance (ft)	2539	2539			985	985	2529	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	50				75
Storage Blk Time (%)		0		6	4		1	
Queuing Penalty (veh)		0		17	3		1	

Intersection: 2: 9th Street & Ventura Avenue

Movement	WB	NB
Directions Served	UL	LR
Maximum Queue (ft)	29	56
Average Queue (ft)	1	17
95th Queue (ft)	9	45
Link Distance (ft)		1550
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 10th Street & Ventura Avenue

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	UL	T	TR	LTR	LTR
Maximum Queue (ft)	24	72	12	19	27	53	55
Average Queue (ft)	2	2	1	1	1	25	14
95th Queue (ft)	11	24	6	6	9	51	40
Link Distance (ft)		566		903	903	2559	2594
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	110		110				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	UL	T	T	R	UL	T	TR	L	T	T	R	UL
Maximum Queue (ft)	198	208	116	64	112	152	196	148	225	196	175	275
Average Queue (ft)	104	68	80	25	58	104	120	61	102	111	17	193
95th Queue (ft)	188	134	121	59	104	151	173	121	187	186	70	298
Link Distance (ft)		903	903			2530	2530		1232	1232		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			100	430			100			55	175
Storage Blk Time (%)	1	0	5					5	8	26	0	48
Queuing Penalty (veh)	1	0	2					11	6	15	0	88

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	453	412
Average Queue (ft)	156	126
95th Queue (ft)	362	278
Link Distance (ft)	2567	2567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 5: Cedar Avenue & Lane Avenue

Movement	EB	WB	SB	SB
Directions Served	LTR	LTR	LT	TR
Maximum Queue (ft)	52	54	44	21
Average Queue (ft)	11	22	5	1
95th Queue (ft)	36	53	27	7
Link Distance (ft)	928	918	1232	1232
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Cedar Avenue & Butler Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	116	98	53	86	241	180	131	86	105	42	152	165
Average Queue (ft)	51	56	27	42	95	27	31	49	58	14	50	67
95th Queue (ft)	98	100	51	72	173	81	78	81	92	36	102	127
Link Distance (ft)		2555			2558			2582	2582		1251	1251
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	60		60	100		100	100			75		
Storage Blk Time (%)	9	6	0	0	6		1	0			2	
Queuing Penalty (veh)	26	10	1	0	7		1	0			1	

Network Summary

Network wide Queuing Penalty: 187

Intersection: 1: Orange Avenue & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	138	158	77	149	188	120	92	65
Average Queue (ft)	71	77	19	43	46	52	37	33
95th Queue (ft)	115	130	53	84	107	106	77	57
Link Distance (ft)	2539	2539			985	985	2529	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	50				75
Storage Blk Time (%)		7	0	6	5		1	0
Queuing Penalty (veh)		3	0	19	4		1	0

Intersection: 2: 9th Street & Ventura Avenue

Movement	WB	NB
Directions Served	UL	LR
Maximum Queue (ft)	51	79
Average Queue (ft)	18	24
95th Queue (ft)	45	61
Link Distance (ft)		1550
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 10th Street & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	48	48	51	35	64	47	116	55
Average Queue (ft)	11	6	5	3	3	2	26	16
95th Queue (ft)	33	27	25	15	24	16	71	47
Link Distance (ft)		566	566		903	903	2559	2594
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	110			110				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	UL	T	T	R	UL	T	TR	L	T	T	R	UL
Maximum Queue (ft)	300	433	404	94	171	225	224	107	99	135	63	258
Average Queue (ft)	167	177	148	32	68	120	143	53	61	73	18	145
95th Queue (ft)	315	363	256	64	120	194	227	92	95	124	40	249
Link Distance (ft)		903	903			2530	2530		1232	1232		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			100	430			100			55	175
Storage Blk Time (%)	30	1	20	0				0	0	19	0	23
Queuing Penalty (veh)	83	1	16	0				0	0	15	0	37

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	283	180
Average Queue (ft)	88	101
95th Queue (ft)	188	153
Link Distance (ft)	2567	2567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 5: Cedar Avenue & Lane Avenue

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LT	LT
Maximum Queue (ft)	31	78	23	23
Average Queue (ft)	10	26	1	1
95th Queue (ft)	33	52	10	8
Link Distance (ft)	928	918	1251	1232
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: Cedar Avenue & Butler Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	138	222	138	74	181	76	92	99	90	68	91	143
Average Queue (ft)	41	108	36	34	70	17	38	42	45	31	43	57
95th Queue (ft)	89	183	91	65	141	47	78	73	82	62	86	108
Link Distance (ft)		2555			2558			2582	2582		1251	1251
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	60		60	100		100	100			75		
Storage Blk Time (%)	2	18	1		2		0	0		0	1	
Queuing Penalty (veh)	9	29	3		2		0	0		0	1	

Network Summary

Network wide Queuing Penalty: 225

Appendix G: Existing plus Project Traffic Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	491	66	64	610	89	86
Future Volume (veh/h)	491	66	64	610	89	86
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	540	73	70	670	98	95
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	1105	492	132	1892	244	217
Arrive On Green	0.31	0.31	0.07	0.54	0.14	0.14
Sat Flow, veh/h	3618	1570	1767	3618	1767	1572
Grp Volume(v), veh/h	540	73	70	670	98	95
Grp Sat Flow(s),veh/h/ln	1763	1570	1767	1763	1767	1572
Q Serve(g_s), s	3.5	0.9	1.1	3.1	1.4	1.6
Cycle Q Clear(g_c), s	3.5	0.9	1.1	3.1	1.4	1.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1105	492	132	1892	244	217
V/C Ratio(X)	0.49	0.15	0.53	0.35	0.40	0.44
Avail Cap(c_a), veh/h	2592	1154	362	3839	1874	1668
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.9	7.0	12.6	3.7	11.1	11.2
Incr Delay (d2), s/veh	0.3	0.1	3.3	0.1	1.1	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.2	0.4	0.3	0.5	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.2	7.1	15.9	3.9	12.2	12.6
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	613			740	193	
Approach Delay, s/veh	8.1			5.0	12.4	
Approach LOS	A			A	B	

Timer - Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		8.5	6.3	13.5				19.8
Change Period (Y+Rc), s		4.6	* 4.2	4.6				4.6
Max Green Setting (Gmax), s		30.0	* 5.8	20.8				30.8
Max Q Clear Time (g_c+I1), s		3.6	3.1	5.5				5.1
Green Ext Time (p_c), s		0.6	0.0	3.3				4.7

Intersection Summary	
HCM 6th Ctrl Delay	7.1
HCM 6th LOS	A

Notes

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

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	502	8	2	14	694	13	14
Future Vol, veh/h	502	8	2	14	694	13	14
Conflicting Peds, #/hr	0	5	0	5	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84	84
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	598	10	2	17	826	15	17

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	607	613	0	1059	309
Stage 1	-	-	-	-	-	608	-
Stage 2	-	-	-	-	-	451	-
Critical Hdwy	-	-	6.46	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.53	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	588	955	-	218	684
Stage 1	-	-	-	-	-	503	-
Stage 2	-	-	-	-	-	606	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	879	879	-	212	681
Mov Cap-2 Maneuver	-	-	-	-	-	212	-
Stage 1	-	-	-	-	-	489	-
Stage 2	-	-	-	-	-	606	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	17.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	330	-	-	879	-
HCM Lane V/C Ratio	0.097	-	-	0.022	-
HCM Control Delay (s)	17.1	-	-	9.2	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection														
Int Delay, s/veh	11.1													
Movement	**EBU**	**EBL**	**EBT**	**EBR**	**WBU**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations														
Traffic Vol, veh/h	3	2	371	142	1	86	600	7	93	4	66	9	1	6
Future Vol, veh/h	3	2	371	142	1	86	600	7	93	4	66	9	1	6
Conflicting Peds, #/hr	0	11	0	3	0	3	0	11	8	0	1	1	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	110	-	-	-	110	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	4	2	436	167	1	101	706	8	109	5	78	11	1	7

Major/Minor	Major1				Major2				Minor1			Minor2		
Conflicting Flow All	714	725	0	0	604	606	0	0	1101	1464	306	1159	1543	376
Stage 1	-	-	-	-	-	-	-	-	535	535	-	925	925	-
Stage 2	-	-	-	-	-	-	-	-	566	929	-	234	618	-
Critical Hdwy	6.46	4.16	-	-	6.46	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.53	2.23	-	-	2.53	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	503	867	-	-	591	961	-	-	165	126	687	150	113	619
Stage 1	-	-	-	-	-	-	-	-	494	520	-	288	344	-
Stage 2	-	-	-	-	-	-	-	-	474	342	-	745	477	-
Platoon blocked, %			-	-			-	-						
Mov Cap-1 Maneuver	598	598	-	-	949	949	-	-	146	110	684	116	99	608
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	146	110	-	116	99	-
Stage 1	-	-	-	-	-	-	-	-	488	513	-	282	304	-
Stage 2	-	-	-	-	-	-	-	-	413	302	-	647	471	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.2	86.4	29.8
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	212	598	-	-	949	-	-	164
HCM Lane V/C Ratio	0.905	0.01	-	-	0.108	-	-	0.115
HCM Control Delay (s)	86.4	11.1	-	-	9.2	-	-	29.8
HCM Lane LOS	F	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	7.3	0	-	-	0.4	-	-	0.4

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	5	137	313	46	9	82	477	102	69	482	57	1
Future Volume (vph)	5	137	313	46	9	82	477	102	69	482	57	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97		1.00	1.00		1.00	1.00	0.96	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.97		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1520		1752	3401		1752	3505	1505	
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1520		1752	3401		1752	3505	1505	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	6	163	373	55	11	98	568	121	82	574	68	1
RTOR Reduction (vph)	0	0	0	39	0	0	18	0	0	0	50	0
Lane Group Flow (vph)	0	169	373	16	0	109	671	0	82	574	18	0
Confl. Peds. (#/hr)				24				9			39	
Confl. Bikes (#/hr)								1				
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	3	8		5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		10.4	23.8	23.8		9.1	22.5		6.0	21.7	21.7	
Effective Green, g (s)		10.4	23.8	23.8		9.1	22.5		6.0	21.7	21.7	
Actuated g/C Ratio		0.13	0.29	0.29		0.11	0.27		0.07	0.26	0.26	
Clearance Time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		220	1009	437		193	926		127	920	395	
v/s Ratio Prot		c0.10	0.11			0.06	c0.20		0.05	c0.16		
v/s Ratio Perm				0.01							0.01	
v/c Ratio		0.77	0.37	0.04		0.56	0.72		0.65	0.62	0.05	
Uniform Delay, d1		34.9	23.4	21.1		34.9	27.2		37.3	26.9	22.7	
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		14.8	0.2	0.0		3.8	2.8		10.7	1.3	0.0	
Delay (s)		49.7	23.7	21.2		38.6	30.1		48.0	28.2	22.8	
Level of Service		D	C	C		D	C		D	C	C	
Approach Delay (s)			30.8				31.2			29.9		
Approach LOS			C				C			C		

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	82.6	Sum of lost time (s)	17.9
Intersection Capacity Utilization	73.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	133	364	137
Future Volume (vph)	133	364	137
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.6	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.96	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1752	3339	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1752	3339	
Peak-hour factor, PHF	0.84	0.84	0.84
Adj. Flow (vph)	158	433	163
RTOR Reduction (vph)	0	39	0
Lane Group Flow (vph)	159	557	0
Confl. Peds. (#/hr)			16
Confl. Bikes (#/hr)			1
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	10.1	26.1	
Effective Green, g (s)	10.1	26.1	
Actuated g/C Ratio	0.12	0.32	
Clearance Time (s)	4.2	4.6	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	214	1055	
v/s Ratio Prot	c0.09	c0.17	
v/s Ratio Perm			
v/c Ratio	0.74	0.53	
Uniform Delay, d1	35.0	23.2	
Progression Factor	1.00	1.00	
Incremental Delay, d2	13.0	0.5	
Delay (s)	48.0	23.7	
Level of Service	D	C	
Approach Delay (s)		28.8	
Approach LOS		C	

Intersection Summary

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	16	10	2	24	40	465	7	6	372	5
Future Vol, veh/h	10	0	16	10	2	24	40	465	7	6	372	5
Conflicting Peds, #/hr	1	0	5	5	0	1	3	0	7	7	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	0	18	11	2	27	45	522	8	7	418	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	791	1065	220	851	1064	273	427	0	0	537	0	0
Stage 1	438	438	-	623	623	-	-	-	-	-	-	-
Stage 2	353	627	-	228	441	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	278	220	781	252	220	722	1122	-	-	1020	-	-
Stage 1	565	575	-	438	474	-	-	-	-	-	-	-
Stage 2	634	472	-	751	573	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	251	204	775	231	204	717	1119	-	-	1013	-	-
Mov Cap-2 Maneuver	251	204	-	231	204	-	-	-	-	-	-	-
Stage 1	531	568	-	410	444	-	-	-	-	-	-	-
Stage 2	572	442	-	724	566	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14	14.6	0.8	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1119	-	-	430	416	1013	-	-
HCM Lane V/C Ratio	0.04	-	-	0.068	0.097	0.007	-	-
HCM Control Delay (s)	8.4	0.2	-	14	14.6	8.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.3	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	196	79	59	302	57	87	436	77	43	377	80
Future Volume (veh/h)	96	196	79	59	302	57	87	436	77	43	377	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	0.98		0.92	0.98		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	120	245	99	74	378	71	109	545	96	54	471	100
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	341	691	582	427	691	574	404	1279	224	376	1239	261
Arrive On Green	0.37	0.37	0.37	0.37	0.37	0.37	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	931	1856	1561	1024	1856	1542	817	2957	518	767	2866	603
Grp Volume(v), veh/h	120	245	99	74	378	71	109	324	317	54	288	283
Grp Sat Flow(s),veh/h/ln	931	1856	1561	1024	1856	1542	817	1763	1712	767	1763	1707
Q Serve(g_s), s	5.9	4.8	2.1	2.8	8.1	1.5	5.3	6.4	6.5	2.7	5.6	5.7
Cycle Q Clear(g_c), s	13.9	4.8	2.1	7.6	8.1	1.5	10.9	6.4	6.5	9.1	5.6	5.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.30	1.00		0.35
Lane Grp Cap(c), veh/h	341	691	582	427	691	574	404	762	741	376	762	738
V/C Ratio(X)	0.35	0.35	0.17	0.17	0.55	0.12	0.27	0.42	0.43	0.14	0.38	0.38
Avail Cap(c_a), veh/h	501	1011	851	598	1000	831	508	985	957	473	985	954
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	17.9	11.4	10.6	14.2	12.4	10.4	13.4	9.9	9.9	13.1	9.7	9.7
Incr Delay (d2), s/veh	0.6	0.3	0.1	0.2	0.7	0.1	0.4	0.4	0.4	0.2	0.3	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	1.1	1.7	0.6	0.6	2.7	0.4	0.8	1.9	1.9	0.4	1.6	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.5	11.7	10.7	14.3	13.1	10.5	13.8	10.3	10.3	13.3	10.0	10.0
LnGrp LOS	B	B	B	B	B	B	B	B	B	B	A	B
Approach Vol, veh/h		464			523			750			625	
Approach Delay, s/veh		13.3			12.9			10.8			10.3	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		26.6		23.6		26.6		23.6				
Change Period (Y+Rc), s		4.9		* 4.9		4.9		4.9				
Max Green Setting (Gmax), s		28.1		* 27		28.1		27.1				
Max Q Clear Time (g_c+I1), s		12.9		15.9		11.1		10.1				
Green Ext Time (p_c), s		3.9		1.8		3.4		2.5				
Intersection Summary												
HCM 6th Ctrl Delay			11.6									
HCM 6th LOS			B									

Notes

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

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	721	47	14	67	701	92	101
Future Volume (vph)	721	47	14	67	701	92	101
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.2	4.6	4.6	4.6
Lane Util. Factor	0.95	1.00		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1529		1752	3505	1752	1568
Flt Permitted	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1529		1752	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	784	51	15	73	762	100	110
RTOR Reduction (vph)	0	21	0	0	0	0	89
Lane Group Flow (vph)	784	30	0	88	762	100	21
Confl. Peds. (#/hr)		4		4			
Turn Type	NA	Perm	Prot	Prot	NA	Prot	Perm
Protected Phases	4		3	3	8	2	
Permitted Phases		4					2
Actuated Green, G (s)	20.8	20.8		4.7	29.7	9.0	9.0
Effective Green, g (s)	20.8	20.8		4.7	29.7	9.0	9.0
Actuated g/C Ratio	0.43	0.43		0.10	0.62	0.19	0.19
Clearance Time (s)	4.6	4.6		4.2	4.6	4.6	4.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1522	663		171	2173	329	294
v/s Ratio Prot	c0.22			c0.05	0.22	c0.06	
v/s Ratio Perm		0.02					0.01
v/c Ratio	0.52	0.04		0.51	0.35	0.30	0.07
Uniform Delay, d1	9.9	7.8		20.5	4.4	16.8	16.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.0		2.6	0.1	0.5	0.1
Delay (s)	10.2	7.8		23.1	4.5	17.3	16.1
Level of Service	B	A		C	A	B	B
Approach Delay (s)	10.0				6.4	16.7	
Approach LOS	B				A	B	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	47.9	Sum of lost time (s)	13.4
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	802	21	6	47	687	15	17
Future Vol, veh/h	802	21	6	47	687	15	17
Conflicting Peds, #/hr	0	8	0	8	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	862	23	6	51	739	16	18

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	885	893	0	1366	451
Stage 1	-	-	-	-	-	882	-
Stage 2	-	-	-	-	-	484	-
Critical Hdwy	-	-	6.46	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.53	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	390	749	-	137	553
Stage 1	-	-	-	-	-	363	-
Stage 2	-	-	-	-	-	583	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	670	670	-	124	549
Mov Cap-2 Maneuver	-	-	-	-	-	124	-
Stage 1	-	-	-	-	-	330	-
Stage 2	-	-	-	-	-	583	-

Approach	EB		WB			NB	
HCM Control Delay, s	0		0.8			25.4	
HCM LOS						D	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	211	-	-	670	-
HCM Lane V/C Ratio	0.163	-	-	0.085	-
HCM Control Delay (s)	25.4	-	-	10.9	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	0.6	-	-	0.3	-

Intersection	
Int Delay, s/veh	5.8

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	3	28	724	62	30	652	8	58	6	59	4	2	20
Future Vol, veh/h	3	28	724	62	30	652	8	58	6	59	4	2	20
Conflicting Peds, #/hr	0	12	0	9	9	0	12	14	0	0	0	0	14
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	110	-	-	110	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	29	754	65	31	679	8	60	6	61	4	2	21

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	688	699	0	0	828	0	0	1277	1621	419	1201	1649	370
Stage 1	-	-	-	-	-	-	-	860	860	-	757	757	-
Stage 2	-	-	-	-	-	-	-	417	761	-	444	892	-
Critical Hdwy	6.46	4.16	-	-	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.53	2.23	-	-	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	522	887	-	-	793	-	-	122	101	580	139	97	624
Stage 1	-	-	-	-	-	-	-	315	369	-	364	411	-
Stage 2	-	-	-	-	-	-	-	581	410	-	560	356	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	819	819	-	-	786	-	-	107	91	575	110	88	609
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	107	91	-	110	88	-
Stage 1	-	-	-	-	-	-	-	300	351	-	346	390	-
Stage 2	-	-	-	-	-	-	-	529	390	-	472	339	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.4	69.1	19.1
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	173	819	-	-	786	-	-	283
HCM Lane V/C Ratio	0.741	0.039	-	-	0.04	-	-	0.096
HCM Control Delay (s)	69.1	9.6	-	-	9.8	-	-	19.1
HCM Lane LOS	F	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	4.7	0.1	-	-	0.1	-	-	0.3

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	9	140	558	78	16	88	535	159	77	347	78	5
Future Volume (vph)	9	140	558	78	16	88	535	159	77	347	78	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97		1.00	0.99		1.00	1.00	0.97	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.97		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1525		1752	3367		1752	3505	1526	
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1525		1752	3367		1752	3505	1526	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	9	143	569	80	16	90	546	162	79	354	80	5
RTOR Reduction (vph)	0	0	0	57	0	0	31	0	0	0	61	0
Lane Group Flow (vph)	0	152	569	23	0	106	677	0	79	354	19	0
Confl. Peds. (#/hr)				26				19			27	
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	3	8		5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		5.3	17.8	17.8		7.1	19.6		5.6	15.1	15.1	
Effective Green, g (s)		5.3	17.8	17.8		7.1	19.6		5.6	15.1	15.1	
Actuated g/C Ratio		0.08	0.28	0.28		0.11	0.31		0.09	0.24	0.24	
Clearance Time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		146	987	429		196	1044		155	837	364	
v/s Ratio Prot		c0.09	0.16			0.06	c0.20		0.05	0.10		
v/s Ratio Perm				0.01							0.01	
v/c Ratio		1.04	0.58	0.05		0.54	0.65		0.51	0.42	0.05	
Uniform Delay, d1		29.0	19.5	16.6		26.5	18.8		27.5	20.4	18.5	
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		85.8	0.8	0.1		3.0	1.4		2.6	0.3	0.1	
Delay (s)		114.8	20.3	16.6		29.5	20.2		30.1	20.7	18.6	
Level of Service		F	C	B		C	C		C	C	B	
Approach Delay (s)			37.8				21.4			21.8		
Approach LOS			D				C			C		

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	17.9
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	125	321	104
Future Volume (vph)	125	321	104
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.6	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.96	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1752	3356	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1752	3356	
Peak-hour factor, PHF	0.98	0.98	0.98
Adj. Flow (vph)	128	328	106
RTOR Reduction (vph)	0	39	0
Lane Group Flow (vph)	133	395	0
Confl. Peds. (#/hr)			24
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	5.3	15.1	
Effective Green, g (s)	5.3	15.1	
Actuated g/C Ratio	0.08	0.24	
Clearance Time (s)	4.2	4.6	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	146	801	
v/s Ratio Prot	c0.08	c0.12	
v/s Ratio Perm			
v/c Ratio	0.91	0.49	
Uniform Delay, d1	28.7	20.7	
Progression Factor	1.00	1.00	
Incremental Delay, d2	48.7	0.5	
Delay (s)	77.4	21.2	
Level of Service	E	C	
Approach Delay (s)		34.4	
Approach LOS		C	

Intersection Summary

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	3	27	7	0	29	8	468	11	6	469	6
Future Vol, veh/h	8	3	27	7	0	29	8	468	11	6	469	6
Conflicting Peds, #/hr	2	0	2	2	0	2	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	9	3	30	8	0	32	9	514	12	7	515	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	816	1085	269	815	1082	267	528	0	0	528	0	0
Stage 1	539	539	-	540	540	-	-	-	-	-	-	-
Stage 2	277	546	-	275	542	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	267	214	726	267	215	728	1028	-	-	1028	-	-
Stage 1	492	518	-	491	517	-	-	-	-	-	-	-
Stage 2	703	514	-	705	516	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	249	208	720	248	209	725	1022	-	-	1026	-	-
Mov Cap-2 Maneuver	249	208	-	248	209	-	-	-	-	-	-	-
Stage 1	483	510	-	484	510	-	-	-	-	-	-	-
Stage 2	663	507	-	664	508	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.8	12.4	0.1	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1022	-	-	452	528	1026	-	-
HCM Lane V/C Ratio	0.009	-	-	0.092	0.075	0.006	-	-
HCM Control Delay (s)	8.6	0	-	13.8	12.4	8.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	330	81	53	245	44	74	337	47	74	362	65
Future Volume (veh/h)	79	330	81	53	245	44	74	337	47	74	362	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	85	355	87	57	263	47	80	362	51	80	389	70
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	467	654	550	394	654	550	454	1130	158	475	1087	194
Arrive On Green	0.35	0.35	0.35	0.35	0.35	0.35	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1056	1856	1559	937	1856	1559	917	3097	432	955	2979	531
Grp Volume(v), veh/h	85	355	87	57	263	47	80	205	208	80	229	230
Grp Sat Flow(s),veh/h/ln	1056	1856	1559	937	1856	1559	917	1763	1767	955	1763	1747
Q Serve(g_s), s	2.3	5.3	1.3	1.8	3.7	0.7	2.4	2.9	2.9	2.3	3.3	3.3
Cycle Q Clear(g_c), s	6.0	5.3	1.3	7.1	3.7	0.7	5.8	2.9	2.9	5.2	3.3	3.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.24	1.00		0.30
Lane Grp Cap(c), veh/h	467	654	550	394	654	550	454	643	645	475	643	638
V/C Ratio(X)	0.18	0.54	0.16	0.14	0.40	0.09	0.18	0.32	0.32	0.17	0.36	0.36
Avail Cap(c_a), veh/h	928	1465	1231	795	1449	1217	861	1427	1430	900	1427	1414
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	10.7	9.0	7.7	11.8	8.5	7.5	10.2	7.9	7.9	9.8	8.0	8.1
Incr Delay (d2), s/veh	0.2	0.7	0.1	0.2	0.4	0.1	0.2	0.3	0.3	0.2	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	1.5	0.3	0.3	1.0	0.1	0.3	0.7	0.7	0.3	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.9	9.7	7.8	12.0	8.9	7.6	10.4	8.2	8.2	10.0	8.4	8.4
LnGrp LOS	B	A	A	B	A	A	B	A	A	A	A	A
Approach Vol, veh/h		527			367			493			539	
Approach Delay, s/veh		9.6			9.2			8.6			8.6	
Approach LOS		A			A			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		17.6		17.1		17.6		17.1				
Change Period (Y+Rc), s		4.9		* 4.9		4.9		4.9				
Max Green Setting (Gmax), s		28.1		* 27		28.1		27.1				
Max Q Clear Time (g_c+I1), s		7.8		8.0		7.2		9.1				
Green Ext Time (p_c), s		2.6		2.6		2.9		1.7				

Intersection Summary			
HCM 6th Ctrl Delay			9.0
HCM 6th LOS			A

Notes

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

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	3	2	371	142	1	86	600	7	93	4	66	9
Future Volume (vph)	3	2	371	142	1	86	600	7	93	4	66	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6			4.2	4.6			4.0		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	0.99			1.00	1.00			0.99		
Flpb, ped/bikes		0.99	1.00			1.00	1.00			1.00		
Frt		1.00	0.96			1.00	1.00			0.95		
Flt Protected		0.95	1.00			0.95	1.00			0.97		
Satd. Flow (prot)		1742	3333			1752	3498			1687		
Flt Permitted		0.95	1.00			0.95	1.00			0.97		
Satd. Flow (perm)		1742	3333			1752	3498			1687		
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	4	2	436	167	1	101	706	8	109	5	78	11
RTOR Reduction (vph)	0	0	29	0	0	0	1	0	0	25	0	0
Lane Group Flow (vph)	0	6	574	0	0	102	713	0	0	167	0	0
Confl. Peds. (#/hr)		11		3		3		11	8		1	1
Confl. Bikes (#/hr)				2								
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Split	NA		Split
Protected Phases	7	7	4		3	3	8		2	2		6
Permitted Phases												
Actuated Green, G (s)		0.6	23.7			7.2	30.3			13.4		
Effective Green, g (s)		0.6	23.7			7.2	30.3			13.4		
Actuated g/C Ratio		0.01	0.36			0.11	0.46			0.20		
Clearance Time (s)		4.2	4.6			4.2	4.6			4.0		
Vehicle Extension (s)		3.0	3.0			3.0	3.0			3.0		
Lane Grp Cap (vph)		15	1202			192	1613			344		
v/s Ratio Prot		0.00	c0.17			0.06	c0.20			c0.10		
v/s Ratio Perm												
v/c Ratio		0.40	0.48			0.53	0.44			0.49		
Uniform Delay, d1		32.4	16.2			27.7	12.0			23.1		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		16.6	0.3			2.8	0.2			1.1		
Delay (s)		49.0	16.5			30.5	12.2			24.2		
Level of Service		D	B			C	B			C		
Approach Delay (s)			16.8				14.5			24.2		
Approach LOS			B				B			C		

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	65.7	Sum of lost time (s)	16.8
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1	6
Future Volume (vph)	1	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frpb, ped/bikes	0.99	
Flpb, ped/bikes	1.00	
Frt	0.95	
Flt Protected	0.97	
Satd. Flow (prot)	1691	
Flt Permitted	0.97	
Satd. Flow (perm)	1691	
Peak-hour factor, PHF	0.85	0.85
Adj. Flow (vph)	1	7
RTOR Reduction (vph)	7	0
Lane Group Flow (vph)	12	0
Confl. Peds. (#/hr)		8
Confl. Bikes (#/hr)		1
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	4.6	
Effective Green, g (s)	4.6	
Actuated g/C Ratio	0.07	
Clearance Time (s)	4.0	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	118	
v/s Ratio Prot	c0.01	
v/s Ratio Perm		
v/c Ratio	0.11	
Uniform Delay, d1	28.6	
Progression Factor	1.00	
Incremental Delay, d2	0.4	
Delay (s)	29.0	
Level of Service	C	
Approach Delay (s)	29.0	
Approach LOS	C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	3	28	724	62	30	652	8	58	6	59	4	2
Future Volume (vph)	3	28	724	62	30	652	8	58	6	59	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6		4.2	4.6			4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95			1.00			1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00			1.00			0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00			1.00			1.00
Frt		1.00	0.99		1.00	1.00			0.94			0.90
Flt Protected		0.95	1.00		0.95	1.00			0.98			0.99
Satd. Flow (prot)		1752	3450		1752	3497			1685			1605
Flt Permitted		0.95	1.00		0.95	1.00			0.98			0.99
Satd. Flow (perm)		1752	3450		1752	3497			1685			1605
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	29	754	65	31	679	8	60	6	61	4	2
RTOR Reduction (vph)	0	0	3	0	0	0	0	0	37	0	0	19
Lane Group Flow (vph)	0	32	816	0	31	687	0	0	90	0	0	8
Confl. Peds. (#/hr)		12		9	9		12	14				
Turn Type	Prot	Prot	NA		Prot	NA		Split	NA		Split	NA
Protected Phases	7	7	4		3	8		2	2		6	6
Permitted Phases												
Actuated Green, G (s)		4.2	66.9		3.6	66.3			13.9			8.8
Effective Green, g (s)		4.2	66.9		3.6	66.3			13.9			8.8
Actuated g/C Ratio		0.04	0.61		0.03	0.60			0.13			0.08
Clearance Time (s)		4.2	4.6		4.2	4.6			4.0			4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0			3.0			3.0
Lane Grp Cap (vph)		66	2098		57	2107			212			128
v/s Ratio Prot		0.02	c0.24		c0.02	0.20			c0.05			c0.00
v/s Ratio Perm												
v/c Ratio		0.48	0.39		0.54	0.33			0.43			0.06
Uniform Delay, d1		51.8	11.1		52.4	10.8			44.4			46.8
Progression Factor		0.84	0.58		0.75	0.54			1.00			1.00
Incremental Delay, d2		5.3	0.5		9.3	0.4			1.4			0.2
Delay (s)		49.1	6.9		48.8	6.2			45.7			47.0
Level of Service		D	A		D	A			D			D
Approach Delay (s)			8.5			8.0			45.7			47.0
Approach LOS			A			A			D			D

Intersection Summary			
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	46.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	21
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	14
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Orange Avenue & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	116	137	71	137	178	206	85	45
Average Queue (ft)	54	60	17	45	55	77	36	29
95th Queue (ft)	94	115	52	94	140	151	69	47
Link Distance (ft)	2539	2539			985	985	2529	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	50				75
Storage Blk Time (%)		4	0	10	5		0	
Queuing Penalty (veh)		2	0	30	3		0	

Intersection: 2: 9th Street & Ventura Avenue

Movement	WB	NB
Directions Served	UL	LR
Maximum Queue (ft)	31	56
Average Queue (ft)	6	23
95th Queue (ft)	26	51
Link Distance (ft)		1550
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 10th Street & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	22	157	246	140	176	201	230	55
Average Queue (ft)	1	81	96	31	62	91	73	22
95th Queue (ft)	7	152	188	79	148	178	139	57
Link Distance (ft)		566	566		903	903	2559	2594
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	110			110				
Storage Blk Time (%)		7		1	3			
Queuing Penalty (veh)		0		2	3			

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	UL	T	T	R	UL	T	TR	L	T	T	R	UL
Maximum Queue (ft)	237	196	186	94	171	319	282	174	212	209	40	183
Average Queue (ft)	108	72	79	25	68	138	149	53	92	90	14	94
95th Queue (ft)	181	140	144	63	144	227	231	111	158	148	34	150
Link Distance (ft)		903	903			2530	2530		1232	1232		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			100	430			100			55	175
Storage Blk Time (%)	2	0	6	0				1	7	22	0	0
Queuing Penalty (veh)	2	0	3	0				1	5	12	0	0

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	182	204
Average Queue (ft)	91	107
95th Queue (ft)	154	164
Link Distance (ft)	2567	2567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 5: Cedar Avenue & Lane Avenue

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	53	31	45	20	23	66
Average Queue (ft)	17	24	8	1	1	2
95th Queue (ft)	44	45	30	7	10	22
Link Distance (ft)	928	918	1251	1251	1232	1232
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Cedar Avenue & Butler Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	111	155	140	93	184	54	86	128	126	68	112	143
Average Queue (ft)	52	70	41	39	86	22	40	51	62	20	49	66
95th Queue (ft)	95	133	94	72	154	54	79	91	116	49	95	125
Link Distance (ft)		2555			2558			2582	2582		1251	1251
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	60		60	100		100	100			75		
Storage Blk Time (%)	5	8	1	0	5		0	1		0	2	
Queuing Penalty (veh)	14	14	2	0	6		0	1		0	1	

Network Summary

Network wide Queuing Penalty: 103

Intersection: 1: Orange Avenue & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	138	170	47	119	160	242	192	182
Average Queue (ft)	65	66	13	52	33	40	56	35
95th Queue (ft)	120	128	39	97	108	127	129	86
Link Distance (ft)	2539	2539			985	985	2529	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	50				75
Storage Blk Time (%)		4		12	3		11	0
Queuing Penalty (veh)		2		43	3		11	0

Intersection: 2: 9th Street & Ventura Avenue

Movement	WB	NB
Directions Served	UL	LR
Maximum Queue (ft)	72	53
Average Queue (ft)	23	23
95th Queue (ft)	55	46
Link Distance (ft)		1550
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 10th Street & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	66	311	331	33	120	113	140	55
Average Queue (ft)	24	101	104	10	26	35	72	17
95th Queue (ft)	52	254	257	25	74	88	123	49
Link Distance (ft)		566	566		903	903	2559	2594
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	110			110				
Storage Blk Time (%)		12			0			
Queuing Penalty (veh)		4			0			

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	UL	T	T	R	UL	T	TR	L	T	T	R	UL
Maximum Queue (ft)	205	267	360	220	135	257	276	107	163	169	169	162
Average Queue (ft)	101	103	128	37	76	152	164	54	82	97	27	97
95th Queue (ft)	175	196	243	124	126	230	242	100	137	147	79	141
Link Distance (ft)		903	903			2530	2530		1232	1232		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			100	430			100			55	175
Storage Blk Time (%)	1	2	14					1	5	28	1	0
Queuing Penalty (veh)	2	3	11					1	4	21	1	0

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	235	222
Average Queue (ft)	108	112
95th Queue (ft)	178	183
Link Distance (ft)	2567	2567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	2	
Queuing Penalty (veh)	2	

Intersection: 5: Cedar Avenue & Lane Avenue

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LT	LT	TR
Maximum Queue (ft)	68	31	44	19	21
Average Queue (ft)	28	28	5	2	1
95th Queue (ft)	55	43	23	11	7
Link Distance (ft)	928	918	1251	1232	1232
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Cedar Avenue & Butler Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	140	280	102	96	141	53	109	64	84	83	131	145
Average Queue (ft)	43	87	31	38	71	20	35	32	44	37	39	63
95th Queue (ft)	82	178	69	71	132	46	70	54	77	71	96	124
Link Distance (ft)		2555			2558			2582	2582		1251	1251
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	60		60	100		100	100			75		
Storage Blk Time (%)	3	11	1	0	2		0			1	1	
Queuing Penalty (veh)	11	17	3	1	2		1			2	1	

Network Summary

Network wide Queuing Penalty: 147

Appendix H: Near Term plus Project Traffic Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	494	66	66	618	89	89
Future Volume (vph)	494	66	66	618	89	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	4.6	4.6	4.6
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1535	1752	3505	1752	1546
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1535	1752	3505	1752	1546
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	543	73	73	679	98	98
RTOR Reduction (vph)	0	42	0	0	0	79
Lane Group Flow (vph)	543	31	73	679	98	19
Confl. Peds. (#/hr)		1				4
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	19.1	19.1	3.1	26.4	8.7	8.7
Effective Green, g (s)	19.1	19.1	3.1	26.4	8.7	8.7
Actuated g/C Ratio	0.43	0.43	0.07	0.60	0.20	0.20
Clearance Time (s)	4.6	4.6	4.2	4.6	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1511	661	122	2088	344	303
v/s Ratio Prot	0.15		c0.04	c0.19	c0.06	
v/s Ratio Perm		0.02				0.01
v/c Ratio	0.36	0.05	0.60	0.33	0.28	0.06
Uniform Delay, d1	8.5	7.3	20.0	4.5	15.2	14.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	7.7	0.1	0.5	0.1
Delay (s)	8.6	7.3	27.7	4.6	15.6	14.6
Level of Service	A	A	C	A	B	B
Approach Delay (s)	8.5			6.8	15.1	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	44.3	Sum of lost time (s)	13.4
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	508	8	2	16	704	13	17
Future Vol, veh/h	508	8	2	16	704	13	17
Conflicting Peds, #/hr	0	5	0	5	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	84	84	84	84	84	84	84
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	605	10	2	19	838	15	20

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	614	620	0	1076	313
Stage 1	-	-	-	-	-	615	-
Stage 2	-	-	-	-	-	461	-
Critical Hdwy	-	-	6.46	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.53	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	582	950	-	212	680
Stage 1	-	-	-	-	-	499	-
Stage 2	-	-	-	-	-	599	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	880	880	-	206	677
Mov Cap-2 Maneuver	-	-	-	-	-	206	-
Stage 1	-	-	-	-	-	485	-
Stage 2	-	-	-	-	-	599	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	16.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	340	-	-	880	-
HCM Lane V/C Ratio	0.105	-	-	0.024	-
HCM Control Delay (s)	16.8	-	-	9.2	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	12.5

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	3	2	380	142	1	88	612	7	93	4	69	9	1	6
Future Vol, veh/h	3	2	380	142	1	88	612	7	93	4	69	9	1	6
Conflicting Peds, #/hr	0	11	0	3	0	3	0	11	8	0	1	1	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	110	-	-	-	110	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	4	2	447	167	1	104	720	8	109	5	81	11	1	7

Major/Minor	Major1				Major2				Minor1			Minor2		
Conflicting Flow All	728	739	0	0	614	617	0	0	1125	1495	311	1184	1574	383
Stage 1	-	-	-	-	-	-	-	-	546	546	-	945	945	-
Stage 2	-	-	-	-	-	-	-	-	579	949	-	239	629	-
Critical Hdwy	6.46	4.16	-	-	6.46	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.53	2.23	-	-	2.53	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	492	857	-	-	582	952	-	-	159	121	682	143	108	612
Stage 1	-	-	-	-	-	-	-	-	487	514	-	280	336	-
Stage 2	-	-	-	-	-	-	-	-	465	335	-	740	471	-
Platoon blocked, %			-	-			-	-						
Mov Cap-1 Maneuver	587	587	-	-	940	940	-	-	140	105	679	109	94	601
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	140	105	-	109	94	-
Stage 1	-	-	-	-	-	-	-	-	481	507	-	274	295	-
Stage 2	-	-	-	-	-	-	-	-	404	294	-	638	465	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.2	97.9	31.4
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	206	587	-	-	940	-	-	155
HCM Lane V/C Ratio	0.948	0.01	-	-	0.111	-	-	0.121
HCM Control Delay (s)	97.9	11.2	-	-	9.3	-	-	31.4
HCM Lane LOS	F	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	7.9	0	-	-	0.4	-	-	0.4

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	5	145	325	54	9	82	487	102	80	482	57	1
Future Volume (vph)	5	145	325	54	9	82	487	102	80	482	57	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97		1.00	1.00		1.00	1.00	0.96	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.97		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1520		1752	3403		1752	3505	1506	
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1520		1752	3403		1752	3505	1506	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	6	173	387	64	11	98	580	121	95	574	68	1
RTOR Reduction (vph)	0	0	0	45	0	0	18	0	0	0	50	0
Lane Group Flow (vph)	0	179	387	19	0	109	683	0	95	574	18	0
Confl. Peds. (#/hr)				24				9			39	
Confl. Bikes (#/hr)								1				
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	3	8		5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		10.1	23.6	23.6		9.1	22.6		6.7	21.4	21.4	
Effective Green, g (s)		10.1	23.6	23.6		9.1	22.6		6.7	21.4	21.4	
Actuated g/C Ratio		0.12	0.29	0.29		0.11	0.28		0.08	0.26	0.26	
Clearance Time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		218	1019	442		196	948		144	924	397	
v/s Ratio Prot		c0.10	0.11			0.06	c0.20		0.05	0.16		
v/s Ratio Perm				0.01							0.01	
v/c Ratio		0.82	0.38	0.04		0.56	0.72		0.66	0.62	0.05	
Uniform Delay, d1		34.6	22.9	20.6		34.1	26.4		36.1	26.3	22.2	
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		21.3	0.2	0.0		3.4	2.7		10.4	1.3	0.0	
Delay (s)		55.9	23.2	20.7		37.5	29.1		46.5	27.6	22.3	
Level of Service		E	C	C		D	C		D	C	C	
Approach Delay (s)			32.2				30.2			29.5		
Approach LOS			C				C			C		

Intersection Summary			
HCM 2000 Control Delay	30.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	81.1	Sum of lost time (s)	17.9
Intersection Capacity Utilization	74.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	133	364	148
Future Volume (vph)	133	364	148
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.6	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.96	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1752	3330	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1752	3330	
Peak-hour factor, PHF	0.84	0.84	0.84
Adj. Flow (vph)	158	433	176
RTOR Reduction (vph)	0	44	0
Lane Group Flow (vph)	159	565	0
Confl. Peds. (#/hr)			16
Confl. Bikes (#/hr)			1
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	9.1	24.1	
Effective Green, g (s)	9.1	24.1	
Actuated g/C Ratio	0.11	0.30	
Clearance Time (s)	4.2	4.6	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	196	989	
v/s Ratio Prot	c0.09	c0.17	
v/s Ratio Perm			
v/c Ratio	0.81	0.57	
Uniform Delay, d1	35.2	24.1	
Progression Factor	1.00	1.00	
Incremental Delay, d2	21.8	0.8	
Delay (s)	57.0	24.9	
Level of Service	E	C	
Approach Delay (s)		31.6	
Approach LOS		C	

Intersection Summary

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	16	10	2	27	40	473	7	8	378	5
Future Vol, veh/h	10	0	16	10	2	27	40	473	7	8	378	5
Conflicting Peds, #/hr	1	0	5	5	0	1	3	0	7	7	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	0	18	11	2	30	45	531	8	9	425	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	807	1085	224	868	1084	278	434	0	0	546	0	0
Stage 1	449	449	-	632	632	-	-	-	-	-	-	-
Stage 2	358	636	-	236	452	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	271	214	776	245	214	716	1115	-	-	1012	-	-
Stage 1	556	568	-	433	470	-	-	-	-	-	-	-
Stage 2	630	468	-	743	566	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	243	197	770	224	197	711	1112	-	-	1005	-	-
Mov Cap-2 Maneuver	243	197	-	224	197	-	-	-	-	-	-	-
Stage 1	522	559	-	405	439	-	-	-	-	-	-	-
Stage 2	565	438	-	714	558	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.2	14.6	0.8	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1112	-	-	420	420	1005	-	-
HCM Lane V/C Ratio	0.04	-	-	0.07	0.104	0.009	-	-
HCM Control Delay (s)	8.4	0.2	-	14.2	14.6	8.6	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.3	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	196	79	59	302	61	87	440	77	45	381	80
Future Volume (vph)	96	196	79	59	302	61	87	440	77	45	381	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1751	1845	1543	1747	1845	1546	1745	3398		1729	3396	
Flt Permitted	0.48	1.00	1.00	0.61	1.00	1.00	0.44	1.00		0.39	1.00	
Satd. Flow (perm)	878	1845	1543	1116	1845	1546	799	3398		703	3396	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	120	245	99	74	378	76	109	550	96	56	476	100
RTOR Reduction (vph)	0	0	62	0	0	48	0	24	0	0	30	0
Lane Group Flow (vph)	120	245	37	74	378	28	109	622	0	56	546	0
Confl. Peds. (#/hr)	3		9	9		3	12		46	46		12
Confl. Bikes (#/hr)						1			4			
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	14.7	14.7	14.7	14.4	14.4	14.4	14.9	14.9		14.9	14.9	
Effective Green, g (s)	14.7	14.7	14.7	14.4	14.4	14.4	14.9	14.9		14.9	14.9	
Actuated g/C Ratio	0.38	0.38	0.38	0.37	0.37	0.37	0.38	0.38		0.38	0.38	
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	330	693	580	411	679	569	304	1294		267	1294	
v/s Ratio Prot		0.13			c0.20			c0.18			0.16	
v/s Ratio Perm	0.14		0.02	0.07		0.02	0.14			0.08		
v/c Ratio	0.36	0.35	0.06	0.18	0.56	0.05	0.36	0.48		0.21	0.42	
Uniform Delay, d1	8.8	8.8	7.8	8.4	9.8	7.9	8.7	9.2		8.1	8.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.3	0.0	0.2	1.0	0.0	0.7	0.3		0.4	0.2	
Delay (s)	9.5	9.1	7.8	8.6	10.8	8.0	9.4	9.5		8.5	9.1	
Level of Service	A	A	A	A	B	A	A	A		A	A	
Approach Delay (s)		8.9			10.1			9.4			9.1	
Approach LOS		A			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	39.1	Sum of lost time (s)	9.8
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	724	47	14	69	706	92	104
Future Volume (vph)	724	47	14	69	706	92	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.2	4.6	4.6	4.6
Lane Util. Factor	0.95	1.00		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1529		1752	3505	1752	1568
Flt Permitted	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1529		1752	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	787	51	15	75	767	100	113
RTOR Reduction (vph)	0	21	0	0	0	0	92
Lane Group Flow (vph)	787	30	0	90	767	100	21
Confl. Peds. (#/hr)		4		4			
Turn Type	NA	Perm	Prot	Prot	NA	Prot	Perm
Protected Phases	4		3	3	8	2	
Permitted Phases		4					2
Actuated Green, G (s)	20.8	20.8		4.8	29.8	9.0	9.0
Effective Green, g (s)	20.8	20.8		4.8	29.8	9.0	9.0
Actuated g/C Ratio	0.43	0.43		0.10	0.62	0.19	0.19
Clearance Time (s)	4.6	4.6		4.2	4.6	4.6	4.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1518	662		175	2176	328	294
v/s Ratio Prot	c0.22			c0.05	0.22	c0.06	
v/s Ratio Perm		0.02					0.01
v/c Ratio	0.52	0.05		0.51	0.35	0.30	0.07
Uniform Delay, d1	9.9	7.9		20.5	4.4	16.8	16.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.0		2.5	0.1	0.5	0.1
Delay (s)	10.2	7.9		23.0	4.5	17.3	16.2
Level of Service	B	A		C	A	B	B
Approach Delay (s)	10.1				6.5	16.7	
Approach LOS	B				A	B	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	48.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	808	21	6	49	694	15	19
Future Vol, veh/h	808	21	6	49	694	15	19
Conflicting Peds, #/hr	0	8	0	8	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	869	23	6	53	746	16	20

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	891	900	0	1380	454
Stage 1	-	-	-	-	-	889	-
Stage 2	-	-	-	-	-	491	-
Critical Hdwy	-	-	6.46	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.53	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	387	744	-	134	550
Stage 1	-	-	-	-	-	359	-
Stage 2	-	-	-	-	-	578	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	667	667	-	121	546
Mov Cap-2 Maneuver	-	-	-	-	-	121	-
Stage 1	-	-	-	-	-	325	-
Stage 2	-	-	-	-	-	578	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	25.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	214	-	-	667	-
HCM Lane V/C Ratio	0.171	-	-	0.089	-
HCM Control Delay (s)	25.3	-	-	10.9	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	0.6	-	-	0.3	-

Intersection	
Int Delay, s/veh	6.1

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	3	28	732	62	32	661	8	58	6	61	4	2	20
Future Vol, veh/h	3	28	732	62	32	661	8	58	6	61	4	2	20
Conflicting Peds, #/hr	0	12	0	9	9	0	12	14	0	0	0	0	14
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	110	-	-	110	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	29	763	65	33	689	8	60	6	64	4	2	21

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	697	709	0	0	837	0	0	1295	1644	423	1220	1672	375
Stage 1	-	-	-	-	-	-	-	869	869	-	771	771	-
Stage 2	-	-	-	-	-	-	-	426	775	-	449	901	-
Critical Hdwy	6.46	4.16	-	-	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.53	2.23	-	-	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	515	879	-	-	786	-	-	119	98	577	135	94	620
Stage 1	-	-	-	-	-	-	-	311	365	-	357	405	-
Stage 2	-	-	-	-	-	-	-	574	404	-	556	353	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	811	811	-	-	779	-	-	104	88	572	105	85	605
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	104	88	-	105	85	-
Stage 1	-	-	-	-	-	-	-	296	347	-	339	384	-
Stage 2	-	-	-	-	-	-	-	521	383	-	466	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.4	72.9	19.5
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	171	811	-	-	779	-	-	275
HCM Lane V/C Ratio	0.761	0.04	-	-	0.043	-	-	0.098
HCM Control Delay (s)	72.9	9.6	-	-	9.8	-	-	19.5
HCM Lane LOS	F	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	4.9	0.1	-	-	0.1	-	-	0.3

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	9	147	566	85	16	88	544	159	86	347	78	5
Future Volume (vph)	9	147	566	85	16	88	544	159	86	347	78	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97		1.00	0.99		1.00	1.00	0.97	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.97		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1525		1752	3369		1752	3505	1526	
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1525		1752	3369		1752	3505	1526	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	9	150	578	87	16	90	555	162	88	354	80	5
RTOR Reduction (vph)	0	0	0	62	0	0	30	0	0	0	61	0
Lane Group Flow (vph)	0	159	578	25	0	106	687	0	88	354	19	0
Confl. Peds. (#/hr)				26				19			27	
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	3	8		5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		5.3	18.0	18.0		7.1	19.8		5.6	15.4	15.4	
Effective Green, g (s)		5.3	18.0	18.0		7.1	19.8		5.6	15.4	15.4	
Actuated g/C Ratio		0.08	0.28	0.28		0.11	0.31		0.09	0.24	0.24	
Clearance Time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		145	990	430		195	1047		154	847	368	
v/s Ratio Prot		c0.09	0.16			0.06	c0.20		0.05	0.10		
v/s Ratio Perm				0.02							0.01	
v/c Ratio		1.10	0.58	0.06		0.54	0.66		0.57	0.42	0.05	
Uniform Delay, d1		29.2	19.6	16.7		26.8	19.0		27.9	20.4	18.5	
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		102.9	0.9	0.1		3.1	1.5		5.0	0.3	0.1	
Delay (s)		132.1	20.5	16.7		29.8	20.5		32.9	20.7	18.6	
Level of Service		F	C	B		C	C		C	C	B	
Approach Delay (s)			41.7				21.7			22.4		
Approach LOS			D				C			C		

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	63.7	Sum of lost time (s)	17.9
Intersection Capacity Utilization	75.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	125	321	113
Future Volume (vph)	125	321	113
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.6	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.96	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1752	3346	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1752	3346	
Peak-hour factor, PHF	0.98	0.98	0.98
Adj. Flow (vph)	128	328	115
RTOR Reduction (vph)	0	44	0
Lane Group Flow (vph)	133	399	0
Confl. Peds. (#/hr)			24
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	5.3	15.4	
Effective Green, g (s)	5.3	15.4	
Actuated g/C Ratio	0.08	0.24	
Clearance Time (s)	4.2	4.6	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	145	808	
v/s Ratio Prot	c0.08	c0.12	
v/s Ratio Perm			
v/c Ratio	0.92	0.49	
Uniform Delay, d1	29.0	20.8	
Progression Factor	1.00	1.00	
Incremental Delay, d2	50.2	0.5	
Delay (s)	79.2	21.3	
Level of Service	E	C	
Approach Delay (s)		34.6	
Approach LOS		C	

Intersection Summary

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	3	27	7	0	31	8	475	11	8	474	6
Future Vol, veh/h	8	3	27	7	0	31	8	475	11	8	474	6
Conflicting Peds, #/hr	2	0	2	2	0	2	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	9	3	30	8	0	34	9	522	12	9	521	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	830	1103	272	830	1100	271	534	0	0	536	0	0
Stage 1	549	549	-	548	548	-	-	-	-	-	-	-
Stage 2	281	554	-	282	552	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	261	208	723	261	209	724	1023	-	-	1021	-	-
Stage 1	485	512	-	486	513	-	-	-	-	-	-	-
Stage 2	699	509	-	698	511	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	242	201	717	241	202	721	1017	-	-	1019	-	-
Mov Cap-2 Maneuver	242	201	-	241	202	-	-	-	-	-	-	-
Stage 1	476	502	-	479	505	-	-	-	-	-	-	-
Stage 2	656	501	-	655	501	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.9	12.4	0.2	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1017	-	-	444	527	1019	-	-
HCM Lane V/C Ratio	0.009	-	-	0.094	0.079	0.009	-	-
HCM Control Delay (s)	8.6	0.1	-	13.9	12.4	8.6	0.1	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.3	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	330	81	53	245	47	74	341	47	76	365	65
Future Volume (vph)	79	330	81	53	245	47	74	341	47	76	365	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1747	1845	1545	1749	1845	1543	1749	3428		1743	3413	
Flt Permitted	0.60	1.00	1.00	0.52	1.00	1.00	0.49	1.00		0.51	1.00	
Satd. Flow (perm)	1098	1845	1545	954	1845	1543	895	3428		931	3413	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	85	355	87	57	263	51	80	367	51	82	392	70
RTOR Reduction (vph)	0	0	49	0	0	32	0	19	0	0	25	0
Lane Group Flow (vph)	85	355	38	57	263	19	80	399	0	82	437	0
Confl. Peds. (#/hr)	10		7	7		10	6		15	15		6
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	13.5	13.5	13.5	13.2	13.2	13.2	12.2	12.2		12.2	12.2	
Effective Green, g (s)	13.5	13.5	13.5	13.2	13.2	13.2	12.2	12.2		12.2	12.2	
Actuated g/C Ratio	0.38	0.38	0.38	0.37	0.37	0.37	0.35	0.35		0.35	0.35	
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	421	707	592	357	691	578	310	1188		322	1182	
v/s Ratio Prot		c0.19			0.14			0.12			c0.13	
v/s Ratio Perm	0.08		0.02	0.06		0.01	0.09			0.09		
v/c Ratio	0.20	0.50	0.06	0.16	0.38	0.03	0.26	0.34		0.25	0.37	
Uniform Delay, d1	7.3	8.3	6.9	7.3	8.0	7.0	8.3	8.5		8.2	8.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.6	0.0	0.2	0.4	0.0	0.4	0.2		0.4	0.2	
Delay (s)	7.5	8.8	6.9	7.5	8.4	7.0	8.7	8.7		8.7	8.8	
Level of Service	A	A	A	A	A	A	A	A		A	A	
Approach Delay (s)		8.3			8.1			8.7			8.8	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	35.2	Sum of lost time (s)	9.8
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	3	2	380	142	1	88	612	7	93	4	69	9
Future Volume (vph)	3	2	380	142	1	88	612	7	93	4	69	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6			4.2	4.6			4.0		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	0.99			1.00	1.00			0.99		
Flpb, ped/bikes		0.99	1.00			1.00	1.00			1.00		
Frt		1.00	0.96			1.00	1.00			0.94		
Flt Protected		0.95	1.00			0.95	1.00			0.97		
Satd. Flow (prot)		1742	3336			1752	3498			1685		
Flt Permitted		0.95	1.00			0.95	1.00			0.97		
Satd. Flow (perm)		1742	3336			1752	3498			1685		
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	4	2	447	167	1	104	720	8	109	5	81	11
RTOR Reduction (vph)	0	0	29	0	0	0	1	0	0	26	0	0
Lane Group Flow (vph)	0	6	585	0	0	105	727	0	0	169	0	0
Confl. Peds. (#/hr)		11		3		3		11	8		1	1
Confl. Bikes (#/hr)				2								
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Split	NA		Split
Protected Phases	7	7	4		3	3	8		2	2		6
Permitted Phases												
Actuated Green, G (s)		0.6	22.1			9.5	31.0			13.4		
Effective Green, g (s)		0.6	22.1			9.5	31.0			13.4		
Actuated g/C Ratio		0.01	0.33			0.14	0.47			0.20		
Clearance Time (s)		4.2	4.6			4.2	4.6			4.0		
Vehicle Extension (s)		3.0	3.0			3.0	3.0			3.0		
Lane Grp Cap (vph)		15	1110			250	1633			340		
v/s Ratio Prot		0.00	c0.18			0.06	c0.21			c0.10		
v/s Ratio Perm												
v/c Ratio		0.40	0.53			0.42	0.45			0.50		
Uniform Delay, d1		32.7	17.9			25.9	11.9			23.5		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		16.6	0.5			1.1	0.2			1.2		
Delay (s)		49.3	18.4			27.1	12.1			24.7		
Level of Service		D	B			C	B			C		
Approach Delay (s)			18.7				14.0			24.7		
Approach LOS			B				B			C		

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	66.4	Sum of lost time (s)	16.8
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1	6
Future Volume (vph)	1	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frpb, ped/bikes	0.99	
Flpb, ped/bikes	1.00	
Frt	0.95	
Flt Protected	0.97	
Satd. Flow (prot)	1691	
Flt Permitted	0.97	
Satd. Flow (perm)	1691	
Peak-hour factor, PHF	0.85	0.85
Adj. Flow (vph)	1	7
RTOR Reduction (vph)	7	0
Lane Group Flow (vph)	12	0
Confl. Peds. (#/hr)		8
Confl. Bikes (#/hr)		1
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	4.6	
Effective Green, g (s)	4.6	
Actuated g/C Ratio	0.07	
Clearance Time (s)	4.0	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	117	
v/s Ratio Prot	c0.01	
v/s Ratio Perm		
v/c Ratio	0.11	
Uniform Delay, d1	29.0	
Progression Factor	1.00	
Incremental Delay, d2	0.4	
Delay (s)	29.4	
Level of Service	C	
Approach Delay (s)	29.4	
Approach LOS	C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	3	28	732	62	32	661	8	58	6	61	4	2
Future Volume (vph)	3	28	732	62	32	661	8	58	6	61	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6		4.2	4.6			4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95			1.00			1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00			1.00			0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00			1.00			1.00
Frt		1.00	0.99		1.00	1.00			0.93			0.90
Flt Protected		0.95	1.00		0.95	1.00			0.98			0.99
Satd. Flow (prot)		1752	3450		1752	3497			1683			1605
Flt Permitted		0.95	1.00		0.95	1.00			0.98			0.99
Satd. Flow (perm)		1752	3450		1752	3497			1683			1605
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	29	762	65	33	689	8	60	6	64	4	2
RTOR Reduction (vph)	0	0	3	0	0	0	0	0	38	0	0	19
Lane Group Flow (vph)	0	32	825	0	33	697	0	0	92	0	0	8
Confl. Peds. (#/hr)		12		9	9		12	14				
Turn Type	Prot	Prot	NA		Prot	NA		Split	NA		Split	NA
Protected Phases	7	7	4		3	8		2	2		6	6
Permitted Phases												
Actuated Green, G (s)		4.2	67.0		3.4	66.2			14.0			8.8
Effective Green, g (s)		4.2	67.0		3.4	66.2			14.0			8.8
Actuated g/C Ratio		0.04	0.61		0.03	0.60			0.13			0.08
Clearance Time (s)		4.2	4.6		4.2	4.6			4.0			4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0			3.0			3.0
Lane Grp Cap (vph)		66	2101		54	2104			214			128
v/s Ratio Prot		0.02	c0.24		c0.02	0.20			c0.05			c0.00
v/s Ratio Perm												
v/c Ratio		0.48	0.39		0.61	0.33			0.43			0.06
Uniform Delay, d1		51.8	11.0		52.6	10.9			44.3			46.8
Progression Factor		0.86	0.58		0.77	0.54			1.00			1.00
Incremental Delay, d2		5.3	0.5		17.0	0.4			1.4			0.2
Delay (s)		50.2	6.9		57.3	6.3			45.7			47.0
Level of Service		D	A		E	A			D			D
Approach Delay (s)			8.5			8.6			45.7			47.0
Approach LOS			A			A			D			D

Intersection Summary			
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	47.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	21
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	14
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Orange Avenue & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	96	117	52	94	91	99	88	47
Average Queue (ft)	45	41	20	40	35	51	42	20
95th Queue (ft)	81	86	47	81	77	100	71	39
Link Distance (ft)	2539	2539			985	985	2529	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	50				75
Storage Blk Time (%)		1		8	2		0	
Queuing Penalty (veh)		1		25	1		0	

Intersection: 2: 9th Street & Ventura Avenue

Movement	WB	NB
Directions Served	UL	LR
Maximum Queue (ft)	31	68
Average Queue (ft)	6	18
95th Queue (ft)	26	47
Link Distance (ft)		1550
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 10th Street & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	24	179	181	81	212	284	183	51
Average Queue (ft)	3	70	86	37	70	94	77	11
95th Queue (ft)	16	146	165	79	176	209	144	36
Link Distance (ft)		566	566		903	903	2559	2594
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	110			110				
Storage Blk Time (%)		3			6			
Queuing Penalty (veh)		0			5			

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	UL	T	T	R	UL	T	TR	L	T	T	R	UL
Maximum Queue (ft)	181	186	182	72	131	234	285	134	195	172	41	221
Average Queue (ft)	92	81	93	25	69	134	147	43	93	97	12	111
95th Queue (ft)	166	149	155	51	111	215	229	86	156	152	29	184
Link Distance (ft)		903	903			2530	2530		1232	1232		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			100	430			100			55	175
Storage Blk Time (%)	0	0	12					1	5	27	0	5
Queuing Penalty (veh)	0	0	7					3	4	15	0	9

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	181	260
Average Queue (ft)	102	136
95th Queue (ft)	164	210
Link Distance (ft)	2567	2567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 5: Cedar Avenue & Lane Avenue

Movement	EB	WB	NB	SB	SB
Directions Served	LTR	LTR	LT	LT	TR
Maximum Queue (ft)	31	55	22	21	42
Average Queue (ft)	18	23	5	2	1
95th Queue (ft)	43	47	18	12	14
Link Distance (ft)	928	918	1251	1232	1232
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Cedar Avenue & Butler Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	110	155	53	91	200	55	120	112	107	67	106	162
Average Queue (ft)	46	64	24	35	90	20	53	50	55	24	48	64
95th Queue (ft)	91	120	48	72	151	50	98	86	93	55	88	118
Link Distance (ft)		2555			2558			2582	2582		1251	1251
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	60		60	100		100	100			75		
Storage Blk Time (%)	6	5	0	0	5		1	0		0	2	
Queuing Penalty (veh)	18	8	1	0	6		2	0		0	1	

Network Summary

Network wide Queuing Penalty: 108

Intersection: 1: Orange Avenue & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	179	184	32	150	189	168	125	87
Average Queue (ft)	85	82	14	64	50	45	56	34
95th Queue (ft)	146	153	37	115	149	136	108	67
Link Distance (ft)	2539	2539			985	985	2529	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	50				75
Storage Blk Time (%)		8		30	3		9	0
Queuing Penalty (veh)		4		105	3		9	0

Intersection: 2: 9th Street & Ventura Avenue

Movement	WB	NB
Directions Served	UL	LR
Maximum Queue (ft)	70	71
Average Queue (ft)	15	32
95th Queue (ft)	44	60
Link Distance (ft)		1550
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 10th Street & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	89	285	339	82	348	408	157	55
Average Queue (ft)	22	124	144	14	69	82	83	24
95th Queue (ft)	64	267	301	47	205	239	139	51
Link Distance (ft)		566	566		903	903	2559	2594
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	110			110				
Storage Blk Time (%)		12			5			
Queuing Penalty (veh)		4			2			

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	UL	T	T	R	UL	T	TR	L	T	T	R	UL
Maximum Queue (ft)	201	260	240	220	134	284	323	174	178	150	62	196
Average Queue (ft)	119	98	104	43	73	160	176	67	89	88	26	96
95th Queue (ft)	193	195	208	129	128	227	254	135	150	144	53	165
Link Distance (ft)		903	903			2530	2530		1232	1232		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			100	430			100			55	175
Storage Blk Time (%)	0	1	11					8	4	27	2	1
Queuing Penalty (veh)	1	1	9					15	3	21	3	1

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	182	227
Average Queue (ft)	114	140
95th Queue (ft)	180	219
Link Distance (ft)	2567	2567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	1	

Intersection: 5: Cedar Avenue & Lane Avenue

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	LT	TR	LT
Maximum Queue (ft)	55	54	45	41	63
Average Queue (ft)	26	22	6	1	6
95th Queue (ft)	50	51	27	14	29
Link Distance (ft)	928	918	1251	1251	1232
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Cedar Avenue & Butler Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	100	279	140	72	98	55	110	107	102	112	196	172
Average Queue (ft)	41	100	40	33	63	21	40	39	51	40	60	78
95th Queue (ft)	81	194	101	67	100	52	86	68	92	84	125	147
Link Distance (ft)		2555			2558			2582	2582		1251	1251
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	60		60	100		100	100			75		
Storage Blk Time (%)	3	14	1		1		0	0		2	3	
Queuing Penalty (veh)	12	23	2		1		0	0		5	2	

Network Summary

Network wide Queuing Penalty: 227

Appendix I: Cumulative Year 2035 No Project Traffic Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	609	98	66	561	111	119
Future Volume (vph)	609	98	66	561	111	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	4.6	4.6	4.6
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1535	1752	3505	1752	1546
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1535	1752	3505	1752	1546
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	669	108	73	616	122	131
RTOR Reduction (vph)	0	53	0	0	0	104
Lane Group Flow (vph)	669	55	73	616	122	27
Confl. Peds. (#/hr)		1				4
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	20.0	20.0	3.0	27.2	9.3	9.3
Effective Green, g (s)	20.0	20.0	3.0	27.2	9.3	9.3
Actuated g/C Ratio	0.44	0.44	0.07	0.60	0.20	0.20
Clearance Time (s)	4.6	4.6	4.2	4.6	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1533	671	115	2086	356	314
v/s Ratio Prot	c0.19		c0.04	0.18	c0.07	
v/s Ratio Perm		0.04				0.02
v/c Ratio	0.44	0.08	0.63	0.30	0.34	0.08
Uniform Delay, d1	8.9	7.5	20.8	4.5	15.6	14.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	10.9	0.1	0.6	0.1
Delay (s)	9.1	7.5	31.7	4.6	16.2	14.9
Level of Service	A	A	C	A	B	B
Approach Delay (s)	8.9			7.5	15.5	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	45.7	Sum of lost time (s)	13.4
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	595	8	2	16	712	13	17
Future Vol, veh/h	595	8	2	16	712	13	17
Conflicting Peds, #/hr	0	5	0	5	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	676	9	2	18	809	15	19

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	685	690	0	1131	348
Stage 1	-	-	-	-	-	686	-
Stage 2	-	-	-	-	-	445	-
Critical Hdwy	-	-	6.46	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.53	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	524	894	-	196	645
Stage 1	-	-	-	-	-	459	-
Stage 2	-	-	-	-	-	610	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	822	822	-	190	642
Mov Cap-2 Maneuver	-	-	-	-	-	190	-
Stage 1	-	-	-	-	-	446	-
Stage 2	-	-	-	-	-	610	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	17.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	316	-	-	822	-
HCM Lane V/C Ratio	0.108	-	-	0.025	-
HCM Control Delay (s)	17.8	-	-	9.5	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	3	2	596	10	1	12	675	7	32	4	32	9	1	6
Future Vol, veh/h	3	2	596	10	1	12	675	7	32	4	32	9	1	6
Conflicting Peds, #/hr	0	11	0	3	0	3	0	11	8	0	1	1	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	110	-	-	-	110	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	2	677	11	1	14	767	8	36	5	36	10	1	7

Major/Minor	Major1				Major2				Minor1			Minor2		
Conflicting Flow All	775	786	0	0	689	691	0	0	1118	1512	348	1164	1513	407
Stage 1	-	-	-	-	-	-	-	-	696	696	-	812	812	-
Stage 2	-	-	-	-	-	-	-	-	422	816	-	352	701	-
Critical Hdwy	6.46	4.16	-	-	6.46	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.53	2.23	-	-	2.53	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	459	822	-	-	521	893	-	-	160	118	645	148	118	591
Stage 1	-	-	-	-	-	-	-	-	396	439	-	337	388	-
Stage 2	-	-	-	-	-	-	-	-	577	386	-	635	437	-
Platoon blocked, %			-	-			-	-						
Mov Cap-1 Maneuver	551	551	-	-	839	839	-	-	152	113	643	131	113	580
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	152	113	-	131	113	-
Stage 1	-	-	-	-	-	-	-	-	390	433	-	330	377	-
Stage 2	-	-	-	-	-	-	-	-	554	375	-	586	431	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	28.4	27
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	230	551	-	-	839	-	-	182
HCM Lane V/C Ratio	0.336	0.01	-	-	0.018	-	-	0.1
HCM Control Delay (s)	28.4	11.6	-	-	9.4	-	-	27
HCM Lane LOS	D	B	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1.4	0	-	-	0.1	-	-	0.3

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	5	118	565	68	9	134	543	127	104	760	214	1
Future Volume (vph)	5	118	565	68	9	134	543	127	104	760	214	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97		1.00	1.00		1.00	1.00	0.96	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.97		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1516		1752	3392		1752	3505	1500	
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1516		1752	3392		1752	3505	1500	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	6	134	642	77	10	152	617	144	118	864	243	1
RTOR Reduction (vph)	0	0	0	56	0	0	21	0	0	0	71	0
Lane Group Flow (vph)	0	140	642	21	0	162	740	0	118	864	172	0
Confl. Peds. (#/hr)				24				9			39	
Confl. Bikes (#/hr)								1				
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	3	8		5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		6.9	25.6	25.6		7.9	26.6		9.7	29.0	29.0	
Effective Green, g (s)		6.9	25.6	25.6		7.9	26.6		9.7	29.0	29.0	
Actuated g/C Ratio		0.07	0.28	0.28		0.09	0.29		0.10	0.31	0.31	
Clearance Time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		130	971	420		149	976		183	1100	470	
v/s Ratio Prot		0.08	0.18			c0.09	c0.22		0.07	c0.25		
v/s Ratio Perm				0.01							0.11	
v/c Ratio		1.08	0.66	0.05		1.09	0.76		0.64	0.79	0.37	
Uniform Delay, d1		42.8	29.6	24.5		42.2	30.0		39.7	28.9	24.6	
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		101.0	1.7	0.1		99.0	3.4		7.6	3.8	0.5	
Delay (s)		143.8	31.3	24.5		141.2	33.4		47.3	32.6	25.1	
Level of Service		F	C	C		F	C		D	C	C	
Approach Delay (s)			49.0				52.3			32.5		
Approach LOS			D				D			C		

Intersection Summary			
HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	92.4	Sum of lost time (s)	17.9
Intersection Capacity Utilization	83.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	231	508	90
Future Volume (vph)	231	508	90
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.6	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.98	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1752	3413	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1752	3413	
Peak-hour factor, PHF	0.88	0.88	0.88
Adj. Flow (vph)	262	577	102
RTOR Reduction (vph)	0	14	0
Lane Group Flow (vph)	264	665	0
Confl. Peds. (#/hr)			16
Confl. Bikes (#/hr)			1
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	12.0	31.6	
Effective Green, g (s)	12.0	31.6	
Actuated g/C Ratio	0.13	0.34	
Clearance Time (s)	4.2	4.6	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	227	1167	
v/s Ratio Prot	c0.15	0.19	
v/s Ratio Perm			
v/c Ratio	1.16	0.57	
Uniform Delay, d1	40.2	24.8	
Progression Factor	1.00	1.00	
Incremental Delay, d2	110.8	0.6	
Delay (s)	151.0	25.5	
Level of Service	F	C	
Approach Delay (s)		60.6	
Approach LOS		E	

Intersection Summary

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	0	10	1	27	2	845	7	8	497	5
Future Vol, veh/h	10	0	0	10	1	27	2	845	7	8	497	5
Conflicting Peds, #/hr	1	0	5	5	0	1	3	0	7	7	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	0	0	11	1	30	2	949	8	9	558	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1062	1550	290	1266	1549	487	567	0	0	964	0	0
Stage 1	582	582	-	964	964	-	-	-	-	-	-	-
Stage 2	480	968	-	302	585	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	176	112	704	125	112	524	994	-	-	704	-	-
Stage 1	463	495	-	272	330	-	-	-	-	-	-	-
Stage 2	533	328	-	680	493	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	161	108	699	121	108	520	991	-	-	699	-	-
Mov Cap-2 Maneuver	161	108	-	121	108	-	-	-	-	-	-	-
Stage 1	460	484	-	269	326	-	-	-	-	-	-	-
Stage 2	498	324	-	664	482	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29	21.2	0	0.3
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	991	-	-	161	264	699	-	-
HCM Lane V/C Ratio	0.002	-	-	0.07	0.162	0.013	-	-
HCM Control Delay (s)	8.6	0	-	29	21.2	10.2	0.1	-
HCM Lane LOS	A	A	-	D	C	B	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.6	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	216	87	60	308	49	167	763	148	53	549	122
Future Volume (vph)	106	216	87	60	308	49	167	763	148	53	549	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1751	1845	1541	1746	1845	1545	1745	3384		1737	3389	
Flt Permitted	0.43	1.00	1.00	0.58	1.00	1.00	0.33	1.00		0.21	1.00	
Satd. Flow (perm)	801	1845	1541	1061	1845	1545	600	3384		379	3389	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	120	245	99	68	350	56	190	867	168	60	624	139
RTOR Reduction (vph)	0	0	67	0	0	38	0	23	0	0	27	0
Lane Group Flow (vph)	120	245	32	68	350	18	190	1012	0	60	736	0
Confl. Peds. (#/hr)	3		9	9		3	12		46	46		12
Confl. Bikes (#/hr)						1			4			
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	16.0	16.0	16.0	15.7	15.7	15.7	24.5	24.5		24.5	24.5	
Effective Green, g (s)	16.0	16.0	16.0	15.7	15.7	15.7	24.5	24.5		24.5	24.5	
Actuated g/C Ratio	0.32	0.32	0.32	0.31	0.31	0.31	0.49	0.49		0.49	0.49	
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	256	590	493	333	579	485	294	1658		185	1660	
v/s Ratio Prot		0.13			c0.19			0.30			0.22	
v/s Ratio Perm	0.15		0.02	0.06		0.01	c0.32			0.16		
v/c Ratio	0.47	0.42	0.06	0.20	0.60	0.04	0.65	0.61		0.32	0.44	
Uniform Delay, d1	13.6	13.3	11.8	12.6	14.5	11.9	9.5	9.3		7.7	8.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.5	0.1	0.3	1.8	0.0	4.8	0.7		1.0	0.2	
Delay (s)	15.0	13.8	11.9	12.9	16.3	11.9	14.3	9.9		8.8	8.5	
Level of Service	B	B	B	B	B	B	B	A		A	A	
Approach Delay (s)		13.7			15.3			10.6			8.5	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	9.8
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	925	90	14	85	725	168	166
Future Volume (vph)	925	90	14	85	725	168	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.2	4.6	4.6	4.6
Lane Util. Factor	0.95	1.00		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1528		1752	3505	1752	1568
Flt Permitted	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1528		1752	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1005	98	15	92	788	183	180
RTOR Reduction (vph)	0	32	0	0	0	0	137
Lane Group Flow (vph)	1005	66	0	107	788	183	43
Confl. Peds. (#/hr)		4		4			
Turn Type	NA	Perm	Prot	Prot	NA	Prot	Perm
Protected Phases	4		3	3	8	2	
Permitted Phases		4					2
Actuated Green, G (s)	24.1	24.1		5.2	33.5	13.2	13.2
Effective Green, g (s)	24.1	24.1		5.2	33.5	13.2	13.2
Actuated g/C Ratio	0.43	0.43		0.09	0.60	0.24	0.24
Clearance Time (s)	4.6	4.6		4.2	4.6	4.6	4.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1511	658		162	2100	413	370
v/s Ratio Prot	c0.29			c0.06	0.22	c0.10	
v/s Ratio Perm		0.04					0.03
v/c Ratio	0.67	0.10		0.66	0.38	0.44	0.11
Uniform Delay, d1	12.7	9.5		24.5	5.8	18.2	16.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.1		9.7	0.1	0.8	0.1
Delay (s)	13.8	9.5		34.2	5.9	19.0	16.9
Level of Service	B	A		C	A	B	B
Approach Delay (s)	13.4				9.3	17.9	
Approach LOS	B				A	B	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	55.9	Sum of lost time (s)	13.4
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	1067	21	6	49	793	15	19
Future Vol, veh/h	1067	21	6	49	793	15	19
Conflicting Peds, #/hr	0	8	0	8	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	1147	23	6	53	853	16	20

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	1170	1178	0	1712	593
Stage 1	-	-	-	-	-	1167	-
Stage 2	-	-	-	-	-	545	-
Critical Hdwy	-	-	6.46	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.53	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	256	583	-	81	446
Stage 1	-	-	-	-	-	256	-
Stage 2	-	-	-	-	-	542	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	504	504	-	71	443
Mov Cap-2 Maneuver	-	-	-	-	-	71	-
Stage 1	-	-	-	-	-	224	-
Stage 2	-	-	-	-	-	542	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	41.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	134	-	-	504	-
HCM Lane V/C Ratio	0.273	-	-	0.117	-
HCM Control Delay (s)	41.7	-	-	13.1	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	1	-	-	0.4	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	3	28	1012	35	21	842	8	11	6	22	4	2	20
Future Vol, veh/h	3	28	1012	35	21	842	8	11	6	22	4	2	20
Conflicting Peds, #/hr	0	12	0	9	9	0	12	14	0	0	0	0	14
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	110	-	-	110	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	29	1054	36	22	877	8	11	6	23	4	2	21

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	885	897	0	0	1099	0	0	1643	2086	554	1531	2100	469
Stage 1	-	-	-	-	-	-	-	1145	1145	-	937	937	-
Stage 2	-	-	-	-	-	-	-	498	941	-	594	1163	-
Critical Hdwy	6.46	4.16	-	-	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.53	2.23	-	-	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	390	746	-	-	625	-	-	65	52	473	79	51	538
Stage 1	-	-	-	-	-	-	-	211	270	-	283	339	-
Stage 2	-	-	-	-	-	-	-	520	338	-	456	265	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	674	674	-	-	620	-	-	55	47	469	63	46	525
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	55	47	-	63	46	-
Stage 1	-	-	-	-	-	-	-	199	255	-	267	323	-
Stage 2	-	-	-	-	-	-	-	472	322	-	403	250	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.3	60.3	28.7
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	104	674	-	-	620	-	-	179
HCM Lane V/C Ratio	0.391	0.048	-	-	0.035	-	-	0.151
HCM Control Delay (s)	60.3	10.6	-	-	11	-	-	28.7
HCM Lane LOS	F	B	-	-	B	-	-	D
HCM 95th %tile Q(veh)	1.6	0.2	-	-	0.1	-	-	0.5

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	9	121	763	146	16	125	753	227	95	641	198	5
Future Volume (vph)	9	121	763	146	16	125	753	227	95	641	198	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.97		1.00	0.99		1.00	1.00	0.97	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.97		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1518		1752	3363		1752	3505	1520	
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1518		1752	3363		1752	3505	1520	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	9	123	779	149	16	128	768	232	97	654	202	5
RTOR Reduction (vph)	0	0	0	75	0	0	29	0	0	0	82	0
Lane Group Flow (vph)	0	132	779	74	0	144	971	0	97	654	120	0
Confl. Peds. (#/hr)				26				19			27	
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	3	8		5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		5.1	28.7	28.7		5.1	28.7		5.1	22.7	22.7	
Effective Green, g (s)		5.1	28.7	28.7		5.1	28.7		5.1	22.7	22.7	
Actuated g/C Ratio		0.06	0.36	0.36		0.06	0.36		0.06	0.29	0.29	
Clearance Time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		112	1265	548		112	1214		112	1000	434	
v/s Ratio Prot		0.08	0.22			c0.08	c0.29		0.06	c0.19		
v/s Ratio Perm				0.05							0.08	
v/c Ratio		1.18	0.62	0.13		1.29	0.80		0.87	0.65	0.28	
Uniform Delay, d1		37.2	20.9	17.1		37.2	22.8		36.9	24.9	22.0	
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		140.9	0.9	0.1		180.2	3.8		45.8	1.5	0.3	
Delay (s)		178.1	21.8	17.2		217.4	26.6		82.7	26.5	22.4	
Level of Service		F	C	B		F	C		F	C	C	
Approach Delay (s)			40.6				50.6			31.3		
Approach LOS			D				D			C		

Intersection Summary			
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	79.5	Sum of lost time (s)	17.9
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	155	484	103
Future Volume (vph)	155	484	103
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.6	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.97	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1752	3396	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1752	3396	
Peak-hour factor, PHF	0.98	0.98	0.98
Adj. Flow (vph)	158	494	105
RTOR Reduction (vph)	0	21	0
Lane Group Flow (vph)	163	578	0
Confl. Peds. (#/hr)			24
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	5.1	23.0	
Effective Green, g (s)	5.1	23.0	
Actuated g/C Ratio	0.06	0.29	
Clearance Time (s)	4.2	4.6	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	112	982	
v/s Ratio Prot	c0.09	0.17	
v/s Ratio Perm			
v/c Ratio	1.46	0.59	
Uniform Delay, d1	37.2	24.2	
Progression Factor	1.00	1.00	
Incremental Delay, d2	247.4	0.9	
Delay (s)	284.6	25.1	
Level of Service	F	C	
Approach Delay (s)		80.6	
Approach LOS		F	

Intersection Summary

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	2	1	7	0	31	1	818	11	8	794	6
Future Vol, veh/h	8	2	1	7	0	31	1	818	11	8	794	6
Conflicting Peds, #/hr	2	0	2	2	0	2	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	9	2	1	8	0	34	1	889	12	9	863	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1340	1796	443	1352	1793	455	876	0	0	903	0	0
Stage 1	891	891	-	899	899	-	-	-	-	-	-	-
Stage 2	449	905	-	453	894	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	110	79	560	108	79	550	760	-	-	742	-	-
Stage 1	302	357	-	298	353	-	-	-	-	-	-	-
Stage 2	556	351	-	553	355	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	100	76	556	103	76	548	756	-	-	741	-	-
Mov Cap-2 Maneuver	100	76	-	103	76	-	-	-	-	-	-	-
Stage 1	299	346	-	297	351	-	-	-	-	-	-	-
Stage 2	519	349	-	534	344	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	44.9	18.6	0	0.2
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	756	-	-	102	305	741	-	-
HCM Lane V/C Ratio	0.001	-	-	0.117	0.135	0.012	-	-
HCM Control Delay (s)	9.8	0	-	44.9	18.6	9.9	0.1	-
HCM Lane LOS	A	A	-	E	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.5	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	330	81	58	268	45	135	603	86	126	624	123
Future Volume (vph)	79	330	81	58	268	45	135	603	86	126	624	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1746	1845	1544	1749	1845	1541	1749	3426		1745	3404	
Flt Permitted	0.55	1.00	1.00	0.45	1.00	1.00	0.30	1.00		0.33	1.00	
Satd. Flow (perm)	1013	1845	1544	826	1845	1541	555	3426		615	3404	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	85	355	87	62	288	48	145	648	92	135	671	132
RTOR Reduction (vph)	0	0	51	0	0	32	0	17	0	0	25	0
Lane Group Flow (vph)	85	355	36	62	288	16	145	723	0	135	778	0
Confl. Peds. (#/hr)	10		7	7		10	6		15	15		6
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	15.4	15.4	15.4	15.1	15.1	15.1	20.4	20.4		20.4	20.4	
Effective Green, g (s)	15.4	15.4	15.4	15.1	15.1	15.1	20.4	20.4		20.4	20.4	
Actuated g/C Ratio	0.34	0.34	0.34	0.33	0.33	0.33	0.45	0.45		0.45	0.45	
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	344	627	524	275	615	513	249	1542		276	1532	
v/s Ratio Prot		c0.19			0.16			0.21			0.23	
v/s Ratio Perm	0.08		0.02	0.08		0.01	c0.26			0.22		
v/c Ratio	0.25	0.57	0.07	0.23	0.47	0.03	0.58	0.47		0.49	0.51	
Uniform Delay, d1	10.8	12.2	10.1	10.9	11.9	10.2	9.3	8.7		8.8	8.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.2	0.1	0.4	0.6	0.0	3.4	0.2		1.4	0.3	
Delay (s)	11.1	13.4	10.2	11.3	12.5	10.2	12.7	8.9		10.1	9.1	
Level of Service	B	B	B	B	B	B	B	A		B	A	
Approach Delay (s)		12.5			12.0			9.5			9.3	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	9.8
Intersection Capacity Utilization	67.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	3	2	596	10	1	12	675	7	32	4	32	9
Future Volume (vph)	3	2	596	10	1	12	675	7	32	4	32	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6			4.2	4.6			4.0		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	1.00			1.00	1.00			0.99		
Flpb, ped/bikes		1.00	1.00			1.00	1.00			1.00		
Frt		1.00	1.00			1.00	1.00			0.94		
Flt Protected		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (prot)		1752	3495			1752	3498			1678		
Flt Permitted		0.95	1.00			0.95	1.00			0.98		
Satd. Flow (perm)		1752	3495			1752	3498			1678		
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	3	2	677	11	1	14	767	8	36	5	36	10
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	33	0	0
Lane Group Flow (vph)	0	5	688	0	0	15	775	0	0	44	0	0
Confl. Peds. (#/hr)		11		3		3		11	8		1	1
Confl. Bikes (#/hr)				2								
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Split	NA		Split
Protected Phases	7	7	4		3	3	8		2	2		6
Permitted Phases												
Actuated Green, G (s)		1.0	76.8			2.4	78.2			11.2		
Effective Green, g (s)		1.0	76.8			2.4	78.2			11.2		
Actuated g/C Ratio		0.01	0.66			0.02	0.67			0.10		
Clearance Time (s)		4.2	4.6			4.2	4.6			4.0		
Vehicle Extension (s)		3.0	3.0			3.0	3.0			3.0		
Lane Grp Cap (vph)		15	2313			36	2358			162		
v/s Ratio Prot		0.00	c0.20			0.01	c0.22			c0.03		
v/s Ratio Perm												
v/c Ratio		0.33	0.30			0.42	0.33			0.27		
Uniform Delay, d1		57.2	8.2			56.1	7.9			48.6		
Progression Factor		0.81	0.69			0.89	0.66			1.00		
Incremental Delay, d2		12.4	0.3			5.6	0.3			0.9		
Delay (s)		58.8	6.0			55.8	5.5			49.6		
Level of Service		E	A			E	A			D		
Approach Delay (s)			6.4				6.4			49.6		
Approach LOS			A				A			D		

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1	6
Future Volume (vph)	1	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frpb, ped/bikes	0.99	
Flpb, ped/bikes	1.00	
Frt	0.95	
Flt Protected	0.97	
Satd. Flow (prot)	1685	
Flt Permitted	0.97	
Satd. Flow (perm)	1685	
Peak-hour factor, PHF	0.88	0.88
Adj. Flow (vph)	1	7
RTOR Reduction (vph)	6	0
Lane Group Flow (vph)	12	0
Confl. Peds. (#/hr)		8
Confl. Bikes (#/hr)		1
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	8.8	
Effective Green, g (s)	8.8	
Actuated g/C Ratio	0.08	
Clearance Time (s)	4.0	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	127	
v/s Ratio Prot	c0.01	
v/s Ratio Perm		
v/c Ratio	0.09	
Uniform Delay, d1	49.9	
Progression Factor	1.00	
Incremental Delay, d2	0.3	
Delay (s)	50.2	
Level of Service	D	
Approach Delay (s)	50.2	
Approach LOS	D	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	3	28	1012	35	21	842	8	11	6	22	4	2
Future Volume (vph)	3	28	1012	35	21	842	8	11	6	22	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6		4.2	4.6			4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95			1.00			1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00			1.00			0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00			1.00			1.00
Frt		1.00	1.00		1.00	1.00			0.92			0.90
Flt Protected		0.95	1.00		0.95	1.00			0.99			0.99
Satd. Flow (prot)		1752	3482		1752	3499			1678			1606
Flt Permitted		0.95	1.00		0.95	1.00			0.99			0.99
Satd. Flow (perm)		1752	3482		1752	3499			1678			1606
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	29	1054	36	22	877	8	11	6	23	4	2
RTOR Reduction (vph)	0	0	1	0	0	0	0	0	21	0	0	19
Lane Group Flow (vph)	0	32	1089	0	22	885	0	0	19	0	0	8
Confl. Peds. (#/hr)		12		9	9		12	14				
Turn Type	Prot	Prot	NA		Prot	NA		Split	NA		Split	NA
Protected Phases	7	7	4		3	8		2	2		6	6
Permitted Phases												
Actuated Green, G (s)		3.8	69.0		2.5	67.7			9.0			8.7
Effective Green, g (s)		3.8	69.0		2.5	67.7			9.0			8.7
Actuated g/C Ratio		0.04	0.65		0.02	0.64			0.08			0.08
Clearance Time (s)		4.2	4.6		4.2	4.6			4.0			4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0			3.0			3.0
Lane Grp Cap (vph)		62	2266		41	2234			142			131
v/s Ratio Prot		0.02	c0.31		0.01	c0.25			c0.01			c0.00
v/s Ratio Perm												
v/c Ratio		0.52	0.48		0.54	0.40			0.13			0.06
Uniform Delay, d1		50.2	9.4		51.2	9.3			44.9			44.9
Progression Factor		0.98	1.03		1.02	0.62			1.00			1.00
Incremental Delay, d2		6.5	0.7		9.0	0.4			0.4			0.2
Delay (s)		55.7	10.4		61.3	6.1			45.3			45.1
Level of Service		E	B		E	A			D			D
Approach Delay (s)			11.7			7.5			45.3			45.1
Approach LOS			B			A			D			D

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	21
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	14
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection: 1: Orange Avenue & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	137	180	170	119	117	118	159	92
Average Queue (ft)	78	90	36	51	28	48	73	29
95th Queue (ft)	133	155	99	94	71	95	125	61
Link Distance (ft)	2539	2539			985	985	2529	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	50				75
Storage Blk Time (%)		11	0	14	2		11	0
Queuing Penalty (veh)		10	0	39	1		13	0

Intersection: 2: 9th Street & Ventura Avenue

Movement	WB	NB
Directions Served	UL	LR
Maximum Queue (ft)	31	55
Average Queue (ft)	8	19
95th Queue (ft)	30	50
Link Distance (ft)		1550
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 10th Street & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	45	136	138	12	232	199	138	75
Average Queue (ft)	7	54	63	3	33	43	50	20
95th Queue (ft)	27	116	136	11	133	124	96	57
Link Distance (ft)		566	566		903	903	2559	2594
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	110			110				
Storage Blk Time (%)		0			2			
Queuing Penalty (veh)		0			0			

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	UL	T	T	R	UL	T	TR	L	T	T	R	UL
Maximum Queue (ft)	185	247	305	220	270	287	279	175	280	337	175	265
Average Queue (ft)	97	166	171	50	119	161	182	108	161	179	111	154
95th Queue (ft)	170	232	247	159	209	247	257	185	241	294	220	229
Link Distance (ft)		903	903			2530	2530		1232	1232		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			100	430			100			55	175
Storage Blk Time (%)	0	3	33					13	25	42	5	7
Queuing Penalty (veh)	0	4	22					49	26	90	19	19

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	323	295
Average Queue (ft)	147	169
95th Queue (ft)	254	268
Link Distance (ft)	2567	2567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	4	
Queuing Penalty (veh)	10	

Intersection: 5: Cedar Avenue & Lane Avenue

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	54	31	67	43	46	42
Average Queue (ft)	8	22	4	1	6	2
95th Queue (ft)	33	45	25	14	28	16
Link Distance (ft)	928	918	1251	1251	1232	1232
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Cedar Avenue & Butler Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	140	225	140	180	315	180	180	259	312	86	152	150
Average Queue (ft)	88	129	49	54	198	58	96	135	166	34	72	70
95th Queue (ft)	146	207	122	147	290	169	178	232	275	76	126	127
Link Distance (ft)		2555			2558			2582	2582		1251	1251
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	60		60	100		100	100			75		
Storage Blk Time (%)	28	27	1	1	38		10	10		1	5	
Queuing Penalty (veh)	86	51	2	3	42		38	17		3	3	

Network Summary

Network wide Queuing Penalty: 548

Intersection: 1: Orange Avenue & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	243	248	170	149	335	307	274	195
Average Queue (ft)	125	134	42	76	75	86	110	65
95th Queue (ft)	208	228	138	139	209	202	189	137
Link Distance (ft)	2539	2539			985	985	2529	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	50				75
Storage Blk Time (%)		19		30	5		23	3
Queuing Penalty (veh)		17		108	5		38	5

Intersection: 2: 9th Street & Ventura Avenue

Movement	EB	WB	NB
Directions Served	T	UL	LR
Maximum Queue (ft)	55	55	72
Average Queue (ft)	2	25	26
95th Queue (ft)	18	51	57
Link Distance (ft)	985		1550
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		125	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: 10th Street & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	209	485	524	36	363	343	74	94
Average Queue (ft)	29	107	138	9	94	103	28	25
95th Queue (ft)	90	302	340	27	270	278	67	59
Link Distance (ft)		566	566		903	903	2559	2594
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	110			110				
Storage Blk Time (%)		6			5			
Queuing Penalty (veh)		2			1			

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	UL	T	T	R	UL	T	TR	L	T	T	R	UL
Maximum Queue (ft)	299	409	423	220	265	305	379	174	271	301	175	274
Average Queue (ft)	123	187	194	86	111	206	238	86	125	121	55	131
95th Queue (ft)	234	329	348	219	201	287	338	153	231	218	140	200
Link Distance (ft)		903	903			2530	2530		1232	1232		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			100	430			100			55	175
Storage Blk Time (%)	0	6	26					17	11	28	4	2
Queuing Penalty (veh)	0	7	38					53	10	55	13	4

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	406	374
Average Queue (ft)	138	145
95th Queue (ft)	240	242
Link Distance (ft)	2567	2567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	2	
Queuing Penalty (veh)	3	

Intersection: 5: Cedar Avenue & Lane Avenue

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	LT	TR	LT
Maximum Queue (ft)	31	53	23	44	44
Average Queue (ft)	11	24	1	3	5
95th Queue (ft)	35	52	10	18	25
Link Distance (ft)	928	918	1251	1251	1232
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: Cedar Avenue & Butler Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	140	395	140	179	230	177	180	195	277	131	87	109
Average Queue (ft)	69	182	58	52	117	34	80	74	101	49	48	65
95th Queue (ft)	143	320	139	117	195	105	139	159	195	103	85	101
Link Distance (ft)		2555			2558			2582	2582		1251	1251
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	60		60	100		100	100			75		
Storage Blk Time (%)	8	41	1		17		5	3		3	1	
Queuing Penalty (veh)	33	66	2		17		14	5		10	1	

Network Summary

Network wide Queuing Penalty: 507

Appendix J: Cumulative Year 2035 plus Project Traffic Conditions

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	732	98	68	620	111	119
Future Volume (vph)	732	98	68	620	111	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.2	4.6	4.6	4.6
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1535	1752	3505	1752	1546
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1535	1752	3505	1752	1546
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	804	108	75	681	122	131
RTOR Reduction (vph)	0	42	0	0	0	105
Lane Group Flow (vph)	804	66	75	681	122	26
Confl. Peds. (#/hr)		1				4
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	22.0	22.0	2.7	28.9	9.4	9.4
Effective Green, g (s)	22.0	22.0	2.7	28.9	9.4	9.4
Actuated g/C Ratio	0.46	0.46	0.06	0.61	0.20	0.20
Clearance Time (s)	4.6	4.6	4.2	4.6	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1623	710	99	2132	346	305
v/s Ratio Prot	c0.23		c0.04	0.19	c0.07	
v/s Ratio Perm		0.04				0.02
v/c Ratio	0.50	0.09	0.76	0.32	0.35	0.08
Uniform Delay, d1	8.9	7.2	22.1	4.5	16.4	15.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	27.7	0.1	0.6	0.1
Delay (s)	9.1	7.2	49.7	4.6	17.0	15.7
Level of Service	A	A	D	A	B	B
Approach Delay (s)	8.9			9.1	16.3	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	47.5	Sum of lost time (s)	13.4
Intersection Capacity Utilization	45.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	727	8	2	16	773	13	17
Future Vol, veh/h	727	8	2	16	773	13	17
Conflicting Peds, #/hr	0	5	0	5	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	826	9	2	18	878	15	19

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	835	840	0	1315	423
Stage 1	-	-	-	-	-	836	-
Stage 2	-	-	-	-	-	479	-
Critical Hdwy	-	-	6.46	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.53	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	420	784	-	148	577
Stage 1	-	-	-	-	-	383	-
Stage 2	-	-	-	-	-	586	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	708	708	-	143	574
Mov Cap-2 Maneuver	-	-	-	-	-	143	-
Stage 1	-	-	-	-	-	370	-
Stage 2	-	-	-	-	-	586	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	21.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	249	-	-	708	-
HCM Lane V/C Ratio	0.137	-	-	0.029	-
HCM Control Delay (s)	21.7	-	-	10.2	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Intersection	
Int Delay, s/veh	27.3

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations														
Traffic Vol, veh/h	3	2	596	142	1	88	675	7	93	4	69	9	1	6
Future Vol, veh/h	3	2	596	142	1	88	675	7	93	4	69	9	1	6
Conflicting Peds, #/hr	0	11	0	3	0	3	0	11	8	0	1	1	0	8
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	-	110	-	-	-	110	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	2	677	161	1	100	767	8	106	5	78	10	1	7

Major/Minor	Major1				Major2				Minor1			Minor2		
Conflicting Flow All	775	786	0	0	839	841	0	0	1365	1759	423	1336	1835	407
Stage 1	-	-	-	-	-	-	-	-	771	771	-	984	984	-
Stage 2	-	-	-	-	-	-	-	-	594	988	-	352	851	-
Critical Hdwy	6.46	4.16	-	-	6.46	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.53	2.23	-	-	2.53	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	459	822	-	-	418	784	-	-	~ 105	83	577	111	74	591
Stage 1	-	-	-	-	-	-	-	-	357	405	-	265	322	-
Stage 2	-	-	-	-	-	-	-	-	456	321	-	635	372	-
Platoon blocked, %			-	-			-	-						
Mov Cap-1 Maneuver	551	551	-	-	772	772	-	-	~ 90	70	575	80	63	580
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	~ 90	70	-	80	63	-
Stage 1	-	-	-	-	-	-	-	-	352	399	-	259	277	-
Stage 2	-	-	-	-	-	-	-	-	387	276	-	536	367	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.2	269.3	42.1
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	137	551	-	-	772	-	-	115
HCM Lane V/C Ratio	1.377	0.01	-	-	0.131	-	-	0.158
HCM Control Delay (s)	269.3	11.6	-	-	10.4	-	-	42.1
HCM Lane LOS	F	B	-	-	B	-	-	E
HCM 95th %tile Q(veh)	12.2	0	-	-	0.5	-	-	0.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	5	145	575	68	9	134	561	127	104	760	214	1
Future Volume (vph)	5	145	575	68	9	134	561	127	104	760	214	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.96		1.00	1.00		1.00	1.00	0.95	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.97		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1510		1752	3395		1752	3505	1492	
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1510		1752	3395		1752	3505	1492	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	6	165	653	77	10	152	638	144	118	864	243	1
RTOR Reduction (vph)	0	0	0	56	0	0	17	0	0	0	67	0
Lane Group Flow (vph)	0	171	653	21	0	162	765	0	118	864	176	0
Confl. Peds. (#/hr)				24				9			39	
Confl. Bikes (#/hr)								1				
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	3	8		5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		11.9	29.8	29.8		11.7	29.6		12.1	31.5	31.5	
Effective Green, g (s)		11.9	29.8	29.8		11.7	29.6		12.1	31.5	31.5	
Actuated g/C Ratio		0.11	0.27	0.27		0.11	0.27		0.11	0.29	0.29	
Clearance Time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		191	960	413		188	923		194	1014	431	
v/s Ratio Prot		c0.10	0.19			0.09	c0.23		0.07	c0.25		
v/s Ratio Perm				0.01							0.12	
v/c Ratio		0.90	0.68	0.05		0.86	0.83		0.61	0.85	0.41	
Uniform Delay, d1		47.8	35.2	29.1		47.8	37.2		46.1	36.5	31.1	
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		37.1	2.0	0.1		30.9	6.2		5.3	7.0	0.6	
Delay (s)		85.0	37.2	29.1		78.7	43.4		51.4	43.5	31.8	
Level of Service		F	D	C		E	D		D	D	C	
Approach Delay (s)			45.6				49.5			41.9		
Approach LOS			D				D			D		

Intersection Summary			
HCM 2000 Control Delay	44.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	108.8	Sum of lost time (s)	17.9
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	231	508	148
Future Volume (vph)	231	508	148
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.6	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.97	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1752	3365	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1752	3365	
Peak-hour factor, PHF	0.88	0.88	0.88
Adj. Flow (vph)	262	577	168
RTOR Reduction (vph)	0	23	0
Lane Group Flow (vph)	264	722	0
Confl. Peds. (#/hr)			16
Confl. Bikes (#/hr)			1
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	17.9	37.6	
Effective Green, g (s)	17.9	37.6	
Actuated g/C Ratio	0.16	0.35	
Clearance Time (s)	4.2	4.6	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	288	1162	
v/s Ratio Prot	c0.15	0.21	
v/s Ratio Perm			
v/c Ratio	0.92	0.62	
Uniform Delay, d1	44.7	29.7	
Progression Factor	1.00	1.00	
Incremental Delay, d2	31.8	1.0	
Delay (s)	76.5	30.7	
Level of Service	E	C	
Approach Delay (s)		42.7	
Approach LOS		D	

Intersection Summary

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	16	10	2	27	40	845	7	8	497	5
Future Vol, veh/h	10	0	16	10	2	27	40	845	7	8	497	5
Conflicting Peds, #/hr	1	0	5	5	0	1	3	0	7	7	0	3
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	0	18	11	2	30	45	949	8	9	558	6

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1149	1636	290	1352	1635	487	567	0	0	964	0	0
Stage 1	582	582	-	1050	1050	-	-	-	-	-	-	-
Stage 2	567	1054	-	302	585	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	152	99	704	108	99	524	994	-	-	704	-	-
Stage 1	463	495	-	241	300	-	-	-	-	-	-	-
Stage 2	473	299	-	680	493	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	128	87	699	95	87	520	991	-	-	699	-	-
Mov Cap-2 Maneuver	128	87	-	95	87	-	-	-	-	-	-	-
Stage 1	417	484	-	216	269	-	-	-	-	-	-	-
Stage 2	398	268	-	647	482	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.8	25.9	0.8	0.3
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	991	-	-	257	216	699	-	-
HCM Lane V/C Ratio	0.045	-	-	0.114	0.203	0.013	-	-
HCM Control Delay (s)	8.8	0.4	-	20.8	25.9	10.2	0.1	-
HCM Lane LOS	A	A	-	C	D	B	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.7	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	106	216	87	60	308	61	167	789	148	58	560	122
Future Volume (vph)	106	216	87	60	308	61	167	789	148	58	560	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1751	1845	1541	1746	1845	1545	1746	3387		1737	3391	
Flt Permitted	0.43	1.00	1.00	0.58	1.00	1.00	0.32	1.00		0.20	1.00	
Satd. Flow (perm)	795	1845	1541	1057	1845	1545	590	3387		360	3391	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	120	245	99	68	350	69	190	897	168	66	636	139
RTOR Reduction (vph)	0	0	68	0	0	39	0	22	0	0	26	0
Lane Group Flow (vph)	120	245	31	68	350	30	190	1043	0	66	749	0
Confl. Peds. (#/hr)	3		9	9		3	12		46	46		12
Confl. Bikes (#/hr)						1			4			
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	16.0	16.0	16.0	15.7	15.7	15.7	24.9	24.9		24.9	24.9	
Effective Green, g (s)	16.0	16.0	16.0	15.7	15.7	15.7	24.9	24.9		24.9	24.9	
Actuated g/C Ratio	0.32	0.32	0.32	0.31	0.31	0.31	0.49	0.49		0.49	0.49	
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	252	585	489	329	574	481	291	1673		177	1675	
v/s Ratio Prot		0.13			c0.19			0.31			0.22	
v/s Ratio Perm	0.15		0.02	0.06		0.02	c0.32			0.18		
v/c Ratio	0.48	0.42	0.06	0.21	0.61	0.06	0.65	0.62		0.37	0.45	
Uniform Delay, d1	13.8	13.5	12.0	12.8	14.7	12.2	9.5	9.3		7.9	8.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.5	0.1	0.3	1.8	0.1	5.2	0.7		1.3	0.2	
Delay (s)	15.3	14.0	12.0	13.1	16.6	12.2	14.7	10.1		9.2	8.5	
Level of Service	B	B	B	B	B	B	B	B		A	A	
Approach Delay (s)		13.9			15.5			10.8			8.5	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	9.8
Intersection Capacity Utilization	70.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	950	90	14	87	770	168	166
Future Volume (vph)	950	90	14	87	770	168	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		4.2	4.6	4.6	4.6
Lane Util. Factor	0.95	1.00		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00
Frt	1.00	0.85		1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3505	1528		1752	3505	1752	1568
Flt Permitted	1.00	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3505	1528		1752	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1033	98	15	95	837	183	180
RTOR Reduction (vph)	0	32	0	0	0	0	115
Lane Group Flow (vph)	1033	66	0	110	837	183	65
Confl. Peds. (#/hr)		4		4			
Turn Type	NA	Perm	Prot	Prot	NA	Prot	Perm
Protected Phases	4		3	3	8	2	
Permitted Phases		4					2
Actuated Green, G (s)	23.1	23.1		6.0	33.3	13.2	13.2
Effective Green, g (s)	23.1	23.1		6.0	33.3	13.2	13.2
Actuated g/C Ratio	0.41	0.41		0.11	0.60	0.24	0.24
Clearance Time (s)	4.6	4.6		4.2	4.6	4.6	4.6
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1453	633		188	2095	415	371
v/s Ratio Prot	c0.29			c0.06	0.24	c0.10	
v/s Ratio Perm		0.04					0.04
v/c Ratio	0.71	0.10		0.59	0.40	0.44	0.17
Uniform Delay, d1	13.5	10.0		23.7	5.9	18.1	16.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	0.1		4.6	0.1	0.8	0.2
Delay (s)	15.2	10.0		28.3	6.0	18.9	17.1
Level of Service	B	B		C	A	B	B
Approach Delay (s)	14.7				8.6	18.0	
Approach LOS	B				A	B	

Intersection Summary			
HCM 2000 Control Delay	12.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	55.7	Sum of lost time (s)	13.4
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBU	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Vol, veh/h	1094	21	6	49	840	15	19
Future Vol, veh/h	1094	21	6	49	840	15	19
Conflicting Peds, #/hr	0	8	0	8	0	0	0
Sign Control	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	-	-	125	-	0	-
Veh in Median Storage, #	0	-	-	-	0	0	-
Grade, %	0	-	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	1176	23	6	53	903	16	20

Major/Minor	Major1		Major2			Minor1	
Conflicting Flow All	0	0	1199	1207	0	1766	608
Stage 1	-	-	-	-	-	1196	-
Stage 2	-	-	-	-	-	570	-
Critical Hdwy	-	-	6.46	4.16	-	6.86	6.96
Critical Hdwy Stg 1	-	-	-	-	-	5.86	-
Critical Hdwy Stg 2	-	-	-	-	-	5.86	-
Follow-up Hdwy	-	-	2.53	2.23	-	3.53	3.33
Pot Cap-1 Maneuver	-	-	245	568	-	74	436
Stage 1	-	-	-	-	-	247	-
Stage 2	-	-	-	-	-	526	-
Platoon blocked, %	-	-			-		
Mov Cap-1 Maneuver	-	-	489	489	-	65	433
Mov Cap-2 Maneuver	-	-	-	-	-	65	-
Stage 1	-	-	-	-	-	215	-
Stage 2	-	-	-	-	-	526	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	45.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	124	-	-	489	-
HCM Lane V/C Ratio	0.295	-	-	0.121	-
HCM Control Delay (s)	45.7	-	-	13.4	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	1.1	-	-	0.4	-

Intersection	
Int Delay, s/veh	21.7

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	3	28	1012	62	35	842	8	58	6	61	4	2	20
Future Vol, veh/h	3	28	1012	62	35	842	8	58	6	61	4	2	20
Conflicting Peds, #/hr	0	12	0	9	9	0	12	14	0	0	0	0	14
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	110	-	-	110	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	3	29	1054	65	36	877	8	60	6	64	4	2	21

Major/Minor	Major1				Major2			Minor1			Minor2		
Conflicting Flow All	885	897	0	0	1128	0	0	1686	2129	569	1559	2157	469
Stage 1	-	-	-	-	-	-	-	1160	1160	-	965	965	-
Stage 2	-	-	-	-	-	-	-	526	969	-	594	1192	-
Critical Hdwy	6.46	4.16	-	-	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.53	2.23	-	-	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	390	746	-	-	609	-	-	~ 60	48	463	75	47	538
Stage 1	-	-	-	-	-	-	-	206	266	-	272	329	-
Stage 2	-	-	-	-	-	-	-	501	328	-	456	257	-
Platoon blocked, %			-	-		-	-						
Mov Cap-1 Maneuver	674	674	-	-	604	-	-	~ 50	42	459	52	41	525
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	~ 50	42	-	52	41	-
Stage 1	-	-	-	-	-	-	-	194	251	-	256	306	-
Stage 2	-	-	-	-	-	-	-	443	305	-	365	243	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.4	$ 359	32.2
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	87	674	-	-	604	-	-	159
HCM Lane V/C Ratio	1.497	0.048	-	-	0.06	-	-	0.17
HCM Control Delay (s)	$ 359	10.6	-	-	11.3	-	-	32.2
HCM Lane LOS	F	B	-	-	B	-	-	D
HCM 95th %tile Q(veh)	10.2	0.2	-	-	0.2	-	-	0.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU
Lane Configurations												
Traffic Volume (vph)	9	147	776	146	16	125	757	227	95	641	198	5
Future Volume (vph)	9	147	776	146	16	125	757	227	95	641	198	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Lane Util. Factor		1.00	0.95	1.00		1.00	0.95		1.00	0.95	1.00	
Frpb, ped/bikes		1.00	1.00	0.96		1.00	0.99		1.00	1.00	0.97	
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Frt		1.00	1.00	0.85		1.00	0.97		1.00	1.00	0.85	
Flt Protected		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (prot)		1752	3505	1512		1752	3361		1752	3505	1514	
Flt Permitted		0.95	1.00	1.00		0.95	1.00		0.95	1.00	1.00	
Satd. Flow (perm)		1752	3505	1512		1752	3361		1752	3505	1514	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	9	150	792	149	16	128	772	232	97	654	202	5
RTOR Reduction (vph)	0	0	0	71	0	0	26	0	0	0	76	0
Lane Group Flow (vph)	0	159	792	78	0	144	978	0	97	654	126	0
Confl. Peds. (#/hr)				26				19			27	
Turn Type	Prot	Prot	NA	Perm	Prot	Prot	NA		Prot	NA	Perm	Prot
Protected Phases	7	7	4		3	3	8		5	2		1
Permitted Phases				4							2	
Actuated Green, G (s)		9.9	31.9	31.9		9.7	31.7		6.9	25.7	25.7	
Effective Green, g (s)		9.9	31.9	31.9		9.7	31.7		6.9	25.7	25.7	
Actuated g/C Ratio		0.10	0.34	0.34		0.10	0.33		0.07	0.27	0.27	
Clearance Time (s)		4.2	4.6	4.6		4.2	4.6		4.2	4.9	4.9	
Vehicle Extension (s)		3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)		182	1175	507		178	1120		127	947	409	
v/s Ratio Prot		c0.09	0.23			0.08	c0.29		0.06	c0.19		
v/s Ratio Perm				0.05							0.08	
v/c Ratio		0.87	0.67	0.15		0.81	0.87		0.76	0.69	0.31	
Uniform Delay, d1		42.0	27.1	22.1		41.8	29.8		43.3	31.1	27.6	
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00	
Incremental Delay, d2		33.9	1.5	0.1		23.0	7.7		23.4	2.2	0.4	
Delay (s)		75.9	28.7	22.3		64.8	37.5		66.7	33.3	28.1	
Level of Service		E	C	C		E	D		E	C	C	
Approach Delay (s)			34.6				40.9			35.6		
Approach LOS			C				D			D		

Intersection Summary			
HCM 2000 Control Delay	37.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	95.1	Sum of lost time (s)	17.9
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR
Lane Configurations			
Traffic Volume (vph)	155	484	113
Future Volume (vph)	155	484	113
Ideal Flow (vphpl)	1900	1900	1900
Total Lost time (s)	4.2	4.6	
Lane Util. Factor	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	
Frt	1.00	0.97	
Flt Protected	0.95	1.00	
Satd. Flow (prot)	1752	3385	
Flt Permitted	0.95	1.00	
Satd. Flow (perm)	1752	3385	
Peak-hour factor, PHF	0.98	0.98	0.98
Adj. Flow (vph)	158	494	115
RTOR Reduction (vph)	0	20	0
Lane Group Flow (vph)	163	589	0
Confl. Peds. (#/hr)			24
Turn Type	Prot	NA	
Protected Phases	1	6	
Permitted Phases			
Actuated Green, G (s)	9.9	29.0	
Effective Green, g (s)	9.9	29.0	
Actuated g/C Ratio	0.10	0.30	
Clearance Time (s)	4.2	4.6	
Vehicle Extension (s)	3.0	3.0	
Lane Grp Cap (vph)	182	1032	
v/s Ratio Prot	c0.09	c0.17	
v/s Ratio Perm			
v/c Ratio	0.90	0.57	
Uniform Delay, d1	42.1	27.8	
Progression Factor	1.00	1.00	
Incremental Delay, d2	38.4	0.8	
Delay (s)	80.5	28.6	
Level of Service	F	C	
Approach Delay (s)		39.5	
Approach LOS		D	

Intersection Summary

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	3	27	7	0	31	8	818	11	8	794	6
Future Vol, veh/h	8	3	27	7	0	31	8	818	11	8	794	6
Conflicting Peds, #/hr	2	0	2	2	0	2	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	9	3	29	8	0	34	9	889	12	9	863	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1356	1812	443	1368	1809	455	876	0	0	903	0	0
Stage 1	891	891	-	915	915	-	-	-	-	-	-	-
Stage 2	465	921	-	453	894	-	-	-	-	-	-	-
Critical Hdwy	7.56	6.56	6.96	7.56	6.56	6.96	4.16	-	-	4.16	-	-
Critical Hdwy Stg 1	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.56	5.56	-	6.56	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	4.03	3.33	3.53	4.03	3.33	2.23	-	-	2.23	-	-
Pot Cap-1 Maneuver	107	77	560	105	77	550	760	-	-	742	-	-
Stage 1	302	357	-	292	347	-	-	-	-	-	-	-
Stage 2	544	345	-	553	355	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	96	73	556	92	73	548	756	-	-	741	-	-
Mov Cap-2 Maneuver	96	73	-	92	73	-	-	-	-	-	-	-
Stage 1	293	346	-	284	338	-	-	-	-	-	-	-
Stage 2	497	336	-	505	344	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	25.1	19.7	0.2	0.2
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	756	-	-	220	286	741	-	-
HCM Lane V/C Ratio	0.012	-	-	0.188	0.144	0.012	-	-
HCM Control Delay (s)	9.8	0.1	-	25.1	19.7	9.9	0.1	-
HCM Lane LOS	A	A	-	D	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.5	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	330	81	58	268	47	135	608	86	131	645	123
Future Volume (vph)	79	330	81	58	268	47	135	608	86	131	645	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1746	1845	1543	1749	1845	1541	1750	3426		1745	3407	
Flt Permitted	0.55	1.00	1.00	0.45	1.00	1.00	0.29	1.00		0.33	1.00	
Satd. Flow (perm)	1008	1845	1543	821	1845	1541	535	3426		609	3407	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	85	355	87	62	288	51	145	654	92	141	694	132
RTOR Reduction (vph)	0	0	52	0	0	34	0	17	0	0	24	0
Lane Group Flow (vph)	85	355	35	62	288	17	145	729	0	141	802	0
Confl. Peds. (#/hr)	10		7	7		10	6		15	15		6
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)	15.5	15.5	15.5	15.2	15.2	15.2	20.8	20.8		20.8	20.8	
Effective Green, g (s)	15.5	15.5	15.5	15.2	15.2	15.2	20.8	20.8		20.8	20.8	
Actuated g/C Ratio	0.34	0.34	0.34	0.33	0.33	0.33	0.45	0.45		0.45	0.45	
Clearance Time (s)	4.6	4.6	4.6	4.9	4.9	4.9	4.9	4.9		4.9	4.9	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	341	624	522	272	612	511	242	1555		276	1547	
v/s Ratio Prot		c0.19			0.16			0.21			0.24	
v/s Ratio Perm	0.08		0.02	0.08		0.01	c0.27			0.23		
v/c Ratio	0.25	0.57	0.07	0.23	0.47	0.03	0.60	0.47		0.51	0.52	
Uniform Delay, d1	10.9	12.4	10.3	11.1	12.1	10.3	9.4	8.7		8.9	8.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	1.2	0.1	0.4	0.6	0.0	4.0	0.2		1.6	0.3	
Delay (s)	11.3	13.6	10.3	11.5	12.7	10.4	13.3	8.9		10.5	9.2	
Level of Service	B	B	B	B	B	B	B	A		B	A	
Approach Delay (s)		12.7			12.2			9.6			9.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	45.8	Sum of lost time (s)	9.8
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (vph)	3	2	596	142	1	88	675	7	93	4	69	9
Future Volume (vph)	3	2	596	142	1	88	675	7	93	4	69	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6			4.2	4.6			4.0		
Lane Util. Factor		1.00	0.95			1.00	0.95			1.00		
Frpb, ped/bikes		1.00	0.99			1.00	1.00			0.99		
Flpb, ped/bikes		0.99	1.00			1.00	1.00			1.00		
Frt		1.00	0.97			1.00	1.00			0.94		
Flt Protected		0.95	1.00			0.95	1.00			0.97		
Satd. Flow (prot)		1742	3385			1752	3498			1685		
Flt Permitted		0.95	1.00			0.95	1.00			0.97		
Satd. Flow (perm)		1742	3385			1752	3498			1685		
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	3	2	677	161	1	100	767	8	106	5	78	10
RTOR Reduction (vph)	0	0	15	0	0	0	0	0	0	26	0	0
Lane Group Flow (vph)	0	5	823	0	0	101	775	0	0	163	0	0
Confl. Peds. (#/hr)		11		3		3		11	8		1	1
Confl. Bikes (#/hr)				2								
Turn Type	Prot	Prot	NA		Prot	Prot	NA		Split	NA		Split
Protected Phases	7	7	4		3	3	8		2	2		6
Permitted Phases												
Actuated Green, G (s)		0.6	28.8			10.2	38.4			13.2		
Effective Green, g (s)		0.6	28.8			10.2	38.4			13.2		
Actuated g/C Ratio		0.01	0.39			0.14	0.52			0.18		
Clearance Time (s)		4.2	4.6			4.2	4.6			4.0		
Vehicle Extension (s)		3.0	3.0			3.0	3.0			3.0		
Lane Grp Cap (vph)		14	1313			240	1810			299		
v/s Ratio Prot		0.00	c0.24			0.06	c0.22			c0.10		
v/s Ratio Perm												
v/c Ratio		0.36	0.63			0.42	0.43			0.54		
Uniform Delay, d1		36.6	18.4			29.3	11.1			27.8		
Progression Factor		1.00	1.00			1.00	1.00			1.00		
Incremental Delay, d2		14.9	0.9			1.2	0.2			2.0		
Delay (s)		51.6	19.3			30.5	11.3			29.8		
Level of Service		D	B			C	B			C		
Approach Delay (s)			19.5				13.5			29.8		
Approach LOS			B				B			C		

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	74.2	Sum of lost time (s)	16.8
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	1	6
Future Volume (vph)	1	6
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	4.0	
Lane Util. Factor	1.00	
Frpb, ped/bikes	0.99	
Flpb, ped/bikes	1.00	
Frt	0.95	
Flt Protected	0.97	
Satd. Flow (prot)	1687	
Flt Permitted	0.97	
Satd. Flow (perm)	1687	
Peak-hour factor, PHF	0.88	0.88
Adj. Flow (vph)	1	7
RTOR Reduction (vph)	7	0
Lane Group Flow (vph)	11	0
Confl. Peds. (#/hr)		8
Confl. Bikes (#/hr)		1
Turn Type	NA	
Protected Phases	6	
Permitted Phases		
Actuated Green, G (s)	5.2	
Effective Green, g (s)	5.2	
Actuated g/C Ratio	0.07	
Clearance Time (s)	4.0	
Vehicle Extension (s)	3.0	
Lane Grp Cap (vph)	118	
v/s Ratio Prot	c0.01	
v/s Ratio Perm		
v/c Ratio	0.10	
Uniform Delay, d1	32.3	
Progression Factor	1.00	
Incremental Delay, d2	0.4	
Delay (s)	32.7	
Level of Service	C	
Approach Delay (s)	32.7	
Approach LOS	C	

Intersection Summary

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	3	28	1012	62	35	842	8	58	6	61	4	2
Future Volume (vph)	3	28	1012	62	35	842	8	58	6	61	4	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	4.6		4.2	4.6			4.0			4.0
Lane Util. Factor		1.00	0.95		1.00	0.95			1.00			1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00			1.00			0.98
Flpb, ped/bikes		1.00	1.00		1.00	1.00			1.00			1.00
Frt		1.00	0.99		1.00	1.00			0.93			0.90
Flt Protected		0.95	1.00		0.95	1.00			0.98			0.99
Satd. Flow (prot)		1752	3465		1752	3499			1683			1606
Flt Permitted		0.95	1.00		0.95	1.00			0.98			0.99
Satd. Flow (perm)		1752	3465		1752	3499			1683			1606
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	29	1054	65	36	877	8	60	6	64	4	2
RTOR Reduction (vph)	0	0	2	0	0	0	0	0	41	0	0	19
Lane Group Flow (vph)	0	32	1117	0	36	885	0	0	89	0	0	8
Confl. Peds. (#/hr)		12		9	9		12	14				
Turn Type	Prot	Prot	NA		Prot	NA		Split	NA		Split	NA
Protected Phases	7	7	4		3	8		2	2		6	6
Permitted Phases												
Actuated Green, G (s)		3.0	62.6		4.2	63.8			13.7			8.7
Effective Green, g (s)		3.0	62.6		4.2	63.8			13.7			8.7
Actuated g/C Ratio		0.03	0.59		0.04	0.60			0.13			0.08
Clearance Time (s)		4.2	4.6		4.2	4.6			4.0			4.0
Vehicle Extension (s)		3.0	3.0		3.0	3.0			3.0			3.0
Lane Grp Cap (vph)		49	2046		69	2106			217			131
v/s Ratio Prot		0.02	c0.32		0.02	c0.25			c0.05			c0.00
v/s Ratio Perm												
v/c Ratio		0.65	0.55		0.52	0.42			0.41			0.06
Uniform Delay, d1		51.0	13.1		49.9	11.2			42.4			44.9
Progression Factor		1.01	0.96		1.01	0.57			1.00			1.00
Incremental Delay, d2		24.8	1.0		4.8	0.4			1.3			0.2
Delay (s)		76.2	13.5		55.0	6.9			43.7			45.1
Level of Service		E	B		D	A			D			D
Approach Delay (s)			15.3			8.8			43.7			45.1
Approach LOS			B			A			D			D

Intersection Summary			
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	16.8
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	20
Future Volume (vph)	20
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.96
Adj. Flow (vph)	21
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	14
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection: 1: Orange Avenue & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	180	245	170	132	94	117	85	91
Average Queue (ft)	75	71	22	47	37	66	35	36
95th Queue (ft)	123	134	73	88	80	113	63	71
Link Distance (ft)	2539	2539			985	985	2529	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	50				75
Storage Blk Time (%)		4		9	2		0	1
Queuing Penalty (veh)		4		28	2		0	1

Intersection: 2: 9th Street & Ventura Avenue

Movement	WB	NB
Directions Served	UL	LR
Maximum Queue (ft)	31	78
Average Queue (ft)	5	21
95th Queue (ft)	23	58
Link Distance (ft)		1550
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	125	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: 10th Street & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	25	222	246	209	255	286	113	31
Average Queue (ft)	2	109	129	46	79	92	68	13
95th Queue (ft)	14	208	220	110	192	192	102	37
Link Distance (ft)		566	566		903	903	2559	2594
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	110			110				
Storage Blk Time (%)		8		0	4			
Queuing Penalty (veh)		0		0	4			

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	UL	T	T	R	UL	T	TR	L	T	T	R	UL
Maximum Queue (ft)	299	310	294	220	217	275	276	175	302	342	175	274
Average Queue (ft)	122	170	177	31	117	182	188	115	197	210	149	210
95th Queue (ft)	216	258	249	95	201	242	281	204	275	296	232	320
Link Distance (ft)		903	903			2530	2530		1232	1232		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			100	430			100			55	175
Storage Blk Time (%)	1	4	35					9	30	48	14	34
Queuing Penalty (veh)	4	6	24					33	32	103	51	85

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	473	372
Average Queue (ft)	225	194
95th Queue (ft)	409	314
Link Distance (ft)	2567	2567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	3	
Queuing Penalty (veh)	8	

Intersection: 5: Cedar Avenue & Lane Avenue

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	54	54	45	65	23	44
Average Queue (ft)	22	25	12	4	4	5
95th Queue (ft)	49	51	34	28	17	27
Link Distance (ft)	928	918	1251	1251	1232	1232
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Cedar Avenue & Butler Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	136	137	109	92	218	180	168	174	212	116	185	195
Average Queue (ft)	61	65	38	36	104	32	77	91	112	46	80	97
95th Queue (ft)	105	110	77	69	177	86	141	154	182	102	153	176
Link Distance (ft)		2555			2558			2582	2582		1251	1251
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	60		60	100		100	100			75		
Storage Blk Time (%)	10	9	2	0	9		7	4		9	6	
Queuing Penalty (veh)	31	17	5	0	11		29	7		24	4	

Network Summary

Network wide Queuing Penalty: 511

Intersection: 1: Orange Avenue & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	R	UL	T	T	L	R
Maximum Queue (ft)	202	237	170	149	165	162	239	195
Average Queue (ft)	113	121	36	73	67	81	99	65
95th Queue (ft)	186	212	113	129	142	149	192	143
Link Distance (ft)	2539	2539			985	985	2529	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			80	50				75
Storage Blk Time (%)		16		30	7		24	2
Queuing Penalty (veh)		14		115	7		39	4

Intersection: 2: 9th Street & Ventura Avenue

Movement	EB	WB	NB
Directions Served	TR	UL	LR
Maximum Queue (ft)	22	96	54
Average Queue (ft)	1	23	27
95th Queue (ft)	10	59	58
Link Distance (ft)	985		1550
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		125	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: 10th Street & Ventura Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	UL	T	TR	UL	T	TR	LTR	LTR
Maximum Queue (ft)	83	408	432	208	270	294	248	56
Average Queue (ft)	30	120	138	19	67	88	86	19
95th Queue (ft)	68	273	309	83	210	237	173	45
Link Distance (ft)		566	566		903	903	2559	2594
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	110			110				
Storage Blk Time (%)		10			5			
Queuing Penalty (veh)		3			2			

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	UL	T	T	R	UL	T	TR	L	T	T	R	UL
Maximum Queue (ft)	286	435	463	220	191	345	364	174	213	219	175	229
Average Queue (ft)	123	194	197	84	108	237	266	63	124	116	53	125
95th Queue (ft)	231	338	341	210	183	326	361	127	201	188	130	194
Link Distance (ft)		903	903			2530	2530		1232	1232		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			100	430			100			55	175
Storage Blk Time (%)	7	6	24	0				5	13	31	6	4
Queuing Penalty (veh)	26	10	34	2				15	12	62	18	10

Intersection: 4: Cedar Avenue & Ventura Avenue

Movement	SB	SB
Directions Served	T	TR
Maximum Queue (ft)	264	274
Average Queue (ft)	135	143
95th Queue (ft)	207	210
Link Distance (ft)	2567	2567
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	2	
Queuing Penalty (veh)	3	

Intersection: 5: Cedar Avenue & Lane Avenue

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	53	53	99	42	44	42
Average Queue (ft)	25	22	10	3	5	2
95th Queue (ft)	51	53	51	20	25	16
Link Distance (ft)	928	918	1251	1251	1232	1232
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: Cedar Avenue & Butler Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	TR	L	T	TR
Maximum Queue (ft)	140	440	140	80	345	180	139	130	172	134	133	149
Average Queue (ft)	77	197	58	40	154	37	71	75	90	65	62	73
95th Queue (ft)	147	353	144	76	262	117	130	123	146	127	120	138
Link Distance (ft)		2555			2558			2582	2582		1251	1251
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	60		60	100		100	100			75		
Storage Blk Time (%)	11	41	1	0	25		10	2		6	3	
Queuing Penalty (veh)	46	66	3	0	27		32	3		19	4	

Network Summary

Network wide Queuing Penalty: 573

Appendix K: Signal Warrants

Signal Warrant Analysis

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet

COUNT DATE 05/29/2019
CALC JB DATE 06/10/2019
CHK DATE

06	FRESNO	n/a	n/a
DIST	CO	RTE	KPM

Major St: **Ventura Avenue** — Critical Approach Speed 35 MPH
Minor St: **9th Street** — Critical Approach Speed 25 (Unposted) MPH

Critical speed of major street traffic > 64 km/h (40 mph)……………… ☐
or } RURAL (R)
In built up area of isolated community of < 10,000 population ……….. ☐
☑ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume

(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume

100% SATISFIED YES ☐ NO ☑
80 % SATISFIED YES ☐ NO ☑

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS) 1 U	1 R	2 or More U	2 or More R	7:00 a.m.	11:00 a.m.	12:00 p.m.	1:00 p.m.	2:00 p.m.	3:00 p.m.	4:00 p.m.	5:00 p.m.
Both Approaches	500	350	600	420	939	969	1149	1046	1175	1331	1338	1329
Major Street	(400)	(280)	(480)	(336)	939	969	1149	1046	1175	1331	1338	1329
Highest Approach	150	105	200	140	14	23	17	24	24	28	19	28
Minor Street	(120)	(84)	(160)	(112)	14	23	17	24	24	28	19	28

Hour

Condition B - Interruption of Continuous Traffic

100% SATISFIED YES ☐ NO ☑
80 % SATISFIED YES ☐ NO ☑

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS) 1 U	1 R	2 or More U	2 or More R	7:00 a.m.	11:00 a.m.	12:00 p.m.	1:00 p.m.	2:00 p.m.	3:00 p.m.	4:00 p.m.	5:00 p.m.
Both Approaches	750	525	900	630	939	969	1149	1046	1175	1331	1338	1329
Major Street	(600)	(420)	(720)	(504)	939	969	1149	1046	1175	1331	1338	1329
Highest Approach	75	53	100	70	14	23	17	24	24	28	19	28
Minor Street	(60)	(42)	(80)	(56)	14	23	17	24	24	28	19	28

Hour

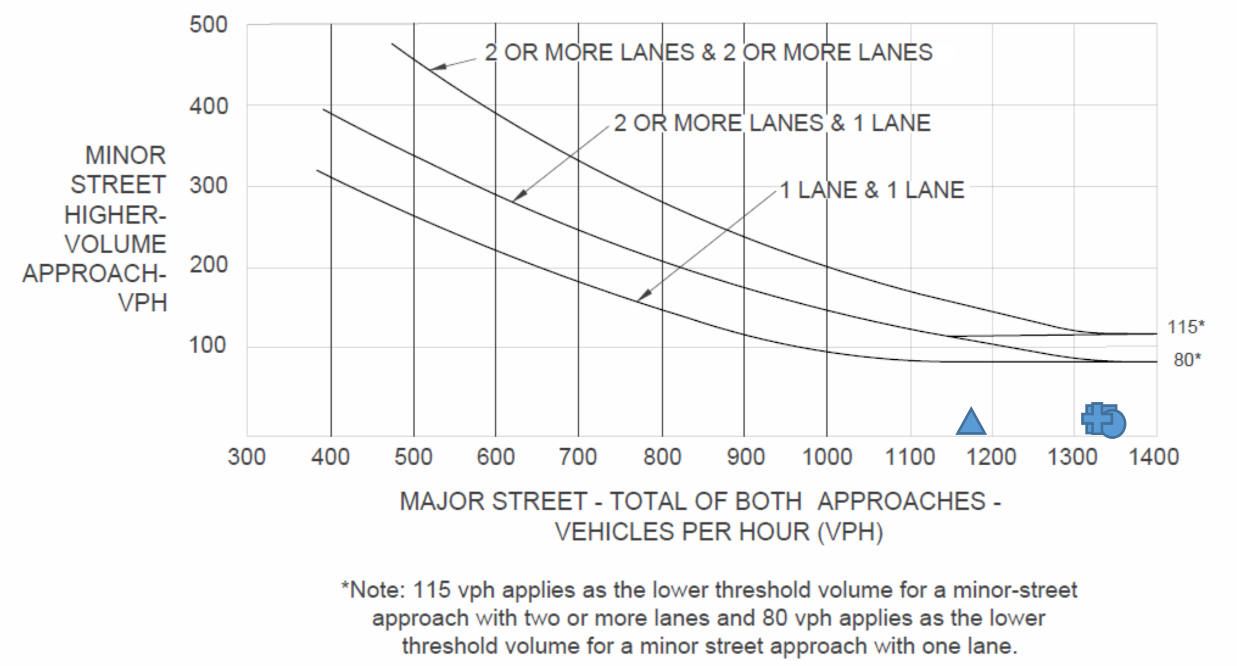
The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Combination of Conditions A & B **SATISFIED** **YES** ☐ **NO** ☑

REQUIREMENT	WARRANT	FULFILLED
TWO WARRANTS SATISFIED 80%	1. MINIMUM VEHICULAR VOLUME	Yes ☐ No ☑
	2. INTERRUPTION OF CONTINUOUS TRAFFIC	

Warrant 2: Four-Hour Vehicular Volume (Urban)

Existing Traffic Conditions
2. 9th Street / Ventura Avenue



9th Street / Ventura Avenue	*1 Lane & 1 Lane*	*2 or More Lanes & 1 Lane*	*2 or More Lanes & 2 or More Lanes*	▲ *2:00 PM Volume*	■ *3:00 PM Volume*	● *4:00 PM Volume*	✚ *5:00 PM Volume*
Ventura Avenue (Total of Both Approaches)	☐	☒	☐	1175	1331	1338	1329
9th Street (Higher Volume Approach)				24	28	19	28

Satisfied: ☐ **Yes** ☒ **No**

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Signal Warrant Analysis

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet

COUNT DATE 05/29/2019
CALC JB DATE 06/10/2019
CHK DATE

DIST	CO	RTE	KPM
06	FRESNO	n/a	n/a

Major St: **Ventura Avenue** Critical Approach Speed 35 MPH
Minor St: **10th Street** Critical Approach Speed 25 (Unposted) MPH

Critical speed of major street traffic > 64 km/h (40 mph)................. ☐
or RURAL (R)
In built up area of isolated community of < 10,000 population .... ☐

☑ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume

(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume

100% SATISFIED YES ☐ NO ☑
80 % SATISFIED YES ☐ NO ☑

		MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				Hour							
		U	R	U	R	11:00 a.m.	12:00 p.m.	1:00 p.m.	2:00 p.m.	3:00 p.m.	4:00 p.m.	5:00 p.m.	6:00 p.m.
APPROACH	LANES	1		2 or More									
Both Approaches Major Street		500	350	600	420	1024	1210	1098	1252	1402	1392	1383	991
		(400)	(280)	(480)	(336)	1024	1210	1098	1252	1402	1392	1383	991
Highest Approach Minor Street		150	105	200	140	36	28	32	35	46	44	46	38
		(120)	(84)	(160)	(112)	36	28	32	35	46	44	46	38

Condition B - Interruption of Continuous Traffic

100% SATISFIED YES ☐ NO ☑
80 % SATISFIED YES ☐ NO ☑

		MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				Hour							
		U	R	U	R	11:00 a.m.	12:00 p.m.	1:00 p.m.	2:00 p.m.	3:00 p.m.	4:00 p.m.	5:00 p.m.	6:00 p.m.
APPROACH	LANES	1		2 or More									
Both Approaches Major Street		750	525	900	630	1024	1210	1098	1252	1402	1392	1383	991
		(600)	(420)	(720)	(504)	1024	1210	1098	1252	1402	1392	1383	991
Highest Approach Minor Street		75	53	100	70	36	28	32	35	46	44	46	38
		(60)	(42)	(80)	(56)	36	28	32	35	46	44	46	38

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

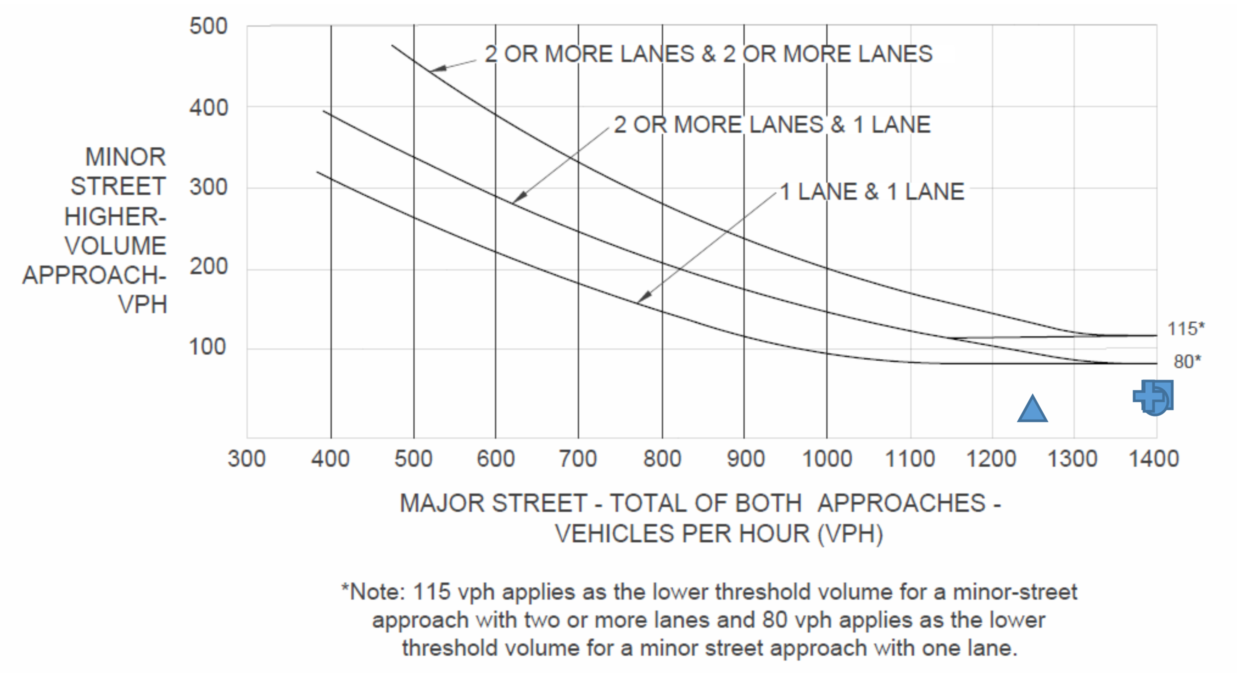
Combination of Conditions A & B **SATISFIED** **YES** ☐ **NO** ☑

REQUIREMENT	WARRANT		FULFILLED
TWO WARRANTS SATISFIED 80%	1. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☑
	2. INTERRUPTION OF CONTINUOUS TRAFFIC		

JLB Traffic Engineering, Inc.
Traffic Engineering, Transportation Planning & Parking Solutions
www.JLBtraffic.com
info@JLBtraffic.com
1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
(559) 570 - 8991

Warrant 2: Four-Hour Vehicular Volume (Urban)

Existing Traffic Conditions
3. 10th Street / Ventura Avenue



10th Street / Ventura Avenue	*1 Lane & 1 Lane*	*2 or More Lanes & 1 Lane*	*2 or More Lanes & 2 or More Lanes*	▲ *2:00 PM Volume*	■ *3:00 PM Volume*	● *4:00 PM Volume*	✚ *5:00 PM Volume*
Ventura Avenue (Total of Both Approaches)	☐	☒	☐	1252	1402	1392	1383
10th Street (Higher Volume Approach)				35	46	44	46

Satisfied: ☐ **Yes** ☒ **No**

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet

DIST	CO	RTE	KPM
06	FRESNO	n/a	n/a

COUNT DATE 05/29/19
CALC JB DATE 06/10/19
CHK DATE

Major St: **Cedar Avenue** Critical Approach Speed 40 MPH
Minor St: **Lane Avenue** Critical Approach Speed 25 (Unposted) MPH

Critical speed of major street traffic > 64 km/h (40 mph)................. ☐
or } RURAL (R)
In built up area of isolated community of < 10,000 population .... ☐
☑ URBAN (U)

WARRANT 1 - Eight Hour Vehicular Volume

(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume

100% SATISFIED YES ☐ NO ☑
80 % SATISFIED YES ☐ NO ☑

MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)													
	U	R	U	R	7:00 a.m.	12:00 p.m.	1:00 p.m.	2:00 p.m.	3:00 p.m.	4:00 p.m.	5:00 p.m.	6:00 p.m.	Hour
APPROACH LANES	1		2 or More										
Both Approaches Major Street	500	350	600	420	911	666	686	879	977	939	822	688	
	(400)	(280)	(480)	(336)	911	666	686	879	977	939	822	688	
Highest Approach Minor Street	150	105	200	140	32	24	27	27	18	33	32	27	
	(120)	(84)	(160)	(112)	32	24	27	27	18	33	32	27	

Condition B - Interruption of Continuous Traffic

100% SATISFIED YES ☐ NO ☑
80 % SATISFIED YES ☐ NO ☑

MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)													
	U	R	U	R	7:00 a.m.	12:00 p.m.	1:00 p.m.	2:00 p.m.	3:00 p.m.	4:00 p.m.	5:00 p.m.	6:00 p.m.	Hour
APPROACH LANES	1		2 or More										
Both Approaches Major Street	750	525	900	630	911	666	686	879	977	939	822	688	
	(600)	(420)	(720)	(504)	911	666	686	879	977	939	822	688	
Highest Approach Minor Street	75	53	100	70	32	24	27	27	18	33	32	27	
	(60)	(42)	(80)	(56)	32	24	27	27	18	33	32	27	

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Combination of Conditions A & B **SATISFIED** **YES** ☐ **NO** ☑

REQUIREMENT	WARRANT		FULFILLED
TWO WARRANTS SATISFIED 80%	1. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☑
	2. INTERRUPTION OF CONTINUOUS TRAFFIC		

JLB Traffic Engineering, Inc.
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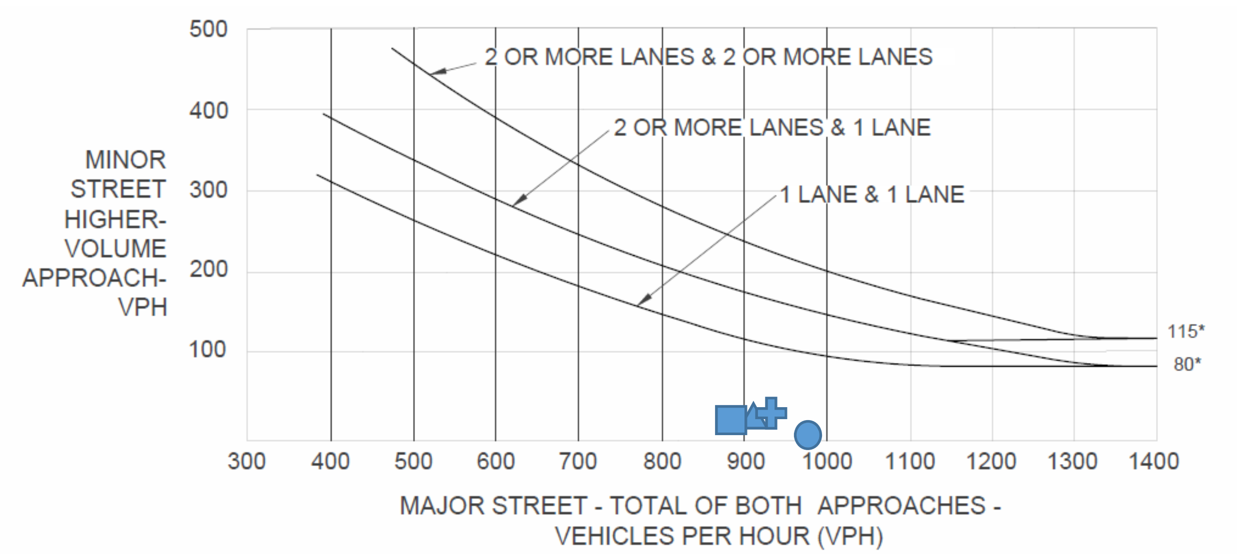
Warrant 2: Four-Hour Vehicular Volume (Urban)

Existing Traffic Conditions
5. Cedar Avenue / Lane Avenue



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor street approach with one lane.

Cedar Avenue / Lane Avenue	*1 Lane & 1 Lane*	*2 or More Lanes & 1 Lane*	*2 or More Lanes & 2 or More Lanes*	*7:00 AM Volume* (▲)	*2:00 PM Volume* (■)	*3:00 PM Volume* (●)	*4:00 PM Volume* (✚)
Cedar Avenue (Total of Both Approaches)	☐	☒	☐	911	879	977	939
Lane Avenue (Higher Volume Approach)				32	27	18	33

Satisfied: ☐ **Yes** ☒ **No**

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

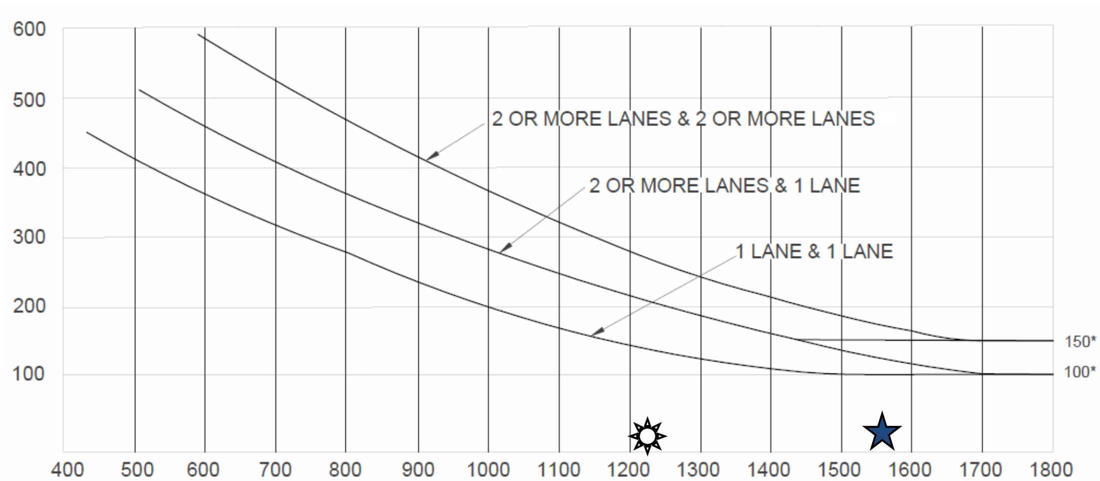
Warrant 3: Peak Hour (Urban)

Existing plus Project Traffic Conditions

2. 9th Street/ Ventura Avenue

AM (PM) Peak Hour

9th Street Highest Approach Volume = 20 (24) VPH



Ventura Avenue Total of Both Approaches = 1220 (1563) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

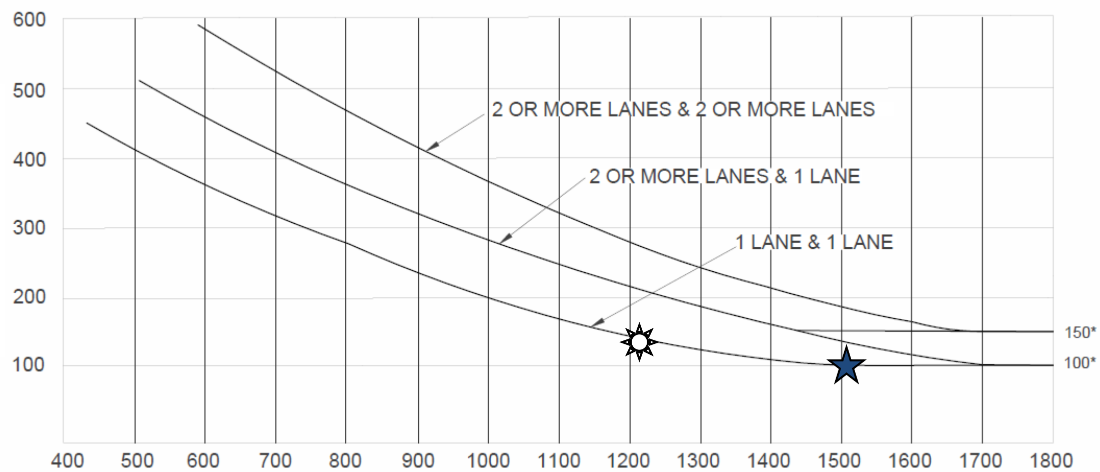
PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warrant 3: Peak Hour (Urban)

Existing plus Project Traffic Conditions
3. 10th Street / Ventura Avenue
AM (PM) Peak Hour

10th Street Highest Approach Volume = 130 (94) VPH



Ventura Avenue Total of Both Approaches = 1212 (1507) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

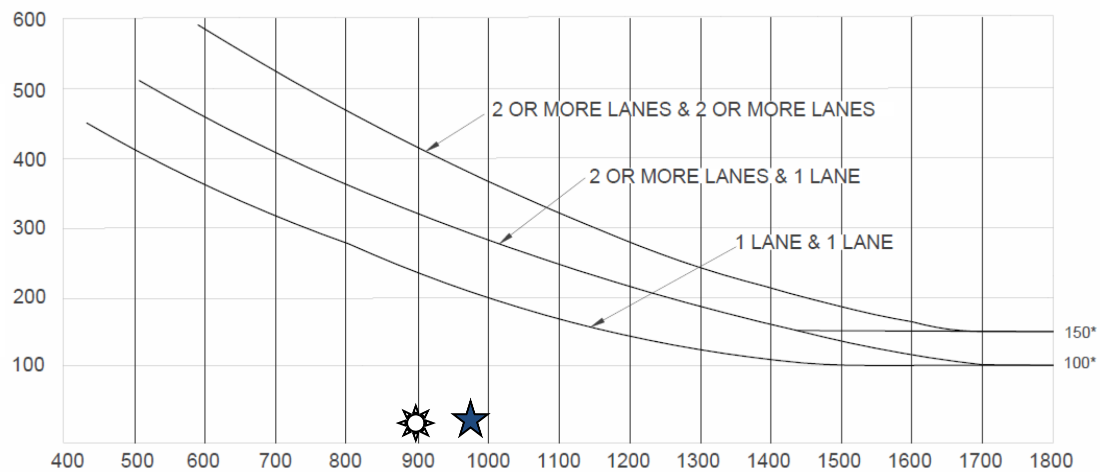
PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warrant 3: Peak Hour (Urban)

Existing plus Project Traffic Conditions
5. Cedar Avenue / Lane Avenue
AM (PM) Peak Hour

Lane Avenue Highest Approach Volume = 24 (25) VPH



Cedar Avenue Total of Both Approaches = 895 (968) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

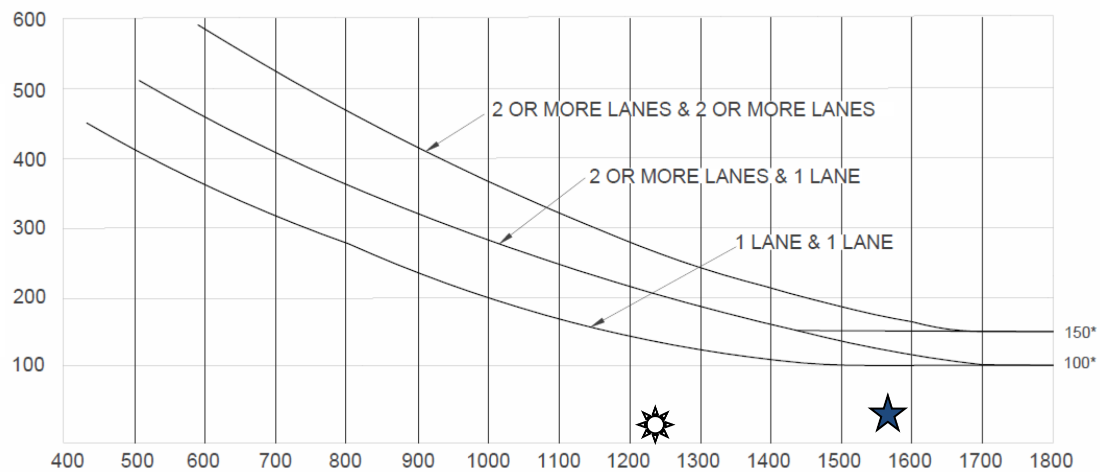
PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warant 3: Peak Hour (Urban)

Near Term plus Project Traffic Conditions
2. 9th Street/ Ventura Avenue
AM (PM) Peak Hour

9th Street Highest Approach Volume = 22 (25) VPH



Ventura Avenue Total of Both Approaches = 1238 (1578) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

☼ **AM Peak Hour – Signal Warrant is Not Met**

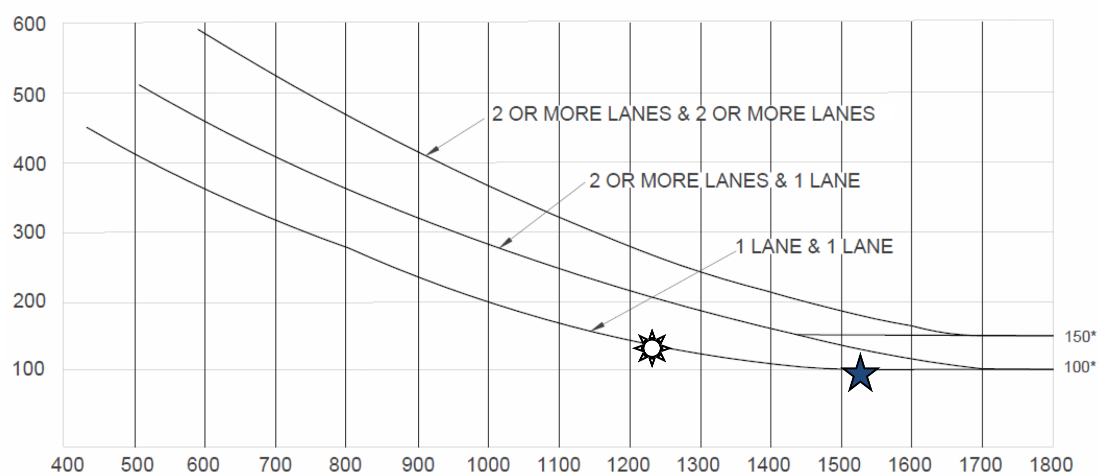
★ **PM Peak Hour – Signal Warrant is Not Met**

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warrant 3: Peak Hour (Urban)

Near Term plus Project Traffic Conditions
3. 10th Street / Ventura Avenue
AM (PM) Peak Hour

10th Street
Highest Approach Volume =
132 (95) VPH



Ventura Avenue Total of Both Approaches =
1235 (1526) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met
PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

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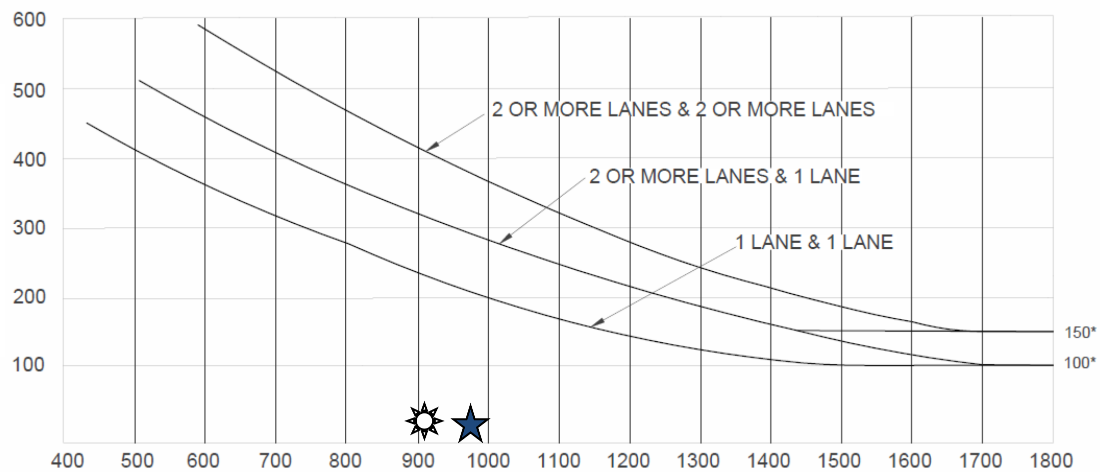
Warrant 3: Peak Hour (Urban)

Near Term plus Project Traffic Conditions
5. Cedar Avenue / Lane Avenue
AM (PM) Peak Hour

Lane Avenue Highest Approach Volume = 26 (25) VPH



Cedar Avenue Total of Both Approaches = 911 (982) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

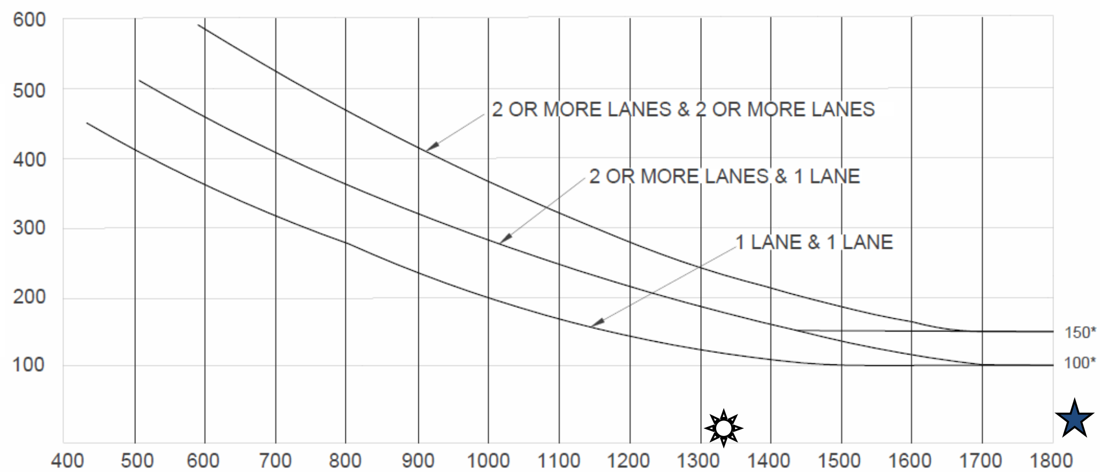
AM Peak Hour – Signal Warrant is Not Met
PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 No Project Traffic Conditions
2. 9th Street/ Ventura Avenue
AM (PM) Peak Hour

9th Street Highest Approach Volume = 22 (25) VPH



Ventura Avenue Total of Both Approaches = 1333 (1936) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

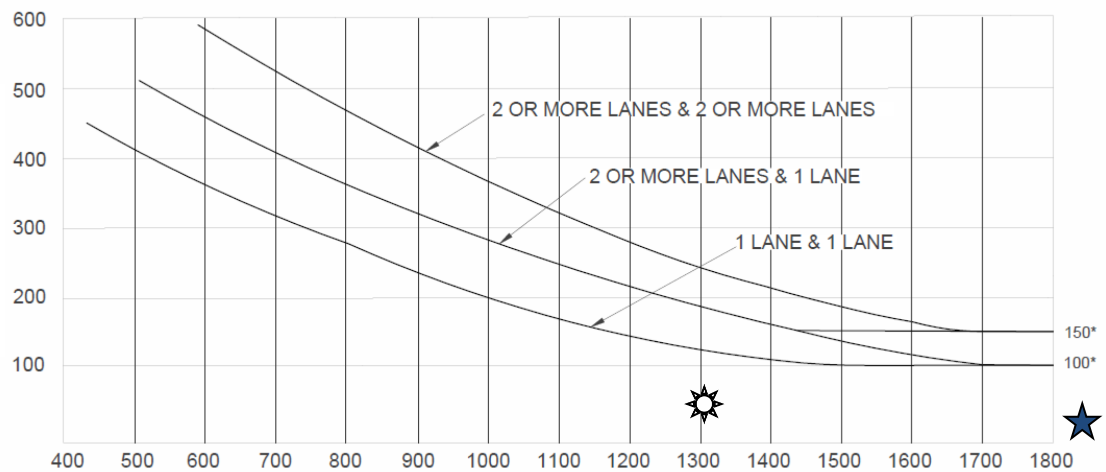
AM Peak Hour – Signal Warrant is Not Met
PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 No Project Traffic Conditions
3. 10th Street / Ventura Avenue
AM (PM) Peak Hour

10th Street Highest Approach Volume = 52 (28) VPH



Ventura Avenue Total of Both Approaches = 1306 (1949) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

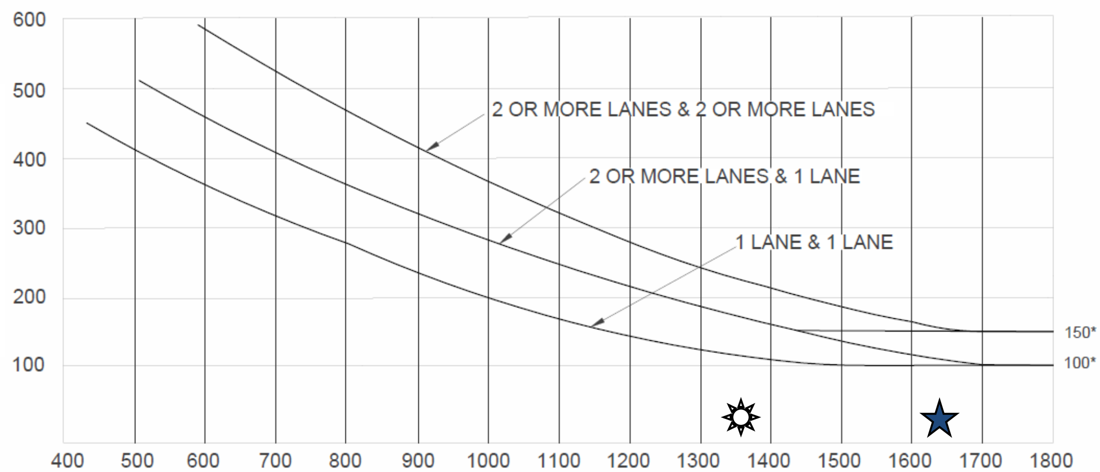
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 No Project Traffic Conditions
5. Cedar Avenue / Lane Avenue
AM (PM) Peak Hour

Lane Avenue

Highest Approach Volume =

25 (23) VPH



Cedar Avenue Total of Both Approaches =

1364 (1638) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

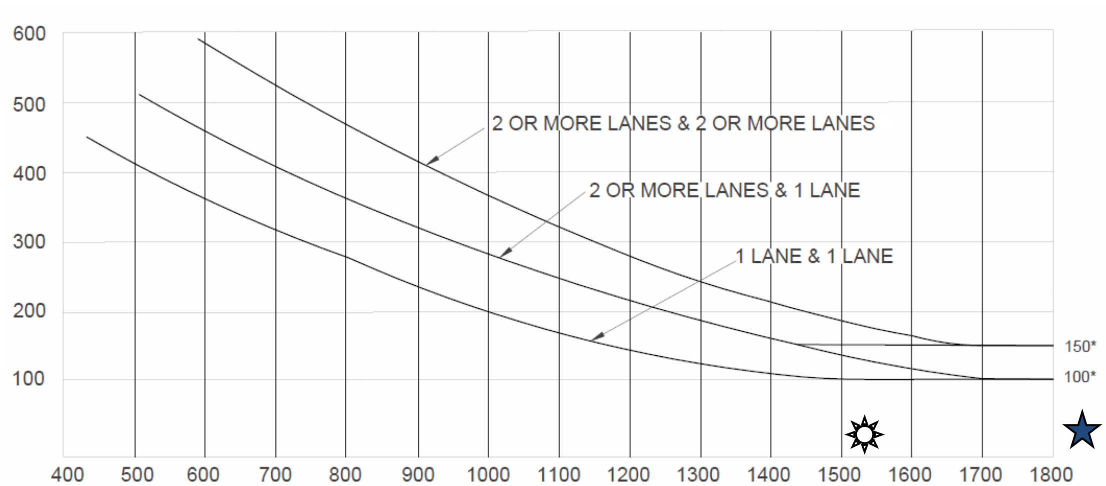
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 plus Project Traffic Conditions
2. 9th Street/ Ventura Avenue
AM (PM) Peak Hour

9th Street

Highest Approach Volume =

22 (25) VPH



Ventura Avenue Total of Both Approaches =

1526 (2010) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

☼ **AM Peak Hour – Signal Warrant is Not Met**

★ **PM Peak Hour – Signal Warrant is Not Met**

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

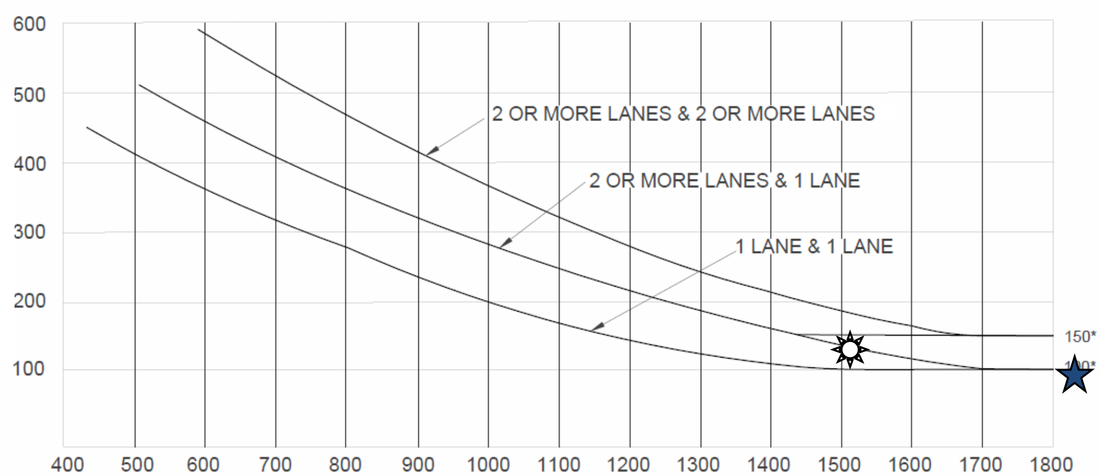
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 plus Project Traffic Conditions
3. 10th Street / Ventura Avenue
AM (PM) Peak Hour

10th Street

Highest Approach Volume =

132 (95) VPH



Ventura Avenue Total of Both Approaches =

1514 (1990) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014

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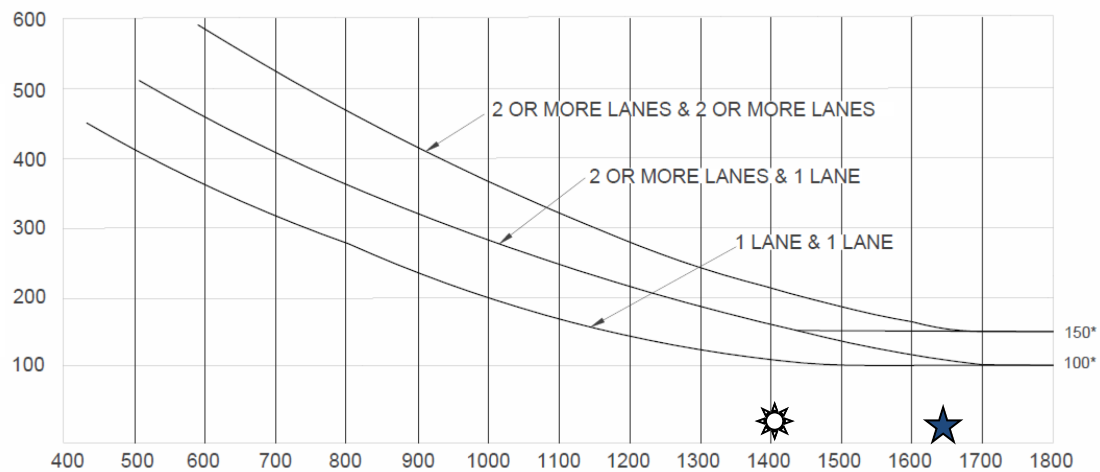
Warrant 3: Peak Hour (Urban)

Cumulative Year 2035 plus Project Traffic Conditions
5. Cedar Avenue / Lane Avenue
AM (PM) Peak Hour

Lane Avenue Highest Approach Volume = 26 (25) VPH



Cedar Avenue Total of Both Approaches = 1402 (1645) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

AM Peak Hour – Signal Warrant is Not Met

PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014