Public Draft Environmental Impact Report

231 Grant Educator Workforce Housing

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EXECUTIVE SUMMARY

This Environmental Impact Report is an informational document prepared pursuant to the California Environmental Quality Act (CEQA), Public Resources Code (PRC) Section 21000 et seq., that is intended to disclose to the public and decision-makers the environmental consequences of the proposed 231 Grant Educator Workforce Housing Project (Project).

This executive summary highlights the major areas of importance in the environmental analysis for the Project, as required by Title 14, California Code of Regulations (CCR), Section 15123 of the CEQA Guidelines (CEQA Guidelines). This executive summary includes (1) a summary description of the proposed project, (2) a synopsis of environmental impacts and recommended mitigation measures (Table ES-1), a summary description of cumulative impacts (Table ES-1), (3) identification of the alternatives evaluated, and (4) a discussion of the areas of controversy associated with the Project.

Summary of the Proposed Project

Project Location and Setting

The project site is at 231 Grant Avenue in the City of Palo Alto and is owned by the County of Santa Clara (County). It is approximately 1.4 acres and is bounded by Park Boulevard, Grant Avenue, and Birch Street, within the Mayfair neighborhood of Palo Alto. An approximately 6,800-square-foot single-story office building completed in 1956 and an associated parking area occupy the project site and is used by the County of Santa Clara Office of the Public Defender. The Assessor's Parcel Numbers [APN] for the project site are 132-31-074 and 984-88-004.

Project Description

The Project would involve demolition of the existing 6,800-square-feet (SF) office building and construction of a new four-story building, totaling approximately 115,000 SF, on the approximately 1.4-acre site. The building would be developed with approximately 110 residential units and associated amenities, resulting in a residential density of just under 79 dwelling units per acre.

Project Objectives

The 231 Grant Educator Workforce Housing Project is currently sponsored by the County of Santa Clara; Facebook; the City of Palo Alto; four Santa Clara County School Districts (Los Altos, Palo Alto, Mountain View Whisman, Mountain View Los Altos); and the Foothill-De Anza Community College District.

The objectives of the Project are to:

1) Provide at least 60 rental housing units for teachers and classified staff in targeted school districts within Santa Clara County and a sufficient number of units to meet the Facebook grant criteria, delivered at an accelerated pace.

2) Provide housing that is affordable to a range of incomes from low-income to incomes at or slightly above the area median income[1].

3) Provide housing that is high-quality and compatible with the surrounding neighborhood, while still maintaining development and operational cost efficiencies.

4) Provide housing that maximizes the number of units on the site.

5) Provide housing that is close to public transit

6) Incorporate innovative technologies and sustainability measures.

7) Provide desirable public and residential amenity spaces.

8) Provide easily accessible bicycle parking and encourage the use of alternative forms of transportation to nearby employment and transit.

Summary of Environmental Impacts and Mitigation Measures

Table ES-1 summarizes all of the impacts of the proposed Project, identifies the significance determination of each impact, and presents the full text of the recommended mitigation measures for each impact. A complete discussion of impacts and associated mitigation measures is presented in Section 3, "Environmental Setting and Impact Assessment," of this EIR.

Potentially significant environmental impacts of the proposed Project have been identified in relation to air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology, noise and vibration, transportation, and tribal cultural resources, as discussed further below. No impacts related to agricultural and forestry resources, land use and planning, mineral resources, and wildfire would occur as a result of the Project. All other impacts related to the physical environment (e.g., aesthetics, energy, greenhouse gas emissions, population and housing, public services and recreation, and utilities and service systems) would be less than significant and would not require implementation of mitigation measures.

Potentially significant environmental impacts of the Project are summarized below and fall within two categories: significant impacts that would remain significant even with mitigation (significant and unavoidable), and potentially significant impacts that could be mitigated to a less-than-significant level. See Table ES-1 for a summary of all Project and cumulative impacts, and recommended mitigation measures.

- Significant and Unavoidable Impacts:
  - Impact NOI-1: Project construction would result in generation of a substantial temporary increase in ambient noise levels (project-level and cumulative).

[1] The area median income is the midpoint of a region's income distribution, meaning that half of households in a region earn more than the median and half earn less than the median. For households and families, the median income is based on the distribution of the total number of households and families including those with no income. The median income for individuals is based on individuals 15 years old and over with income.

  - Impact NOI-2: Project construction would result in generation of substantial temporary vibration levels (project-level).

  Although mitigation measures have been proposed that would minimize or lessen these impacts, the impacts would not be reduced to a level that is less than significant.

- Potentially significant impacts that would be reduced to less than significant with mitigation:
  - Impact AIR-2: Project construction could result in fugitive dust emissions.
  - Impact BIO-4: Project construction could disturb nesting birds.
  - Impact CUL-1: Project construction could result in vibration damage to a potentially historic resource.
  - Impact CUL-2: Project construction could disturb previously unidentified cultural resources.
  - Impact GEO-3: Project construction could result in destabilization of the adjacent building foundations.
  - Impact GEO-6: Project construction could disturb unique paleontological resources.
  - Impact HAZ-3: Project construction could result in human health and environmental hazards if contaminated groundwater is improperly contained, treated, and discharged. Project operations could expose future residents and site users to vapor intrusion risks.
  - Impact HYD-1: Project construction could result in violation of water quality standards if contaminated groundwater is improperly contained, treated, and discharged.
  - Impact HYD-5: Project construction could conflict with the provisions of the San Francisco Bay Basin Plan if contaminated groundwater is improperly contained, treated, and discharged.
  - Impact TRA-3: Project operation could increase the potential for bicycle/vehicle or pedestrian/vehicle accidents.
  - Impact TCR-1: Project construction could disturb previously unidentified tribal cultural resources.

Summary of Project Alternatives

The alternatives discussion of this EIR was prepared in accordance with Section 15126(d) of the CEQA Guidelines and focuses on alternatives that are capable of eliminating or reducing significant adverse effects associated with the Project while feasibly attaining most of the basic objectives. The following discussion summarizes the alternatives evaluated in this EIR. See Chapter 4, “Alternatives,” for additional detail.

- **No Project Alternative:** CEQA Guidelines Section 15126.6(e) requires that an EIR analyze a “No Project” alternative. The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the project with the impacts of not approving the project. The No Project Alternative reflects the conditions that would reasonably be expected to occur in the foreseeable future if the project were not approved (CEQA Guidelines Section 15126.6(e)). Under the No Project Alternative, the existing single-story office building would not be demolished, and no construction or site improvements would occur at the site. The existing building would continue to be used by the County of Santa Clara Office of the Public Defender and various community groups.

- **Alternative 1 – Traditional Construction Methods:** Alternative 1 would be identical to the proposed Project, except that it would utilize traditional "stick-built" construction methods rather than modular construction methods. All operational components, including the number of residential units and associated amenities, flex space and public amenities, size and layout of the proposed building, landscaping, access, and utilities, would be the same as described for the Project.
- **Alternative 2 – Reduced-Scale Alternative:** Alternative 2 would demolish the existing 6,800-square-feet (SF) office building and would construct a new three-story building, totaling approximately 75,000 SF, on the approximately 1.4-acre site. The building would be developed with approximately 63 residential units (compared to the Project's 110 units) and associated amenities, resulting in a residential density of 45 dwelling units per acre (compared to approximately 79 units per acre for the Project). Modular construction methods would be used, similar to that described for the Project.

Environmentally Superior Alternative

CEQA requires that, among the alternatives, an "environmentally superior" alternative be selected and that the reasons for such selection be disclosed. In general, the environmentally superior alternative is the alternative that would generate the fewest or least severe adverse impacts. For the purposes of this EIR, the No Project Alternative is environmentally superior, because it would have reduced impacts compared to the Project with regard to the greatest number of environmental impact areas and would avoid the Project's significant and unavoidable noise and vibration impacts.

When the No Project Alternative is the environmentally superior alternative, CEQA requires that an additional alternative be identified. In this case, the next environmentally superior alternative would be Alternative 2. Although Alternative 2 would still result in a substantial temporary increase in noise and vibration levels during construction that would be significant and unavoidable, the degree and duration of the substantial temporary increases would be less than for the Project. In addition, Alternative 2 would avoid the potentially significant hydrology impacts of the Project, and would avoid some less than significant aesthetics and geology impacts.

Areas of Controversy

Section 15213 of the CEQA Guidelines requires that the lead agency identify areas of controversy and issues to be resolved, including issues raised by other agencies and the public. The Notice of Preparation and comments received in response to the Notice of Preparation are included in Appendix A and are discussed in Section 1.2.1, "Notice of Preparation and Scoping Meeting" of this Draft EIR.

The following issues were raised through scoping and comments on the Notice of Preparation that could be considered controversial:

- Request that the Project should be designed to suit the existing development in the neighborhood.
- Request for analysis of construction activities on the potential release of volatile organic compounds from the California-Olive-Emerson regional groundwater plume and proper disposal of contaminated groundwater, if encountered during construction. The City of Palo Alto also stated that although not part of CEQA, the County would need to coordinate with the Regional Water Quality Control Board, Department of Toxic Substances Control, and/or the County Department of Environmental Health to identify appropriate measures for the safety of future Project residents/users relating to the groundwater plume.
- The City of Palo Alto provided a Comprehensive Plan conformity analysis discussing the Project's consistency with the Comprehensive Plan's land use designation of the project site and consistency of the Project with the City's Housing Element and Land Use Element. The County reviewed and considered the comments provided by the City of Palo Alto and those comments have been addressed in the discussion of Impact LUP-2.
- Recognition that the Project is a critical and needed housing complex for educator workforce employees that will serve as a model for other communities and demonstrate how partnerships can create much needed housing.
- Support for teachers and educators to be able to live within the community they serve.
- Request that the Project include some public space and green space.
- Concern regarding potential impacts from new curb cuts on Park Boulevard to bicycles using the existing bike route.
- Concern that the Project may contribute to residents' concerns regarding volume and speed of traffic in the area, and request to consider traffic calming measures if appropriate.
- Concern regarding cumulative impacts of construction from the Project and the City's Public Service Building construction.
- Request that information regarding number of truck trips, wide loads, etc. associated with the modular construction method be included as part of the environmental analysis.
- The City of Palo Alto stated that oversized vehicle and encroachment permits would be required, and that a Traffic Control Plan would need to be submitted for the City's review and approval prior to construction.
- The City of Palo Alto stated that its adopted thresholds for VMT may differ from the County's thresholds and requested that the City's thresholds be used in-lieu of, or in addition to, the County's thresholds.
- The City of Palo requested that a separate local traffic analysis be prepared (outside of CEQA) so that the local impacts of the proposed development can be understood in accordance with the City of Palo Alto's Local Transportation Impact Analysis Policy and the City's Comprehensive Plan, even though level of service analysis is not required under CEQA in accordance with SB 743 (PRC Section 21099(b)(2); CEQA Guidelines Section 15064.3).

Issues to be Resolved

The State CEQA Guidelines require that an EIR present issues to be resolved by the lead agency. These issues include the choice among alternatives and whether or how potentially significant impacts can be mitigated. The major issues to be resolved by the County regarding the Project are whether:

- the recommended mitigation measures should be adopted or modified;
- there are any additional mitigation measures that should be applied to the proposed Project; and
- the proposed Project, a project alternative, or no project should be approved.

Table ES-1: Summary of Impacts and Mitigation Measures

Summary of Impacts and Mitigation	Level of Significance
Impact AES-1: Scenic Vistas The Project would not have a substantial adverse effect on a scenic vista. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact AES-2: Scenic Resources The Project would not substantially damage scenic resources. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact AES-3: Scenic Quality The Project would not conflict with applicable zoning and other regulations governing scenic quality. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact AES-4: Light and Glare The Project would not create a new source of substantial light or glare. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-AES-3: Cumulative Scenic Quality The overall cumulative impact on scenic quality would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-AES-4: Cumulative Light and Glare The overall cumulative impact for new sources of light and glare would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact AIR-1: Air Quality Plan Conflicts The Project would not conflict with or obstruct implementation of applicable air quality plans. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact AIR-2: Net Increase in Criteria Pollutants The Project could 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.	Before Mitigation: PS

Summary of Impacts and Mitigation	Level of Significance
Mitigation: MM-AIR-2: Fugitive Dust Reduction Measures The Developer shall comply with all of the following BAAQMD best management practices for reducing construction emissions of uncontrolled fugitive dust (PM10 and PM2.5): • All exposed surfaces (e.g., parking areas, staging areas, soil piles, stockpiles, graded areas, and unpaved access roads) shall be watered twice daily, or as often as needed, treated with non-toxic soil stabilizers, or covered to control dust emissions. Watering shall be sufficient to prevent airborne dust from the leaving the site. • All haul trucks transporting soil, sand, or other loose material off site shall be covered. • All visible mud or dirt track-out onto adjacent public roads and paved access roads shall be removed using wet power (with reclaimed water, if possible) vacuum street sweepers at least once per day, or as often as needed. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 miles per hour. • All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. • Idling times shall be minimized either by shutting equipment off when not in use or by reducing the maximum idling time to 5 minutes (as required by California airborne toxics control measure Title 13 CCR Section 2485). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. • A publicly visible sign shall be posted with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 48 hours. BAAQMD's phone number also shall be visible to ensure compliance with applicable regulations. The Developer's project manager or his/her designee shall verify compliance that these measures are included in the Project's grading plan and have been implemented during normal construction site inspections.	After Mitigation: LTSM
Impact AIR-3: Exposure of Sensitive Receptors The Project would not expose sensitive receptors to substantial pollutant concentrations.	Before Mitigation: LTS
Mitigation: none required	After Mitigation: N/A
Impact AIR-4: Other Emissions Including Odors The Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people	Before Mitigation: LTS
Mitigation: none required	After Mitigation: N/A
Impact C-AIR-1: Cumulative Air Quality Plan Conflicts or Net Increase in Criteria Pollutants The overall cumulative impact would be potentially significant.	Before Mitigation: PS
Mitigation: MM-AIR-2 (detailed for Impact AIR-2)	After Mitigation: LTSM
Impact C-AIR-2: Cumulative Exposure of Sensitive Receptors to Pollutants or Other Emissions The overall cumulative impact would be less than significant.	Before Mitigation: LTS
Mitigation: none required	After Mitigation: N/A

Summary of Impacts and Mitigation	Level of Significance
Impact BIO-1: Candidate, Sensitive, or Special Status Species The Project would not have a substantial adverse effect on any species identified as a candidate, sensitive, or special-status species. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact BIO-2: Riparian Habitat or Other Sensitive Natural Communities The project would not have a substantial adverse effect on any riparian habitat or other sensitive natural communities. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact BIO-3: State or Federally Protected Wetlands The Project would not have a substantial adverse effect on state or federally protected wetlands. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact BIO-4: Fish or Wildlife Movement, Migration or Nursery Sites The Project could interfere substantially with the movement of any native resident or migratory fish or wildlife species. Mitigation: <u>MM-BIO-4: Nesting Bird Avoidance Measures</u> To the extent practicable, demolition and construction activities and any tree trimming/removal shall be performed from September 16 through January 14 to avoid the general nesting period for birds. If demolition or construction cannot be performed during this period, nesting bird surveys and active nest buffers (as necessary) shall be implemented as follows: • Nesting Bird Surveys: If Project-related demolition or construction work is scheduled during the nesting season (typically February 15 to August 30 for small bird species such as passerines; January 15 to September 15 for owls; and February 15 to September 15 for other raptors), the Developer shall retain a qualified biologist to conduct two surveys for active nests of such birds within 14 days prior to the beginning of the demolition or construction work, with the final survey conducted within 48 hours prior to demolition or construction. Appropriate minimum survey radii surrounding the work area are typically the following: i) 50 feet for passerines; ii) 300 feet for raptors. Surveys shall be conducted at the appropriate times of day and during appropriate nesting times, as determined by the qualified biologist. • Active Nest Buffers: If the qualified biologist documents active nests within the project area or in nearby surrounding areas, an appropriate buffer between the nests and active demolition and construction activities shall be established. The buffer shall be clearly marked and maintained until all of the young have fledged and are foraging independently. Prior to demolition and construction, the qualified biologist shall conduct baseline monitoring of the nests to characterize “normal” bird behavior and establish a buffer distance which allows the birds to exhibit normal behavior. The qualified biologist shall monitor the nesting birds daily during construction activities and increase the buffer if the birds show signs of unusual or distressed behavior (e.g., defensive flights and vocalizations, standing up from a brooding position, and/or flying away from the nest). If buffer establishment is not possible, all demolition and construction work in the area shall cease until the young have fledged and the nest is no longer active. Work may only continue without the establishment of a buffer if a permit and authorization from USFWS are obtained in accordance with the MBTA.	Before Mitigation: PS After Mitigation: LTSM
Impact BIO-5: Local Policy or Ordinance Conflicts The Project would not conflict with any local policies or ordinances protecting biological resources. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A

Summary of Impacts and Mitigation	Level of Significance
Impact BIO-6: Habitat Conservation Plan or Natural Community Conservation Plan Conflicts The Project would not conflict with the provisions of an approved local, regional, or state habitat conservation plan. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact C-BIO-4: Cumulative Impacts to Fish or Wildlife Movement, Migration or Nursery Sites The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-BIO-5: Cumulative Conflicts with Local Ordinances The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact CUL-1: Historical Resources The Project would not cause a substantial adverse change in the significance of a historical resource. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact CUL-2: Archaeological Resources The Project could cause a substantial adverse change in the significance of an archaeological resource. Mitigation: <u>MM-CUL-2: Inadvertent Discovery of Prehistoric, Historic, or Tribal Cultural Resources</u> A. Prior to the start of earthmoving activities, the Developer shall implement a worker environmental awareness program for all construction personnel involved with excavation activities. The program shall include training to inform workers regarding the possibility of encountering buried cultural resources (including tribal cultural resources), the appearance and types of resources likely to be seen during construction, and proper notification procedures to be followed should resources be encountered. B. During all ground disturbing activities (e.g., excavation, grading, and utility trenching) occurring in areas of the project site and/or at depths that have not already been disturbed during prior phases of Project construction, the Developer shall retain a qualified tribal cultural resources monitor to undertake construction monitoring at the project site. Where feasible, the tribal cultural resources monitor shall be a representative of the Tamien Nation. The frequency of monitoring shall be determined based on the rate of excavation and grading activities, the materials being excavated, the depth and location of excavation, and, if found, the abundance and type of archaeological resources encountered. Monitoring activities may be curtailed if the tribal cultural resources monitor determines, in consultation with the County and Developer, that there is limited potential for encountering cultural resources. C. In the event that prehistoric or historic resources are encountered during project construction, all activity within a 50-foot radius of the find shall be stopped, the Developer's Project Manager or designee and the County's Project Manager or designee shall be notified, and a qualified archaeologist shall examine the find. Project personnel shall not collect or move any cultural material. The archaeologist shall evaluate the find(s) to determine if it meet the definition of a historical, unique archaeological, and/or tribal cultural resource and follow the further procedures outlined below: i) If the find(s) does not meet the definition of a historical resource or unique archaeological resource, no further study or protection is necessary prior to resuming Project implementation.	Before Mitigation: PS After Mitigation: LTSM

Summary of Impacts and Mitigation	Level of Significance
ii) If the find(s) does meet the definition of a historical resource or unique archaeological resource, then it shall be avoided by Project activities. If avoidance is not feasible, as determined by the County, the qualified archaeologist shall make appropriate recommendations regarding the treatment and disposition of such finds, and significant impacts to such resources shall be mitigated in accordance with the recommendations of the archaeologist prior to resuming construction activities within the 50-foot radius. iii) If the find(s) is potentially a tribal cultural resource, then tribal representatives of the Tamien Nation shall be consulted. If, after consultation with the Tamien Nation, it is determined that the find(s) is a tribal cultural resource, then the find(s) shall be avoided by Project activities. If avoidance is not feasible, as determined by the County, the qualified archaeologist, in consultation with tribal representatives and the County, shall make appropriate recommendations regarding the treatment and disposition of such finds and significant impacts to such resources shall be mitigated in accordance with the recommendations of the archaeologist prior to resuming construction activities within the 50-foot radius. iv) If the find(s) are human remains or grave goods, the requirements of Public Resources Code Section 5097.98 and County Ordinance Code Sections B6-18 through B6-20 shall be followed. Recommendations for treatment and disposition of finds could include, but are not limited to, the collection, recordation, and analysis of any significant cultural materials, or the turning over of tribal cultural resources to tribal representatives for appropriate treatment. A report of findings documenting any data recovery shall be submitted to the County Director of Planning and Development. D. Fill soils used for construction purposes shall not contain archaeological materials.	*(continued)*
Impact CUL-3: Human Remains The Project would not disturb any human remains. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-CUL-1: Cumulative Impacts to Historical Resources The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-CUL-2: Cumulative Impacts to Archaeological Resources or Human Remains The overall cumulative impact could be potentially significant. Mitigation: MM-CUL-2 (detailed for Impact CUL-2)	Before Mitigation: PS After Mitigation: LTSM
Impact ENE-1: Wasteful, Inefficient, or Unnecessary Consumption of Energy Resources The Project would not result in wasteful, inefficient, or unnecessary consumption of energy resources. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact ENE-2: Conflict with or Obstruct a Renewable Energy or Energy Efficiency Plan The Project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A

Summary of Impacts and Mitigation	Level of Significance
Impact C-ENE-1: Cumulative Energy Impacts The overall cumulative impact would be less than significant.	Before Mitigation: LTS
Mitigation: none required	After Mitigation: N/A
Impact GEO-1: Seismic Hazards The Project would not cause potential substantial adverse effects involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides.	Before Mitigation: LTS
Mitigation: none required	After Mitigation: N/A
Impact GEO-2: Soil Erosion The Project would not result in substantial soil erosion or loss of topsoil.	Before Mitigation: LTS
Mitigation: none required	After Mitigation: N/A
Impact GEO-3: Unstable Soils or Geological Units The Project could be located on unstable soils.	Before Mitigation: PS
Mitigation: MM-GEO-3: Prepare a Subsequent Geotechnical Report and Implement a Monitoring Program During Construction Prior to the issuance of building permits, the Developer shall retain a licensed geotechnical engineer to prepare a subsequent geotechnical report for the project site to supplement and refine the recommendations in Section 7 of the Geotechnical Investigation prepared by Rockridge Geotechnical (March 25, 2021). The subsequent report shall include underground investigative testing to determine the full horizontal and lateral extent, along with the exact location in relationship to property lines and setbacks, and the foundation type(s), of the neighboring basement walls to the east. The subsequent geotechnical report shall make final recommendations for foundation design of the proposed building once foundation loads and the vertical and lateral extent of the existing neighboring buildings are known. Underpinning of the neighboring building to the southeast may be needed if excavations would occur adjacent to and extend below the elevation of the bottom of the foundation for the adjacent structure. To determine the need for underpinning and, if underpinning is needed, to provide information for design of the underpinning system, the subsequent geotechnical report shall determine the configuration and depth of existing foundations that bottom above an imaginary line extending up at an inclination of 1.5:1 (horizontal to vertical) from the proposed excavation. If as-built plans cannot be obtained, test pits shall be excavated prior to construction to determine the foundation type and depth to complete the design for an appropriate underpinning system of the neighboring building to the southeast. As determined by a geotechnical engineer, the underpinning system may consist of end-bearing piers that are designed to gain support by transferring building loads onto firm alluvium. A monitoring program shall be implemented during construction to ensure that neighboring basement walls are not destabilized during Project construction. The conditions of existing buildings within 20 horizontal feet from the sides of excavations on the project site shall be photographed and surveyed prior to the start of construction and monitored periodically during construction. In addition, prior to the start of excavation, the contractor shall establish survey points on the shoring system, on the ground surface at critical locations behind the shoring, and on adjacent buildings. These survey points shall be used to monitor the vertical and horizontal movements of the shoring and the ground behind the shoring throughout construction. If the monitoring program detects movement greater than 0.5 inch, construction shall be immediately halted and a geotechnical and structural engineer shall be consulted regarding potential remedies, which may include more aggressive underpinning of the adjacent building. Construction shall not resume until an appropriate remedy sufficient to fully stabilize the adjacent foundation has been presented to and approved by the County and the City of Palo Alto Building Department.	After Mitigation: LTSM

Summary of Impacts and Mitigation	Level of Significance
Impact GEO-4: Expansive Soils The Project would not be located on expansive soils. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact GEO-5: Soil Suitability for Septic Systems The Project would not have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact GEO-6: Geological or Paleontological Resources The Project could destroy a unique paleontological resource or site or unique geological feature. Mitigation: MM-GEO-6: Paleontological Awareness Training and Monitoring To minimize the potential for destruction of or damage to potentially unique, scientifically important paleontological resources during earthmoving activities in the eastern portion of the project site where deep excavation is proposed, the Developer shall implement the measures described below. • Prior to the start of earthmoving activities associated with deep excavation for building foundations, all construction personnel involved with excavation activities shall be informed regarding the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and proper notification procedures should fossils be encountered. This worker training shall be prepared by an experienced field paleontologist. • An experienced field paleontologist shall provide full-time construction monitoring during deep excavation activities for the building foundations (i.e., where excavation would occur 17 to 27 feet below the ground surface), and particularly during drilling activities for the drilled displacement columns. • If paleontological resources are discovered during earthmoving activities, all work within 50 feet of the find shall immediately cease and the construction contractor shall notify the County Building Department. The on-site paleontological monitor shall evaluate the resource and prepare a recovery plan based on Society of Vertebrate Paleontology Guidelines (SVP 2010). The recovery plan may include, but is not limited to, a field survey, additional construction monitoring, sampling and data recovery procedures, museum curation for any specimen recovered, and a report of findings. Recommendations in the recovery plan that are determined by the County, as the CEQA lead agency, to be necessary and feasible shall be implemented before construction activities can resume at the location where the paleontological resources were discovered.	Before Mitigation: PS After Mitigation: LTSM
Impact C-GEO-1: Cumulative Seismic Hazards The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-GEO-2: Cumulative Soil Erosion Impacts The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A

Summary of Impacts and Mitigation	Level of Significance
Impact C-GEO-3: Cumulative Impacts to Unstable Soils The overall cumulative impact would be less than significant.	Before Mitigation: LTS
Mitigation: none required	After Mitigation: N/A
Impact C-GEO-4: Cumulative Impacts to Expansive Soils The overall cumulative impact would be less than significant.	Before Mitigation: LTS
Mitigation: none required	After Mitigation: N/A
Impact C-GEO-6: Cumulative Impacts to Geological Resources The overall cumulative impact would be less than significant.	Before Mitigation: LTS
Mitigation: none required	After Mitigation: N/A
Impact GHG-1: GHG Emissions The Project would not generate GHG emissions that may have a significant impact on the environment.	Before Mitigation: LTCC
Mitigation: none required	After Mitigation: N/A
Impact GHG-2: GHG Plan, Policy, or Regulation Conflicts The Project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions.	Before Mitigation: LTCC
Mitigation: none required	After Mitigation: N/A
Impact C-GHG-1: Cumulative GHG Emissions or GHG Plan, Policy, or Regulation Conflicts The overall cumulative impact would be significant. However, the Project's contribution would be not cumulatively considerable.	Before Mitigation: LTCC
Mitigation: none required	After Mitigation: N/A
Impact HAZ-1: Use or Release of Hazardous Materials The Project would not create a significant hazard through the routine transport, use, or disposal of hazardous materials or reasonably foreseeable upset and accident conditions involving the release of hazardous materials.	Before Mitigation: LTS
Mitigation: none required	After Mitigation: N/A
Impact HAZ-2: Hazardous Emissions near Schools The Project would not emit hazardous emissions or handle hazardous emissions within a quarter mile of a school.	Before Mitigation: NI
Mitigation: none required	After Mitigation: N/A

Summary of Impacts and Mitigation	Level of Significance
Impact HAZ-3: Hazards from Cortese-List Sites The Project could create a significant hazard to the public or the environment due to the site being a known hazardous materials site. Mitigation: MM-HAZ-3A: Perform Site Assessment and Implement Associated Recommendations Prior to the issuance of a building permit, the Developer shall obtain regulatory oversight from either the County of Santa Clara Department of Environmental Health, the San Francisco Bay Regional Water Quality Control Board, or the California Department of Toxic Substances Control (the “Selected Regulatory Agency”). The Developer shall consult with the Selected Regulatory Agency to identify the requirements needed for a Site Assessment and Conceptual Site Model to ensure adequate characterization of the soil, groundwater, and soil gas at the project site. The Site Assessment and Conceptual Site Model shall examine and discuss all potential exposure pathways, including the following: • dermal—physical contact with contaminated soil and groundwater during construction; • inhalation—indoor air quality and dust generated by construction activities and potential vapor intrusion; and • surface and groundwater—potential for overland flow from construction dewatering to enter surface waters, and to percolate into clean groundwater that is not part of the current contaminated groundwater plume. The Site Assessment and Conceptual Site Model shall evaluate potential hazards to both construction workers and future site residents and employees during the operational phase, and shall make recommendations governing soil re-use or disposal, and construction dewatering requirements, during construction. The Developer shall provide the results from the completed Site Assessment and Conceptual Site Model to the Selected Regulatory Agency for review and approval. Once the Selected Regulatory Agency approves the completed Site Assessment and Conceptual Site Model, the Developer shall prepare a Site Management Plan that describes the Developer’s plan to manage all of the identified risks and shall submit the Site Management Plan to the Selected Regulatory Agency for review and approval. The Developer shall incorporate all elements of the approved Site Management Plan into the construction contractor specifications in accordance with Mitigation Measures MM-HAZ-3B and MM-HAZ-3C, and shall inform preparation of a site-specific health and safety plan in accordance with Mitigation Measure MM-HAZ-3D.	Before Mitigation: PS After Mitigation: LTSM
MM-HAZ-3B: Obtain Permit for Construction Dewatering of Contaminated Groundwater (as Necessary) and Implement Appropriate Treatment Measures Prior to Discharge If construction dewatering at the project site is necessary, the Developer shall obtain a permit for construction dewatering of potentially contaminated groundwater from the San Francisco Bay RWQCB. The Developer shall comply with all requirements of the RWQCB permit and shall include all of the RWQCB permit requirements in the construction contractor specifications. An appropriate method for storing the groundwater prior to discharge shall be employed (as determined by a registered environmental engineer retained specifically for the Project in coordination with the Selected Regulatory Agency).	*(continued)*

Summary of Impacts and Mitigation	Level of Significance
MM-HAZ-3C: Incorporate Standards for HazMat Training and the Proper Handling and Disposal of Contaminated Soils into the Project's Construction Specifications Based on the results of the Site Assessment and Conceptual Site Model that are completed pursuant to Mitigation Measure MM-HAZ-3A, the Developer shall require specifications and procedures to be followed by the construction contractor for potential contact with contaminated groundwater, and the safe handling, treatment, and disposal of excavated soils from the project site (if soils are found to be contaminated), consistent with all applicable federal, State, and local requirements. The following provisions shall be included in the project's construction specifications: • All construction workers who will be involved with ground disturbance shall be trained in Hazardous Waste Operations and Emergency Response (HAZWOPER) as related to contaminated groundwater, and as related to contaminated soil if any is found to be present based on the results of the Phase II investigation. • If the results of the Site Assessment and Conceptual Site Model indicate that contaminated soil is present, then the Developer shall retain a licensed engineering contractor with a Class A license and hazardous substance removal certification to perform any soil removal from the project site. A California-licensed engineer shall provide field oversight on behalf of the Developer, to document the origin and destination of all removed materials. If necessary, removed materials shall be stockpiled temporarily and covered with plastic sheeting, pending relocation, segregation, or off-site hauling. To protect groundwater and surface water quality, contaminated soils shall not be stored on-site during the winter rainy season (i.e., November through April). All materials shall be disposed at an appropriately licensed landfill or facility. The Developer shall provide the County Facilities and Fleet Department and Selected Regulatory Agency with documentation verifying that all of these requirements have been met.	*(continued)*
MM-HAZ-3D: Prepare and Implement a Site-Specific Health and Safety Plan. To protect the health of construction workers and the environment, the Developer shall prepare and implement a site-specific Health and Safety Plan (HASP). The HASP shall be prepared in accordance with State and federal Occupational Safety and Health Administration (OSHA) regulations (29 CFR 1910.120) and shall be approved by a certified industrial hygienist. Copies of the HASP shall be made available to construction workers for review during their orientation training and/or during regular health and safety meetings. The HASP shall identify potential hazards (including contaminated groundwater, and the potential for stained or odiferous soils at any location where earthmoving activities would occur), chemicals of concern, personal protective equipment and devices, decontamination procedures, the need for personal or area monitoring, and emergency response procedures. The HASP shall be consistent with all applicable components of the Site Management Plan approved by the Selected Regulatory Agency pursuant to Mitigation Measure MM-HAZ-3A.	*(continued)*
MM-HAZ-3E: Install Vapor Barrier and Perform Periodic Indoor Air Quality Testing, if required The Developer shall install a Vapor Intrusion Mitigation System (VIMS) or other engineering controls if required by the Selected Regulatory Agency. The design, installation, and operation of the VIMS and all periodic indoor air quality testing shall comply with all requirements of the Selected Regulatory Agency.	*(continued)*
Impact HAZ-4: Airport-related Hazards The Project would not result in airport-related safety or noise hazards. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A

Summary of Impacts and Mitigation	Level of Significance
Impact HAZ-5: Emergency Response or Evacuation Plan Impairment The Project would not impair implementation of an emergency response plan or emergency evacuation plan. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact HAZ-6: Wildland Fire Hazards The Project would not expose people or structures to significant risk from wildland fires. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact C-HAZ-1: Cumulative Use or Release of Hazardous Materials The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-HAZ-3: Cumulative Hazards from Cortese-List Sites The overall cumulative impact would be potentially significant. Mitigation: MM-HAZ-3A through MM-HAZ-3E (detailed for Impact HAZ-3)	Before Mitigation: PS After Mitigation: LTSM
Impact C-HAZ-5: Cumulative Emergency Response or Evacuation Plan Impairment The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact HYD-1: Water Quality Standard Violations The Project could violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. Mitigation: MM-HAZ-3B (detailed in Impact HAZ-3)	Before Mitigation: PS After Mitigation: LTSM
Impact HYD-2: Groundwater Supply and Recharge The Project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact HYD-3: Alteration of Drainage Patterns The Project would not substantially alter drainage patterns resulting in erosion or siltation, flooding, pollution, or redirection of flood flows. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact HYD-4: Release of Pollutants due to Inundation The Project would not risk release of pollutants in flood, tsunami, or seiche hazard zones. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact HYD-5: Water Quality Control Plan or Sustainable Groundwater Management Plan Conflicts The Project could conflict with a water quality control plan or sustainable groundwater management plan. Mitigation: MM-HAZ-3B (detailed in Impact HAZ-3)	Before Mitigation: PS After Mitigation: LTSM

Summary of Impacts and Mitigation	Level of Significance
Impact C-HYD-1: Cumulative Hydrology Impacts The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact LUP-1: Physically Divide a Community The Project would not physically divide an established community. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact LUP-2: Land Use Plan, Policy, or Regulation Conflicts The Project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact NOI-1: Ambient Noise Levels The Project could result in generation of a substantial temporary increase in ambient noise levels in excess of applicable standards. <u>Mitigation: MM-NOI-1: Construction Noise Reduction Measures</u> The Developer shall include the following measures in contractor specifications for the Project, and such measures shall be implemented during all demolition and construction phases: **A.** In accordance with Chapter 9.10 of the City of Palo Alto Municipal Code, the hours of construction, including the loading and unloading of materials and truck movements, shall generally be limited to between the hours of 8 a.m. and 6 p.m. Monday through Friday, and between 9 a.m. and 6 p.m. on Saturday. No construction activities shall be permitted on Sundays or holidays. In limited instances where adherence to the allowable hours of construction is not feasible, the contractor shall apply for an exception permit from the City of Palo Alto (and, if the proposed construction work would occur prior to 7 a.m. or after 7 p.m., a variance from the County noise ordinance) and adhere to any conditions imposed. In addition, the Developer shall give advance notice of such instances to the owners and occupants of the all residential properties within 50 feet of the project site and provide the contact details of the dedicated disturbance coordinator (see MM-NOI-1A). B. In accordance with Chapter 9.10 of the City of Palo Alto Municipal Code, the hours of construction, including the loading and unloading of materials and truck movements, shall generally be limited to between the hours of 8 a.m. and 6 p.m. Monday through Friday, and between 9 a.m. and 6 p.m. on Saturday. No construction activities shall be permitted on Sundays or holidays. In limited instances where adherence to the allowable hours of construction is not feasible, the contractor shall apply for an exception permit from the City of Palo Alto (and, if the proposed construction work would occur prior to 7 a.m. or after 7 p.m., a variance from the County noise ordinance) and adhere to any conditions imposed. In addition, the Developer shall give advance notice of such instances to the owners and occupants of the all residential properties within 50 feet of the project site and provide the contact details of the dedicated disturbance coordinator (see MM-NOI-1A). C. A disturbance coordinator shall be designated for the duration of the construction period, and this person's number shall be conspicuously posted around the project site and in all construction notifications. The disturbance coordinator shall receive complaints about construction disturbances and, in coordination with the County, shall determine the cause of the complaint and implement feasible measures to alleviate the problem.	Before Mitigation: S&U After Mitigation: S&U *(continued)* *(continued)*

Summary of Impacts and Mitigation	Level of Significance
D. The following noise minimization measures shall be implemented: • Construction equipment shall be properly maintained and all internal combustion engine driven machinery with intake and exhaust mufflers and engine shrouds, as applicable, shall be in good condition. During construction, all equipment, fixed or mobile, shall be operated with closed engine doors and shall be equipped with properly operating and maintained mufflers, consistent with manufacturers' standards. • Construction equipment shall be operated in a manner to reduce or avoid high levels of noise emissions (e.g., to the extent practical, lower—rather than drop—loads into trucks or onto platforms to reduce noise-generating impacts of contacting surfaces). • "Quiet" models of construction equipment, particularly air compressors, generators, pumps, and other stationary noise sources, shall be selected and used on site. For example, oil-cooled air compressors shall be used in lieu of air-cooled compressors. • Electrical power, rather than diesel equipment, shall be used to power tools and any temporary structures, such as construction trailers. • Staging areas and stationary noise-generating equipment, such as compressors, shall be located as far away from noise-sensitive uses as feasible. • Idling times of equipment shall be minimized by either shutting equipment off when not in use or reducing the maximum idling time to 5 minutes. • Where available, mobile construction equipment shall have smart back-up alarms that automatically adjust the sound level of the alarm in response to ambient noise levels. Alternatively, back-up alarms shall be disabled and replaced with human spotters to ensure safety when mobile construction equipment is moving in the reverse direction. • All noise from workers' radios shall be controlled to a point that they are not audible at sensitive receptors near construction activity.	*(continued)*
E. Temporary sound barriers using sound blankets and/or an engineered acoustic barrier shall be installed and maintained along the boundaries of the construction site. The barriers shall be kept in place throughout all phases of the construction period, except during periods when they would interfere with construction activities in the vicinity. For street-frontages (Park Boulevard, Grant Avenue, and Birch Street), the barrier shall be at least 8 feet in height. For the rear (southeast) boundary of the site the barrier shall be at least 16 feet in height. Alternatively, if the owner and tenants of the buildings on the adjacent properties agree, temporary sound barriers may be installed on individual balconies and windows of the adjacent buildings in lieu of the property-line barrier previously described.	*(continued)*
Impact NOI-2: Groundborne Vibration The Project could result in generation of a substantial temporary or permanent increase in ambient noise levels in excess of applicable standards.	Before Mitigation: S&U
Mitigation: MM-NOI-2: Vibration Reduction Measures The Developer shall include the following measures in its contractor specifications, and such measures shall be implemented by the Contractor(s) during construction: A. The owners and occupants of the residential apartment building at 200 Sheridan Avenue and owners and tenants of the Courthouse Plaza office building at 260 Sheridan Avenue) and other vibration sensitive uses within 50 feet of heavy construction activity shall be notified of the construction schedule, as well as the name and contact information of the project disturbance coordinator identified under MM-NOI-1b. B. Operation of vibratory equipment, such as vibratory rollers or vibratory plate compactors, shall not be undertaken outside of the City's allowable construction hours specified in MM-NOI-1A.	After Mitigation: S&U

Summary of Impacts and Mitigation	Level of Significance
C. Operation of vibratory equipment, such as vibratory rollers or vibratory plate compactors, shall not be undertaken within a 15 feet buffer zone around existing buildings on adjacent residential and commercial properties, unless: • The equipment is operated in "static mode" with all vibratory functions turned off; or • Realtime vibration monitoring is undertaken at the adjacent buildings during all use of vibratory equipment within the buffer zone, and vibratory equipment usage is stopped, or operated in "static mode" if vibration levels exceed 0.49 in/sec PPV at those buildings; or • A qualified acoustic consultant is retained by the contractor to review and revise the buffer zone distance based on site-specific conditions and vibration levels generated by the actual equipment used at the site, such that vibration levels at the adjacent buildings shall not exceed 0.49 in/sec PPV during any construction activities.	*(continued)*
Impact NOI-3: Airport Noise The Project would not expose people to excessive noise levels from nearby airports. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact C-NOI-1: Cumulative Noise Impacts The cumulative impact would be significant and unavoidable. Mitigation: MM-NOI-1 (detailed in Impact NOI-1)	Before Mitigation: PS After Mitigation: S&U
Impact C-NOI-2: Cumulative Vibration Impacts The cumulative impact would be significant and unavoidable. Mitigation: MM-NOI-2 (detailed in Impact NOI-2)	Before Mitigation:PS After Mitigation: S&U
Impact POP-1: Growth Inducement The Project would not directly or indirectly induce substantial unplanned population growth in an area. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact POP-2: Displacement of People or Housing The Project would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. Mitigation: none required	Before Mitigation: NI After Mitigation: N/A
Impact C-POP-1: Cumulative Growth Inducement The overall cumulative impact would be potentially significant. The Project's contribution to the overall cumulative impact would be less than cumulatively considerable. Mitigation: none required	Before Mitigation: LTCC After Mitigation: N/A
Impact PSR-1: Demand for Public Services The Project would not result in substantial adverse physical impacts associated with the provision of or need for new or physically altered governmental facilities. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A

Summary of Impacts and Mitigation	Level of Significance
Impact PSR-2: Existing Recreational Facilities The Project would not increase the use of existing recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact PSR-3: New Recreational Facilities The Project would not include or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-PSR-1: Cumulative Public Service Impacts The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-PSR-2: Cumulative Recreation Impacts The overall cumulative impact would be potentially significant, but the Project's contribution to the cumulative impact would be less than cumulatively considerable. Mitigation: none required	Before Mitigation: LTCC After Mitigation: N/A
Impact TRA-1: Transportation Plan or Program Conflicts The Project would not conflict with a program plan, ordinance or policy addressing the circulation system. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact TRA-2: Vehicle Miles Traveled The Project would not conflict with CEQA Guidelines related to vehicle miles traveled. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact TRA-3: Traffic Safety Hazards The Project could substantially increase traffic-related hazards. Mitigation: MM-TRA-3A: Pedestrian/Bicycle Warning System The Developer shall require that an audio warning be installed at all parking garage exits to warn cyclists and pedestrians when a vehicle is approaching the garage exit. Warning signs reminding exiting motorists to watch out and yield to pedestrians and cyclists shall also be provided in the garage before/near the egress. MM-TRA-3B: Maximize Site Distance The Developer shall work with the City of Palo Alto to limit on-street parking in the immediate vicinity of the proposed site access point on Birch Streets, and to locate proposed street trees on the Birch Street and Park Boulevard so that the sight distance for vehicles exiting the project site meets City requirements.	Before Mitigation: PS After Mitigation: LTSM

Summary of Impacts and Mitigation	Level of Significance
Impact TRA-4: Emergency Access The Project would not result in inadequate emergency access. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-TRA-1: Cumulative Transportation Plan or Program Conflicts The overall cumulative impact would be potentially significant, but the contribution of the Project would be less than cumulatively considerable. Mitigation: none required	Before Mitigation: LTCC After Mitigation: N/A
Impact C-TRA-2: Cumulative Vehicle Miles Travelled Impacts The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-TRA-3: Cumulative Traffic Safety Hazards and Emergency Access The overall cumulative impact would be potentially significant. Mitigation: MM-C-TRA-3: Coordination of Construction Traffic Plans The Developer and its construction contractor for the 231 Grant Educator Workforce Housing project shall consult with the City of Palo Alto and its construction contractor for the Public Safety Building project to coordinate the Construction Traffic Management Plans for both projects such that: • Temporary lane and/or road closures and detour routes do not conflict; • Notification to local residents, bicycle and pedestrian advocacy groups, and the Valley Transit Authority are coordinated and clearly identify locations and periods of road closures, alternative routes, and other pertinent information; and • Emergency access is maintained to all properties in the vicinity of both projects throughout the combined construction period.	Before Mitigation: PS After Mitigation: LTSM
Impact TCR-1: Tribal Cultural Resources The Project could cause a substantial adverse change in the significance of an as-yet unidentified tribal cultural resource. Mitigation: MM-CUL-2 (detailed in Impact CUL-2)	Before Mitigation: PS After Mitigation: LTSM
Impact C-TCR-1: Cumulative Tribal Cultural Resources Impacts The overall cumulative impact would be potentially significant. Mitigation: MM-CUL-2 (detailed in Impact CUL-2)	Before Mitigation: PS After Mitigation: LTSM
Impact UTI-1: New or Expanded Utility Services The Project would not require new or expanded utility services that could cause significant environmental effects. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact UTI-2: Water Supply Availability The Project would have sufficient water supplies available. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A

Summary of Impacts and Mitigation	Level of Significance
Impact UTI-3: Wastewater Treatment Capacity The Project would not result in determination of inadequate wastewater treatment capacity. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact UTI-4: Solid Waste Capacity The Project would not generate solid waste in excess of local standards or capacity of local infrastructure. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact UTI-5: Solid Waste Statutes and Regulations The Project would comply with solid waste management and reduction statutes and regulations. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-UTI-1: Cumulative Impacts to Utility Services The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-UTI-2: Cumulative Water Supply Availability Impacts The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-UTI-3: Cumulative Wastewater Treatment Impacts The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-UTI-4: Cumulative Solid Waste Capacity Impacts The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact C-UTI-5: Cumulative Solid Waste Regulations Impacts The overall cumulative impact would be less than significant. Mitigation: none required	Before Mitigation: LTS After Mitigation: N/A
Impact MFS-1: Substantial Adverse Effects to Biological or Cultural Resources The Project would not have a substantial adverse effect on wildlife or plant species or eliminate important examples of the major periods of California history or prehistory. Mitigation: MM-BIO-4, MM-CUL-2 (detailed in Impact BIO-4 and Impact CUL-2)	Before Mitigation: PS After Mitigation: LTSM

Summary of Impacts and Mitigation	Level of Significance
Impact MFS-2: Individually Limited but Cumulatively Considerable Impacts	
The Project would have cumulative construction noise and vibration impacts that are cumulatively considerable. The Project's contribution to other cumulative impacts would be less than cumulatively considerable or would be reduced to less than cumulatively considerable with implementation of mitigation measures.	Before Mitigation: PS
Mitigation: MM-AIR-1, MM-CUL-2, MM-HAZ-3A through MM-HAZ-3E, MM-NOI-1 and MM-NOI-2	After Mitigation: S&U
Impact MFS-3: Direct or Indirect Adverse Effects on Human Beings	
The Project would have environmental effects related to construction noise and vibration which will cause substantial adverse effects on human beings, either directly or indirectly.	Before Mitigation: PS
Mitigation: MM-NOI-1 and MM-NOI-2	After Mitigation: S&U

Source: Prepared by AECOM in 2021.

Acronyms: LTS = less than significant impact; LTSM = less than significant with mitigation; LTCC = less than cumulatively considerable; NI = no impact; PS = potentially significant; S&U = significant and unavoidable; N/A = not applicable.

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Appendices

Figures

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Acronyms and Abbreviations

°F	fahrenheit
1,1,1-TCA	1,1,1-trichloroethane
1,1-DCA	1,1-dichloroethane
1,1-DCE	1,1-dichloroethene
1,2-DCE	1,2-dichloroethene
AAQS	Ambient Air Quality Standards
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ACM	asbestos-containing material
ADA	Americans with Disabilities Act
AEP	annual exceedance probability
AF/Y	acre-feet per year
APN	Assessor's Parcel Number
ATCMs	Airborne Toxics Control Measures
B.P.	Before Present
BAAQMD	Bay Area Air Quality Management District
Bay Area Clean Air Plan	*Bay Area Clean Air Plan: Spare the Air, Cool the Climate*
bgs	below ground surface
BMP	best management practices
Btu	British thermal units
CAAQS	California Ambient Air Quality Standards
CAFX	California Avenue Foothill Express
CAL FIRE	California Department of Forestry and Fire Protection
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CalGreen	California Green Building Standards Code
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Standards Code
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CDOF	California Department of Finance
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	Methane
CHRIS	California Historical Resources Information System
City	City of Palo Alto
CNDDB	California Natural Diversity Data Base
CNEL	community noise equivalent level
CO	carbon monoxide
CO_2	carbon dioxide

CO_2e	carbon dioxide equivalents
Construction General Permit	*National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities*
County	County of Santa Clara
CRHR	California Register of Historical Resources
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CWC	California Water Code
dB	decibels
dBA	A-weighted dB
dBA/DD	A-weighted decibel per doubling of distance
DDT	dichlorodiphenyltrichloroethane
Developer	Mercy Housing California and Abode Communities
DOF	Department of Finance
DPR	Department of Parks and Recreation
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EDD	Employee Development Department
EIR	environmental impact report
ESA	Federal Endangered Species Act of 1973
ESLs	Environmental Screening Limits
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FR	Federal Register
FTA	Federal Transit Administration
g	gravity
GHG	greenhouse gas
GSAs	groundwater sustainability agencies
GSP	groundwater sustainability plan
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HI	hazard index
HP	horsepower
HPD	Historic Properties Directory
HSC	Health and Safety Code
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
I-	Interstate
IFC	International Fire Code
in/sec	inches per second
iPAC	Information for Planning and Consulting
ITE	Institute of Transportation Engineers
LBP	lead-based paint
LCFS	low carbon fuel standard
L_{dn}	day-night noise level
L_{eq}	equivalent noise level
LID	low impact development

L_{max}	maximum noise level
L_{min}	minimum noise level
L_n	statistical descriptor
LOS	level of service
LTS	less than significant impact
LTSM	less than significant impact with mitigation
MBTA	Migratory Bird Treaty Act of 1918
MGD	million gallons per day
MISP	Major Institution, Special Facilities
MMBtu	Million British thermal units
MMT	million metric tons
mph	miles per hour
MS4 Permit	municipal separate storm sewer systems
MT	metric tons
MTC	Metropolitan Transportation Commission
N_2O	Nitrous Oxide
NAAQS	National Air Quality Ambient Standards
NAHC	Native American Heritage Commission
NEHRP	National Earthquake Hazards Reduction Program
NHTSA	National Highway Traffic Safety Agency
NI	no impact
NO	nitric oxide
NO_2	nitrogen dioxide
NOI	Notice of Intent
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
O_3	Ozone
OES	Office of Emergency Services
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PAFD	Palo Alto Fire Department
PAMC	Palo Alto Municipal Code
PAPD	Palo Alto Police Department
PAUSD	Palo Alto Unified School District
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
PDA	priority development area
PG&E	Pacific Gas & Electric Company
Phase I ESA	Phase I Environmental Site Assessment
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
PPV	peak particle velocity
PRC	Public Resources Code
PS	potentially significant impact
PSB	Public Safety Building
QA/QC	Quality Assurance/Quality Control
Qhff	fine-grained alluvial fan and basin deposits

RCRA	Resource Conservation and Recovery Act of 1976
RHNA	Regional Housing Needs Allocation
RMS	root-mean-square
ROGs	Reactive organic gases
RWQCB	Regional Water Quality Control Board
RWQCP	Regional Water Quality Control Plant
SAFE	Safer Affordable Fuel Efficient
SARA	Superfund Amendments and Reauthorization Act
SB	Senate Bill
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SFPUC	San Francisco Public Utilities Commission
SGMA	Sustainable Groundwater Management Act
SMAQMD	Sacramento Metropolitan Air Quality Management District
SO_2	sulfur dioxide
SOI	Secretary of the Interior
SO_X	oxides of sulfur
SU	significant and unavoidable impact
SV 2.0	Silicon Valley 2.0
SWPPP	storm water pollution prevention plan
SWRCB	State Water Resources Control Board
TCE	trichloroethene
TDM	travel demand management
the Project	231 Grant Educator Workforce Housing
TMDL	Total Maximum Daily Load
TMDLs	total maximum daily loads
tpd	tons per day
TPH	Total petroleum hydrocarbons
TUP	Temporary Use Permit
UBC	Uniform Building Code
UCMP	University of California, Berkeley Museum of Paleontology
U.S.	United States
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UWMP	urban water management plan
VdB	vibration decibels
VMT	Vehicle Miles Traveled
VTA	Santa Clara Valley Transportation Authority
WDR	waste discharge reports
WSA	Water Supply Assessment
ZOI	zone-of-influence
µg/L	micrograms per liter
µg/m^3	micrograms per cubic meter

1 Introduction

This environmental impact report (EIR) for the proposed 231 Grant Educator Workforce Housing Project (the Project) has been prepared in accordance with, and complies with, all criteria, standards, and procedures of the California Environmental Quality Act (CEQA) of 1970 as amended (Public Resources Code [PRC] Section 21000 et seq.) and CEQA Guidelines (California Code of Regulations [CCR], Title 14, Section 15000 et seq.).

Per Section 21067 of CEQA and Sections 15367 and 15050 through 15053 of the CEQA Guidelines, the County of Santa Clara (County) is the lead agency under whose authority this document has been prepared. As an informational document, this EIR is intended for use by the County decision makers and members of the public in evaluating the potential environmental effects of the Project.

1.1 Purpose of the EIR and CEQA Process

An EIR is an informational document used by a lead agency (in this case, the County) when considering whether to approve a project. The purpose of an EIR is to provide public agencies and members of the public with detailed information concerning the environmental effects associated with the implementation of a project, prior to taking final action to approve a project.

An EIR should analyze the environmental consequences of a project, identify ways to reduce or avoid potential environmental effects resulting from the project, and identify alternatives to the project that are capable of avoiding or reducing impacts. CEQA requires that all state and local government agencies consider the environmental consequences of projects over which they have discretionary authority. This EIR provides information to be used in the planning and decision-making process. It is not the purpose of an EIR to recommend approval or denial of a project.

Prior to approval of the Project, the County, as lead agency and the decision-making entity, is required to certify that the EIR has been completed in compliance with CEQA, that the information in this EIR has been considered, and that the EIR reflects the independent judgment of the County. CEQA requires decision makers to balance the benefits of a project against its unavoidable environmental consequences.

If environmental impacts are identified as significant and unavoidable, the lead agency may still approve the project if it finds that social, economic, legal, technological or other benefits outweigh the unavoidable impacts. The lead agency would then be required to state in writing the specific reasons for approving a project, based on information in the EIR and other information sources in the administrative record. This reasoning is called a “statement of overriding considerations” (PRC Section 21081 and CEQA Guidelines Section 15093).

In addition, the County as lead agency must adopt a Mitigation Monitoring and Reporting Program describing the measures that were made a condition of project approval to avoid or mitigate significant effects on the environment (PRC Section 21081.6; CEQA Guidelines Section 15097). The Mitigation Monitoring and Reporting Program is adopted at the time of project approval and is designed to ensure compliance with the project description and mitigation measures of the EIR during and after project implementation. If the County decides to approve the Project, it would be responsible for verifying implementation of the Mitigation Monitoring and Reporting Program.

The EIR will be used by the County during its consideration and potential approval of the Project.

1.2 Environmental Review Process

Consistent with CEQA Guidelines Sections 15080 to 15097, the CEQA process has multiple phases, many of which require notification to, and opportunity for comments from, the public. The main steps in this process are described below.

1.2.1 Notice of Preparation and Scoping Meeting

Consistent with the requirements of CEQA, a good-faith effort has been made to contact all responsible and trustee agencies; organizations; persons who may have an interest in the Project; and all government agencies, including the Governor's Office of Planning and Research (OPR) State Clearinghouse. This effort includes the circulation of a Notice of Preparation on December 2, 2020, which began a 30-day scoping period that ended on January 6, 2021. Two written comment letters were received during the scoping period.

A public scoping meeting was held by the County on December 16, 2020, starting at 6:30 p.m., to inform the public about the Project and receive comments on the Project, its potential impacts, and suggestions for mitigation measures or alternatives. Due to the restrictions on public gatherings that were in effect in Santa Clara County at that time (due to the COVID-19 global pandemic), the meeting was held virtually with options for joining by phone or computer. One individual verbal comment on the content of the Draft EIR was provided during the scoping meeting.

The Notice of Preparation and the written comments received during the scoping period are included as Appendix A. A summary of the topics raised in scoping comments is provided at the beginning of each environmental topic discussion within Section 3.0, "Environmental Setting and Impacts Assessment."

In addition, a virtual study session was held on February 8, 2021 by the City of Palo Alto (City) City Council. County staff presented Project details at the study session to inform the City Council and members of the public about the Project. The City invited members of the public to make verbal comments during this study session—such comments were taken into consideration during the preparation of this EIR but are not considered official scoping comments under CEQA.

1.2.2 Draft EIR Public Review

The County filed a Notice of Completion with the State Clearinghouse on October 5, 2021, indicating that this Draft EIR has been completed and is available for review. A Notice of Availability of the EIR has been published concurrently with distribution of this document.

This Draft EIR is being circulated for a 45-day public review and comment period, commencing on Tuesday October 5, 2021 and concluding at 5:00 p.m. on Friday November 19, 2021.

During this period, comments from the public, organizations, and agencies regarding environmental issues identified in the EIR and the EIR's accuracy and completeness may be submitted to the lead agency at the following address:

- County of Santa Clara Facilities and Fleet Department
  Attention: Emily Chen
  2310 North First Street, Suite 200
  San José, CA 95131
  E-mail: Emily.F.Chen@faf.sccgov.org

The Draft EIR, related technical appendices, and all documents incorporated by reference in the Draft EIR are available for review online at: https://www.sccgov.org/231grant.

An electronic copy of the Draft EIR has been emailed to parties that have previously expressed an interest in the Project and is available to others upon request.

Hard copies of the Draft EIR are also available for public review during operating hours at the following locations:

- County of Santa Clara, Facilities and Fleet Department, 2310 N. First Street, Suite 200, San José, CA 95131.
- City of Palo Alto Development Center, 285 Hamilton Ave Palo Alto, CA 94301.
- Mitchell Park Library, 3700 Middlefield Road, Palo Alto, CA 94303.

During the public review period for the Draft EIR, the County of Santa Clara will conduct a public meeting at the following time and location:

- 6:30 p.m. on Wednesday October 20, 2021. Virtual meeting via Zoom, details available at https://www.sccgov.org/231grant.

Comments on the Draft EIR must be received before the end of the comment period (5:00 p.m. on Friday November 19, 2021) in order for those comments to be responded to in the Final EIR, as described below. The Final EIR may not include responses to comments received after this date and time. Oral comments made at the public meeting will be responded to in the Final EIR.

1.2.3 Responses to Comments Document and Final EIR

Upon completion of the public review and comment period for the Draft EIR, the County will prepare a Response to Comments document that addresses all substantive written and oral comments received on the Draft EIR, and identifies text revisions to the Draft EIR as a result of those responses or other changes initiated by the County. The Response to Comments document, together with the Draft EIR, will constitute the Final EIR. The County of Santa Clara Board of Supervisors will consider the adequacy of the Final EIR in accordance with the requirements of CEQA when it considers the Project during a public meeting.

The County of Santa Clara Board of Supervisors must certify the Final EIR before deciding whether to approve the Project. Prior to approval of a project that would have a significant environmental effect, CEQA requires the adoption of certain findings (PRC Section 21081; CEQA Guidelines, Sections 15091 through 15093).

If the Final EIR identifies significant adverse impacts that cannot be avoided or mitigated to less-than-significant levels, the findings must include a Statement of Overriding Considerations for those impacts (CEQA Guidelines, Section 15093(b)) specifying the economic, legal, social, technological, or other benefits of the project, including region-wide or statewide environmental benefits that the Lead Agency considers outweigh the unavoidable adverse environmental effects.

1.2.4 Mitigation Monitoring and Reporting Program

Throughout this EIR, mitigation measures have been recommended in a format that will facilitate preparation of a Mitigation Monitoring and Reporting Program. As required under CEQA (see CEQA Guidelines, Section 15097), a Mitigation Monitoring and Reporting Program will be prepared and presented to the County of Santa Clara Board of Supervisors for adoption at the time of certification of the Final EIR for the Project and will identify the specific timing and roles and responsibilities for implementation of adopted mitigation measures if the Project is approved.

1.3 Project Background

In 2018, County Supervisor Joe Simitian proposed building teacher housing on a County-owned site, across the street from the County Courthouse in Palo Alto. In response to Supervisor Simitian's proposal, the Board of Supervisors agreed to designate the 231 Grant Avenue site for a potential teacher housing site and to allocate $6 million to help fund the project. The Palo Alto City Council[2], and several local school districts (Foothill-De Anza Community College, Mountain View Whisman Palo Alto Unified, Mountain View Los Altos, and Los Altos school districts) also directed their administrations to identify funding to contribute to the project.

In February 2019, the County of Santa Clara issued a request for proposals "to create a high-quality educator workforce housing development at a central location in Palo Alto." The non-profit developers Mercy Housing California and Abode Communities (collectively, "Developer") were selected to partner with the County to develop the site.

The County was seeking to support local school districts and their teachers and staff, whose incomes are generally not high enough to afford market-rate rental or sales prices. This housing development would assist the school districts in their retention and recruitment efforts, as well as allow educators and staff to live within the communities in which they work.

In October 2019, Facebook announced a commitment of $25 million in funds to support the project and increase the number of units that could be built, which would also allow the project to serve public and nonprofit schools in southeastern San Mateo County, including the Cities of Menlo Park and East Palo Alto. See Section 2.3.2 for additional information about the Facebook grant.

[2] The City's $3 million in developer fees to help fund the project is contingent on a formal proposal being acceptable to the City.

1.4 Document Organization

This EIR is divided into the following sections and appendices:

- Section 1, "Introduction," provides introductory information, including the history of the Project, the purpose of this document, and the lead agency for the Project.
- Section 2, "Project Description," presents a detailed discussion of the location, setting, and characteristics of the project site, the Project objectives, the Project features, and environmental review requirements.
- Section 3, "Environmental Setting and Impact Assessment," describes the approach to the environmental impact assessment, including the cumulative impact assessment, and contains individual sections that reflect the CEQA Appendix G recommended environmental resource areas and describe existing conditions, detail the regulatory framework, and assess the potential environmental impacts of the Project. When the analysis identifies potentially significant effects, mitigation measures are presented to lessen the impacts. Implementing these measures would reduce potentially significant impacts to less-than-significant levels whenever feasible.
- Section 4, "Alternatives," describes a reasonable range of alternatives to the Project, evaluates the extent to which those alternatives could substantially lessen the Project's significant impacts while attaining most of the Project objectives, and compares the effects of the alternatives to those of the Project. This section also identifies the environmentally superior alternative, as required by CEQA.
- Section 5, "Other CEQA Considerations," describes the significant and unavoidable environmental impacts of the Project, as well as the significant irreversible environmental changes that would result from Project implementation.
- Section 6, "References," lists the documents and other sources of information cited within the EIR.
- Section 7, "List of Preparers," identifies County staff and consultants who helped prepare this document.

Appendices provide additional information regarding multiple issues discussed throughout this document.

2 Project Description

2.1 Project Location and Setting

The project site is at 231 Grant Avenue in the City of Palo Alto and is owned by the County of Santa Clara (Figure 2.1-1). It is approximately 1.4 acres and is bounded by Park Boulevard, Grant Avenue, and Birch Street, within the Mayfair neighborhood of Palo Alto. An approximately 6,800-square-foot single-story office building completed in 1956 and an associated parking area occupy the project site and is used by the County of Santa Clara Office of the Public Defender (Figure 2.1-2). The Assessor's Parcel Numbers [APN] for the project site are 132-31-074 and 984-88-004.

An outdoor café and multifamily residential housing development are adjacent to the northeast boundary of the project site at the corner of Sheridan Avenue and Park Boulevard, and a multistory office building is adjacent to southeast boundary of the project site at the corner of Sheridan Avenue and Birch Street. The County of Santa Clara Superior Court building is west of the project site, across Grant Avenue. Areas to the east and west of Grant Avenue and south of Birch Street in the vicinity of the project site are predominantly multifamily residential housing. Office buildings and multifamily residential housing are north of the project site along Park Boulevard. Oregon Expressway runs roughly north to south, approximately 200 feet east of the project site, providing access to US-101 further north and I-280 further south. El Camino Real (State Route 82) runs in a roughly east to west direction, approximately 1000 feet to the south of the project site. The California Avenue Caltrain Station is approximately 650 feet north of the project site.

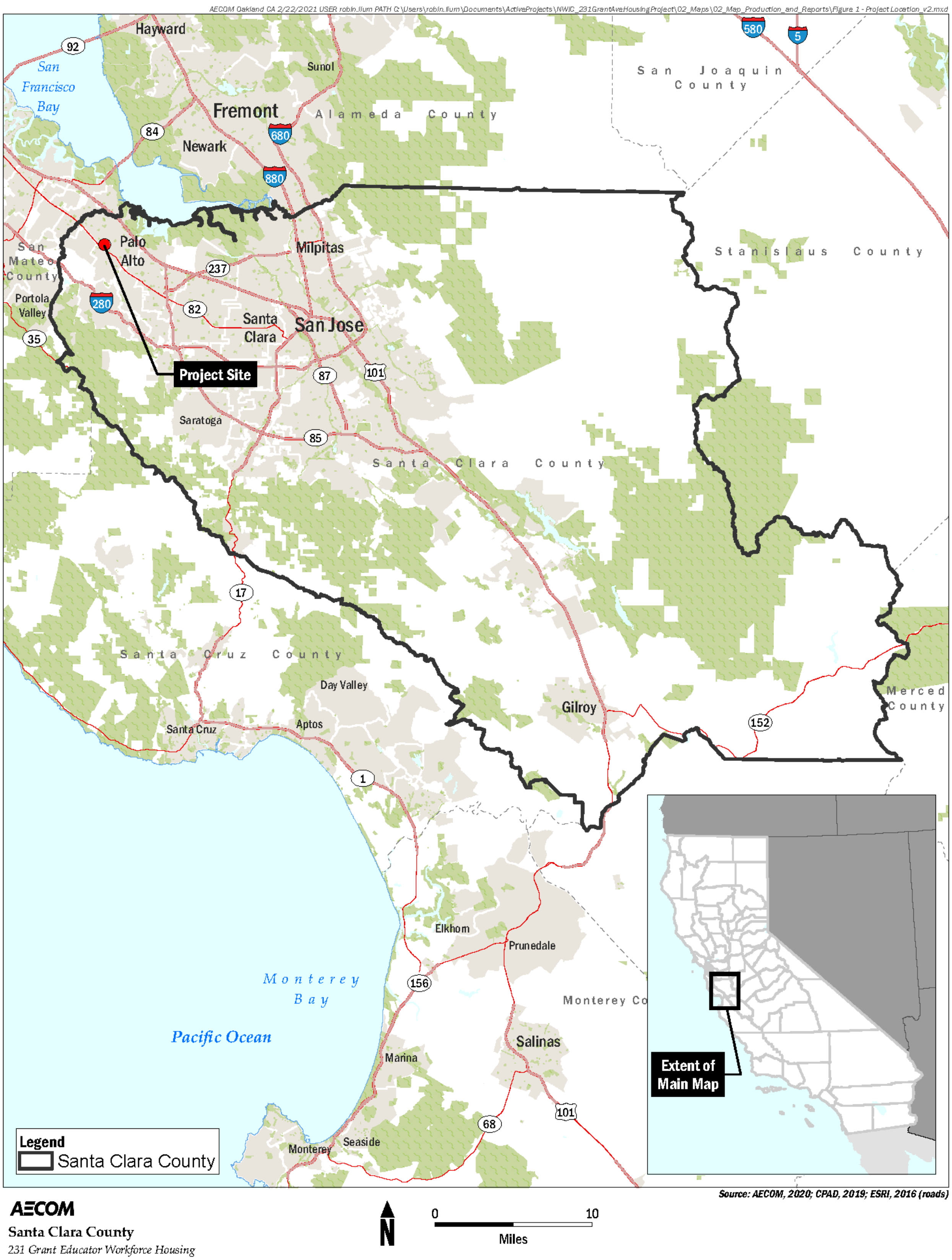

Figure 2.1-1 Project Site Location

Source: AECOM, 2020; ESRI, 2020; CPAD, 2019; ESRI, 2016 (roads)

AECOM

Santa Clara County

231 Grant Educator Workforce Housing

N

0 200

Feet

Figure 2.1-2 Project Site

2.2 Project Objectives

The 231 Grant Educator Workforce Housing Project is currently sponsored by the County of Santa Clara; Facebook; the City of Palo Alto; four Santa Clara County School Districts (Los Altos, Palo Alto, Mountain View Whisman, Mountain View Los Altos); and the Foothill-De Anza Community College District.

The objectives of the Project are to:

1. Provide at least 60 rental housing units for teachers and classified staff in targeted school districts within Santa Clara County and a sufficient number of units to meet the Facebook grant criteria, delivered at an accelerated pace.
2. Provide housing that is affordable to a range of incomes from low-income to incomes at or slightly above the area median income[3].
3. Provide housing that is high-quality and compatible with the surrounding neighborhood, while still maintaining development and operational cost efficiencies.
4. Provide housing that maximizes the number of units on the site.
5. Provide housing that is close to public transit
6. Incorporate innovative technologies and sustainability measures.
7. Provide desirable public and residential amenity spaces.
8. Provide easily accessible bicycle parking and encourage the use of alternative forms of transportation to nearby employment and transit.

2.3 Project Characteristics

The Project would demolish the existing 6,800-square-feet (SF) office building and would construct a new four-story building, totaling around 115,000 SF, on the approximately 1.4-acre site. The building would be developed with approximately 110 residential units and associated amenities, resulting in a residential density of just under 79 dwelling units per acre. Site plans are provided in Figures 2.3-1 through 2.3-8.

2.3.1 Building Design and Site Layout

On the ground floor level, the building would be roughly rectangular in shape, with the main lobby area accessed from mid-way along the Grant Avenue frontage and the parking garage taking up the rear portion of the footprint (see Figure 2.3-1). The three upper levels would be structured as two C-shaped buildings connected by an open-air bridge at each level (Figure 2.3-2).

The minimum building setback along Grant Avenue would be approximately 10 feet, with areas of greater setback forming three public plazas (see Figure 2.3-1). The minimum setback along Birch Avenue would be approximately 13 feet, and approximately 7 feet along Park Boulevard.

[3] The area median income is the midpoint of a region's income distribution, meaning that half of households in a region earn more than the median and half earn less than the median. For households and families, the median income is based on the distribution of the total number of households and families including those with no income. The median income for individuals is based on individuals 15 years old and over with income.

The minimum rear boundary setback would be 8.5 feet at ground floor level, and approximately 10 feet at the upper levels.

The roof of the building would be 50 feet in height (measured to the roof plane), with the parapet extending up to 55 feet and elevator/stairwell shafts extending up to 60 feet maximum height (see the conceptual elevations in Figure 2.3-3 through Figure 2.3-5).

2.3.2 Residential Units and Resident Amenities

The approximately 110 residential units would be a mix of studio, 1-bedroom, and 2-bedroom units, as shown in Table 2.3-1. Approximately 78 of these units would serve teachers and other full-time staff from the participating school districts. Pursuant to the Facebook grant, the other 32 units would be set aside for school employees in certain public and nonprofit schools in southern San Mateo County. If there are not enough school employees to fill the 32 units then any remaining units would be made available to persons employed in public safety professions (e.g., police, firefighters, nurses). In the unlikely event that there are not enough school employees or public safety professionals to fill the units, then the remaining units would be offered to employees of nonprofit, public interest organizations agreed to by the County and Facebook.

There would be 5 residential units on the first floor (ground level). The second, third, and fourth floors would each have 35 residential units arranged around three outdoor courtyards, totaling approximately 10,000 SF (see Figure 2.3-2). The three landscaped courtyards and connecting pathway would provide a variety of passive and active facilities for resident use, such as dining areas with tables and barbeque grills, seating and lounge areas, ping pong and shuffleboard tables, pet area, and children’s play area.

An approximately 1,000 SF community room would be provided for residents’ use, with an adjacent approximately 800 SF outdoor “community porch.” Other residential amenities such as a laundry, storage areas, bike storage room as well as property management and related services would be provided on the ground floor.

Table 2.3-1 Number of Residential Units by Unit Type and Floor Level

Unit Type	Level 1	Level 2	Level 3	Level 4	Total
Studio	0	8	8	8	**24**
1-Bedroom	4	19	19	19	**61**
2-Bedroom	1	8	8	8	**25**
Total	**5**	**35**	**35**	**35**	**110**

Source: Prepared by AECOM based on information provided by Mercy Housing and Abode Communities in 2021.

Note: Number of units is based on conceptual design plans and may be subject to change during detailed design process.

2.3.3 Flex Space and Public Amenities

Approximately 1,100 SF of “flex space,” which could be utilized as a café or other retail or commercial use, would be provided at the northeast corner of the building with an adjacent, approximately 1,600 SF outdoor plaza. A second, approximately 3,000 SF outdoor plaza would connect the main building lobby with Grant Avenue, and a third, approximately 1,200 SF outdoor plaza would be centered around the large Canary palm tree that would be retained at the corner of Birch and Grant Avenues (see Figure 2.3-1).

2.3.4 Landscaping, Utilities, and Other Site Improvements

The existing, mature Canary Island palm tree near the corner of Grant Avenue and Birch Street would be retained, along with two valley oak trees along the Birch Street frontage, two Coast redwood trees at the rear of the site, and the four northernmost street trees on Park Boulevard. Along the rear boundary of the site, the Italian cypress trees on the adjacent properties would also be retained. All other trees on the site, including the 12 other street trees, would be removed during construction. The existing mature camphor tree and Coast redwood tree along the Grant Avenue frontage, which are considered “heritage trees” under the City of Palo Alto’s tree protection ordinance, were originally planned to be retained as part of the development. However, the arborist report prepared for the Project determined that both trees are in poor condition and would be unlikely to survive. The City’s arborist has reviewed the arborist report and concurs that both trees should be removed and replaced (Passmore, pers. comm, 2021). As part of the Project, 13 new street trees would be installed to replace the 12 being removed, and eight new heritage trees would be planted to replace the camphor and Coast redwood (see Figure 2.3-7).

The total area of impervious surfaces at the site would be 41,300 SF (80 percent of the total site), which is approximately 3 percent more than the existing area of impervious surface (40,018 SF). Planters would be installed adjacent to Park Boulevard, which would capture approximately 25 percent of storm flows, with the remaining 75 percent being captured in a Low Impact Development device, which would be located either on the Birch Street or Park Avenue frontages, and would connect to the municipal stormwater system.

The Project would connect to existing public utilities and service systems in the area, via new utility service laterals. No improvement or upgrade is anticipated to the existing utilities adjacent to the project site. The Project would be 100 percent electric with no natural gas infrastructure. Photovoltaic solar panels and heating, ventilation, and air conditioning (HVAC) equipment would be installed on the rooftop, as indicated on Figure 2.3-8. These rooftop utilities would not extend above the parapet. Exterior light sources would be designed so as not to create significant light and glare on adjacent properties through the use of concealed sources and/or downcast light fixtures.

2.3.5 Access and Circulation

The rear (southeast) of the building would contain an at-grade parking garage on the ground floor, with vehicular access from Birch Avenue and Park Boulevard (see Figure 2.3-1). Due to the central median along Birch Avenue, the garage entrance on that side of the property would be restricted to right turn in and right turn out movements only.

The parking structure would provide 112 parking spaces, 6 of which would be Americans with Disabilities Act (ADA) spaces and 12 would be electric vehicle-ready. The proposed parking stacker system would allow double the number of vehicles to be parked within the same area as a traditional parking garage.

A secure bicycle parking room would be provided on the ground floor, with capacity for 134 bicycles, which would be accessed through the ground floor lobby/hallway. Additional short-term bicycle parking (at least 12 spaces) would be provided in the exterior public open spaces.

The Project would also include installation of new curb, gutter, and sidewalk adjacent to the project site, as well as repaving within the adjacent roadway on Grant Avenue to repair any construction-related damage, if necessary.

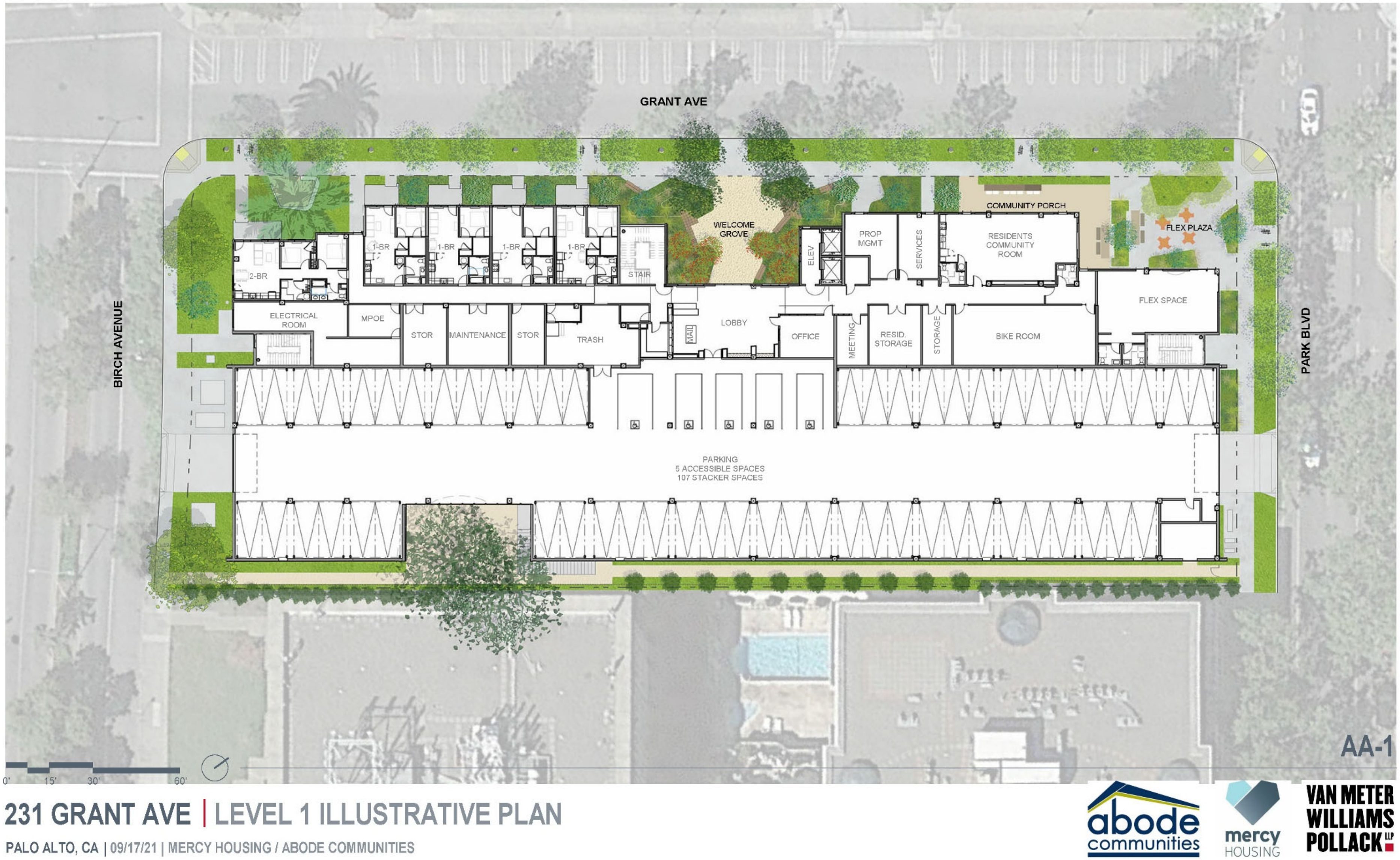

Figure 2.3-1 Conceptual Ground Floor Plan

Source: Mercy Housing and Abode Communities 2021a.

Figure 2.3-2 Conceptual Upper Floor Plan

Source: Mercy Housing and Abode Communities 2021a.

Figure 2.3-3 Conceptual Elevations – Grant Avenue Frontage

Source: Mercy Housing and Abode Communities 2021a.

Figure 2.3-4 Conceptual Elevations – Birch Street Frontage

Source: Mercy Housing and Abode Communities 2021a.

Figure 2.3-5 Conceptual Elevations – Rear Site Boundary

Source: Mercy Housing and Abode Communities 2021a

Figure 2.3-6 Conceptual Elevations – Park Boulevard Frontage

Source: Mercy Housing and Abode Communities 2021a.

TREE REPLACEMENT SCHEDULE		
EXISTING TREES		
SYMBOL	NAME	QUANTITY
P	PROTECT TREE IN PLACE	9
	#25 QUERCUS LOBATA / VALLEY OAK	
	#31 QUERCUS LOBATA / VALLEY OAK	
	#33 PHOENIX CANAROENSIS / CANARY ISLAND PALM	
	#38 PLATNUS X ACERFOLIA / LONDON PLANE TREE	
	#39 PLATNUS X ACERFOLIA / LONDON PLANE TREE	
	#40 PLATNUS X ACERFOLIA / LONDON PLANE TREE	
	#41 PLATNUS X ACERFOLIA / LONDON PLANE TREE	
	#76 SEQUOIA SEMPERVIRENS / COAST REDWOOD	
	#77 SEQUOIA SEMPERVIRENS / COAST REDWOOD	
	PROTECT TREE IN PLACE - ADJACENT PROPERTY	48
	CUPRESSUS SEMPERVIRENS / ITALIAN CYPRESS	
HX	HERITAGE TREES TO BE REMOVED	2
	#64 SEQUOIA SEMPERVIRENS / COAST REDWOOD	
	#67 CINNAMOMUM CAMPHORA / CAMPHOR TREE	
SX	STREET TREES TO BE REMOVED	12
	REMOVE TREE WITH NO REPLACEMENT	19
PROPOSED TREE REPLACEMENTS		
H	HERITAGE TREE REPLACEMENT (N) TREES 48" BOX	4
H	HERITAGE TREE REPLACEMENT (N) TREES 36" BOX	4
S	PROPOSED (N) MEDIUM STREET TREE (680 CU SF OF SOIL VOLUME)	13

NOTES:

1. REFER TO L4.11 AND L4.12 FOR TREE SPECIES
2. REFER TO "ASSESSMENT OF AND RECOMMENDATIONS FOR PRIVATE TREES AND STREET TREES AT AND ADJACENT TO 231 GRANT PALO ALTO, CALIFORNIA (SANTA CLARA COUNTY LAND) BY WALTER LEVISON"

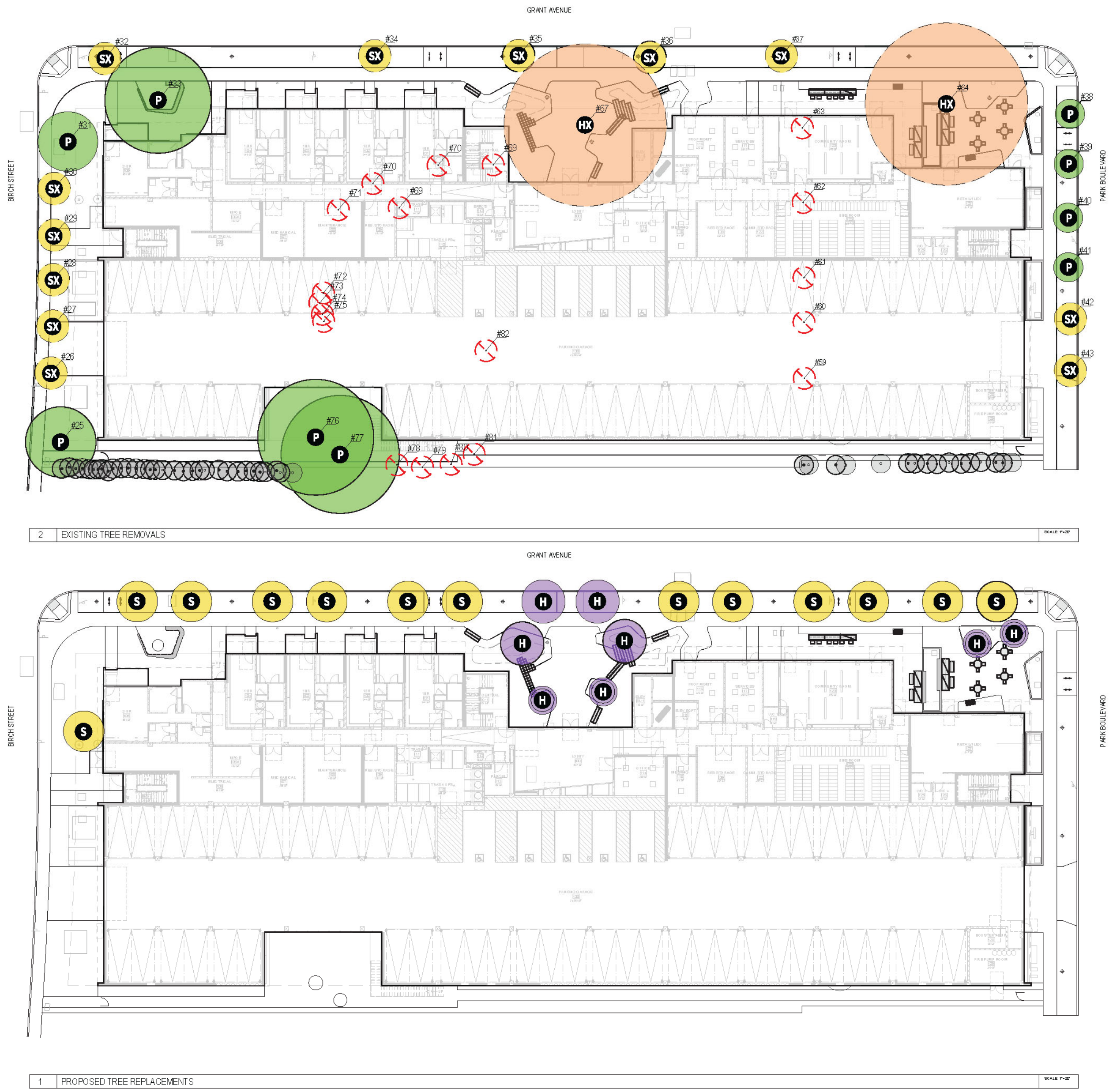

Figure 2.3-7 Conceptual Tree Removal and Tree Planting Plan

Source: Mercy Housing and Abode Communities 2021a.

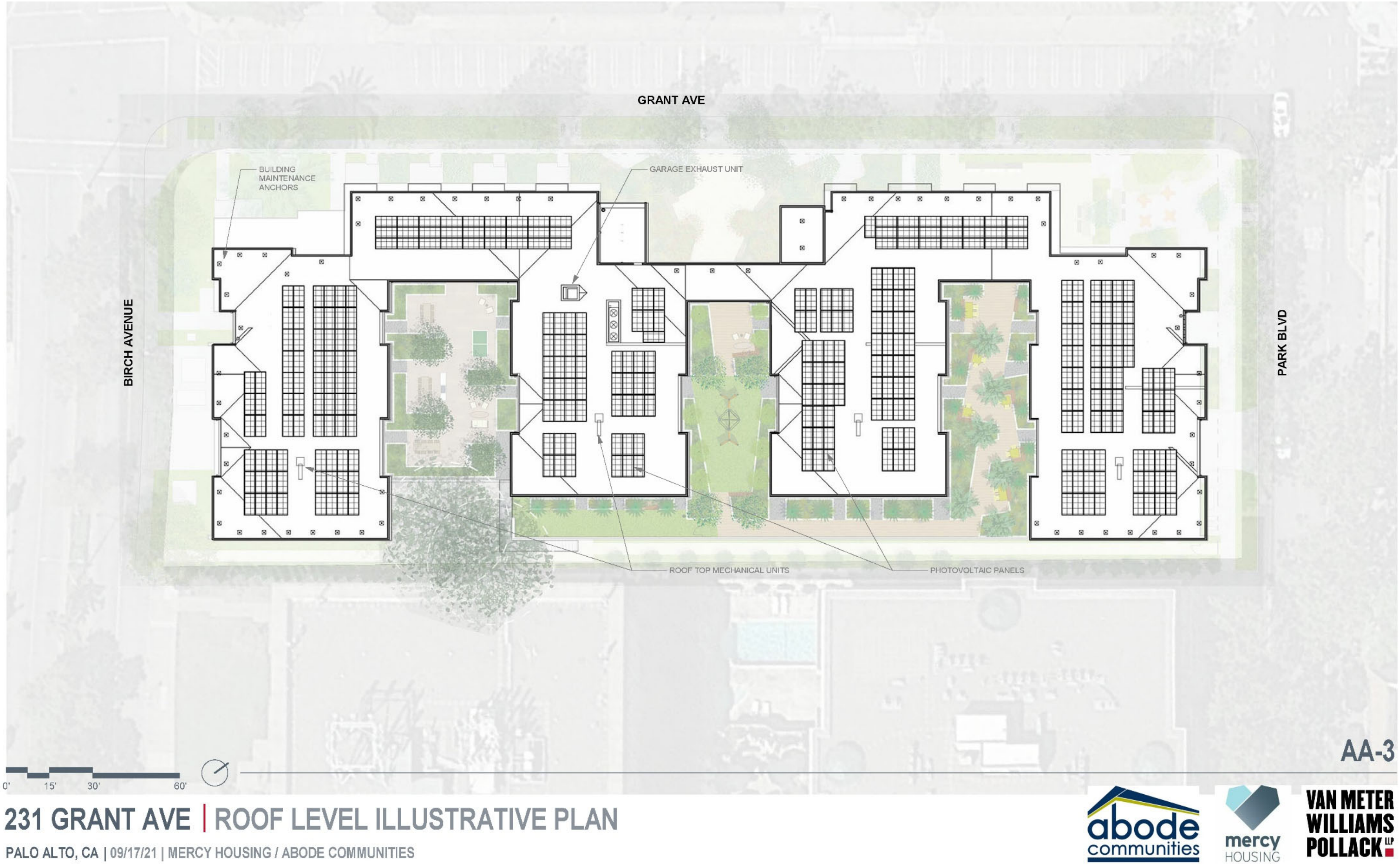

Figure 2.3-8 Conceptual Roof Plan

Source: Mercy Housing and Abode Communities 2021a.

2.4 Project Construction

The Project is anticipated to use modular construction methods. Modular construction is a process in which portions of a building are constructed off-site in repeated sections called modules, which are then transported to the project site and assembled. The modules are typically placed or "set" using a crane and joined together using inter-module connections that tie the individual modules together to form the overall building structure. Other portions of the building are built on-site (site-built). Modular construction uses the same materials and is required to meet the same codes and standards as conventionally built facilities. While the Project would use modular construction methods, the use of traditional construction methods is analyzed as an alternative to the Project (see Section 4, "Alternatives").

The site-built portion of the Project will consist of all Level 1 improvements including five residential units, community rooms, lobby, offices, flex space, storage, bike room, mechanical/electrical rooms, stairs. The parking, parking stackers and podium will also be site-built. On Level 2, the landscaping and site furniture will be site-built. There will be some limited site-built portions on Levels 2 through 4, including the building finish façade, stairwells and elevators, but the majority will be the modular residential units. The roofing, solar panels and HVAC equipment will be site-built.

2.4.1 Construction Phasing, Equipment, Personnel

Construction is anticipated to begin in mid-2022 and the construction period is expected to last approximately 15 to 18 months in total. This project schedule is dependent on market conditions, regulatory approvals, and other factors and, therefore, is subject to change. Estimated construction phasing, equipment, and personnel needs have been established for the Project, as shown in Table 2.4-1.

Construction activities would generally be limited to between 8:00 a.m. and 6:00 p.m. Monday through Friday and between 9:00 a.m. and 6:00 p.m. on Saturdays, in accordance with Chapter 9.10 of the City of Palo Alto Municipal Code[4]. No construction would occur on Sundays or public holidays. Early starts or late finishes may be required on occasion to accommodate major concrete pours, crane mobilization, or other logistical needs.

Construction phase activities would begin with the abatement of hazardous materials within the existing building on the site, including asbestos-containing materials, lead-based paint, electrical equipment containing polychlorinated biphenyls, and fluorescent tubes containing mercury vapors and lights. Construction worker health and safety regulations and hazardous materials removal and disposal protocols would be implemented in accordance with applicable federal and state standards, including the California Division of Occupational Safety and Health and the Bay Area Air Quality Management District (BAAQMD) regulations. The Project contractor would comply with all local, state, and federal requirements regarding hazardous materials. All hazardous materials would be disposed of at an approved facility.

[4] The City's Municipal Code is more restrictive on construction hours than the County noise ordinance. The County noise ordinance allows construction between 7:00 a.m. and 7:00 p.m., Monday through Saturday, with no construction allowed on Sundays or holidays.

Table 2.4-1 Estimated Construction Phasing, Equipment and Personnel

Construction Phase	Estimated Duration[1]	Equipment Type	Average Number of Workers
1. Site Clearing, Grading and Excavation	6 weeks	2 truck excavators 1 skid steer loader 1 truck tractor 1 backhoe loader 1 hollow stem auger vibratory rollers vibratory plate compactors jackhammers jumping jack compactors	15
2. Underground Utilities	4 weeks	1 backhoe loader 1 mini-excavator vibratory plate compactors	15
3. Ground Floor Concrete Work	20 weeks	2 reach forklifts 1 mobile crane (intermittent) 1-2 boom lifts 1 backhoe loader 1 skid steer vibratory plate compactors	30
4. Modular Placement/Setting, Wood Framing and Structural Connections	11 weeks	2 reach forklifts 1 boom lift 1 large crawler crane	30
5. Interior Finishes/Landscaping	33 weeks	1 reach forklift 1-2 boom lifts 1 mobile crane (intermittent)	65

Source: Prepared by AECOM based on information provided by Mercy Housing and Abode Communities in 2021.
Notes: 1. It is assumed that up to two weeks overlap could occur between each phase.

The Project contractor would install site fencing, traffic controls, tree protection (e.g., fencing off trees that are to be retained on the project site to avoid accidental damage during construction) and other site controls in preparation for demolition. The Project contractor would also remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities, and would disconnect and cap abandoned utilities.

Demolition would be performed in a manner that maximizes salvage and recycling of materials. A minimum of 50 percent, by weight, of the solid waste generated would be diverted from landfill disposal through re-use and recycling as required by the most current version of the California Green Building Standards Code. Materials to be recycled or re-used would be stored onsite in non-combustible containers. All demolition materials, waste, and debris that are not designated to be salvaged would become the Project contractor’s property and would be removed and disposed of in compliance with all local, state, and federal regulations.

The site would then be graded and excavated in preparation for construction. Preliminary estimates of site grading volumes, and associated truck trips for fill import/export are shown in Table 2.4-2. Depending on the selected foundation design, the maximum depth of excavation is estimated to be approximately 17 feet (“deep foundation” design) or up to 27 feet (“drilled displacement sand-cement columns” design).

Following grading and excavation, underground utilities would be installed at the site, connecting to the existing utilities in the adjacent road rights-of-way. Ground-floor concrete work to create the foundation and parking garage of the building would then be undertaken, which would also form the base on which the modular units would be set. Setting of the modular units using a large mobile crane would take approximately four weeks to complete, followed by miscellaneous framing work such as the parapets and corridors, as well as structural connections. Finally, the interior of the building would be completed, and exterior landscaping/paving would be completed.

Table 2.4-2 Estimated Material Import/Export Volumes

Material Type	Volume	Estimated Truck Loads	Estimated Truck Trips
Demolition Debris	3,000 cubic yards	300	600
Soil Export	10,000 cubic yards	1,000	2,000
Modular Units	105 units	105	210
Total	**13,000 cubic yards and 105 modular units**	**1,405**	**2,810**

Source: Prepared by AECOM in 2021.

Notes: Soil and debris volumes and number of modular truck trips provided by Developer. Calculation of truck loads for soil and debris based on dump truck volume of 10 cubic yards.

2.4.2 Construction Haul Routes, Staging, and Traffic Control

Haul routes would vary depending on material/destination and be determined in consultation with the County of Santa Clara prior to issuance of building permits. For general construction materials, it is anticipated that the majority of truck traffic would access the site via US-101, Oregon Expressway, Birch Avenue and Grant Avenue.

For the transportation of modular components from the factory in Vallejo, typical haul routes are anticipated to be along Interstate-80 North, Interstate-680 South, State Route 237 West, US-101 North, Oregon Expressway, and Birch Avenue to Grant Avenue, however this route is subject to change per approval by the permitting agencies. Trucks transporting some of the wider modular units would require full police escorts. Figure 2.4-1 shows anticipated haul routes.

No off-site construction staging areas are anticipated, except for the street frontages immediately adjacent to the site, described below. Workers would be expected to park in public parking lots within a quarter mile of the site.

One-way traffic controls and temporary closure of on-street parking would be required on Grant Avenue between Park Boulevard and Birch Avenue throughout the majority of the construction period, and Grant Avenue would likely need to be closed periodically during the construction period to allow for crane mobilization and/or concrete pours, including a full closure for 4 to 8 weeks during crane setting of modular units. Lane closures on Birch Avenue (northbound side of median only) and Park Boulevard may also be required occasionally, including two days each for crane setting of the far southwest and far southeast modular units, respectively.

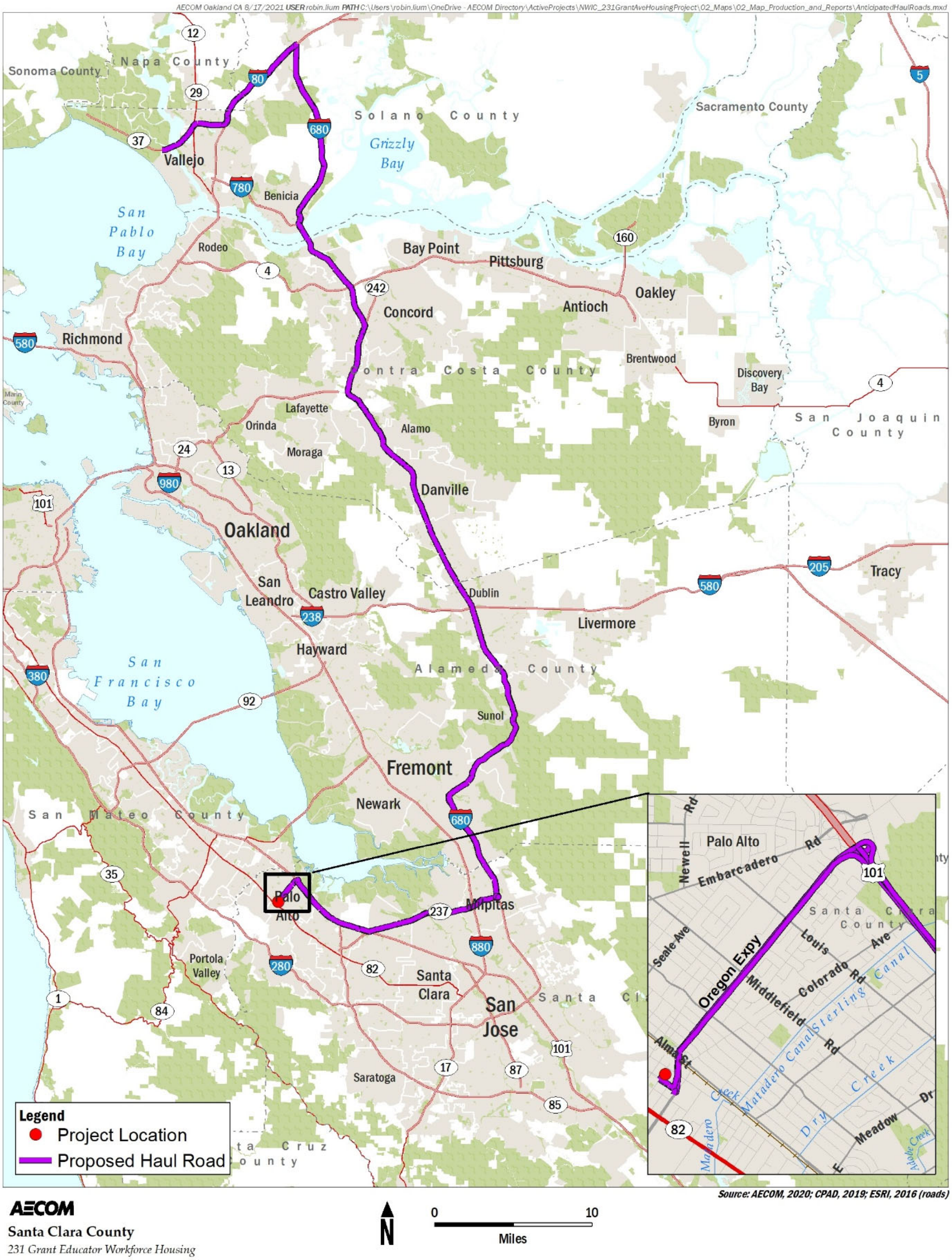

Figure 2.4-1 Anticipated Construction Haul Routes

Source: Prepared by AECOM based on information provided by Mercy Housing and Abode Communities in 2021.

Before construction begins, the construction contractor would prepare and implement a traffic control plan as part of the Project, in consultation with the City of Palo Alto. The traffic control plan would be prepared in accordance with the City's latest Traffic Control Plan Requirements and Public Works Standard Specifications, and would include the following:

- Development and implementation of a process for communicating with affected residents and landowners about the Project, with at least 72 hours advance notice to abutting property owners and tenants prior to commencing work on the project. Written notification shall include the construction schedule, the exact location and duration of activities on each roadway, detours and alternative routes that may be available to avoid delays, and contact information for questions and complaints.
- Schedule of construction showing each phase of the project, construction hours, and anticipated method of handling traffic for each phase, including drawings identifying lane configurations, haul routes, road and lane closures, detour routes, work areas, staging areas, and worker parking areas. The location of signs, barricades, codes, etc., to warn, direct, and guide traffic shall be shown on the plan, as well as any supplementary traffic control devices that might be required.
- Posting of appropriate warning signs in advance of construction activities, alerting bicyclists and pedestrians to any closures of nonmotorized facilities and necessary detours, if applicable.
- Notification of administrators of any affected police and fire stations, ambulance service providers, transit providers, schools and recreational facility managers regarding the timing, location, and duration of construction activities and the locations of detours and road or lane closures. Access for emergency vehicles in and/or adjacent to roadways affected by construction activities would be maintained at all times.
- The repair and restoration of any damaged or deteriorated roadway rights-of-way according to responsible agency requirements after construction is completed.
- Scheduling equipment/deliveries during off-peak vehicular commuter hours and use of flaggers for large equipment.

2.5 Required Permits and Approvals

The Project is being implemented by the County of Santa Clara pursuant to its intergovernmental and sovereign immunity and would be reviewed and considered for approval by the County Board of Supervisors. Other permits and/or approvals that may be required include the following:

- County of Santa Clara building permits, tree removal permit, oversized vehicle permit, noise ordinance variance permit, and demolition permit.
- California Department of Housing and Community Development Factory Built Housing Permit
- California Department of Transportation (Caltrans) oversized vehicle permit and encroachment permit.
- Santa Clara Valley Transportation Authority (VTA) oversight permit.

- City of Palo Alto encroachment permit, utility permits, tree removal permit, oversized vehicle permit, noise ordinance exception permit, and street closure permit.
- Bay Area Air Quality Management District (BAAQMD) asbestos dust mitigation plan.
- Regional Water Quality Control Board (RWQCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit), and approval of dewatering discharges.
- Regulatory oversight and approval from either the County of Santa Clara Department of Environmental Health, the San Francisco Bay Regional Water Quality Control Board, or the California Department of Toxic Substances Control for a Site Assessment, Conceptual Site Model, and Site Management Plan for managing potential risks associated with contamination from California-Olive-Emerson regional groundwater plume.

3 Environmental Setting and Impact Analysis

3.1 Methodology

3.1.1 Impact Assessment Methodology

Appendix G of the CEQA Guidelines provides a sample initial study checklist that identifies a number of factual inquiries related to various environmental topics. CEQA grants lead agencies discretion to develop their own thresholds of significance. Although lead agencies are not required to use the Appendix G inquiries as thresholds of significance, it is a common practice for lead agencies to do so and the County has done so for this Project. Specific thresholds of significance are established for each of the environmental topics discussed within this section, based on Appendix G of the CEQA Guidelines.

Each environmental topic section within this EIR (Sections 3.2 through 3.17) provides a description of the existing setting with respect to the particular topic, an overview of the applicable regulatory framework at the federal, state, and local levels, and then discusses the impacts of the Project and compares those impacts to the established thresholds of significance. Each environmental topic section also includes an assessment of the cumulative-level impacts.

3.1.2 Cumulative Impact Assessment Methodology

CEQA requires that an EIR include an assessment of the cumulative impacts that could be associated with implementation of a project. This assessment involves examining project-related effects in connection with the environmental effects of past, current, and probable future projects. An EIR must discuss the cumulative impacts of a project when the project's incremental effect would be cumulatively considerable contribution to a significant cumulative impact (CEQA Section 21083(b)(2)).

Although project-related impacts may be individually minor, in combination with other past, present and probable future projects producing related impacts, where the project's incremental effect could be cumulatively considerable, the EIR should evaluate whether the project's effect, in combination with other projects, would be cumulatively significant (CEQA Guidelines Section 15130(a)). CEQA Guidelines Section 15130(b) indicates that the level of detail for the cumulative impact analysis need not be as great as for the project impact analyses, but that it should reflect the severity of the impacts and their likelihood of occurrence, and that it should be focused, practical, and reasonable.

CEQA Guidelines Section 15130(b)(1) identifies two approaches to analyzing cumulative impacts. The first is the list approach, through which a defined set of past, present, and probable future projects producing related or cumulative impacts is considered for analysis. The second is the summary approach (also known as the "plan" approach), wherein the relevant projections, as contained in an adopted general plan or related planning document that evaluates regional or area wide conditions, are summarized. This EIR's cumulative impact analysis is based on a combination of these approaches, as described below, depending on the resource area being analyzed. Please also see the individual resources sections of this EIR (Sections 3.2 through 3.18) for additional information.

The geographic study area and method for conducting the cumulative analysis also varies by resource area. For example, air quality impacts are evaluated against conditions in the air basin. Other cumulative analyses, such as cultural resources, consider the potential loss of resources in a broader, more regional context. Cumulative impacts for each resource area are discussed within the specific resource sections. The cumulative projects and growth discussed in the subsequent sections is considered conservative as many of these projects will not be completed or fully constructed within the 2024 horizon year of this Project.

List of Cumulative Projects

The effects of past and present projects on the environment are reflected by the existing conditions in the Project area. A list of probable future projects in the vicinity of the project site is provided below in Table 3.1-1. The table is not intended to be an all-inclusive list of projects in Santa Clara County or the City of Palo Alto, but rather probable future projects in the project vicinity that have the possibility of combining with the Project to generate a cumulative impact (based on proximity and construction schedule) and either:

- are partially occupied or under construction at the time of the Notice of Preparation,
- have received final discretionary approvals at the time of the Notice of Preparation, or
- have applications accepted as complete by local agencies and are currently undergoing review at the time of the Notice of Preparation.

Table 3.1-1 identifies current and probable future projects that were considered in the development and analysis of the Project's potential cumulative impacts.

Table 3.1-1 List of Cumulative Projects

Project Name	Status	Project Location	Details
Public Safety Building	Approved, Under Construction	250 Sherman Avenue (approximately 400 feet northwest of project site)	New 50-foot-tall, approximately 56,000 SF building to house the Palo Alto Police Department, 911 Emergency Dispatch Center, Emergency Operations Center, Office of Emergency Services, and administration services for the Fire Department.
2755 El Camino Real Multi-Family Residential Project	Approved	2755 El Camino Real (approximately 1,000 feet south of project site)	New 50-foot-tall, 4 story building totaling 41,304 SF with up to 60 residential units, and a zoning code text change amendment to create a Special Purpose Combining District overlay for the Public Facilities zone.

Source: Patel, pers. comm. 2020.

Acronyms: SF = square feet

Projected Cumulative Growth

The following discussion is based on an understanding of anticipated growth within the region that would affect the severity of Project impacts identified in this EIR, based on the City of Palo Alto Comprehensive Plan (City of Palo Alto 2017a). Further discussion is also provided in relation to the cumulative context and impact analysis for each resource topic in Sections 3.2.4 through 3.18.4 of this EIR.

The City of Palo Alto Comprehensive Plan 2030 was adopted by the Palo Alto City Council in November 2017 and contains the City's official policies on land use and community design, transportation, housing, natural environment, safety, business and economics, and community services. The Comprehensive Plan, Zoning Code and other implementing ordinances guide land uses within the City. As part of the comprehensive plan study process, the City of Palo Alto evaluated a total of six scenarios with varying degrees of growth for the year 2030. The City Council eventually adopted a scenario with growth approximately mid-way of the evaluated scenarios, with between 3,500 and 4,400 new housing units proposed by 2030.

The most recent Housing Element was adopted in November 2014 and addresses growth within the City between 2015 through 2023. The Housing Element of the Comprehensive Plan projects growth within the City, anticipating an increase in population within the City to 73,400 by 2025 and 84,000 by 2035. In 2020, the population of the City was estimated at 69,226 (California Department of Finance 2020). The Housing Element includes the Association of Bay Area Governments (ABAG) Regional Housing Needs Allocation (RHNA) targets for Palo Alto, which includes a total of 1,988 new residential units by 2022.

The City is currently preparing an update to its Housing Element, which will plan for growth in the City between 2023 and 2031. The Housing Element update will include updated RHNA allocations for the City, which are anticipated to be finalized by ABAG in late 2021 (ABAG 2021).

3.2 Aesthetics

This section describes the existing visual setting of the project area and evaluates whether the Project would result in significant adverse effects to aesthetics. The following comment relating to aesthetics was received during the public scoping period in response to the Notice of Preparation (see Appendix A):

- Request that the Project should be designed to "suit" the existing development in the neighborhood.

3.2.1 Environmental Setting

The approximately 1.4-acre project site is at 231 Grant Avenue in the City of Palo Alto, and is bounded by Park Boulevard, Grant Avenue, and Birch Street. The site is owned by the County and the existing office building currently houses the County of Santa Clara Office of the Public Defender. Surface parking lots are on the north and south ends of the project site.

The existing single-story building is approximately 6,800 square feet and is oriented northwest toward Grant Avenue. The building was completed in 1956 and represents a Contemporary architectural style. Rough stucco siding covers much of the exterior with a stack-course brick wall section on the façade and stack-course concrete masonry units on the slightly taller roof on the south section of the building. Mature landscaping including camphor, redwood, eucalyptus, and magnolia trees and numerous shrubs are on the boundary and within the project site.

Across Grant Avenue from the project site is the County of Santa Clara Courthouse and parking lot. An outdoor café and four-story multifamily residential housing are adjacent to the northeast boundary of the project site at the corner of Sheridan Avenue and Park Boulevard, and a four-story office building is adjacent to the southeast boundary of the project site at the corner of Sheridan Avenue and Birch Street. Areas to the east and west of Grant Avenue and south of Birch Street in the vicinity of the project site are predominantly multifamily residential housing. Office buildings and multifamily residential housing are north of the project site along Park Boulevard. The buildings in the project vicinity are generally one to four stories. These buildings vary in architectural style, height, color, and bulk. Viewers of the project site from these locations include motorists, employees and patrons of local businesses, residents, pedestrians, and bicyclists. Landscaping associated with these buildings generally consists of mature trees, shrubs, and grass that provide visual contrast in terms of form, color, mass, and scale.

Scenic Highways and Corridors

The California Department of Transportation (Caltrans) administers the California Scenic Highways Program. There are no officially designated California Scenic Highways in the immediate vicinity of the project site (Caltrans 2018). The nearest officially designated California Scenic Highway is the portion of Interstate 280 (I-280) within San Mateo County, approximately 3 miles southwest of the project site. Within Santa Clara County, I-280 is eligible but has not been officially designated.

The City of Palo Alto Comprehensive Plan designates the whole length of Oregon Expressway/Page Mill Road as a local scenic route (City of Palo Alto 2016a).[5] Oregon

[5] The City of Palo Alto defines local scenic routes as roadways with a unique set of surrounding visual characteristics worthy of preservation (City of Palo Alto 2016a)

Expressway is a wide, landscaped arterial linking United States Highway 101 (US-101) to the Alma Street underpass and interchange. Oregon Expressway connects with Page Mill Road at El Camino Real. Southwest of El Camino Real, Page Mill Road passes by the Stanford Research Park, where landscaping and setbacks create an aesthetically uniform corridor. Page Mill Road continues to Foothill Expressway/Junipero Serra Boulevard, ascending north of Coyote Hill into Los Altos Hill to offer views of the foothills, Palo Alto and the San Francisco Bay. It continues under Interstate 280 (I-280) and re-enters Palo Alto to serve as the main entrance into Foothills Park and provides access to Los Trancos Open Space Preserve.

The project site is located approximately 0.6 mile west of Oregon Expressway. In the vicinity of the project site, this section of the Oregon Expressway is surrounded by urban development, including multifamily residential housing, office complexes, and retail establishments. Thus, there are no views of scenic resources from the Oregon Expressway in the vicinity of the project site.

Scenic Vistas

There are no designated scenic vistas in Palo Alto. However, the City identifies the forested foothills of the Santa Cruz Mountains to the southwest and the San Francisco Bay and adjacent baylands to the northeast, as well as views of the East Bay Hills, as character-defining elements that frame the city (City of Palo Alto 2016a).

Light and Glare

The project area is located in a highly urbanized environment and is surrounded by existing sources of light and glare. These sources of light and glare include streetlights along Grant Avenue, Park Boulevard, Birch Street, and Sheridan Avenue; exterior lighting on office and residential buildings; outdoor lighting on surface parking lots; illuminated signage; reflective building material; and vehicular headlights.

3.2.2 Regulatory Framework

Federal

There are no relevant federal regulations regarding aesthetics applicable to the Project.

State

There are no relevant state regulations regarding aesthetics applicable to the Project.

Local

County of Santa Clara General Plan policies relating to aesthetics only apply to unincorporated areas of the County. Because the project site lies within the City of Palo Alto, there are no County General Plan policies applicable to the Project. In addition, the project site is on County-owned property and the County is generally not subject to City of Palo Alto general plan policies and land use designations, City zoning, or other City regulations for public projects such as the Project. Therefore, there are no relevant local regulations regarding aesthetics applicable to the Project.

3.2.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to aesthetics:

- **Impact AES-1:** Would the Project have a substantial adverse effect on a scenic vista?

- **Impact AES-2:** Would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
- **Impact AES-3:** Would the Project, for non-urbanized areas substantially degrade the existing visual character or quality of public views of the site and its surroundings (public views are those that are experienced from a publicly accessible vantage point)? In an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?
- **Impact AES-4:** Would the Project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Impact AES-1: Scenic Vistas

Impact AES-1 would be **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, the Project may have a significant impact if it would have a substantial adverse effect on a scenic vista.

Impact Analysis

There are no designated scenic vistas in Palo Alto. However, the City identifies the forested foothills of the Santa Cruz Mountains and the San Francisco Bay and adjacent baylands as well as views of the East Bay Hills as character-defining elements that frame the city. Because the topography of the project site and surrounding area is generally flat, construction of the Project would not obstruct background views of scenic resources, such as views of hillsides or the baylands approximately 2 miles to the west and northeast, respectively. In addition, distant views of the project site would be indistinguishable from the surrounding area due to the density of urban development. Therefore, construction and operation of the Project would not have a substantial adverse effect on a scenic vista and **no impact** would occur.

Impact AES-2: Scenic Resources

Impact AES-2 would be **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, the Project may have a significant impact if it would substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

Impact Analysis

There are no officially designated California Scenic Highways in the vicinity of the project site. The project site is approximately 0.6 mile west of Oregon Expressway, which is designated as a local scenic route by the City of Palo Alto Comprehensive Plan. In the vicinity of the project site, Oregon Expressway is below grade to pass under the CalTrain corridor, and is surrounded by urban development, including multifamily residential housing, office complexes, and retail establishments up to four stories in height. Thus, there are no views of the project site from Oregon Expressway. In addition, the proposed new building would have a roof plane height of 50 feet, which is similar to the existing buildings near the project site. The trees to be removed as part of the Project are not scenic resources. Therefore, construction or operation of the Project would not affect scenic resources within a state or local scenic route and **no impact** would occur.

Impact AES-3: Scenic Quality

Impact AES-3 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if, in non-urbanized areas, it would 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 a publicly accessible vantage point) or in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality.

The project site is within an urbanized area; therefore, the Project would have a significant impact only if it would conflict with applicable zoning and other regulations governing scenic quality.

Impact Analysis

As discussed further below in Section 3.11, "Land Use and Planning," the County is sponsoring the Project and the Project would primarily serve a public purpose. Thus, under state law, the Project is exempt from the City's land use regulations. County General Plan policies and regulations governing scenic quality apply only to unincorporated areas of the County and, therefore, are not applicable to the Project, which is within the incorporated city limits of Palo Alto. Therefore, the Project would not conflict with any zoning or other regulations governing scenic quality.

A scoping comment requested that the Project should be designed to "suit" existing development in the neighborhood. Although Palo Alto's zoning and other design guidelines do not apply to this Project, a brief discussion of the Project's consistency with the City's development standards and design criteria is provided below.

The Project would be consistent with the development standards and design criteria provided in Chapters 18.23 and 18.34 in Section 18 of the City municipal code, including standards for setbacks, usable common and private open space, landscaping and visual screening, and building size and bulk. The setback of the building from the street would vary, allowing provision of three outdoor plaza areas along the Grant Avenue frontage of the site. The existing, mature Canary Island palm tree near the corner of Grant Avenue and Birch Street would be retained, along with two valley oak trees along the Birch Street frontage, and two redwood trees at the rear of the site. Minimum setbacks along Birch Avenue and Park Boulevard would be approximately 15 feet and 7 feet respectively.

As discussed in Section 3.2.1, "Environmental Setting," the buildings in the project vicinity are generally one to four stories. The proposed new building would also be four stories; however, the new building would exceed the maximum height standard (40 feet) identified in Section 18.34.04 of Section 18 of the City's municipal code for the California Avenue Pedestrian and Transit Oriented Development Combining District. The roof of the building would be 50 feet in height (measured to the roof plane), with the parapet extending up to 55 feet and elevator/stairwell shafts extending up to 60 feet maximum height (see Figure 2.3-3 through 2.3-5 in Section 2). As stated previously, the Project is exempt from the City's land use regulations. Although the new building would exceed maximum height standards, the project site is surrounded by urban development, including multifamily residential housing, office complexes, and retail establishments up to four stories in height, and the Project's roof plane height of 50 feet is similar to the existing buildings near the project site. Therefore, the Project would have a **less than significant impact** on scenic quality.

Impact AES-4: Light and Glare

Impact AES-4 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, the Project may have a significant impact if it would create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Impact Analysis

Construction

Construction activities for the Project would comply with the City's construction hours, which are limited to daytime (8am to 6pm on weekdays; 9am to 6pm on Saturdays and holidays; no construction allowed on Sundays). While some nighttime lighting may be required during late afternoon twilight periods in late fall or winter, or for site security throughout the construction period, this would be directed downwards and/or shielded to reduce spillover onto neighboring properties and public rights-of-way. Construction-related impacts from light and glare would be **less than significant**.

Operation

The light and glare created by development under the Project would be consistent with the levels of lighting and glare currently emitted by the multifamily residential and office buildings surrounding the project site and street lighting. Exterior light sources would be designed so as not to create significant light and glare on adjacent properties through the use of concealed sources and/or downcast light fixtures. Because the Project would not introduce new sources of light and glare substantially different from the existing light and glare from surrounding uses and street lighting, the Project would not generate a substantial new source of light and glare that would adversely affect day or nighttime views in the area. Thus, the Project's impacts related to light and glare would be **less than significant**.

3.2.4 Cumulative Impacts and Mitigation

As discussed in Section 3.2.3 above, the Project would have no impact related to scenic vistas (Impact AES-1) or scenic resources (Impact AES-2). Therefore, the Project would not contribute to any potential cumulative impacts for these issues. This section analyzes the potential of the Project to contribute to the following cumulative aesthetics impacts:

- Impact C-AES-3: Scenic Quality
- **Impact C-AES-4:** Create New Sources of Light and Glare

Cumulative Impact C-AES-3: Scenic Quality

The overall cumulative impact for scenic quality would be **less than significant.**

Cumulative Context

The geographic context for cumulative impacts related to scenic quality is proposed development in the vicinity of the project site. As shown in Table 3.1-1, these cumulative projects consist of the Public Safety Building and the El Camino Real Multi-Family Residential Project.

Cumulative Impact Analysis

Cumulative development within the City of Palo Alto, such as the Public Safety Building and the El Camino Real Multi-Family Residential Project, would be required to comply with the development standards and design criteria identified in Chapter 18.23 and 18.34 in Section 18 of the City municipal code. These standards include required setbacks, usable common and private open space, landscaping and visual screening, and building size and bulk. As stated in Impact AES-3, the Project would also be generally consistent with the City's design requirements, except for building height. Although the Project's roof plane height of 50 feet would exceed the City's standards, it is similar to the existing buildings near the project site. Implementation of the City's development standards and design criteria would reduce the impacts of the cumulative projects; therefore, the overall cumulative impact on scenic quality would be **less than significant**.

Cumulative Impact C-AES-4: Light and Glare

The overall cumulative impact for new sources of light and glare would be **less than significant.**

Cumulative Context

The geographic context for cumulative impacts related to the creation of new sources of light and glare is proposed development in the vicinity of the project site. As shown in Table 3.1-1, these cumulative projects consist of the Public Safety Building and the El Camino Real Multi-Family Residential Project.

Cumulative Impact Analysis

Cumulative development within the City of Palo Alto, such as the Public Safety Building and the El Camino Real Multi-Family Residential Project, would be required to incorporate lighting design standards identified in Chapter 18.23.030 in Section 18 of the City municipal code. These standards include using low-intensity lighting on building exteriors, in parking areas, and along pedestrian pathways; directing lighting downward and/or shielding to minimize glow and glare beyond property lines and using timing devices to minimize light. As stated in Impact AES-4, exterior light sources associated with the Project would also be designed so as not to create significant light and glare on adjacent properties through the use of concealed sources and/or downcast light fixtures. Implementation of these design standards would reduce the impacts of all cumulative projects; therefore, the overall cumulative impact from new sources of light and glare would be **less than significant**.

3.3 Air Quality

This section describes the regulatory framework and existing conditions of the project area related to air quality and evaluates whether the Project would result in adverse effects on air quality. This analysis is based on the methodology recommended by BAAQMD for project-level review, using information available. Mitigation measures are recommended, as necessary, to reduce potentially significant adverse air quality impacts. No comments relating to air quality were received during the public scoping period in response to the Notice of Preparation.

3.3.1 Environmental Setting

Topography, Meteorology, and Climate

Regional

The Project is located in the City of Palo Alto, within Santa Clara County. The City of Palo Alto is in the San Francisco Bay Area Air Basin (SFBAAB), which consists of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties; the western portion of Solano County; and the southern portion of Sonoma County. Air quality is determined by natural factors such as topography, meteorology, and climate, in addition to the presence of existing air pollution sources and ambient conditions. These factors along with applicable regulations are discussed below.

The SFBAAB is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays, which distort normal wind flow patterns. The Coast Range is not continuous, with a western coast gap, Golden Gate, and an eastern coast gap, Carquinez Strait, which allow air to flow in and out of the SFBAAB and the Central Valley. The climate is dominated by the strength and location of a semi-permanent, subtropical high-pressure cell.[6] During the summer, 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 because of the northwesterly flow produces a band of cold water off the California coast. The cool and moisture-laden air approaching the coast from the Pacific Ocean is further cooled by the presence of the cold water band resulting in condensation and the presence of fog and stratus clouds along the Northern California coast. In the winter, the Pacific high-pressure cell weakens and shifts southward resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Weak inversions[7] coupled with moderate winds result in a low air pollution potential (BAAQMD 2017a).

Local

The Santa Clara Valley is bounded by the San Francisco Bay to the north and by mountains to the east, south and west. During the summer, mostly clear skies result in warm daytime temperatures and cool nights. Winter temperatures are mild, except for very cool but generally frost-less mornings. Further inland where the moderating effect of the bay is not as strong, temperature extremes are greater. Wind patterns are influenced by local terrain, with a northwesterly sea breeze typically developing during the daytime. Winds are usually stronger

[6] The Pacific high pressure cell is a large-scale meteorological condition which involves a semi-permanent, subtropical area of high pressure in the North Pacific Ocean. It is strongest in the Northern Hemispheric summer and is displaced towards the equator during the winter when the Aleutian Low becomes more dominant. This high pressure cell keeps storms from affecting the California coast (BAAQMD 2017a, NOAA 2009).

[7] An inversion is a layer of warmer air over a layer of cooler air. Inversions affect air quality conditions significantly because they influence the mixing depth, i.e., the vertical depth in the atmosphere available for diluting air contaminants near the ground. The highest air pollutant concentrations in the SFBAAB generally occur during inversions (BAAQMD 2017a).

in the spring and summer. Annual rainfall amounts are modest, ranging from 13 inches in the lowlands to 20 inches in the hills (BAAQMD 2019).

Air Pollutants of Concern

Criteria Air Pollutants

The United States Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) have identified six air pollutants that can cause harm to human health and the environment: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), and lead. Because the ambient air quality standards for these air pollutants are regulated using human health and environmentally based criteria, they are commonly referred to as “criteria air pollutants.” Reactive organic gases (ROGs) and oxides of nitrogen (NO_X) are criteria pollutant precursors that form ozone through chemical and photochemical reactions in the atmosphere. In general, the State of California’s standards, particularly those for ozone and PM (PM_{10} and $PM_{2.5}$), are more stringent than the federal standards.

This section provides a brief description of criteria air pollutants and health effects of exposure:

- **Ozone (O_3)** is a colorless gas that is odorless at ambient levels. Ozone is the primary component of urban smog. It is not emitted directly into the air but is formed through a series of reactions involving ROGs and NO_X in the presence of sunlight. ROG and NO_X are referred to as “ozone precursors.” Because ozone is not directly emitted, air quality regulations focus on reducing the ozone precursors of ROG and NO_X. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the time involved for precursors to form ozone, peak ozone concentrations often occur far downwind of the precursor emissions. Therefore, ozone is a regional pollutant that often affects large areas. Individuals exercising outdoors, children, and people with lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible subgroups for ozone effects. Short-term ozone exposure (lasting for a few hours) can result in changes in breathing patterns, reductions in breathing capacity, increased susceptibility to infections, inflammation of lung tissue, and some immunological changes. Chronic exposure to high ozone levels can permanently damage lung tissue (BAAQMD 2017a).
- **Carbon Monoxide (CO)** is a colorless and odorless gas that, in the urban environment, is produced primarily by the incomplete burning of carbon in fuels; primarily, from mobile (transportation) sources. Relatively high concentrations are typically found near crowded intersections and along heavily used roadways carrying slow-moving traffic. Even under the most severe meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Vehicular traffic emissions can cause localized CO impacts, and severe vehicle congestion at major signalized intersections can generate elevated CO levels, called “hot spots,” which can be hazardous to human receptors adjacent to the intersections. CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, drastically reducing the amount of oxygen available to the cells. Adverse health effects from exposure to high CO concentrations, which typically can occur only indoors or within similarly enclosed spaces, include dizziness, headaches, and fatigue. CO

exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (USEPA 2019a).

- **Nitrogen Dioxide (NO_2)** is one of a group of highly reactive gases known as oxides of nitrogen, or NO_X. NO_2 is formed when ozone reacts with nitric oxide (NO) in the atmosphere and is listed as a criteria pollutant because NO_2 is more toxic than nitric oxide. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Inhalation is the most common route of exposure to NO_2. Breathing air with a high concentration of NO_2 can lead to respiratory illness. Short-term exposure can aggravate respiratory diseases, particularly asthma, resulting in respiratory symptoms (such as coughing, wheezing, or difficulty breathing), hospital admissions, and visits to emergency rooms. Longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma, and potentially increase susceptibility to respiratory infections (USEPA 2019b).
- **Sulfur Dioxide (SO_2)** is one component of the larger group of gaseous oxides of sulfur (SO_X). SO_2 is used as the indicator for the larger group of SO_X because it is the component of greatest concern and found in the atmosphere at much higher concentrations than other gaseous SO_X. SO_2 is typically produced by stationary sources such as coal and oil combustion facilities, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. On contact with the moist mucous membranes, SO_2 produces sulfurous acid, a direct irritant. Concentration rather than duration of exposure is an important determinant of respiratory effects. Children, the elderly, and those who suffer from asthma are particularly sensitive to effects of SO_2 (USEPA 2019c).
- **Suspended Particulate Matter (PM_{10} and $PM_{2.5}$)** is a complex mixture of extremely small particles and liquid droplets made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Natural sources of particulates include windblown dust and ocean spray. The major areawide sources of $PM_{2.5}$ and PM_{10} are fugitive dust, especially from roadways, agricultural operations, and construction and demolition. Other sources of PM_{10} include crushing or grinding operations. $PM_{2.5}$ sources also include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes. Exhaust emissions from mobile sources contribute only a very small portion of directly emitted $PM_{2.5}$ and PM_{10} emissions; however, they are a major source of ROGs and NO_X, which undergo reactions in the atmosphere to form PM known as secondary particles. These secondary particles make up the majority of PM pollution. Effects from short- and long-term exposure to elevated concentrations of PM_{10} include respiratory symptoms, aggravation of respiratory and cardiovascular diseases, and cancer (World Health Organization 2018). $PM_{2.5}$ poses an increased health risk because these very small particles can be inhaled deep in the lungs and may contain substances that are particularly harmful to human health.
- **Lead** is a highly toxic metal that may cause a range of human health effects. Lead is found naturally in the environment and is used in manufactured products. Previously, the lead used in gasoline anti-knock additives represented a major source of lead emissions to the atmosphere. Metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers. Although the ambient lead standards are no longer exceeded, lead emissions from stationary sources

still pose “hot spot” problems in some areas. Fetuses, infants, and children are more sensitive than others to the adverse effects of lead exposure. Exposure to low levels of lead can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotients. In adults, increased lead levels are associated with increased blood pressure. Lead poisoning can cause anemia, lethargy, seizures, and death, although it appears that lead does not directly affect the respiratory system.

- **Reactive Organic Gases (ROGs)/Volatile Organic Compounds** are compounds composed primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of ROGs. Other sources of ROGs include evaporative emissions from paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. Adverse effects on human health are not caused directly by ROGs, but rather by reactions of ROGs to form secondary pollutants such as ozone. There are no Ambient Air Quality Standards (AAQS) established for ROGs. However, because they contribute to the formation of ozone, the BAAQMD has established a significance threshold for this pollutant.

Toxic Air Contaminants

In addition to criteria air pollutants, concentrations of toxic air contaminants are also used as indicators of air quality conditions that can harm human health. Air pollutant human exposure standards are identified for many toxic air contaminants including the following common toxic air contaminants relevant to development projects: particulate matter, fugitive dust, lead, and asbestos. These air pollutants are termed toxic air contaminants because they are air pollutants that may cause or contribute to an increase in mortality or in serious illness or that may pose a hazard to human health. Toxic air contaminants are usually present in minute quantities in the ambient air; however, their high toxicity or health impact may pose a threat to public health even at low concentrations. Toxic air contaminants can cause long-term health effects (such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage) or short-term acute affects (such as eye watering, respiratory irritation, runny nose, throat pain, or headaches).

Toxic air contaminants are separated into carcinogens and noncarcinogens based on the nature of the physiological effects associated with exposure to a particular toxic air contaminant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. Cancer risk is typically expressed as excess cancer cases per million exposed individuals, typically over a lifetime exposure or other prolonged duration. For noncarcinogenic substances, there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels may vary depending on the specific pollutant. Acute and chronic exposure to noncarcinogens is expressed as a hazard index (HI), which is the ratio of expected exposure levels to acceptable reference exposure levels.

Diesel Particulate Matter

The majority of the estimated health risks from toxic air contaminants can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines. In 1998, CARB identified diesel particulate matter as a toxic air contaminant based on evidence of a relationship between diesel exhaust exposure and lung cancer and other adverse health effects. Almost all diesel exhaust particles are 10 micrometers or less in diameter. Because of their extremely small size, these particles can be inhaled, and eventually trapped in the bronchial and alveolar regions of the lungs.

Regional – San Francisco Bay Area Air Basin

The determination of whether a region's air quality is healthful or unhealthful is made by comparing contaminant levels in ambient air samples to the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS).

Ambient air concentrations are monitored throughout the SFBAAB to designate the Basin's attainment status with respect to the NAAQS and CAAQS for criteria air pollutants. The purpose of these designations is to identify areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are "nonattainment," "attainment," and "unclassified" (the latter is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards). Table 3.3-1 lists the CAAQS and NAAQS values for each pollutant, and Table 3.3-2 presents the recent attainment designations for the SFBAAB. With respect to the NAAQS, the is designated as a nonattainment area for ozone and $PM_{2.5}$, and as an attainment or unclassified area for all other pollutants. With respect to the CAAQS, the SFBAAB is designated as a nonattainment area for ozone, PM_{10}, and $PM_{2.5}$, and as an attainment area for all other pollutants (BAAQMD 2017b).

Table 3.3-1 National and California Ambient Air Quality Standards

Pollutant and Averaging Time	CAAQS[1]	Primary NAAQS[2,3]	Secondary NAAQS[2,3]
CO 1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	n/a
CO 8-Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	n/a
NO_2 1-hour	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	n/a
NO_2 Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary
Ozone 1-hour	0.09 ppm (180 µg/m^3)	n/a [4]	n/a
Ozone 8-hour	0.070 ppm (137 µg/m^3)[8]	0.070 ppm (137 µg/m^3)[5]	Same as Primary
PM_{10} 24-hour	50 µg/m^3	150 µg/m^3	Same as Primary
PM_{10} Annual Arithmetic Mean	20 µg/m^3 [6]	n/a	n/a
$PM_{2.5}$ 24-hour	n/a	35 µg/m^3	Same as Primary
$PM_{2.5}$ Annual Arithmetic Mean	12 µg/m^3 [6]	12 µg/m^3 [10]	15.0 µg/m^3
SO_2 1-hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)	n/a
SO_2 24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	n/a
SO_2 Annual Arithmetic Mean	n/a	0.030 ppm (80 µg/m^3)	n/a
Sulfates 24-hour	25 µg/m^3	n/a	n/a
H_2S 1-hour	0.03 ppm (42 µg/m^3)	n/a	n/a
Lead 30-day Average	1.5 µg/m^3	n/a	n/a
Lead Calendar quarter	n/a	1.5 µg/m^3	Same as Primary
Lead Rolling 3-month Average	n/a	0.15 µg/m^3 [9]	Same as Primary
Vinyl Chloride 24-hour	0.01 ppm (26 µg/m^3)	n/a	n/a
Visibility-Reducing Particles 8-hour	See Note 7	n/a	n/a

Source: BAAQMD 2017b

Acronyms: µg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; CAAQS = California ambient air quality standards; CO = carbon monoxide; H_2S = hydrogen sulfide; NO_2 = nitrogen dioxide; n/a = not applicable; NAAQS = National Ambient Air Quality Standard; O_3 = ozone; PM_{10} = particulate matter 10 microns in diameter or less; $PM_{2.5}$ = particulate matter 2.5 microns in diameter or less; ppm = parts per million; ppb = parts per billion; SO_2 = sulfur dioxide

[1] *California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM_{10}, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe carbon monoxide, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour or 24-hour average (i.e., all standards except for lead and the PM_{10} annual standard), then some measurements may be excluded. In particular, measurements are excluded that CARB determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the state standard.*

[2] *National standards shown are the "primary standards" designed to protect public health. National standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.070 ppm (70 ppb) or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m^3. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m^3. Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM_{10} is met if the 3-year average falls below the standard at every site. The annual $PM_{2.5}$ standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.*

[3] *National air quality standards are set by the USEPA at levels determined to be protective of public health with an adequate margin of safety.*

[4] *The national 1-hour ozone standard was revoked by the USEPA on June 15, 2005.*

[5] *On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. An area will meet the standard if the fourth-highest maximum daily 8-hour ozone concentration per year, averaged over three years, is equal to or less than 0.070 ppm. USEPA will make recommendations on attainment designations by October 1, 2016, and issue final designations October 1, 2017. Nonattainment areas will have until 2020 to late 2037 to meet the health standard, with attainment dates varying based on the ozone level in the area.*

[6] *In June 2002, CARB established new annual standards for $PM_{2.5}$ and PM_{10}.*

[7] *Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This 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.*

[8] *The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006.*

[9] *National lead standard, rolling 3-month average: final rule signed October 15, 2008. Final designations effective December 31, 2011.*

[10] *In December 2012, USEPA strengthened the annual PM 2.5 National Ambient Air Quality Standards (NAAQS) from 15.0 to 12.0 micrograms per cubic meter (µg/m^3). In December 2014, USEPA issued final area designations for the 2012 primary annual $PM_{2.5}$ NAAQS. Areas designated "unclassifiable/attainment" must continue to take steps to prevent their air quality from deteriorating to unhealthy levels. The effective date of this standard is April 15, 2015.*

Table 3.3-2 San Francisco Bay Area Basin Attainment Status

Pollutant (averaging period)	State Attainment Status	Federal Attainment Status
CO (1-hour and 8-hour)	Attainment	Attainment
Ozone (1-hour)	Nonattainment	n/a
Ozone (8-hour)	Nonattainment	Nonattainment
NO_2 (1-hour)	Attainment	n/a
NO_2 (Annual)	n/a	Attainment
PM_{10} (24-hour)	Nonattainment	Unclassified
PM_{10} (Annual)	Nonattainment	n/a
$PM_{2.5}$ (24-hour)	n/a	Nonattainment [1]
$PM_{2.5}$ (Annual)	Nonattainment	Unclassified/Attainment
SO_2 (1-hour and 24-hour)	Attainment	Unclassified/Attainment [2]
Lead (30-Day)	Attainment	Attainment
Lead (Quarter)	n/a	Attainment
Lead (3-month)	n/a	n/a
H_2S (1-hour)	Unclassified	n/a
Vinyl Chloride	No information available	n/a
Visibility Reducing Particles	Unclassified	n/a

Source: BAAQMD 2017b.

Acronyms: n/a = not applicable; BAAQMD = Bay Area Air Quality Management District; CO = carbon monoxide; H_2S = hydrogen sulfide; NAAQS = National Ambient Air Quality Standard; NO_2 = nitrogen dioxide; PM_{10} = particulate matter 10 microns in diameter or less; $PM_{2.5}$ = particulate matter 2.5 microns in diameter or less; ppm = parts per million; SO_2 = sulfur dioxide; USEPA = United States Environmental Protection Agency

Notes:

[1] *On January 9, 2013, USEPA issued a final rule to determine that the Bay Area attains the 24-hour $PM_{2.5}$ national standard. Despite this action, the Bay Area will continue to be designated as "non-attainment" for the national 24-hour $PM_{2.5}$ standard until such time as the BAAQMD submits a "redesignation request" and a "maintenance plan" to USEPA, and USEPA approves the proposed redesignation.*

[2] *On June 2, 2010, the USEPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO_2 NAAQS, however, must continue to be used until 1 year following USEPA initial designations of the new 1-hour SO_2 NAAQS.*

Local – Project Vicinity

The BAAQMD maintains multiple air quality monitoring stations that continually measure the ambient concentrations of major air pollutants throughout the SFBAAB. Table 3.3-3 summarizes published monitoring data for 2017 through 2019. The nearest monitoring station to the project site is the Redwood City monitoring station, approximately 5 miles northwest from the project site. This station monitors ozone, NO_2, and $PM_{2.5}$. Data for PM_{10} were obtained from the San Jose-Jackson Street monitoring station approximately 14.5 miles southeast from the project site. In general, the ambient air quality measurements from this station are representative of the air quality in the project vicinity. As shown in Table 3.3-3, the ozone state and national standards were exceeded in 2017 and 2019. The PM_{10} state standard was exceeded every year between 2017 and 2019. The $PM_{2.5}$ national standard was exceeded in 2017 and 2018.

Table 3.3-3 Local Air Quality Monitoring Summary for Years 2017 through 2019

Pollutant	Averaging Period	Item	2017	2018	2019
Ozone	1 hour	Max 1 Hour (ppm)	0.115	0.067	0.083
Ozone	1 hour	Days > State Standard (0.09 ppm)	2	0	0
Ozone	8 hour	Max 8 Hour (ppm)	0.086	0.049	0.077
Ozone	8 hour	Days > State Standard (0.070 ppm)	2	0	2
Ozone	8 hour	Days > National Standard (0.070 ppm)	2	0	2
NO_2	Annual	Annual Average (ppm)	0.010	0.010	0.009
NO_2	1 hour	Max 1 Hour (ppm)	0.067	0.077	0.054
NO_2	1 hour	Days > State Standard (0.18 ppm)	0	0	0
PM_{10}	Annual	Annual Average (μg/m^3)	21.3	23.1	19.1
PM_{10}	24 hour	Max 24 Hour (μg/m^3)	69.8	121.8	77.1
PM_{10}	24 hour	Days > State Standard (50 μg/m^3)	19	12	12
PM_{10}	24 hour	Days > National Standard (150 μg/m^3)	0	0	0
$PM_{2.5}$	Annual	Annual Average (μg/m^3)	9.1	10.6	id
$PM_{2.5}$	24 hour	Max 24 Hour (μg/m^3)	60.8	120.9	29.5
$PM_{2.5}$	24 hour	Days > National Standard (35 μg/m^3)	6	13	0

Source: CARB 2021.

Notes: id = insufficient data; μg/m^3 = micrograms per cubic meter; NO_2 = nitrogen dioxide; PM10 = particulate matter 10 microns in diameter or less; PM2.5 = particulate matter 2.5 microns in diameter or less; ppm = parts per million

Local – Project Site

As described in Section 2, “Project Description”, an approximately 6,800-square-foot single-story office building completed in 1956 and an associated parking area occupy the project site, which is used by the County of Santa Clara Office of the Public Defender. Existing emissions from the project site include those associated with operation of the office building, such as emissions from area, mobile, and energy sources. Area-source emissions are associated with activities such as the use of consumer products, parking lot degreasers, fertilizers/pesticides, and cleaning supplies. Mobile-source emissions include commute trips by the office employees. Energy-source emissions are associated with the combustion of natural gas for uses such as space heating. Table 3.3-4 below summarizes the existing emissions at the project site. Emissions were estimated using the latest version of the California Emissions Estimator Model (CalEEMod), version 2020.4.0, released in June 2021. Energy emissions were estimated using the “historical” energy intensity values provided within CalEEMod which reflect 2005 Title 24 Standards. Since the building was constructed in 1956, prior to the development of the Title 24 Standards, existing energy emissions may actually be higher than those presented in Table 3.3-4. Mobile source emissions were based on information in the Traffic Impact Analysis prepared for the Project (refer Appendix E).

Table 3.3-4 Estimated Emissions from Existing Office Building at Project Site

Source/Description	ROG	NOx	PM_{10}	$PM_{2.5}$
Area Emissions (tons per year)	0.03	<0.01	<0.01	<0.01
Energy (tons per year)	<0.01	0.01	<0.01	<0.01
Mobile (tons per year)	0.01	0.01	0.02	<0.01
Total Annual Emissions (tons per year)	**0.04**	**0.02**	**0.02**	**<0.01**
Total Average Daily Emissions (lbs per day)	**0.22**	**0.10**	**0.08**	**0.03**

Source: Estimated by AECOM in 2021. See Appendix B for detailed modeling assumptions, outputs, and results.

Notes: Totals may not add due to rounding. Average daily emissions are based on the annual operational emissions divided by 365 days.

lbs per day = pounds per day; NOx = Nitrous oxides; PM_{10} = particulate matter 10 microns in diameter or less; $PM_{2.5}$ = particulate matter 2.5 microns in diameter or less; ROG = reactive organic gases

3.3.2 Regulatory Framework

Federal

Clean Air Act

The USEPA's air quality mandates are drawn primarily from the federal Clean Air Act, which was enacted in 1970 and amended in 1977 and 1990 (Clean Air Act Amendments). The Clean Air Act requires the USEPA to establish the NAAQS, as shown in Table 3.3-1 above. NAAQS have been established for the six major air pollutants described in Section 3.3.1: ozone, CO, NO_2, SO_2, lead, PM_{10} and $PM_{2.5}$. The Clean Air Act identifies two types of NAAQS. Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The Clean Air Act requires each state with regions that have not attained the NAAQS to prepare a State Implementation Plan, detailing how these standards are to be met in each local area. The State Implementation Plan is a legal agreement between each state and the federal government to commit resources to improving air quality. It serves as the template for conducting regional and project-level air quality analyses. The State Implementation Plan is not a single document, but a compilation of new and previously submitted attainment plans, emissions reduction programs, district rules, state regulations, and federal controls.

Nonroad Sources and Emission Standards

Before 1994, there were no standards to limit the amount of emissions from off-road equipment, such as bulldozers and other construction equipment. In 1994, the USEPA established emission standards for hydrocarbons, NO_X, CO, and PM to regulate new pieces of off-road equipment. These emission standards came to be known as Tier 1. This rule was issued under the USEPA's authority in Section 213 of the Clean Air Act. Since that time, increasingly more stringent Tier 2, Tier 3, and Tier 4 (interim and final) standards were adopted by the USEPA, as well as by CARB. Tier 1 emission standards became effective in 1996. The more stringent Tier 2 and Tier 3 emission standards became effective between 2001 and 2008, with the effective date dependent on engine horsepower. Tier 4 interim standards became effective between 2008 and 2012, and Tier 4 final standards became effective in 2014 and 2015. Each adopted emission standard was phased in over time. New engines built in and after 2015 across all horsepower sizes must meet Tier 4 final emission standards. In other words, new manufactured engines cannot exceed the emissions established for Tier 4 final emissions standards (USEPA 2018a).

Regulations for On-road Vehicles and Engines

The USEPA also has certain regulations for on-road vehicles and engines, including passenger vehicles, commercial trucks and buses, and motorcycles (USEPA 2017a). In 2001, the USEPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. This rule was issued under the USEPA's authority in Section 202 of the Clean Air Act. Passenger cars and trucks are regulated by the USEPA under "light-duty" vehicle programs. The USEPA regulates passenger vehicles to reduce the amount of harmful emissions. There are regulations for multiple aspects of passenger vehicles, including standards for exhaust and evaporative emissions; control of hazardous air pollutants and air toxics; National Low Emission Vehicle Program; Compliance Assurance Program 2000; onboard refueling vapor recovery; and inspection and maintenance.

Safer Affordable Fuel Efficient Vehicle Rule

In September 2019, the National Highway Traffic Safety Agency (NHTSA) and the USEPA published the Safer Affordable Fuel Efficient (SAFE) Vehicle Rule Part One: One National Program. The SAFE Part One Rule revokes California's authority and vehicle waiver to set its own emissions standards and set zero emission vehicle mandates in California for passenger cars and light trucks and establish new standards, covering model years 2021 through 2026. In April 2020, the USEPA and NHTSA issued the second part of the proposed SAFE Vehicles Rule. This final rule was made effective on June 29, 2020. During the period the federal action is in effect, CARB will administer the affected portions of its program on a voluntary basis. On January 20, 2021, President Biden signed an Executive Order directing consideration of labor unions, States, and industry views to propose suspension, revision, or rescindment of the SAFE Vehicles Rule (The White House 2021).

State

CARB is the lead agency responsible for developing the State Implementation Plan in California. Local air districts and other agencies prepare air quality attainment plans or air quality management plans, and submit them to CARB for review, approval, and incorporation into the applicable State Implementation Plan.

California Clean Air Act

CARB is also responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act. The California Clean Air Act was adopted in 1988 and requires CARB to establish CAAQS, as shown in Table 3.3-1 above. In most cases, CAAQS are more stringent than NAAQS.

Other CARB responsibilities include, but are not limited to, overseeing local air district compliance with state and federal laws; approving local air quality plans; submitting State Implementation Plans to the USEPA; monitoring air quality; determining and updating area designations and maps; and setting emission standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels. CARB maintains air quality monitoring stations throughout the state in conjunction with local air districts. Data collected at these stations are used by CARB to classify air basins as being in attainment or nonattainment with respect to each pollutant and to monitor progress in attaining air quality standards.

California Health and Safety Code Section 40914

The California Clean Air Act requires that each area exceeding the CAAQS for ozone, CO, SO_2, and NO_2 develop a plan aimed at achieving those standards. California Health and Safety Code Section 40914 requires air districts to design a plan that achieves an annual reduction in district-wide emissions of 5 percent or more, averaged every consecutive 3-year period. To satisfy this requirement, the local air districts have to develop and implement air pollution reduction measures, which are described in their air quality attainment plans, and outline strategies for achieving the CAAQS for any criteria pollutants for which the region is classified as nonattainment.

In-Use Off-Road Diesel Vehicle Regulation, On-Road Light-Duty Certification, and California Reformulated Gasoline Program

CARB has established emission standards for vehicles sold in California and for various types of equipment. California gasoline specifications are governed by both state and federal agencies. During the past decade, federal and state agencies have imposed numerous requirements on the production and sale of gasoline in California. CARB has also adopted control measures for diesel PM and more stringent emissions standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators).

Tanner Air Toxics Act and the Air Toxics Hot Spots Information and Assessment Act

In addition to criteria pollutants, both federal and state air quality regulations also focus on toxic air contaminants. Toxic air contaminants in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act (Chapter 1252, Statutes of 1987). AB 1807 sets forth a formal procedure for CARB to designate substances as toxic air contaminants. Research, public participation, and scientific peer review must occur before CARB can designate a substance as a toxic air contaminant. The Air Toxics Hot Spots Information and Assessment Act requires that toxic air contaminant emissions from stationary sources be quantified and compiled into an inventory according to criteria and guidelines developed by CARB, and if directed to do so by the local air district, a health risk assessment must be prepared to determine the potential health impacts of such emissions.

CARB has adopted a Diesel Risk Reduction Plan, which recommends control measures to achieve a diesel PM reduction of 85 percent by 2020 from year 2000 levels. Recent regulations and programs include the low-sulfur diesel fuel requirement and more stringent emission standards for heavy-duty diesel trucks and off-road in-use diesel equipment. As emissions are reduced, it is expected that the risks associated with exposure to the emissions will also be reduced.

Air Quality and Land Use Guidance

CARB developed the *Air Quality and Land Use Handbook: A Community Health Perspective* to provide guidance on land use compatibility with sources of toxic air contaminants (CARB 2005). These sources include freeways and high-traffic roads, commercial distribution centers, rail yards, refineries, dry cleaners, gasoline stations, and industrial facilities. The handbook is not a law or adopted policy but offers advisory recommendations for the siting of sensitive receptors near uses associated with toxic air contaminants. The handbook acknowledges that land use agencies must balance health risks with other considerations, including housing and transportation needs, economic development priorities, and quality of life issues. The recommendations include avoidance of siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day, or rural roads with 50,000 vehicles per day.

In response to new research demonstrating benefits of compact, infill development along transportation corridors, CARB released a technical supplement, *Technical Advisory: Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways* (Technical Advisory;

CARB 2017a), to the 2005 Air Quality and Land Use Handbook. This Technical Advisory was developed to identify strategies that can be implemented to reduce exposure at specific developments or as recommendations for policy and planning documents. It is important to note that the Technical Advisory is not intended as guidance for a specific project and does not discuss the feasibility of mitigation measures for the purposes of compliance with the CEQA. Some of the strategies identified in the Technical Advisory include implementation of speed reduction mechanisms, including roundabouts, traffic signal management, and speed limit reductions; design that promotes air flow and pollutant dispersion along street corridors, such as solid barriers and vegetation for pollutant dispersion; and indoor high efficiency filtration (CARB 2017a).

Local

In Santa Clara County, BAAQMD is the agency responsible for protecting public health and welfare through the administration of federal and state air quality laws and policies. Included in BAAQMD's tasks are monitoring of air pollution, preparation of air quality plans, and promulgation of rules and regulations. The BAAQMD regulations and rules listed below are not an exhaustive list of the rules and regulations applicable to construction and operation of the Project, but the identified plans and regulations below are the principal ones providing guidance and standards used in this EIR.

BAAQMD 2017 Bay Area Clean Air Plan

BAAQMD adopted the *Bay Area Clean Air Plan: Spare the Air, Cool the Climate* (Bay Area Clean Air Plan) on April 19, 2017, to provide a regional strategy to improve Bay Area air quality and meet public health goals (BAAQMD 2017c). The control strategy described in the Bay Area Clean Air Plan includes a wide range of control measures designed to reduce emissions and decrease ambient concentrations of harmful pollutants in the region, safeguard public health by reducing exposure to air pollutants that pose the greatest health risk, and reduce greenhouse gas (GHG) emissions to protect the climate. To protect public health, the Bay Area Clean Air Plan describes how BAAQMD will continue progress toward attaining all state and federal air quality standards in the region and eliminating health risk disparities from exposure to air pollution among Bay Area communities.

The Bay Area Clean Air Plan addresses four categories of pollutants: (1) ground-level ozone and its key precursors, ROGs and NO_X; (2) PM, primarily $PM_{2.5}$, and precursors to secondary $PM_{2.5}$; (3) air toxics; and (4) GHGs. The control measures are categorized based upon the economic sector framework including stationary sources, transportation, energy, buildings, agriculture, natural and working lands, waste management, and water measures (BAAQMD 2017c).

BAAQMD Particulate Matter Plan

To fulfill federal air quality planning requirements, BAAQMD adopted a $PM_{2.5}$ emissions inventory for year 2010 at a public hearing on November 7, 2012. The Bay Area 2017 Clean Air Plan also included several measures for reducing PM emissions from stationary sources and wood burning. On January 9, 2013, the USEPA issued a final rule determining that the San Francisco Bay Area has attained the 24-hour $PM_{2.5}$ NAAQS, suspending federal State Implementation Plan planning requirements for the SFBAAB. Despite this USEPA action, the will continue to be designated as nonattainment for the national 24-hour $PM_{2.5}$ standard until such time as BAAQMD submits a redesignation request and a maintenance plan to the USEPA, and the USEPA approves the proposed redesignation.

BAAQMD Regulation 11, Rule 2

BAAQMD Regulation 11, Rule 2 (adopted December 15, 1976) regulates hazardous pollutants from asbestos demolition, renovation, and manufacturing activities. The purpose of the rule is to control emissions of asbestos to the atmosphere during demolition, renovation, milling and manufacturing and establish appropriate waste disposal procedures.

BAAQMD Regulation 6, Rule 3

BAAQMD Regulation 6, Rule 3 (adopted July 9, 2008 and amended November 20, 2019) prohibits the installation, sale, and supply of wood-burning devices within BAAQMD boundaries. The purpose of the rule is to limit emissions of PM and visible emissions from wood-burning devices used for primary heat, supplemental heat or ambiance.

BAAQMD Regulation 8, Rule 3

BAAQMD Regulation 8, Rule 3 (adopted July 1, 2009) denotes volatile organic compound limits for a variety of coatings, including flat, nonflat, and specialty coatings. The purpose of the rule is to limit the quantity of volatile organic compounds in architectural coatings supplied, sold, and applied in the BAAQMD boundaries.

3.3.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to air quality:

- **Impact AIR-1:** Would the Project conflict with or obstruct implementation of an applicable air quality plan?
- **Impact AIR-2:** Would the Project result in a cumulative 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?
- **Impact AIR-3:** Would the Project expose sensitive receptors to substantial pollutant concentrations?
- **Impact AIR-4:** Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Impact AIR-1: Air Quality Plan Conflicts

Impact AIR-1 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would result in a conflict with or obstruct implementation of the applicable air quality plan.

The applicable air quality plan for the SFBAAB is the 2017 Clean Air Plan developed by BAAQMD. The Project would not result in a conflict with the 2017 Clean Air Plan if it supports the goals of the Clean Air Plan, includes applicable control measures from the Clean Air Plan, and would not disrupt or hinder implementation of any control measures from the Clean Air Plan.

Impact Analysis

The primary goals of the Bay Area 2017 Clean Air Plan are to protect public health and protect the climate by reducing emissions, decreasing concentrations of harmful pollutants, and reducing exposure to air pollutants that pose the greatest health risk. To meet the primary goals, the 2017 Clean Air Plan includes individual control measures that describe specific actions to reduce emissions of air and climate pollutants categorized into various categories including but not limited to mobile and stationary sources, and land use and local impacts.

Consistency with the 2017 Clean Air Plan also is determined through evaluation of project-related air quality impacts and demonstration that project-related emissions would not increase the frequency or severity of existing violations, nor contribute to a new violation of the NAAQS or CAAQS. The BAAQMD CEQA Air Quality Guidelines include thresholds of significance that are applied to evaluate regional impacts of project-specific emissions of air pollutants and their impact on BAAQMD's ability to reach attainment (BAAQMD 2017a). Emissions that are above these thresholds have not been accommodated in the air quality plans and would not be consistent with the air quality plans.

Construction

The Project demolition and construction activities would involve the temporary use of off-road equipment, haul trucks, and worker commute trips. As discussed for Impact AIR-2 below, construction-related emissions of the Project would not exceed the thresholds of significance recommended by the BAAQMD. In addition, consistent with Stationary Source Control Measures SS36 (PM from Trackout) and SS38 (Fugitive Dust) of the 2017 Clean Air Plan, the Project would implement BAAQMD's Basic Construction Mitigation Measures as identified in Mitigation Measure MM-AIR-2, which would reduce fugitive dust emissions during construction.

In addition, prior to demolition of the existing on-site building, any asbestos-containing materials and/or lead-based paint would be identified and removed in compliance with the appropriate worker health and safety regulations and hazardous materials removal and disposal protocols in accordance with BAAQMD Regulation 11, Rule 2. This would be consistent with one of the primary goals the 2017 Clean Air Plan of protecting public health. Further, Project construction and demolition activities would be consistent with 2017 Clean Air Plan Measure WA4, Recycling and Waste Reduction, which calls for the recycling of construction and demolition materials. The Project would maximize salvage and recycling of materials. A minimum of 50 percent of the solid waste generated would be diverted from landfill disposal as required by the current version of the California Green Building Standards Code. Therefore, construction of the Project would not conflict with the BAAQMD 2017 Clean Air Plan. This construction-related impact would be **less than significant**.

Operation

Operation of the Project would also support the goals of the BAAQMD 2017 Clean Air Plan and include applicable control measures from the Clean Air Plan. Consistent with Clean Air Plan control measures TR9/TCM-D1 and TR9/TCM-D2, which call for expansion and improvement of bicycle and pedestrian facilities serving employment sites, educational and cultural facilities, residential areas, shopping districts, and other activity centers, one of the project objectives is to provide easily accessible bicycle parking to residents. Further, consistent with Clean Air Plan Mitigation Measure TR10/TCM-D3, which calls for the promotion and support for land use patterns and infrastructure investments that support high-density, mixed-use, residential and employment development to facilitate walking, bicycling, and transit use, the Project would also encourage the use of alternative forms of transportation to nearby employment and transit and would develop flex space that could be utilized as a café or other retail or commercial use in addition to the residential units. Additionally, the Clean Air Plan also includes Building Control Measures, BL1: Green Buildings and BL2: Decarbonize Buildings, which prioritize energy efficiency and renewable energy sources in residential and commercial buildings. One of the Project objectives, consistent with these measures, is to incorporate innovative technologies and sustainability measures, which includes design features such as all-electric building and installation of photovoltaic solar panels on the rooftop. Similarly, the Project would also include provision for at least ten percent of the parking spaces in the garage to be "electric vehicle-ready," consistent with Clean Air Plan control measure TR14/MSM-A2, which calls for an expanded regional charging network.

Projects that are consistent with the assumptions used in development of the air quality plan are considered to not conflict with or obstruct the attainment of air quality levels identified in the plan. Assumptions for emission estimates are based on population, employment, and land use projections taken from local and regional planning documents. As discussed in more detail in Section 3.11, Land Use Planning, the Project would be consistent with the City's land use designation for the site. Because the Project would be consistent with the development assumptions for land uses within the City's Comprehensive Plan, the intensity of operational emissions has been accounted for in the air quality plan.

In addition, the Project would be consistent with the Bay Area's Transportation Plan/Sustainable Community Strategy (Plan Bay Area), which provides a number of complementary policies and programs to the Bay Area Clean Air Plan. The Project is consistent with the comprehensive strategy of Plan Bay Area to reduce motor vehicle travel on a per-capita basis by improving the region's public transit network; and promoting bicycling, walking, and ridesharing. The Project is also consistent with one of the primary targets in Plan Bay Area to increase the share of affordable housing. The Project would produce housing in a transit-rich location and create more affordable housing options for school employees. As discussed in Section 3.15, "Transportation", the Project would generate Vehicle Miles Traveled (VMT) per service population lower than the Santa Clara County average. Therefore, operation of the Project would not conflict with or obstruct implementation of the 2017 Bay Area Clean Air Plan. The operational impact would be **less than significant**.

Impact AIR-2: Net Increase in Criteria Pollutants

Impact AIR-2 would be **potentially significant**. However, with implementation of mitigation measure MM AIR-2 the impact would be reduced to **less than significant with mitigation.**

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would 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 BAAQMD has prepared CEQA Air Quality Guidelines to assist in the evaluation of air quality impacts of projects and plans proposed in the SFBAAB. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA requirements; and include recommended thresholds of significance, mitigation measures, and background air quality information. They also include recommended assessment methodologies for air toxics, odors, and GHG emissions. In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update of the BAAQMD CEQA Guidelines. These thresholds are designed to establish the level at which the BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA.

In May 2011, the updated BAAQMD CEQA Air Quality Guidelines were amended to include a risk and hazards threshold for new receptors and modified procedures for assessing impacts related to risk and hazard impacts; however, this later amendment regarding risk and hazards was the subject of a California Supreme Court decision California Building Industry Association v BAAQMD, 62 Cal.4th 369 (2015), which clarified that CEQA generally does not require an evaluation of impacts of the environment on the proposed project itself (i.e., its users or residents). The Supreme Court also held that public agencies remain free to conduct this analysis regardless of whether it is required by CEQA. To account for these updates, the BAAQMD published a newer version of its CEQA Guidelines dated May 2017, which includes revisions made to address the Supreme Court's opinion. The BAAQMD is also currently in the process of updating its CEQA Guidelines.

The following sections describe the BAAQMD thresholds of significance to analyze the Project's potential impacts with respect to air quality per the BAAQMD May 2017 CEQA Guidelines. BAAQMD has stated that its CEQA Guidelines are for informational purposes only and should be followed by local governments at their own discretion (BAAQMD 2017a). The BAAQMD CEQA Guidelines may inform environmental review for development projects in the Bay Area, but do not commit local governments or the BAAQMD to any specific course of action. The thresholds for criteria pollutants were developed through a quantitative examination of the efficacy of fugitive dust mitigation measures and a quantitative examination of statewide nonattainment emissions and are used for the analysis of project-generated emissions.

Table 3.3-5 presents the BAAQMD-recommended thresholds of significance for construction-related and operations-related criteria air pollutant and precursor emissions. These thresholds represent the levels at which a project's individual emissions of criteria air pollutants or precursors would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions. If daily average or annual emissions of construction-related or operational criteria air pollutants or precursors would exceed any applicable threshold listed in Table 3.3-5, the Project would result in a cumulatively significant impact.

Table 3.3-5 Average Daily and Annual Criteria Pollutant Emissions Thresholds

Pollutant	Construction Phase Average Daily Emissions (lb/day)	Operational Phase Average Daily Emissions (lb/day)	Operational Phase Maximum Annual Emissions (tons/year)
ROG [1]	54	54	10
NO_x [1]	54	54	10
PM_{10}	82 (exhaust)[2]	82	15
$PM_{2.5}$	54 (exhaust)[2]	54	10

Source: BAAQMD 2017a

Acronyms: ROG = reactive organic gases; NO_x = nitrogen oxides; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; lb/day = pounds per day

Notes:

1 ROG and NOx are not criteria air pollutants; however, they are criteria pollutant precursors that form ozone through chemical and photochemical reactions in the atmosphere. Since ozone is not directly emitted, thresholds of significance have been established for these ozone precursors.

2 The BAAQMD does not have quantitative mass emissions thresholds for fugitive PM_{10} and $PM_{2.5}$ dust. Instead, the BAAQMD recommends that all projects, regardless of the level of average daily emissions, implement applicable best management practices, including those listed as Basic Construction Measures in the BAAQMD CEQA Guidelines (BAAQMD 2017a).

Impact Analysis

By its very nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development within the SFBAAB, and this regional impact is cumulative rather than being attributable to any one source. A project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects. Cumulative air quality impacts are discussed in more detail in Section 3.3.4 below.

Construction

Construction emissions are described as “short-term” or temporary; however, they have the potential to represent a significant impact with respect to regional and localized air quality. Project demolition and construction activities would temporarily generate emissions of ROGs, NO_X, PM_{10}, and $PM_{2.5}$. These emissions are associated primarily with mobile equipment exhaust, including off-road construction equipment and on-road motor vehicles. PM_{10} and $PM_{2.5}$ emissions are also associated with fugitive dust emissions from site preparation and grading activities. Fugitive PM emissions vary as a function of parameters such as soil silt content, soil moisture, wind speed, acreage of disturbance area, and the miles traveled by construction vehicles on- and off-site. Earthmoving and material-handling operations would be the primary sources of fugitive PM dust emissions from Project construction activities.

As described in more detail in Section 2, “Project Description,” construction of the Project is expected to begin in mid-2022 and last approximately 15 to 18 months in total. Emissions associated with typical construction activities were modeled using the CalEEMod, Version 2020.4.0. CalEEMod allows the user to enter project-specific construction information, such as types, number, and horsepower of construction equipment, and number and length of off-site motor vehicle trips. Based on the anticipated construction activities, it is estimated that approximately 3,000 cubic yards of demolition debris would be exported from the project site, requiring approximately 300 truckloads or 600 truck trips. An estimated 10,000 cubic yards of soil export would also be necessary, requiring approximately 1,000 trucks and generating 2,000 truck trips. The modular construction method would also require the delivery of the modular units which would require approximately 105 trucks or 210 truck trips. The trucks associated with delivery of the modular units were assumed to travel approximately 70 miles in each direction (distance to the factory in Vallejo). It is estimated that construction activities would require between 15 and 65 workers per day. Additional modeling assumptions and details are provided in Appendix B.

As shown in Table 3.3-6, construction-related emissions associated with the Project would not exceed the average daily thresholds of significance. Because construction-related exhaust emissions would not exceed the significance thresholds, the Project would not 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.

Table 3.3-6 Average Daily and Annual Criteria Pollutant Construction Emissions

Description	ROG	NO_X	PM_{10} (Exhaust)	$PM_{2.5}$ (Exhaust)
Total Emissions (tons)	0.90	2.26	0.09	0.08
Average Daily Emissions (lb/day)[1]	**4.54**	**11.35**	**0.45**	**0.41**
Thresholds of Significance	54	54	82	54
Exceeds Threshold?	No	No	No	No

Source: Estimated by AECOM in 2021. See Appendix B for detailed modelling assumptions, outputs, and results.

Notes:

[1] Average daily emission estimates are based on approximately 398 construction workdays (15 months of construction, 6 days of construction per week).

Acronyms: lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter.

The BAAQMD does not have quantitative mass emissions thresholds for fugitive PM_{10} and $PM_{2.5}$ dust. Instead, the BAAQMD recommends that all projects, regardless of the level of average daily emissions, implement applicable best management practices (BMPs), including those listed as Basic Construction Measures in the BAAQMD CEQA Guidelines (BAAQMD 2017a). Fugitive dust emissions are considered to be significant unless the project implements the BAAQMD's BMPs for fugitive dust control during construction. Construction-related impacts from the Project would therefore be **potentially significant**. Mitigation Measure MM-AIR-2 is recommended to address this potentially significant impact.

MM-AIR-2: Fugitive Dust Reduction Measures

The Developer shall comply with all of the following BAAQMD best management practices for reducing construction emissions of uncontrolled fugitive dust (PM10 and PM2.5):

- *All exposed surfaces (e.g., parking areas, staging areas, soil piles, stockpiles, graded areas, and unpaved access roads) shall be watered twice daily, or as often as needed, treated with non-toxic soil stabilizers, or covered to control dust emissions. Watering shall be sufficient to prevent airborne dust from the leaving the site.*
- *All haul trucks transporting soil, sand, or other loose material off site shall be covered.*
- *All visible mud or dirt track-out onto adjacent public roads and paved access roads shall be removed using wet power (with reclaimed water, if possible) vacuum street sweepers at least once per day, or as often as needed. The use of dry power sweeping is prohibited.*
- *All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.*
- *All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.*
- *Idling times shall be minimized either by shutting equipment off when not in use or by reducing the maximum idling time to 5 minutes (as required by California airborne toxics control measure Title 13 CCR Section 2485). Clear signage shall be provided for construction workers at all access points.*
- *All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.*
- *A publicly visible sign shall be posted with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 48 hours. BAAQMD's phone number also shall be visible to ensure compliance with applicable regulations.*

The Developer's project manager or his/her designee shall verify compliance that these measures are included in the Project's grading plan and have been implemented during normal construction site inspections.

As explained previously, fugitive dust emissions are considered to be significant unless the Project implements the BAAQMD's BMPs for fugitive dust control during construction. MM-AIR-2 would require implementation of the BAAQMD's BMPs to minimize fugitive dust emissions from Project-related construction activities; therefore, the Project would not 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. Implementation of MM-AIR-2 would therefore reduce Project impacts from fugitive dust emissions to **less than significant with mitigation.**

Operation

After construction, long-term emissions of criteria air pollutants would be generated from area, energy, and mobile sources during operation of the Project. Area sources would include emissions from use of consumer products, periodic architectural coatings, and landscape equipment. Energy sources would include emissions from electricity consumption (discussed in more detail in Section 3.8, Greenhouse Gas Emissions). Mobile sources would involve vehicle trips associated with residential and visitor activities (e.g., work, shopping, and other trips).

Project-generated vehicle trips would be the primary source of long-term criteria air pollutant emissions. The Project would generate approximately 925 daily vehicle trips (considering both the residential and flex space uses of the Project). The Project's daily vehicle trips were estimated using the trip generation rates from the Institute of Transportation Engineers' (ITE) Trip Generation Manual (10^{th} Edition). Although a specific tenant for the proposed 'flex space' has not been decided at the point of this analysis, for the purposes of estimating average daily vehicle trips, the trip rate for a "Fast Food Restaurant without Drive-Thru" (ITE Land Use 933) was chosen to represent the potential use of this area as a café or similar use. Area source emissions were based on CalEEMod defaults, which incorporate data on the evaluation of consumer product use, reapplication of architectural coatings, and landscape equipment fuel combustion based on the region. In addition, energy source emissions incorporated Title 24 2019 Building Energy Efficiency Standards as well as the project design feature that the building would be all-electric (i.e., no natural gas infrastructure). Additional modeling details are provided in Appendix B. As shown in Table 3.3-7 and Table 3.3-8, the total and net increase in operational emissions generated by the Project would not exceed the BAAQMD daily or annual thresholds.

Table 3.3-7 Annual Operational Criteria Air Pollutant Emissions

Description	ROG	NO_X	PM_{10}	$PM_{2.5}$
Annual Project Emissions (tons/year)	0.84	0.41	0.73	0.20
Existing Annual Emissions (tons/year)	0.04	0.02	0.02	<0.01
Net Project Annual Emissions (tons/year)[1]	**0.79**	**0.39**	**0.71**	**0.20**
Thresholds of Significance (tons/year)	10	10	15	10
Exceeds Threshold?	No	No	No	No

Source: Estimated by AECOM in 2021. See Appendix B for detailed modelling assumptions, outputs, and results.

Notes:

[1]Net Project annual emissions calculated by subtracting the existing annual emissions from the uses that would be demolished from the Project emissions.

Acronyms: ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter.

Table 3.3-8 Average Daily Operational Criteria Air Pollutant Emissions

Description	ROG	NO_X	PM_{10}	$PM_{2.5}$
Total Project Average Daily Emissions (lb/day)[1]	4.58	2.23	3.98	1.10
Existing Average Daily Emissions (lbs/day)	0.22	0.10	0.08	0.03
Net Project Average Daily Emissions (lbs/day)[2]	**4.36**	**2.13**	**3.89**	**1.07**
Thresholds of Significance	54	54	82	54
Exceeds Threshold?	No	No	No	No

Source: Estimated by AECOM in 2021. See Appendix B for detailed modelling assumptions, outputs, and results.

Notes:

[1] Average daily emission estimates are based on the annual operational emissions divided by 365 days.

[2] Net project emissions calculated by subtracting operational emissions from the existing uses that would be demolished from the project's operational emissions.

Acronyms: lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM^{2.5}$ = particulate matter less than 2.5 microns in diameter.

Because operational emissions from the Project would not exceed the BAAQMD daily or annual thresholds, the Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state AAQS. Therefore, operational activities associated with the Project would be **less than significant**.

Impact AIR-3: Exposure of Sensitive Receptors

Impact AIR-3 would be **less than significant**. No mitigation is required.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would expose sensitive receptors to substantial pollutant concentrations.

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. Sensitive receptors are facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants, such as schools and residences. The nearest sensitive receptors to the project site include the multifamily residential apartment building on the adjacent parcel immediately southeast of the project site and other multifamily residences to the northeast of Park Avenue and southwest of Birch Street.

Impact Analysis

Construction

Construction-related Project activities would result in emissions of criteria air pollutants and toxic air contaminants.

As shown in Table 3.3-6 above, construction-related activities would result in emissions of criteria air pollutants, but at levels that would not exceed the BAAQMD regional thresholds of significance. The regional thresholds of significance were designed to identify those projects that would result in significant levels of air pollution and to assist the region in attaining the applicable state and federal ambient air quality standards. The ambient air quality standards were established using health-based criteria to protect the public with a margin of safety from adverse health impacts due to exposure to air pollution.

The Project is estimated to generate approximately 2 tons of NO_X emissions and less than 1 ton of ROGs emissions during construction activities. As discussed above, NO_X is an ozone precursor. Individuals exercising outdoors, children, and people with lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible subgroups for ozone effects. Short-term ozone exposure (lasting for a few hours) can result in changes in breathing patterns, reductions in breathing capacity, increased susceptibility to infections, inflammation of lung tissue, and some immunological changes. Chronic exposure to high ozone levels can permanently damage lung tissue (BAAQMD 2017a). Because of the reaction time and other factors involved in ozone formation, ozone is considered a regional pollutant that is not linearly related to emissions (i.e., ozone impacts vary depending on the location of the emissions, the location of other precursor emissions, meteorology, and seasonal impacts). Peak ozone concentrations often occur far downwind of the precursor emissions. Thus, ozone is considered a regional pollutant that often affects large areas. There currently is no way to accurately quantify ozone-related health impacts from NOx emissions from small projects. These limitations are due to photochemistry and regional model limitations; a large amount of additional precursor emissions is required to cause a modeled increase in ambient ozone levels (SCAQMD 2015). However, because the BAAQMD regional thresholds of significance for NO_x and other ozone precursors were established with these factors in mind, the Project's compliance with the BAAQMD thresholds indicates that the Project's NO_X emissions would not expose sensitive receptors to substantial concentrations of ozone or any other criteria air pollutant.

As discussed previously, construction activities associated with the Project would also result in toxic air contaminant emissions. The greatest potential for toxic air contaminant emissions would be related to diesel particulate matter (diesel PM) emissions associated with heavy-duty construction equipment operations. The Office of Environmental Health Hazard Assessment developed a Guidance Manual for Preparation of Health Risk Assessments (Office of Environmental Health Hazard Assessment 2015). According to the guidance manual's methodology, health impacts from carcinogenic toxic air contaminants are usually described in terms of individual cancer risk, which is based on a 30-year lifetime exposure to toxic air contaminants. Construction activities are anticipated to last approximately 15 to 18 months (less than 5 percent of the 30-year total exposure period used for typical health risk calculations) and construction-related emissions would cease following completion of the construction activities. Further, construction activities would occur intermittently throughout the day and would not serve as a constant source of emissions from the project site. Emissions associated with construction activities would vary day to day and would also occur at varying distances from the nearest sensitive receptors, depending on the location of machinery and equipment within the project site. In addition, modular construction is a process in which portions of a building are constructed off-site in repeated sections called modules, which are then transported to the project site and assembled. As such, construction of these modular units would be performed at a facility far from the adjacent sensitive receptors.

CARB has adopted Airborne Toxics Control Measures (ATCMs) applicable to off-road diesel equipment and portable diesel engines rated 50 horsepower (HP) and greater. The purpose of these ATCMs is to reduce emissions of PM from engines subject to the rule. The ATCMs require diesel engines to comply with PM and NO_X emission limitations on a fleet-average basis. It is important to note that recently manufactured construction equipment is designed to nearly eliminate diesel PM emissions. While the use of new off-road equipment is not required, these vehicles are increasingly in use in construction equipment fleets and must meet the required fleet average index (i.e., indicator of a fleet's overall emission rate) each year. CARB has also adopted an ATCM that limits diesel-fueled commercial motor vehicles idling. The rule restricts vehicles from idling for more than five minutes at any location. All off-road diesel equipment, on-road heavy-duty diesel trucks, and portable diesel equipment used for the Project must meet California's applicable ATCMs for control of diesel PM or NOx in the exhaust (e.g., ATCMs for portable diesel engines, off-road vehicles, and heavy-duty on-road diesel trucks, and 5-minute diesel engine idling limits) that are in effect during the construction of the Project.

Considering the intermittent nature of the emissions, proposed construction activities, existing regulations to reduce emissions including diesel PM from off-road and on-road equipment, and the short duration of the exposure period, the Project is not anticipated to expose sensitive receptors to substantial pollutant concentrations of toxic air contaminants. Thus, the Project's construction-related impact would be less than significant.

Operation

Certain land uses are more likely than others to generate substantial toxic air contaminant emissions due to allowable activities within those land use designations. Operation of the Project would involve residential and retail land uses that would not be a substantial source of toxic air contaminant and/or $PM_{2.5}$ emissions. Additionally, any increase in vehicle trips by visitors to the project site would primarily be light-duty vehicles, which are not substantial sources of toxic air contaminant emissions (e.g., diesel PM) that are primarily associated with diesel-fueled vehicles. As such, implementation of the Project would not expose sensitive receptors to substantial pollutant concentrations. This impact would be **less than significant.**

Note: As described previously, the California Supreme Court decision in California Building Industry Association v BAAQMD (62 Cal. 4th 369) clarified that CEQA does not generally require an evaluation of impacts of the environment on a project. However, for informational purposes, this analysis also evaluated whether the Project's future residents would be exposed to existing sources of TAC emissions.

Consistent with the recommendations in the BAAQMD CEQA Guidelines (BAAQMD 2017a) for receptor thresholds, risks and hazards were evaluated within the zone of influence of the potential new receptors (1,000-foot radius from the project site). The closest sources of toxic air contaminant and/or $PM_{2.5}$ emissions within 1,000 feet of the project site would be generators at the Judicial Council of California (approximately 233 feet west), Santa Clara County Roads & Airports (approximately 896 feet north), and Cloudera Inc. (approximately 958 feet east) (BAAQMD 2021a). According to BAAQMD's Health Risk Calculator (BAAQMD 2021b) which considers distance to the receptors, the total cancer risk would be approximately 1.29 in a million, which is below BAAQMD's recommended significance threshold of a cancer risk greater than 10 in a million. In addition, the BAAQMD resources indicate that the cancer risks provided on their Permitted Sources Risk and Hazards Map (BAAQMD 2021a) include screening level risks and hazards are intentionally conservative and based on worst-case assumptions. Therefore, it is reasonably expected that the actual cancer risk would be lower and that the Project would not expose future residents to substantial concentrations of TAC emissions.

Impact AIR-4: Other Emissions Including Odors

Impact AIR-4 would be **less than significant**. No mitigation is required.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Impact Analysis

Construction

The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. Although offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable distress among the public, and causing citizens to submit complaints to local governments and regulatory agencies. Typical facilities that generate odors include wastewater treatment facilities, sanitary landfills, composting facilities, petroleum refineries, chemical manufacturing plants, and food processing facilities.

During Project-related construction activities, construction equipment exhaust, hazardous materials abatement activities associated with demolition of the existing building, application of asphalt, and architectural coatings may temporarily generate odors. Although the units would be constructed using modular construction methods, which would likely limit the potential for odors during building construction activities, the Project's other construction activities, such as asphalt paving activities, may still generate odors associated with off-gassing. However, while modular construction may reduce odors compared to conventional construction, the Project odors would be typical of most construction sites and temporary in nature. Additionally, odors would be confined to the immediate vicinity of the construction equipment. Furthermore, nuisance odors are regulated under the BAAQMD's Regulation 7, Odorous Substances, which requires abatement of any nuisance generating an odor complaint. Regulation 7 places general limitations on odorous substances, and specific emission limitations on certain odorous compounds. Therefore, Project construction would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people and impacts during construction would be **less than significant**.

Operation

The Project would develop residential apartments and a "flex space" that would be used for retail or commercial uses. The type of facilities that are considered to result in other emissions such as those leading to objectionable odors include wastewater treatment plants, compost facilities, landfills, solid waste transfer stations, fiberglass manufacturing facilities, paint/coating operations (e.g., auto body shops), dairy farms, petroleum refineries, asphalt batch plants, chemical manufacturing, and food processing facilities (BAAQMD 2017a). Residential, retail, and commercial land uses are not typical odor-generating facilities and would be similar to the uses surrounding the project site. Therefore, Project operations would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. This impact would be **less than significant.**

3.3.4 Cumulative Impacts and Mitigation

This section addresses the potential of the Project to contribute to the following cumulative air quality impacts:[8]

- **Impact C-AIR-1:** Contribution to cumulative effects related to conflict with or obstruction of implementation of an applicable air quality plan or net increases of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard.
- **Impact C-AIR-2:** Contribution to cumulative effects related to exposure of sensitive receptors to substantial pollutant concentrations or other emissions (such as those leading to odors).

Cumulative Impact C-AIR-1: Air Quality Plan Conflicts or Net Increase in Criteria Pollutants

The overall cumulative impact for C-AIR-1 would be **potentially significant**. However, with implementation of MM-AIR-2, the Project's contribution would be reduced to **less than significant with mitigation.**

Cumulative Context

This section describes the potential cumulative air quality impacts resulting from the Project in conjunction with past, present, and future projects. The geographic scope for the cumulative analysis of air quality impacts C-AIR-1 is considered to be the SFBAAB. It is appropriate to consider the entire air basin because air emissions can travel substantial distances and are not confined by jurisdictional boundaries; rather, they are influenced by large-scale climatic and topographical features. Although some air quality emissions can be localized, such as toxic air contaminant impacts or odor, the overall consideration of cumulative air quality is typically more regional. By its very nature, air pollution is largely a cumulative impact.

Cumulative Impact Analysis

As described above, the SFBAAB is in nonattainment of ozone, PM_{10}, and $PM_{2.5}$ with respect to the CAAQS. The nonattainment status of regional pollutants is a result of past and present development in the SFBAAB, and this regional impact is cumulative rather than attributable to any one source and is **potentially significant**.

Cumulative projects throughout the air basin would generate construction and operational air emissions that could contribute to regional air quality impacts. Generally, projects that are consistent with the applicable planning documents used to formulate the Clean Air Plan and State Implementation Plan would not produce emissions beyond what is forecast and would not hinder the ability to meet air quality standards.

A project's emissions may be individually limited, but cumulatively considerable when taken in combination with past, present, and future development projects. As discussed in relation to project-level impacts AIR-1 and AIR-2, the thresholds of significance are relevant to whether a project's individual emissions would result in a cumulatively considerable incremental contribution to the existing cumulative air quality conditions. If a project's emissions would be

[8] Note that project-level impacts have been combined for the purposes of cumulative analysis. Cumulative impact C-AIR-1 addresses the same issues as project-level impacts AIR-1 and AIR-2, while cumulative impact C-AIR-2 addresses the same issues as project-level impacts AIR-3 and AIR-4.

less than those threshold levels, the project would not be expected to result in a cumulatively considerable incremental contribution to the significant cumulative impact (BAAQMD 2017a).

Construction-related emissions of the Project would not exceed the thresholds of significance recommended by the BAAQMD. These thresholds are designed to identify those projects that would result in significant levels of air pollution, and to assist the region in attaining the applicable CAAQS and NAAQS. As mentioned in the BAAQMD CEQA Guidelines, the thresholds represent levels above which a project's individual emissions would be a cumulatively considerable contribution to the SFBAAB's existing air quality conditions (BAAQMD 2017a). In addition, with implementation of MM-AIR-2, the Project would not generate substantial fugitive dust emissions. Furthermore, operational emissions associated with the Project would also not exceed the thresholds of significance recommended by the BAAQMD. On the contrary, implementation of the Project is aligned with the overall land use and transportation goals for the region to promote housing near transit and reduce motor vehicle travel and associated emissions in the region. Therefore, in relation to the potentially significant cumulative impacts on criteria air pollutants or conflicts with applicable air quality plans, the Project's incremental contribution would not be cumulatively considerable. Therefore, the Project would have a **less than significant with mitigation** cumulative impact with regard to C-AIR-1.

Cumulative Impact C-AIR-2: Exposure of Sensitive Receptors to Pollutants or Other Emissions

The overall cumulative impact for C-AIR-2 would be **less than significant.** No mitigation is required

Cumulative Context

The geographic context for the cumulative analysis of air quality impact C-AIR-2 would be the immediate vicinity of the project site. For the cumulative analysis of exposure of sensitive receptors to sources that generate toxic air contaminant and/or $PM_{2.5}$ emissions, the BAAQMD considers a 1,000-foot radius (BAAQMD 2017a). The temporal context would include those probable future projects that have the potential to emit pollutants or other emissions that could result in exposure of the same sensitive receptors as the Project during the same time period.

Cumulative Impact Analysis

As identified in Table 3.1-1, the City's Public Safety Building located at 250 Sherman Avenue, approximately 400 feet west of the Project site, is currently under construction. Construction of the Public Safety Building is anticipated to be completed in Summer 2023, overlapping with the construction activities for this Project. Construction of the Public Safety Building began in June 2021 and demolition/removal of existing water and sewer systems and preliminary soil off-haul activities are currently underway (City of Palo Alto 2021e). Since construction of the Project is anticipated to begin in Summer 2022, it is anticipated that the construction activities of the Public Safety Building that would involve intensive construction activities that have the potential to generate higher toxic air contaminant emissions (e.g., grading activities [haul trucks for soil import/export and concurrent use of multiple heavy-duty equipment units]) would be complete. As such, the intensive phases of construction for the two projects are not anticipated to overlap. In addition, construction of the Public Safety Building requires the use of construction equipment that meets USEPA Tier IV Final emissions standards (for equipment greater than 25-horsepower). As stated in the EIR for the Public Safety Building, the use of Tier IV equipment for all diesel-powered construction equipment greater than 25-horsepower was estimated to reduce $PM_{2.5}$ exhaust emissions by approximately 89% (City of Palo Alto 2018a).

Further, construction activities and the associated emissions would occur at varying distances from the surrounding receptors as construction moves across both project sites. Therefore, any overlapping activities and associated emissions would not be generated from the same location or concentrated on a single receptor for an extended period of time. As such, it is not anticipated that the cumulative cancer risk associated with overlapping construction activities in the project vicinity would exceed the BAAQMD cumulative threshold for cancer risk of 100 in a million. Therefore, criteria pollutant, toxic air contaminant, or odorous emissions from the Project combined with other nearby construction emissions would not adversely affect nearby sensitive receptors.

In addition, since the Project would not add any new substantial sources of toxic air contaminant emissions during operation, and operation of the Public Safety Building, which primarily consists of safety, office and administration services (e.g., Police Department, Emergency Dispatch Center, Emergency Operations Center), would also not add any substantial sources of toxic air contaminant emissions, the cumulative cancer risk in the project vicinity would also not exceed the BAAQMD cumulative threshold for cancer risk of 100 in a million. Therefore, the overall impact to sensitive receptors from pollutant or other emissions (such as those leading to odors) from cumulative projects, including the Project, would be **less than significant.**

3.4 Biological Resources

This section describes the existing biological setting of the project area and evaluates whether the Project would result in adverse effects on biological resources. No comments relating to biological resources were received during the public scoping period in response to the Notice of Preparation.

3.4.1 Environmental Setting

The project site is in an urbanized area within the City of Palo Alto and is surrounded by developed land. The site is generally flat and is currently developed with one single story building, hardscape, and landscaped areas. Hardscaped areas include two large paved parking lots which occupy approximately half of the site. Vegetation within the landscaped areas includes sod, ornamental shrubs, and ornamental trees. In addition to the various ornamental trees, native trees on the site include three coast redwoods (*Sequoia sempervirens*) and two valley oaks (*Quercus lobata*). No natural habitats occur on site. The nearest natural habitat and National Wetland Inventory feature is Matadero Creek, which is approximately 0.4-mile southeast and separated from the Project site by developed land and the Oregon Expressway. No hydrologic features occur within the project area.

3.4.2 Regulatory Framework

Federal

Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (MBTA) makes it illegal to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter any migratory bird, or the parts, nests, or eggs of such bird, except under the terms of a valid federal permit. Migratory bird species protected by the act are listed in the Code of Federal Regulations (CFR) in 50 CFR Part 10.13. The United States Fish and Wildlife Service (USFWS) has statutory authority for enforcing the Migratory Bird Treaty Act (16 United States [U.S.] Code Sections 703-712).

Federal Endangered Species Act

The Federal Endangered Species Act of 1973 (ESA) (16 U.S. Code Section 1531 et seq.) provides a regulatory program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The USFWS and National Marine Fisheries Service are the lead agencies responsible for implementing the ESA. The USFWS maintains a list of endangered species that includes birds, insects, fish, reptiles, mammals, crustaceans, plants, and trees.

The ESA prohibits any action that would cause the take of any listed species of endangered fish or wildlife. Section 7 of the ESA requires federal agencies to consult with the USFWS and/or National Marine Fisheries Service for any actions that they authorize, carry out, or fund, that may jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat. Section 10 of the ESA requires a project applicant to obtain a permit for actions that would affect listed species or their habitats.

State

California Endangered Species Act

The California Endangered Species Act (CESA) conserves and protects animals at risk of extinction. Plants and animals may be designated as threatened or endangered under CESA after a formal listing process by the California Fish and Game Commission. A CESA-listed species may not be killed, possessed, purchased, or sold without authorization from the California Department of Fish and Wildlife (CDFW).

California Fish and Game Code Fully Protected Species

Sections 3511, 4700, 5050, and 5515 of the California Fish and Game Code designate 37 species of wildlife as Fully Protected in California. Fully Protected species may not be taken or possessed at any time, and no licenses or permits may be issued for their take, except for the authorized collection of these species for necessary scientific research and relocation of bird species for the protection of livestock.

California Fish and Game Code Section 2081 Incidental Take Permits

Section 2081(b) of the California Fish and Game Code allows the CDFW to authorize take of CESA-listed species categorized as endangered, threatened, candidate, or rare plant species if that take is incidental to otherwise lawful activities, and if certain conditions are met. Section 2081(b) permits are commonly referred to as Incidental Take Permits.

Local

County of Santa Clara Tree Ordinance

The County of Santa Clara Ordinance Code, Division C16, *Tree Preservation and Removal,* requires an administrative permit or encroachment permit for removal of any protected tree on any private or public property in unincorporated Santa Clara County or on any other land owned or leased by the County. Although the project site is within the limits of the City of Palo Alto, the project site is owned by the County of Santa Clara and, therefore, is subject to the County's Tree Ordinance. The ordinance defines a protected tree as including the following:

- Any heritage tree that the County Board of Supervisors has included on the County's heritage resource inventory.
- Any tree on any property owned or leased by the County that measures over 37.7 inches in circumference (12 inches or more in diameter) measured 4.5 feet above the ground, or which exceeds 20 feet in height.
- Any tree, regardless of size, within road rights-of-way and easements of the County anywhere in Santa Clara County.

Under Section C16-4 of the County's tree preservation ordinance, a permit for removal of a protected tree is not required for the cutting, removal, destruction, or pruning of a tree in circumstances where the tree is diseased, dead, or dying, or substantially damaged from natural causes; is needed to remove a hazard to life and personal property; is necessary to carry out a building site approval or other land use application approved by the County; or for maintenance works within public utility easements.

Section C16-7 of the tree preservation ordinance specifies the requirements for an administrative permit to remove protected trees. Among other provisions, Section C16-7(e) specifies that the ratio of trees removed to trees planted shall be determined by the County Planning Department.

City of Palo Alto

The City of Palo Alto regulates specific species and categories of trees identified in Title 8, *Trees and Vegetation,* of the Palo Alto Municipal Code. Regulated trees must be maintained in accordance with regulations and require permits for pruning, removal, or any activities that might impact them. Regulated trees can fall under the following three broad categories:

- Public/Street Trees. All public or street trees are regulated regardless of size. Public trees include all trees growing within the street right-of-way, on public property such as parks, and outside private property. A permit from the Public Works and Planning Departments is required prior to any work on or within the drip-line of any public/street tree.
- Protected Trees. Protected trees can be on either public or private property. Individual species of trees that are protected are all Coast Live Oaks, Valley Oaks (greater than 11.5 inches in diameter), and Coast Redwood (greater than 18 inches in diameter). Heritage Trees are also protected. Heritage trees are individual trees of any size or species or historical significance that are deemed as such by City Council.
- Designated Trees. Trees under or near powerlines are regulated. The City of Palo Alto has a plan in place to maintain vegetation clearance from their electric conductors and related equipment.

3.4.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to biological resources:

- **Impact BIO-1:** 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?
- **Impact BIO-2:** Would the Project have a substantial adverse effect on any riparian habitat or other sensitive natural community?
- **Impact BIO-3:** Would the Project have a substantial adverse effect on state or federally protected wetlands?
- **Impact BIO-4:** Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species?
- **Impact BIO-5:** Would the Project conflict with any local policies or ordinances protecting biological resources?
- **Impact BIO-6:** Would the Project conflict with the provisions of an approved local, regional, or state habitat conservation plan?

Impact BIO-1: Candidate, Sensitive, or Special Status Species

Impact BIO-1 would be **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, the Project may have a significant impact if it would 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 CDFW or USFWS.

Impact Analysis

Special-Status Plants

As discussed previously within the Environmental Setting section above, the entirety of the project site is either occupied by a building, paved, or landscaped. Based on the developed nature of the site and lack of native or riparian habitat, no federal- or state-listed endangered, threatened, rare, or otherwise sensitive flora are anticipated to occur on the site. There is no potential for special-status plant species to occur in the landscaped areas present on site. Therefore, construction and operation of the Project would have **no impact** on special-status plant species.

Special-Status Wildlife

A desktop analysis was conducted to identify potential special-status wildlife species in the vicinity of the project site. Google Maps and Google Earth were used to aerially identify potential habitats that may be present in and around the project site. In addition, the following online resources were used to identify special-status wildlife species with potential to occur on or near the project site:

- USFWS: Information for Planning and Consulting (IPaC) (USFWS 2021a)
- CDFW: California Natural Diversity Data Base (CNDDB): The search area consisted of a 3-mile buffer on the project site. (CDFW 2021)

Table 3.4-1 lists those special-status animal species identified in the desktop analysis review, their status under federal and state law, and whether suitable habitat for each species is present at the project site. As shown in Table 3.4-1, the project site does not provide suitable habitat for any of the special-status animal species identified during the records search. Because there is no suitable habitat for special-status species, construction and operation of the Project would have **no impact** on special status wildlife species**.**

Table 3.4-1 Special-Status Species Potential to Occur in the Project Area

Common Name	Scientific Name	Taxonomic Group	Status	Habitat Present
Bay checkerspot butterfly	*Euphydryas editha bayensis*	Invertebrate	FT	None
San Bruno elfin butterfly	*Callophrys mossii bayensis*	Invertebrate	FE	None
Salt marsh harvest mouse	*Reithrodontomys raviventris*	Mammal	FE, FP	None
Burrowing owl	*Athene cunicularia*	Bird	SSC	None
Marbled murrelet	*Brachyramphus marmoratus*	Bird	FT	None
Western snowy plover	*Charadrius nivosus nivosus*	Bird	FT	None
Yellow-billed cuckoo	*Coccyzus americanus*	Bird	FT	None
California black rail	*Laterallus jamaicensis coturniculus*	Bird	ST, FP	None
California clapper rail (=*R. obsoletus*)	*Rallus longirostris obsoletus*	Bird	FE, SE, FP	None
California least tern	*Sternula antillarum browni*	Bird	FE, SE, FP	None
Green sea turtle	*Chelonia mydas*	Reptile	FT	None
Western pond turtle	*Emys marmorata*	Reptile	SSC	None
San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	Reptile	FE, FP	None
California tiger salamander	*Ambystoma californiense*	Amphibian	FT, ST	None
California red-legged frog	*Rana draytonii*	Amphibian	FE, SSC	None
Delta smelt	*Hypomesus transpacificus*	Fish	FT, ST	None
Steelhead – Central California Coast distinct population segment	*Oncorhynchus mykiss irideus*	Fish	FT	None

Source: Compiled by AECOM based on information from USFWS 2021a and CDFW 2021.
Status Acronyms:
Federal
FE – listed as Endangered under the Federal Endangered Species Act
FT – listed as Threatened under the Federal Endangered Species Act
State
SE – Listed as Endangered under the California Endangered Species Act
ST – Listed as Threatened under the California Endangered Species Act
SSC – State species of special concern
FP – Fully protected under California Fish and Game Code

Impact BIO-2: Riparian Habitat or Other Sensitive Natural Communities

Impact BIO-2 would be **no impact**. No mitigation is required.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS.

Impact Analysis

No riparian habitat or other sensitive natural communities are located on the project site; therefore, Project construction or operation would not disturb any such areas. The Project would not alter or impact Matadero Creek, which is the nearest natural area, because the creek is 0.4 mile from the project site with Oregon Expressway and other developed land between. The nearest critical habitat is for bay checkerspot butterfly and is located 4.1 miles from the project site. The critical habitat is separated from the site by developed land and a major freeway (Interstate 280). Because of the lack of natural habitats on or close to the project site, construction and operation of the Project would have **no impact** on riparian habitat or other sensitive natural communities.

Impact BIO-3: State or Federally Protected Wetlands

Impact BIO-3 would be **no impact**. No mitigation is required.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would 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.

Impact Analysis

No state or federally protected wetlands are located on the project site. The nearest National Wetland Inventory feature to the project site (USFWS 2021b) is Matadero Creek; a riverine wetland resource approximately 0.4 mile to the south and separated from the project site by Oregon Expressway and other developed land. The Project would not involve the direct removal, filling, hydrological interruption, or other impacts to the bed, bank, channel, or adjacent upland area of Matadero Creek. Therefore, the Project would have **no impact** on state or federally protected wetlands.

Impact BIO-4: Fish or Wildlife Movement, Migration or Nursery Sites

Impact BIO-4 would be **potentially significant**. With implementation of mitigation measure MM-BIO-4 the impact would be reduced to **less than significant with mitigation**.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Impact Analysis

Construction

There are no water bodies, documented migratory wildlife corridors, or wildlife nursery sites on the project site or in the vicinity of the project site. The nearest wildlife corridor is Matadero Creek, which is approximately 0.4 mile west of the project site and separated from the project by Oregon Expressway and other developed land. Resident and migratory waterfowl are not anticipated to use the project site because it is already developed and contains no waterbodies or other habitat frequented by such species.

None of the windows in the existing building at the project site are missing or broken, and the eaves or other overhanging architectural features are exposed and not suitable for bat roosting. Therefore, the building is not likely to be used as roosting habitat by bat species that may be migrating through the area and no bat roosting habitat would be disturbed by Project construction.

The various ornamental shrubs, ornamental trees, valley oak trees, and coast redwood trees on the project site may provide suitable habitat for common nesting birds, such as house finch, mourning dove, common raven, and other birds that typically occupy urban environments. As discussed in the regulatory section, these birds, their nests, and eggs are protected under the Migratory Bird Treaty Act. The majority of street trees and existing trees on the project site would be removed, except for select trees which would be retained as part of the Project.

Construction of the Project, including tree removal, could directly impact nesting birds by damaging or destroying nests, or directly killing or injuring nesting birds. Noise and vibration from proposed demolition and construction activities associated with the Project could also disturb birds that are nesting in other trees on and near the project site or cause adult birds to abandon their nests. Although nesting birds in this urban setting are habituated to a noisy environment, the increased human activity, noise, and vibration associated with Project construction would cause additional disturbance beyond what they would normally be accustomed to. Therefore, the impact of Project construction to nesting birds would be **potentially significant.** Mitigation measure MM-BIO-4, detailed below, is recommended to address this potentially significant impact.

Operation

Project operation would not cause impacts to native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites, as no such corridors or sites are present in the vicinity of the project site. Although the Project would result in a decrease of nesting habitat for common bird species due to the removal of mature trees from the project site, this would not be a significant reduction in habitat compared to the overall habitat for nesting birds available in the project vicinity, and would only be a temporary reduction until the replacement trees planted as part of the Project mature.

The Project would result in increased human activity at the project site due to the proposed change in land use from a small public office building to a 110-unit residential apartment building; however, the level of activity at the project site would be similar to other multi-family apartment buildings in the vicinity. Therefore, indirect effects to nesting birds from project operation are unlikely, because it is reasonable to anticipate that birds nesting in or near the project site would be habituated to the existing urban environment. Therefore, the impact of Project operation on nesting birds would be **less than significant**.

The following mitigation measure is recommended to reduce impacts to nesting birds during Project construction:

MM-BIO-4: Nesting Bird Avoidance Measures

To the extent practicable, demolition and construction activities and any tree trimming/removal shall be performed from September 16 through January 14 to avoid the general nesting period for birds. If demolition or construction cannot be performed during this period, nesting bird surveys and active nest buffers (as necessary) shall be implemented as follows:

- *Nesting Bird Surveys: If Project-related demolition or construction work is scheduled during the nesting season (typically February 15 to August 30 for small bird species such as passerines; January 15 to September 15 for owls; and February 15 to September 15 for other raptors), the Developer shall retain a qualified biologist to conduct two surveys for active nests of such birds within 14 days prior to the beginning of the demolition or construction work, with the final survey conducted within 48 hours prior to demolition or construction. Appropriate minimum survey radii surrounding the work area are typically the following: i) 50 feet for passerines; ii) 300 feet for raptors.*

Surveys shall be conducted at the appropriate times of day and during appropriate nesting times, as determined by the qualified biologist.

- *Active Nest Buffers: If the qualified biologist documents active nests within the project area or in nearby surrounding areas, an appropriate buffer between the nests and active demolition and construction activities shall be established. The buffer shall be clearly marked and maintained until all of the young have fledged and are foraging independently. Prior to demolition and construction, the qualified biologist shall conduct baseline monitoring of the nests to characterize "normal" bird behavior and establish a buffer distance which allows the birds to exhibit normal behavior. The qualified biologist shall monitor the nesting birds daily during construction activities and increase the buffer if the birds show signs of unusual or distressed behavior (e.g., defensive flights and vocalizations, standing up from a brooding position, and/or flying away from the nest). If buffer establishment is not possible, all demolition and construction work in the area shall cease until the young have fledged and the nest is no longer active. Work may only continue without the establishment of a buffer if a permit and authorization from USFWS are obtained in accordance with the MBTA.*

MM-BIO-4 would protect nesting birds by ensuring that all active nests with the potential to be impacted by construction noise or human presence would be identified, appropriate avoidance buffers would be applied to active nests, and biologists would monitor active nests and bird behavior during construction so that the effectiveness of the buffer zone can be determined and the buffer distance can be adjusted if needed. Given the urban setting of the project site and presence of typical urban noise and visual barriers such as other buildings in the vicinity of the construction zone, the minimum search radii specified in MM-BIO-4 (50 feet for passerines and 300 feet for raptors) are considered appropriate to reduce potential disturbance of nesting birds to a less than significant level.

With the implementation of MM-BIO-4, construction of the Project would not interfere with the movement of species or impede the use of nursery sites, and potential impacts to nesting birds would be reduced to **less than significant with mitigation.**

Impact BIO-5: Local Policy or Ordinance Conflicts

Impact BIO-5 would be **less than significant impact**. No mitigation is required.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. As discussed further below in Section 3.11, "Land Use and Planning," the project site is on County-owned property and, under state law, cities and counties are exempt from each other's land use regulations for projects that primarily serve a public purpose. The portion of Grant Avenue adjacent to the project site is a private access way owned by the County. However, Birch Street and Park Boulevard are public streets and the City of Palo Alto owns the street trees within those rights-of-way. Therefore, a permit would be required from the City for removal and replacement of the street trees along Birch Street and Park Boulevard. With regard to the other trees to be removed from the project site, the City's Tree Ordinance is not applicable to the Project. The City of Palo Alto's urban forester has confirmed this approach (Passmore, pers. comm. 2021).

The County's tree ordinance is applicable to trees on County-owned property including the project site and the portion of Grant Avenue adjacent to it.

Impact Analysis

The majority of street trees and ornamental trees within the project site would be removed to facilitate construction. The trees proposed for removal are located within the existing parking lot and landscaped areas. Street trees proposed for removal are adjacent to Grant Avenue, Birch Street, and Park Boulevard. The trees would be removed to accommodate the footprint of the new building and to allow site access during construction. Those trees which are to be retained at the site, including the Canary Island palm, two valley oaks, two coast redwoods and four street trees would be protected from damage during demolition and construction activities, along with the Italian cypress trees on the adjacent properties at the rear of the project site.

The County's Tree Ordinance requires issuance of an administrative permit prior to removing any tree on the project site that measures 12 inches or more in diameter, measured 4.5 feet above the ground, or that exceeds 20 feet in height. However, as described above, there are exceptions to this permit requirement for trees that are diseased, dead, or dying, or substantially damaged from natural causes, or are necessary to carry out a land use application approved by the County (County of Santa Clara Ordinance Code Section C16-4). The County's approval process for the Project would include a replanting plan for all trees to be removed, which must include a detailed description of replacement trees.

Because the street trees to be removed along Birch Street and park Boulevard are owned by the City of Palo Alto, a tree permit from the City would also be required for the removal and replacement of these street trees. The City arborist has indicated that they would credit planting site improvements (adding soil cells and/or structural soil rooting corridors) toward the canopy replacement goal instead of requiring a particular replacement ratio, as that is more beneficial to maximize growth potential for the existing number of sites instead of having many trees in substandard growing conditions (Passmore, pers. comm. 2021).

The County or Project Developer would obtain all necessary permits and approvals and adhere to any conditions. Because the Project would not conflict with any applicable local policies or ordinances protecting biological resources, the impact would be **less than significant**.

Impact BIO-6: Habitat Conservation Plan or Natural Community Conservation Plan Conflicts

Impact BIO-6 would be **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Impact Analysis

Although the project site is within Santa Clara County, it does not fall within the Permit Area of the Santa Clara Valley Habitat Plan. The project site is not within an approved Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, there would be **no impact.**

3.4.4 Cumulative Impacts and Mitigation

As discussed in Section 3.4.3 above, the Project would have no impact on special-status species (Impact BIO-1), riparian habitat or other sensitive natural communities (Impact BIO-2), protected wetlands (Impact BIO-3), or conflicts with applicable conservation plans (Impact BIO-6). Therefore, the Project would not contribute to any potential cumulative impacts for these issues. This section analyzes the potential of the Project to contribute to the following cumulative biological resources impacts:

- **Impact C-BIO-4:** Contribution to cumulative effects on fish or wildlife movement, migration or nursery sites.
- **Impact C-BIO-5:** Contribution to cumulative effects related to conflicts with local ordinances or policies protecting biological resources.

Cumulative Impact C-BIO-4: Fish or Wildlife Movement, Migration or Nursery Sites

The overall cumulative impact for C-BIO-4 would be **less than significant.**

Cumulative Context

As discussed for Impact BIO-4 in Section 3.4.3 above, the Project would only have biological resource impacts on common resident and nesting birds in the vicinity of the project site during the construction period. The context for analysis of cumulative impacts is therefore limited to those past, present, and probable future projects that would also have impacts to the same types of common resident and nesting birds or removal of trees within the City of Palo Alto.

Cumulative Impact Analysis

The cumulative projects that may result in potential impacts to common resident and nesting birds would be subject to applicable federal, state, regional, and local regulations discussed previously in Section 3.4.2, and would also be required to implement typical nesting bird avoidance measures, similar to those described for the project in MM-BIO-4. Because these standard avoidance measures would reduce the impacts of all cumulative projects, the overall cumulative impact to common resident and nesting birds in the City of Palo Alto would be **less than significant**.

Cumulative Impact C-BIO-5: Conflicts with Local Ordinances or Policies

The overall cumulative impact for C-BIO-5 would be **less than significant.**

Cumulative Context

The cumulative context for conflicts with local ordinances or policies protecting biological resources are those past, present, and probable future projects that would involve cutting, removal, destruction, pruning, or other activities that would impact trees protected by the County's Tree Ordinance or Title 8, *Trees and Vegetation,* of the Palo Alto Municipal Code.

Cumulative Impact Analysis

All cumulative projects that would result in cutting, removal, destruction, or pruning of protected trees would be required to comply with the applicable tree protection ordinance(s), including obtaining a permit, if necessary, and adhering to any conditions of permit approval. Therefore, the overall cumulative impact would be **less than significant**.

3.5 Cultural Resources

This section describes the existing cultural resources setting of the project site and evaluates whether the Project would result in significant impacts on cultural resources. No comments relating to cultural resources were received during the public scoping period in response to the Notice of Preparation.

3.5.1 Environmental Setting

CEQA Study Area for Cultural Resources

For the purposes of this study, the CEQA study area for Project-related impacts to cultural resources includes the project site and all areas where potential Project-related ground disturbance would occur to account for potential direct impacts and the immediate surroundings of the project site to account for potential indirect impacts. Direct impacts include physical alteration of a resource, and indirect impacts include visual, auditory, or atmospheric intrusions on a resource. This CEQA study area is illustrated in Figure 3.5-1.

Recent surveys and evaluations, reviewed as part of the background investigation, provided comprehensive information on cultural resources in the CEQA study area, including sufficient identification methods and evaluations as defined in Section 16054.5 of the CEQA Guidelines. For the purposes of this study, previous surveys and evaluations were reviewed for consistency with current conditions. Historical resources and archaeological resources in the CEQA study area are discussed in the following sections.

Figure 3.5-1 CEQA Study Area for Cultural Resources

Source: Prepared by AECOM in 2021.

Archaeological Resources

Archival Research

A records search was conducted at the Northwest Information Center (NWIC) of the California Historical Resources Information System on November 23, 2020 (File No. 20-0817). Site records and previous studies were accessed for the project site and for a 0.25-mile radius on the Palo Alto, California 7.5-minute quadrangle of the U.S. Geological Survey topographic map.

No archaeological resources were identified within the project site as a result of the NWIC records search and the study area has not been included in any site-specific archaeological studies. The project site has been included in three larger, background studies; however, two of these (S-33061, Sikes et al. 2006; and S-41536, Corbett and Bradley 2001) did not specifically include and/or study the current project site and therefore are not relevant to this analysis. The third (S-48738, Jurich and Grady 2011) is a study of the built environment only (i.e., structures and buildings) and is not applicable to the archaeological analysis.

Two previously recorded resources (P-43-000617 and P-43-02626) were identified in the NWIC 0.25-mile search radius around the project site. P-43-000617 is approximately 0.2-mile northeast of the project site. Bocek (1987) describes the resource as a dark grey/black midden with shell (primarily oyster, horn snail, and mussel), large faunal skeletal elements, and Franciscan chert flakes. P-43-02626 is approximately 0.21-mile south/southwest of the CEQA study area. Kaptain (2012) describes it as a deposit of 10 three-millimeter shell fragments and one two-centimeter faunal bone fragment in an approximately three-meter by one-meter landscaped area.

Twelve studies were previously completed within a 0.25-mile radius, ten of which were archaeological studies[9] as detailed in Appendix C-1. Only one of the studies identified resources within 0.25 miles of the project site: S-039469 (Kaptain 2012; which identified P-43-02626, described above).

Historical Map Analysis

Historic period maps were also reviewed to determine the potential for unrecorded historic-era archaeological resources associated with prior developments in the project site. Review of Sanborn Fire Insurance maps and historic aerials indicate development within the vicinity of the project site by 1904, when a building is depicted at the north extent of the project site, along Park Boulevard (Sanborn Map Company 1904). Additional development—one building at the southern extent and one building and two ancillary buildings near the central portion of the current project site—is depicted on the 1908 Sanborn map (Sanborn Map Company 1908). By 1945, the building depicted in the northern extent of the project site is non-extant, and four buildings, likely two domiciles and two ancillary buildings, are depicted in its place. A 1948 aerial shows the northern and southern extent of the project site developed, with the central portion empty (Historicaerials.com 2021). By 1956, one ancillary building is depicted in the southern extent of the Project footprint, and the building that is currently located at 231 Grant Avenue is depicted on the 1956 Sanborn map. The buildings in the northern portion of the Project footprint remain until 1968 (Historicaerials.com 2021; Sanborn Map Company 1956). By 1982, the project site appears to be much as it is today, with two asphalt parking lots and the Office Building at 231 Grant Avenue.

[9] The other two studies only considered the built environment and therefore are not relevant to this discussion of archaeological resources.

Native American Heritage Commission Sacred Lands File Search

On March 9, 2021, the County of Santa Clara contacted the NAHC to request the AB 52 Tribal Consultation list and a Sacred Lands File search. Ms. Sarah Fonseca responded on March 19, 2021, with a letter stating: “the result of any Sacred Lands File check conducted through the NAHC was negative.”

Archaeological Survey

AECOM conducted an intensive pedestrian survey of the study area on September 23, 2020. Given that the study area included an extant building and two asphalt parking lots, almost the entirety (approximately 90 to 95 percent) of the study area was paved or built. The landscaped and/or unpaved areas within the parking lots, in front of and behind the building were examined for evidence of cultural resources (e.g., culturally darkened soil [midden], shell fragments, or stone tools). No evidence of potential archaeological resources was encountered during the survey.

Prehistoric Context

The CEQA study area is located within the San Francisco Bay Area. The following section is adapted from Milliken et al. (2007), which is representative of one of the most recent contributions to understanding prehistory within the San Francisco Bay Area. The dates presented below, in conjunction with the hybridized cultural and temporal sequence, are based on calibrated radiocarbon dates.

Paleoindian Period, 11,500–8000 B.C.

Characterized by big-game hunters occupying broad geographic areas. Evidence of human habitation during this period has not yet been discovered in the San Francisco Bay Area (Milliken et al. 2007).

Early Holocene (Lower Archaic), cal 8000–3500 B.C.

Early occupation of the San Francisco Bay region is characterized by the use of milling slabs, hand stones, and flaked tools, including the use of large, wide-stemmed and leaf-shaped projectile points. Data yielded from these early sites indicate a mobile foraging strategy.

Early Period (Middle Archaic), 3500–500 cal B.C.

Indicators of a general trend toward a more sedentary lifestyle are the hallmarks of this time period. New groundstone technology and the first cut shell beads in mortuary settings imply regional symbolic integration and an increase in trade throughout the San Francisco Bay Area.

Lower Middle Period (Initial Upper Archaic), 500 cal B.C.–A.D. 430

The somewhat abrupt change in the bead style during this time period is indicative of a cultural disruption. New bone tools and ornaments, such as elk femur spatulae, whistles, and basketry tools were produced. While milling slabs were still in use at some locations, there was a prevailing use of mortars and pestles throughout this period.

Upper Middle Period (Late Upper Archaic) cal A.D. 430–1050

During this period, the *Olivella* saucer bead trade network collapsed, sea otter use increased and the Meganos extended burial mortuary pattern spread within the interior of the East Bay and into the Santa Clara Valley. Bead Horizon M3 is the apex of the Upper Middle Period, characterized by small, delicate square saddle *Olivella* beads in burials, often in off-village single component cemeteries. Single barbed bone fish spears, ear spools and large mortars appear during the M3 horizon.

Initial Late Period (Lower Emergent) cal A.D. 1050–1550 and the Terminal Late Period

Lifeways during this period became more socio-economically complex as a new level of sedentism and social stratification emerged. The cultural items affiliated with this bead horizon include bird bone whistles and tubes, flanged steatite pipes, the "banjo" abalone effigy ornament, and the *Olivella* callus cup bead. The only shell beads in the South and Central bay mortuaries from this period were *Olivella* lipped and spire-lopped beads.

Ethnography and Tribal Resources

Based on a compilation of ethnographic, historic, and archaeological data, the CEQA study area is located within the ancestral territory of the Puichon, who are believed to have spoken the Ramaytush dialect of the Costanoan language (Milliken et al. 2009). More detailed ethnographic context and information for descendants from the ancestral territory of the Puichon is provided in Section 3.16, "Tribal Cultural Resources".

Historical Resources

Archival Research

In addition to the NWIC records search on November 23, 2020 (File No. 20-0817), the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), and the California Office of Historic Preservation Historic Properties Directory (HPD) data files were also reviewed. The background investigation to identify known and potential historical (built environment) resources also reviewed the California Historical Landmarks and Points of Interest publications and updates, the California Office of Historic Preservation Built Environment Resource Directory, the Santa Clara County Heritage Resource Inventory, and the Palo Alto Historic Inventory. The investigation also reviewed online sources of information including historic newspapers and architectural journals, historic Sanborn Fire Insurance maps, historic and modern aerial photography, U.S. Geographical Survey maps, architect directories, and other relevant sources of information.

Archival research did not identify any previously inventoried or evaluated built environment resources in the CEQA study area at the federal, state or local level.

Built Environment Survey

An intensive pedestrian survey was conducted on September 23, 2020. Contextual and detailed photographs and notes were taken to observe and assess the CEQA study area. The office building at 231 Grant Avenue was recorded and described on Department of Parks and Recreation (DPR) 523 series forms. The historical resource evaluation of the office building at 231 Grant Avenue for this Project, attached as Appendix C-2, concluded that the building is not eligible for listing in the NRHP or CRHR and does not meet the criteria as a historical resource for the purposes of CEQA.

Two additional resources within CEQA study area (the Palo Alto Superior Courthouse at 270 Grant Avenue and the Courthouse Plaza office building at 260 Sheridan Avenue) were identified as potential historical resources due to their age.

Historic Context

The following historic context is adapted from the *Letter Report – 231 Grant Avenue, Palo Alto Historic Resource Evaluation* prepared by AECOM, which is attached as Appendix C-2.

Mayfield and Palo Alto

The project site is within the former community of Mayfield that was initially settled as "Mayfield Farm" in 1853 by Elisha O. Crosby near El Camino Real. A small commercial district grew on Lincoln Avenue (now S. California Avenue) just north of El Camino Real and Mayfield grew after the establishment of nearby Stanford University in 1891. In July 1925, the citizens of Mayfield voted to annex their town to the City of Palo Alto. Additional details regarding the development of Mayfield is provided in Appendix C-2.

In 1956, the project site and its immediate vicinity contained older residential building stock. The construction of the office building at 231 Grant Avenue served as a catalyst to transform this section of the City from single-family residences to offices and apartment buildings to serve the expanding influence of Stanford as a research and technology center. By 1960, ground was broken across Grant Avenue for the County of Santa Clara Office Building, and Oregon Expressway cut through the adjacent parcels to the east that connected the Bayshore Freeway to El Camino Real, which required demolition of 90 residences. Between 1960 and 1968, the majority of the remaining residences on the project site and the adjacent residential parcel to the east were razed to make way for parking lots and a four-story office building. By 1980, nearly all of the older residential and commercial buildings on the nine blocks bounded by Park Avenue on the north, Sherman Avenue on the west, El Camino Real to the south, and Oregon Expressway on the east were demolished and replaced with multi-story office buildings and large apartment complexes.

Project Site History

The office building at 231 Grant Avenue was originally constructed in 1956 to house the offices of Annual Reviews, Inc., a non-profit publishing entity associated with Stanford University. Additional details regarding Annual Reviews, Inc. and its relationship with Stanford University is provided in Appendix C-2.

In 1963, the four-story County of Santa Clara Office Building was completed directly across Grant Avenue from the project site and housed County offices for the Clerk, Jury Commissioner, Juvenile Probation, Municipal Court Clerk, Civil Defense Substation of the Sheriff Department, Welfare Department, Health Department, and a Holding Facility for the jail. In 1967, the County declared eminent domain on Annual Reviews' building at 231 Grant Avenue, and the company relocated to 4139 El Camino Way the following year. The County transferred the Juvenile Probation Department, Civil Defense Substation of the Sheriff Department, Branch Office of the District Attorney, Adult Probation Department, and Weights & Measures to 231 Grant Avenue.

Between 1972 and 1974, only three County departments were housed in 231 Grant Avenue: the branch offices for the District Attorney, Juvenile Probation Department, and Adult Probation Department. By 1976, the North Santa Clara County Mental Health Center (later the North County Community Mental Health Center) took over the entire building. By the 1990s, the North County Treatment & Recovery for drug and alcohol rehabilitation also moved into the building.

In 2011, North County Community Mental Health Center vacated the building and was replaced with the Office of the Alternate Defender and the County of Santa Clara/North County Offices of the Public Defender. The departments shared the building for approximately five years, and the current occupants, the Office of the Public Defender and the Kurt E. Kumli Resource Center, have occupied the building since 2016.

Structures Over 50 Years Old in the CEQA Study Area

The following three structures over 50 years old were identified in the CEQA study area:

- Office Building (231 Grant Avenue)
- Palo Alto Superior Courthouse (270 Grant Avenue)
- Courthouse Plaza Office Building (260 Sheridan Avenue)

Office Building (231 Grant Avenue)

The office building is a Contemporary-style single-story building that is oriented northwest toward Grant Avenue with a concrete slab foundation and an irregular L-shaped plan that forms a rear courtyard area (Photograph 1). It has a flat roof system, rough stucco siding, a stack-course Roman brick wall section on the façade, and stack-course concrete masonry units. The stepped façade features non-original recessed single anodized-frame glass doors flanked by sidelights; other fenestration includes two-part metal-frame windows separated by narrow wood pilasters and perpendicular louvered wood screens.

Photograph 1. Office Building at 231 Grant Avenue, view to southeast from Grant Avenue

Source: AECOM 2020

Palo Alto Superior Courthouse (270 Grant Avenue)

The Palo Alto Superior Courthouse is a four-story civic building with a T-shaped plan located at 270 Grant Avenue. The building has a flat roof and symmetrical arrangement. The building is angled with a southwest-facing façade at the corner of Grant Avenue and Birch Street. It has glass commercial storefronts, a curtain wall window, and ribbon windows (Photograph 2). The east and west side elevations have no windows or doors and feature concrete panels with geometric motifs. The primary entrance is accessed via concrete steps covered by cantilever canopies and porches with curved overhangs.

Architect Paul James Huston designed the building in the International Style in 1960 (Murray et al. 2019: 45). Born in 1916 in Illinois, Huston became a prominent local architect in Palo Alto during the 1940s (Murray et al. 2019). Among Huston's significant designs include the Original Lockheed Buildings in Sunnyvale (1956), the Mountain View Library (1957), and the Draper, Gaither, and Anderson Building in Stanford (1959).

The International Style was widely used in governmental, institutional, and commercial buildings from 1945 to the 1960s (rare examples were constructed as early as 1925). It is characterized by unornamented wall surfaces with no decorative details, flat roofs, smooth and uniform wall surfaces, windows with minimal exterior reveals, cantilevered upper floors and balconies, box shape, and horizontality, usually in ribbon windows. Facades were often clad in brick, concrete, or stucco; and stacked brick incorporated as an accent material. Other character-defining features of the International Style present at the Palo Alto Superior Courthouse building include its concrete facades, ribbon windows, cubic form, and geometric panel accents.

Photograph 2. Palo Alto Superior Courthouse, view to west from Grant Avenue

Source: (Google Maps Street View 2020)

Courthouse Plaza Office Building (260 Sheridan Avenue)

The Courthouse Plaza office building located at 260 Sheridan Avenue was constructed in 1967. The building is a four-story concrete and steel commercial building with elements of Brutalism and the International Style (Photograph 3). The building is located at the southeast corner of Sheridan Avenue and Birch Street and has a south-facing façade and a rectangular plan. It has a flat roof with a slight overhang with concrete bracket supports. The upper stories have recessed bands of lancet windows in groups of three and single arrangements. The ground level has a pedestal base with glass storefronts enclosed by a wrap-around porch with square column supports. A bronze statue of Nikola Tesla is located to the south of the building, designed by Terry Guyer and installed in 2013. The building has distinctive characteristics of the International Style, including elevated vertical box massing, concrete exterior walls, extensive windows, and a repetitious cell-like character expressed in the exterior fenestration. Elements of Brutalism include the use of solid concrete forms and the imposing monumentality of the building.

Photograph 3. Courthouse Plaza Office Building, view to north from Sheridan Avenue and Birch Street Intersection

Source: (Google Maps Street View 2020)

3.5.2 Regulatory Framework

Federal

Although this Project is not subject to federal regulations, the criteria for the NRHP and the Secretary of the Interior's (SOI) Standards for the Treatment of Historic Properties are referenced due to their role in analyzing impacts and formulating mitigation for the purposes of CEQA.

National Register of Historic Places

The NRHP was established by the National Historic Preservation Act of 1966 as "an authoritative guide to be used by federal, State, and local governments, private groups and citizens to identify the Nation's cultural resources and to indicate what properties should be considered for protection from destruction or impairment" (CFR 36 CFR 60.2). The NRHP recognizes properties that are significant at the national, state, and local levels. To be eligible for listing in the NRHP, a resource must be significant in American history, architecture, archaeology, engineering, or culture. Districts, sites, buildings, structures, and objects of potential significance must also possess integrity of location, design, setting, materials, workmanship, feeling, and association. A property is eligible for the NRHP if it is significant under one or more of the following criteria:

A. It is associated with events that have made a significant contribution to the broad patterns of our history;

B. It is associated with the lives of persons who are significant in our past;

C. 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 represents a significant and distinguishable entity whose components may lack individual distinction; and/or

D. It has yielded, or may be likely to yield, information important in prehistory or history.

Historic properties that are listed in the NRHP are automatically listed in the CRHR.

State

California Environmental Quality Act

CEQA requires the lead agency to determine whether a project could have a significant effect on historical resources and states that a substantial adverse change in the significance of an historical resource may have a significant effect on the environment (Section 21084.1). CEQA Guidelines Section 15064.5 outlines the process for determining the significance of impacts to archaeological and historical resources.

CEQA Guidelines Section 15064.5(a) defines "historical resources" as:

- A resource listed, or determined to be eligible by the State Historical Resources Commission for listing, in the CRHR (PRC Section 5024.1, Title 14 CCR Section 4850 et seq.).
- A resource included in a local register of historical resources, as defined in PRC Section 5020.1(k), or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g), shall be presumed to be historically or culturally

significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

- Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be historically significant if the resource meets the criteria for listing in the CRHR (PRC Section 5024.1, Title 14, CCR Section 4852), including the following:

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; or
4. Has yielded, or may be likely to yield, information important in prehistory or history

- The fact that a resource is not listed or not determined eligible for listing in the CRHR or not included in a local register of historical resources (pursuant to PRC Section 5020.1[k]), or not identified in a historical resources survey (meeting the criteria in PRC Section 5024.1[g]) does not preclude a lead agency from determining that the resource may be a historical resource, as defined in PRC Sections 5020.1(j) and 5024.1.

CEQA Guidelines Section 15064.5(b) defines "substantial adverse change" as "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired." Further, that the significance of an historical resource is "materially impaired" when a project:

- Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in the CRHR; or
- Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources… or its identification in an historical resources survey…, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR as determined by a lead agency for purposes of CEQA.

CEQA also requires lead agencies to consider whether a project would impact "unique archaeological resources." PRC Section 21083.2(g) defines a unique archaeological resource as "an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person."

The CEQA Guidelines provide detailed direction on the requirements for avoiding or mitigating significant impacts to historical and archaeological resources. Section 15064.5(b)(4) states that a lead agency shall identify mitigation measures and ensure that the adopted measures are fully enforceable through permit conditions, agreements, or other measures. In addition, Section 15126.4(b)(3) states that public agencies should, whenever feasible, seek to avoid damaging effects on any historical resources of an archaeological nature. Preservation in place is the preferred manner of avoiding impacts to archaeological sites, although data recovery through excavation is acceptable if preservation is not feasible. If data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provisions for adequately recovering the scientifically consequential information from and about the historical resource.

Senate Bill 297

Senate Bill (SB) 297 addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction; and establishes the NAHC to resolve disputes regarding the disposition of such remains. The provisions of SB 297 have been incorporated into Section 15064.5(e) of the CEQA Guidelines.

Local

County of Santa Clara Historic Preservation Ordinance

The County of Santa Clara has adopted a Historic Preservation Ordinance (County of Santa Clara Ordinance Code, Division C17). The ordinance was established for the preservation, protection, enhancement, and perpetuation of resources of architectural, historical, and cultural merit within Santa Clara County and to benefit the social and cultural enrichment, and general welfare of the people. The purpose and intent of Section C17-2 of the ordinance is to:

a. Identify, protect, preserve, and enhance historic resources (as defined in Section C17-3(J) below) representing distinctive elements of the cultural, social, economic, political, and architectural history of Santa Clara County;
b. Provide a mechanism to compile, update and maintain the heritage resource inventory;
c. Enhance the visual identity of Santa Clara County by maintaining the scale and character of historic resources and their settings, and integrating the preservation of historic resources into public and private development;
d. Encourage, through public and private action and collaboration with other organizations, the maintenance and rehabilitation of historic resources;
e. Promote public knowledge, participation, understanding, and appreciation of Santa Clara County's rich history and sense of place;

f. Foster civic pride and a sense of identity based upon the recognition and use of Santa Clara County's historic resources;

g. Protect and enhance Santa Clara County's attraction to tourists and visitors thereby stimulating business and industry;

h. Promote awareness of the economic, social and cultural benefits of historic preservation in collaboration with other organizations;

i. Provide for consistency with state and federal preservation standards, criteria, and practices; and

j. Make available incentive opportunities to preserve Santa Clara County's historic resources as provided in Article V.

In order to be designated as a "landmark," a historic resource must meet the following designation criteria:

A. Fifty years or older. If less than 50 years old, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the historic resource and/or the historic resource is a distinctive or important example of its type or style; and

B. Retains historic integrity. If a historic resource was moved to prevent demolition at its former location, it may still be considered eligible if the new location is compatible with the original character of the property; and

C. Meets one or more of the following criteria of significance:

1. Associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2. Associated with the lives of persons important to local, California or national history;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. Yielded or has the potential to yield information important to the pre-history or history of the local area, California, or the nation.

Section C17-23 of the ordinance requires a landmark alteration permit for any project that proposes demolition of an historic resource that is listed in the heritage resource inventory and meets the criteria of significance for a landmark.

County of Santa Clara Cemeteries and Indian Burial Grounds Ordinance

County Ordinance Code Sections B6-18 through B6-20 set forth the procedures to be followed in the event of an encounter with human skeletal remains or artifacts and discovery of a Native American burial site.

Upon discovering or unearthing any burial site as evidenced by human skeletal remains, the person making such discovery shall immediately notify the County Coroner. Upon determination by the County Coroner that the remains are Native American, the coroner shall contact the California NAHC, pursuant to Health and Safety Code Section 7050.5 (c) and the County Coordinator of Indian Affairs.

No further disturbance of the site may be made except as authorized by the County Coordinator of Indian Affairs in accordance with the provisions of state law and this ordinance. The County Coordinator of Indian Affairs shall contact the California NAHC and assist in contacting persons believed to be most likely descendants. Within 24 hours following receipt of information that a Native American burial site has been discovered or unearthed, the County Coordinator of Indian Affairs shall conduct inspection of the site in accordance with the provisions set forth in PRC Section 5097.98. Any agreement reached in accordance with PRC Section 5097.98 shall be presented to the County Engineer. The County Engineer shall issue a permit setting forth the conditions of the agreement to be met by the owner of the property.

Such conditions of the permit shall be in furtherance of the intent of this ordinance and shall be formulated by a Costanoan Advisory Committee appointed by the County Board of Supervisors and shall consist of three persons of Costanoan descent, two professional archeologists with fieldwork experience and with a degree in archaeology and one person with a background in civil engineering.

The process involves the County Engineer, the County Coroner, the County Coordinator of Indian Affairs, the NAHC, and advisory committee made up of three persons of Costanoan descent, two professional archaeologists, and a person with background in civil engineering. These professionals contribute to the determination of how to handle archaeological resources discovered.

City of Palo Alto Municipal Code – Historic Preservation (Chapter 16.49)

The City of Palo Alto found that the protection, enhancement, perpetuation and use of structures, districts and neighborhoods of historical and architectural significance located within the city are of cultural and aesthetic benefit to the community and, therefore, adopted Historic Preservation Municipal Code Chapter 16.49.

The criteria for designating historic structures/sites provided in Chapter 16.49.040 (b), along with the definitions of historic categories and districts in Section 16.49.020, shall be used for designating additional historic structures/sites or districts to the historic inventory:

(1) The structure or site is identified with the lives of historic people or with important events in the city, state or nation;

(2) The structure or site is particularly representative of an architectural style or way of life important to the city, state or nation;

(3) The structure or site is an example of a type of building which was once common, but is now rare;

(4) The structure or site is connected with a business or use which was once common, but is now rare;

(5) The architect or building was important;

(6) The structure or site contains elements demonstrating outstanding attention to architectural design, detail, materials or craftsmanship.

City of Palo Alto Comprehensive Plan

The City's Comprehensive Plan provides specific policies for preserving historic and archaeological resources. The Land Use and Community Design Element emphasizes the value and importance of the sustainable management of archaeological resources as well as historic buildings and places (City of Palo Alto 2017a).

The Land Use and Community Design Element of the Comprehensive Plan provides general guidelines for the treatment of archaeological resources. In general, these guidelines correspond with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 Federal Register 44720–44726)) and the California Office of Historic Preservation Instructions for Recording Historical Resources (California Office of Historic Preservation 1995). In addition to these standards and guidelines, the City's Comprehensive Plan Land Use and Community Design Element specifies, "assessing the need for archaeological surveys and mitigation plans on a project-by-project basis, consistent with the California Environmental Quality Act and the National Historic Preservation Act" (City of Palo Alto 2017a).

3.5.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to cultural resources:

- **Impact CUL-1:** Would the Project cause a substantial adverse change in the significance of a historical resource?
- **Impact CUL-2:** Would the Project cause a substantial adverse change in the significance of an archaeological resource?
- **Impact CUL-3:** Would the Project disturb any human remains?

Impact CUL-1: Historical Resources

Impact CUL-1 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5.

"Substantial adverse change" is defined in CEQA Guidelines Section 15064.5(b), as the "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired," as detailed further in Section 3.5.2 above.

Impact Analysis

Construction

The Project would demolish the existing 6,800-square-foot office building at the project site and would construct a new four-story building, totaling approximately 115,000 square feet. AECOM evaluated the existing office building, which was built in 1956, for listing in the NRHP or CRHR and concluded that it does not meet any evaluation criteria and is not eligible for listing in the NRHP or CRHR, or as a Santa Clara County Landmark. Therefore, the building is not a historical resource for the purposes of CEQA (Appendix C-2).

As discussed in Section 3.5.1, "Environmental Setting," the Palo Alto Courthouse (270 Grant Avenue) and the Courthouse Plaza Office Building (260 Sheridan Avenue), which are more than fifty years old, are adjacent to the project site. As discussed in Section 3.12, "Noise," Project construction would not result in vibration levels at the Palo Alto Courthouse that could exceed the threshold for building damage but could result in exceedance of the threshold at the Courthouse Plaza Office Building. Therefore, the impact to historic resources is **potentially significant**.

Mitigation measure MM-NOI-2, detailed in Section 3.12.3, is recommended to address this potentially significant impact.

> ***Implement MM-NOI-2: Vibration Reduction Measures. See Section 3.12.3 for full details of this measure.***

Implementation of mitigation measure MM-NOI-2 would avoid the potential for vibratory damage to the Courthouse Plaza Office Building during construction by avoiding or limiting the use of vibratory equipment within a specified buffer zone around the building so that vibration levels at the building would not exceed the threshold for building damage. Alternatively, realtime vibration monitoring would be used to allow the use of vibratory equipment within the buffer, so long as the threshold for building damage is not exceeded. Although mitigated vibration levels could still exceed the thresholds for potential human annoyance, MM-NOI-2 would reduce vibration levels to below the threshold for potential building damage, therefore construction would not result in a substantial adverse change in the significance of an historical resource. Because the MM-NOI-2 would avoid the potential for vibration damage to the Courthouse Plaza Office Building, the impact to historic resources would be **less than significant with mitigation.**

Operation

The Palo Alto Courthouse (270 Grant Avenue) and the Courthouse Plaza Office Building (260 Sheridan Avenue) are adjacent to the project site and the proposed four-story, approximately 115,000 square feet apartment building would be within view of these two potential historical resources. However, both the Palo Alto Courthouse and the Courthouse Plaza Office Building are situated on rectangular lots with large setbacks, parking lots, and mature trees. These settings already include extensive modern infill mixed-use commercial and residential development similar to the Project. The new apartment building on the project site would be compatible with the existing settings and would not alter the surroundings of the Palo Alto Courthouse or Courthouse Plaza Office Building such that their relationship to the surrounding area, including their large setbacks and mature vegetation, would be diminished. Further, the height of the proposed apartment building is of a similar scale to the two adjacent buildings, and therefore would not dominate or overshadow them. Therefore, the settings of the Palo Alto Courthouse or Courthouse Plaza Office Building would not be materially impaired and the impact of the Project on historic resources would be **less than significant**.

Impact CUL-2: Archaeological Resources

Impact CUL-2 would be **potentially significant**. However, with implementation of mitigation measure MM-CUL-2 the impact would be reduced to **less than significant with mitigation**.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would cause a substantial adverse change in the significance of an archaeological resource pursuant Section 15064.5. "Substantial adverse change" is defined in CEQA Guidelines Section 15064.5(b), as detailed in 3.5.2 above.

Impact Analysis

No prehistoric archaeological resources have been identified within the CEQA study area; however, two prehistoric resources have been identified within 0.25-mile of the project site. The project site is mapped as Holocene-age fine-grained alluvial fan and basin deposits (Qhff) by Witter et al. (2006), suggesting that the surficial landform is young enough that there is a potential for buried prehistoric resources that may not be visible at the surface. However, the project site is located relatively far from perennial water (approximately 0.38 mile west of the historical alignment of Matadero Creek) which is one of the key indicators of prehistoric archaeological site potential. Together, these factors indicate a moderate sensitivity for buried prehistoric archaeological resources within the project site. The previous historic-period development of the project site (described below) has likely diminished the sensitivity of the project site in the areas where development occurred (e.g., in building footprints). Therefore, the project site is low to moderately sensitive for harboring buried prehistoric archaeological resources.

As discussed above, analysis of historic maps indicates some historic-period development of the project site. Given the lack of modern development throughout the project site, outside of the envelope of the existing building, there is a potential for unanticipated subsurface historic-era archaeological deposits associated with the buildings that were depicted within the northern and southern extent of the current Project footprint. These historic-era archaeological deposits would most likely be domestic and farming-related refuse deposits (e.g., privies and wells). Palo Alto was an early adopter of municipal domestic water (1896) and sewer systems (1898). However, as discussed above, Mayfield was not incorporated into Palo Alto until 1925, so any historic-era archaeological deposits within the project site would likely date from the earliest period of development (circa 1904 to 1925).

The horizontal footprint of the Project spans almost the entirety of the parcel, and the maximum vertical footprint could be between 17 and 27 feet below ground surface in the vicinity of the adjacent apartment building parking garage, depending on the foundation support method utilized in this area. The rest of the building would be supported by conventional spread footings with deepened perimeter footing. Given that the horizontal and vertical disturbance footprints could extend beyond areas of previous ground disturbance, it is possible that as-yet unidentified *in situ* prehistoric and historic-period archaeological deposits could be encountered during Project-related ground disturbance.

Therefore, construction of the Project could uncover as yet unrecorded subsurface prehistoric and historic-era archaeological resources on the project site. Such impacts could be **potentially significant.** Mitigation measure MM-CUL-2 is recommended to address this potentially significant impact (and to address potentially significant impacts to tribal cultural resources, as further discussed in Section 3.16).

The following mitigation measure is recommended to reduce impacts to potential unidentified subsurface cultural resources on the project site:

MM-CUL-2: Inadvertent Discovery of Prehistoric, Historic, or Tribal Cultural Resources

A. Prior to the start of earthmoving activities, the Developer shall implement a worker environmental awareness program for all construction personnel involved with excavation activities. The program shall include training to inform workers regarding the possibility of encountering buried cultural resources (including tribal cultural resources), the appearance and types of resources likely to be seen during construction, and proper notification procedures to be followed should resources be encountered.

B. During all ground disturbing activities (e.g., excavation, grading, and utility trenching) occurring in areas of the project site and/or at depths that have not already been disturbed during prior phases of Project construction, the Developer shall retain a *qualified tribal cultural resources monitor to undertake construction monitoring at the project site. Where feasible, the tribal cultural resources monitor shall be a representative of the Tamien Nation. The frequency of monitoring shall be determined based on the rate of excavation and grading activities, the materials being excavated, the depth and location of excavation, and, if found, the abundance and type of archaeological resources encountered. Monitoring activities may be curtailed if the tribal cultural resources monitor determines, in consultation with the County and Developer, that there is limited potential for encountering cultural resources.*

C. In the event that prehistoric or historic resources are encountered during project construction, all activity within a 50-foot radius of the find shall be stopped, the Developer's Project Manager or designee and the County's Project Manager or designee shall be notified, and a qualified archaeologist shall examine the find. Project personnel shall not collect or move any cultural material. The archaeologist shall evaluate the find(s) to determine if it meet the definition of a historical, unique archaeological, and/or tribal cultural resource and follow the further procedures outlined below:

i) If the find(s) does not meet the definition of a historical resource or unique archaeological resource, no further study or protection is necessary prior to resuming Project implementation.

ii) If the find(s) does meet the definition of a historical resource or unique archaeological resource, then it shall be avoided by Project activities. If avoidance is not feasible, as determined by the County, the qualified archaeologist shall make appropriate recommendations regarding the treatment and disposition of such finds, and significant impacts to such resources shall be mitigated in accordance with the recommendations of the archaeologist prior to resuming construction activities within the 50-foot radius.

iii) If the find(s) is potentially a tribal cultural resource, then tribal representatives of the Tamien Nation shall be consulted. If, after consultation with the Tamien Nation, it is determined that the find(s) is a tribal cultural resource, then the find(s) shall be avoided by Project activities. If avoidance is not feasible, as determined by the County, the qualified archaeologist, in consultation with tribal representatives and the County, shall make appropriate recommendations regarding treatment and disposition of such finds and significant impacts to such resources shall be mitigated in accordance with the recommendations of the archaeologist prior to resuming construction activities within the 50-foot radius.

iv) If the find(s) are human remains or grave goods, the requirements of Public Resources Code Section 5097.98 and County Ordinance Code Sections B6-18 through B6-20 shall be followed.

Recommendations for treatment and disposition of finds could include, but are not limited to, the collection, recordation, and analysis of any significant cultural materials, or the turning over of tribal cultural resources to tribal representatives for appropriate treatment. A report of findings documenting any data recovery shall be submitted to the County Director of Planning and Development.

D. Fill soils used for construction purposes shall not contain archaeological materials.

Mitigation measure MM-CUL-2, requiring that that construction workers receive cultural resources awareness training and specifying procedures be followed in the event that prehistoric or historic resources are encountered during ground disturbance, is recommended to reduce impacts to subsurface cultural resources on the project site. This mitigation measure would require stoppage of work within the area of any find(s) to allow a qualified archaeologist to evaluate it and determine if it meets the definition of a historical, unique archaeological or tribal cultural resource, and to either avoid the find, if feasible, or to implement the archaeologist's and, in the case of tribal cultural resources, the Tamien Nation's, recommendations regarding the treatment and disposition of the find to reduce potential adverse impacts to the resource. Therefore, with implementation of MM-CUL-2, Project impacts to subsurface cultural resources would be reduced to **less than significant with mitigation**.

Impact CUL-3: Human Remains

Impact CUL-3 would be **less than significant**. No mitigation would be required.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would disturb human remains, including those interred outside of dedicated cemeteries.

Impact Analysis

Human burials, in addition to being potential archaeological resources, have specific provisions for treatment in Section 5097 of the California Public Resources Code. The California Health and Safety Code (Sections 7050.5, 7051, and 7054) has specific provisions for the protection of human burial remains. Existing regulations address the illegality of interfering with human burial remains, and protect them from disturbance, vandalism, or destruction, and established procedures to be implemented if Native American skeletal remains are discovered. Public Resources Code Section 5097.98 also addresses the disposition of Native American burials, protects such remains, and established the NAHC to resolve any related disputes. County Ordinance Code Sections B6-18 through B6-20 set out specific procedures to be followed in the event of inadvertent discovery or disturbance of human remains within Santa Clara County.

The project site has a low to moderate sensitivity for buried Native American archaeological deposits and cultural materials, which could include human remains. Human remains can be encountered in fill, re-deposited, or disturbed soils, as well as intact soils. Despite the low sensitivity of the project site for unanticipated human remains, the possibility of encountering human remains during Project construction cannot be completely discounted. If human remains were uncovered during demolition or excavation activities, the procedures in County Ordinance Code Sections B6-18 through B6-20 would be followed, which would reduce potential impacts to **less than significant**.

3.5.4 Cumulative Impacts and Mitigation

This section analyzes the potential of the Project to contribute to the following cumulative cultural resources impacts:[10]

- **Impact C-CUL-1:** Contribution to cumulative impacts to historical resources.
- **Impact C-CUL-2:** Contribution to cumulative impacts to archaeological resources and human remains.

Cumulative Impact C-CUL-1: Historical Resources

The overall cumulative impact for C-CUL-1 would be **less than significant.** No mitigation is required.

Cumulative Context

The Project would have a less-than-significant indirect impact on two adjacent buildings that are over 50 years old: the Palo Alto Courthouse (270 Grant Avenue), and the Courthouse Plaza Office Building (260 Sheridan Avenue). Therefore, the cumulative context for historical resource impacts would be any past, present, or probable future projects that have had, or would combine to have, a significant impact on those potential historical resources.

Cumulative Impact Analysis

Past development in the vicinity of the Palo Alto Courthouse and Courthouse Plaza Office Building have changed the general setting of the area since those buildings were constructed in 1960s, with the neighborhood now containing extensive modern infill mixed-use commercial and residential development. The Public Safety Building project, identified as a cumulative project in Table 3.1-1, is located directly across Sherman Avenue from the Palo Alto Courthouse. The EIR prepared for that project concluded that construction of the Public Safety Building would not alter the immediate surroundings such that it would affect the historic integrity of any historic or potentially historic resource.

Although a full historical resource evaluation of the Palo Alto Courthouse and Courthouse Plaza Office Building has not been undertaken, the architectural historians with the County's CEQA consultant, AECOM, do not consider the changes to the surrounding area since the Courthouse or Courthouse Plaza buildings were constructed, including the recent and proposed construction of the Public Safety Building and this Project, to have materially impaired the setting of these sites, as the two sites maintain their relationship to the surrounding area, their large setbacks and mature vegetation. Additionally, recent development in the area is of a similar or smaller scale than the two sites, such that the site settings are not dominated by adjacent, newer structures. Therefore, the overall cumulative impact to historic or potentially historic resources from the Project combined with past, present, and reasonably foreseeable development would be **less than significant.**

Cumulative Impact C-CUL-2: Archaeological Resources or Human Remains

The overall cumulative impact for C-CUL-2 would be **potentially significant.** Implementation of mitigation measure MM-CUL-2 would reduce the Project's contribution to **less than significant**.

[10] Cumulative impact C-CUL-2 addresses the same issues as project-level impacts CUL-2 and CUL-3.

Cumulative Context

The cumulative context for archaeological resources and human remains addresses the impacts of the Project along with other closely related past, present, and probable future projects, and specifically focuses on local developments in the City of Palo Alto that could potentially change the environment by affecting archaeological resources or human remains.

Cumulative Impact Analysis

Past, present, and future developments within the City could impact known or unknown archaeological resources and/or human remains, depending on the proximity to known resources, sensitivity of the area, and the extent of the proposed ground-disturbing activities. Such impacts would be **potentially significant**; however, each of the cumulative projects would be subject to its own environmental review under CEQA, either at a project-level or as part of a programmatic CEQA analysis, and therefore appropriate mitigation measures to avoid or reduce potential impacts would be required, similar to the Project. Furthermore, existing laws relating to the treatment of human remains would apply to all projects. With implementation of such mitigation measures and mandatory regulations, the overall cumulative effect on archaeological resources or human remains would be reduced to less than significant. Therefore, the overall cumulative impact to archaeological resources or human remains from the Project and past, present, and reasonably foreseeable development would be **less than significant with mitigation**.

Cumulative Mitigation Measures

See MM-CUL-2 in Section 3.5.3 above.

3.6Energy

This section describes the existing energy setting of the project area and evaluates the potential for the Project to result in the wasteful, inefficient, and unnecessary consumption of energy; and whether the Project would conflict with a plan for renewable energy or energy efficiency.

Energy efficiency is a possible indicator of environmental impacts. The actual adverse physical environmental effects of energy use and the efficiency of energy use are detailed throughout this EIR in the environmental topic–specific sections. For example, the use of energy for transportation leads to air pollutant emissions, the impacts of which are addressed in Section 3.3, “Air Quality.” The use of energy for electricity leads to indirect GHG emissions, the impacts of which are addressed in Section 3.8, “Greenhouse Gas Emissions.” There is no physical environmental effect associated with energy use that is not addressed in the environmental topic-specific sections of this EIR.

No comments relating to energy were received during the public scoping period in response to the Notice of Preparation.

3.6.1 Environmental Setting

Statewide and Regional

In 2019, California generated a total of 277,704 gigawatt-hours of electricity, of which approximately 200,475 gigawatt-hours were generated in-state (CEC 2021a). The total non-residential and residential electricity consumption for Santa Clara County in 2019 was estimated to be approximately 16,664 gigawatt-hours (CEC 2021b).

In 2019, California consumed approximately 2,217 trillion British thermal units (Btu) of natural gas, of which the majority was volume delivered to consumers which include residential, commercial, industrial, vehicle fuel, and electric power uses (EIA 2021a, 2021b). The total non-residential and residential natural gas consumption for Santa Clara County in 2019 was estimated to be approximately 460 million therms, or 46 trillion Btu (CEC 2021c).

Electrical and natural gas service in the County of Santa Clara is provided by the Pacific Gas & Electric Company (PG&E). In 2019, PG&E delivered approximately 78,071 gigawatt-hours of electricity within its service area (California Energy Commission 2021d). PG&E’s total natural gas throughput was approximately 867 million cubic feet in 2019 (PG&E 2020). PG&E provides power from a variety of sources: biomass and biowaste, geothermal, small and large hydroelectric, solar, wind, natural gas, and nuclear (PG&E 2020).

Transportation is the largest energy-consuming sector in California, accounting for approximately 39 percent of all energy use in the state in 2019 (EIA 2021b). More motor vehicles are registered in California than in any other state, and commute times in California are among the greatest in the country (EIA 2021a). Gasoline and diesel fuel constitute 50 and 16 percent of petroleum-based fuels consumed in California, respectively (EIA 2021b). While gasoline and diesel fuel remain the primary fuels used for transportation in California, the types of transportation fuel have diversified in California and elsewhere. Various statewide regulations and plans (e.g., Low Carbon Fuel Standard, AB 32 Scoping Plan) encourage the use of a variety of alternatives to reduce demand for petroleum-based fuel. Depending on the vehicle capability, conventional gasoline and diesel are increasingly being replaced by alternative transportation fuels including biodiesel, electricity, ethanol, hydrogen, natural gas, and other synthetic fuels. California has a growing number of alternative fuel vehicles through the joint efforts of the California Energy Commission (CEC), CARB, local air districts, federal government, transit agencies, utilities, and other public and private entities. By the end of 2019, California drivers owned almost 600,000 electric and plug-in hybrid vehicles. In 2020, about one-fourth of the nation's public access electric vehicle charging stations, and almost one-third of the charging outlets were in California (EIA 2021a).

Project Site and Vicinity

As described in Section 2, Project Description, an approximately 6,800-square-foot single-story office building completed in 1956 and an associated parking area occupy the project site, which is used by the County of Santa Clara Office of the Public Defender. The City of Palo Alto Utilities supplies electricity and natural gas throughout the city, including the project site. The City intakes energy from PG&E's transmission system. As of 2013, the City of Palo Alto Utilities derives the majority of its electric power from renewable energy sources and is 100 percent carbon-neutral by offsetting the non-renewable portion of its portfolio with renewable energy certificates (City of Palo Alto 2016a).

The existing land uses on the project site consume energy in the form of electricity and natural gas associated with building operations as well as transportation fuel associated with the employee commute trips (diesel, gasoline, and electric vehicle types). Table 3.6-1 below summarizes the existing energy demand for each source and shows the conversion of all energy requirements to a common energy unit of Btu. Energy demand associated with building operations was based on the estimated electricity and natural gas demand as provided by CalEEMod and discussed in more detail in Section 3.8, "Greenhouse Gas Emissions." Transportation fuel requirements associated with the employee commutes were derived based on the estimated existing annual vehicle miles traveled as provided by CalEEMod and EMFAC2021 fleet mix data for Santa Clara County. Refer to Appendix B for detailed model inputs, assumptions, and calculations.

Table 3.6-1 Existing Energy Demand

Energy Consuming Activity	Energy Requirement	Annual Energy Consumption (MMBtu)
Building Electricity Consumption	139,876 kWh/year	477
Building Natural Gas Consumption	135,728 kBtu/year	136
Building Operations Subtotal	**-**	***613***
Transportation Electricity Consumption	40 kWh/year	0.1
Transportation Diesel Consumption	12 gal/year	2
Transportation Gasoline Consumption	1,258 gal/year	157
Transportation (Employee Commute) Subtotal	**-**	**159**
Total Existing Energy Demand	**-**	**772**

Source: Modeled by AECOM in 2021

Acronyms: "-" indicates blank cell; gal = gallons; kBtu = thousand British thermal unit; kWh = kilowatt-hours; MMBtu= Million British thermal units.

Notes: Building energy use from building operations. Transportation energy use from employee commute.

3.6.2 Regulatory Framework

The federal, state, and local regulatory background of energy plans, policies, regulations, and laws is presented below.

Federal

Energy Policy and Conservation Act of 1975

The Energy Policy and Conservation Act of 1975 established the first fuel economy standards for on-road motor vehicles sold in the United States. The National Highway Traffic and Safety Administration is responsible for establishing standards for vehicles and revising the existing standards. The Corporate Average Fuel Economy program was created to determine vehicle manufacturers' compliance with the fuel economy standards. The USEPA administers the testing program that generates the fuel economy data.

National Energy Act of 1978

The National Energy Act of 1978 includes the Public Utility Regulatory Policies Act (Public Law 95-617), Energy Tax Act (Public Law 95-318), National Energy Conservation Policy Act (Public Law 95-619), Power Plant and Industrial Fuel Use Act (Public Law 95-620), and Natural Gas Policy Act (Public Law 95-621).

The intent of the National Energy Act was to promote greater use of renewable energy, provide residential consumers with energy conservation audits to encourage slower growth of electricity demand, and promote fuel efficiency. The Public Utility Regulatory Policies Act created a market for nonutility electric power producers to permit independent power producers to connect to their lines and to pay for the electricity that was delivered.

The Energy Tax Act promoted fuel efficiency and renewable energy through taxes and tax credits. The National Energy Conservation Policy Act required utilities to provide residential consumers with energy conservation audits and other services to encourage slower growth of electricity demand.

Energy Policy Acts of 1992 and 2005

The Energy Policy Act of 1992 was enacted to reduce dependence on imported petroleum and improve air quality by addressing all aspects of energy supply and demand, including alternative fuels, renewable energy, and energy efficiency. This law requires certain federal, state, and local government and private fleets to purchase alternate fuel vehicles. The act also defines "alternative fuels" to include fuels such as ethanol, natural gas, propane, hydrogen, electricity, and biodiesel.

The Energy Policy Act of 2005 was enacted on August 8, 2005. This law set federal energy management requirements for energy-efficient product procurement, energy savings performance contracts, building performance standards, renewable energy requirements, and use of alternative fuels. The Energy Policy Act of 2005 also amends existing regulations, including fuel economy testing procedures.

Energy Independence and Security Act of 2007

Signed into law in December 2007, the Energy Independence and Security Act was enacted to increase the production of clean renewable fuels; increase the efficiency of products, buildings, and vehicles; improve the federal government's energy performance; and increase U.S. energy security, develop renewable fuel production, and improve vehicle fuel economy. The Energy Independence and Security Act included the first increase in fuel economy standards for passenger cars since 1975. The act also included a new energy grant program for use by local governments in implementing energy-efficiency initiatives, as well as a variety of green building incentives and programs.

Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards

On May 7, 2010, the final Light-Duty Vehicle Greenhouse Gas (GHG) Emissions Standards and Corporate Average Fuel Economy Standards were published in the Federal Register. Phase 1 of the emissions standards required that model year 2012–2016 vehicles meet an estimated combined average emissions level of 250 grams of carbon dioxide (CO_2) per mile, which is equivalent to 35.5 miles per gallon, if the automobile industry were to meet this CO_2 level solely through fuel economy improvements.

On August 28, 2012, the U.S. Department of Transportation and USEPA issued a joint Final Rulemaking requiring additional federal GHG and fuel economy standards for Phase 2 of the emissions standards for model year 2017 through 2025 passenger cars and light-duty trucks. The standards would require these vehicles to meet an estimated combined average emissions level of 163 grams of CO_2 per mile in model year 2025, which is equivalent to 54.5 miles per gallon, if the improvements were made solely through fuel efficiency. However, as discussed in more detail in Section 3.7, "Greenhouse Gas Emissions," the USEPA issued the Safer Affordable Fuel Efficient Vehicles Rule in April 2020, which only requires an increase in stringency of CO_2 emissions standards by 1.5 percent each year through model year 2026, as compared with the CO_2 standards issued in 2012, which would have required increases of about 5 percent per year (NHTSA 2020).

Renewable Fuel Standard Program

Created by the Energy Policy Act of 2005, which amended the federal Clean Air Act, the Renewable Fuel Standard Program established requirements to replace certain volumes of petroleum-based fuels with renewable fuels. The four renewable fuel types accepted as part of the Renewable Fuel Standard Program are biomass-based diesel, cellulosic biofuel, advanced biofuel, and total renewable fuel. The 2007 Energy Independence and Security Act expanded the program and its requirements to include long-term goals of using 36 billion gallons of renewable fuels and extending annual renewable-fuel volume requirements to year 2022. "Obligated parties," such as refiners and importers of gasoline or diesel fuel, must meet specific blending requirements for the four renewable fuel types. The USEPA implements the program in consultation with U.S. Departments of Agriculture and Energy. The obligated parties are required to demonstrate their compliance with the Renewable Fuel Standard Program.

State

Senate Bills 1078 and 107, Executive Orders S-14-08 and S-21-09, and Senate Bills 350 and 100

SB 1078 (Chapter 516, Statutes of 2002) required retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

Executive Order S-14-08 expanded the state's Renewables Portfolio Standard to 33 percent renewable power by 2020. Executive Order S-21-09 directs the CARB, under its AB 32 authority, to enact regulations to help the state meet its Renewables Portfolio Standard goal of 33 percent renewable energy by 2020.

The 33 percent-by-2020 goal and requirements were codified in April 2011 with SB X1-2. This new Renewables Portfolio Standard applies to all electricity retailers in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. SB 350 (2015) increased the renewable-source requirement to 50 percent by 2030. This was followed by SB 100 in 2018, which further increased the Renewables Portfolio Standard to 60 percent by 2030 and added the requirement that all state's electricity come from carbon-free resources by 2045.

California Green Building Standards Code

In January 2010, the State of California adopted the California Green Building Standards Code, which establishes mandatory green building standards for all buildings in California. The code covers five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality. These standards include a set of minimum requirements and more rigorous voluntary measures for new construction projects to achieve specific green building performance levels. This code went into effect as part of local jurisdictions' building codes on January 1, 2011. The 2019 California Building Standards Code (Cal. Code Regs., Title 24) was published July 1, 2019, with an effective date of January 1, 2020.

Local

County of Santa Clara Sustainability Master Plan

In January 2021, County of Santa Clara prepared a Sustainability Master Plan which integrates the County's many existing policies, programs, practices, and Countywide initiatives that promote the three core elements of sustainability: Environment, Economy, and Equity. The Sustainability Master Plan includes eight goals, 30 strategies and 90 targets to monitor the implementation of the County's sustainability vision. Goal 1, Carbon Neutrality, includes strategies such as 1.2, Decarbonization of Buildings and Facilities, which is a goal to enhance energy efficiency of and electrify new and existing buildings (County of Santa Clara 2021a).

3.6.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to energy:

- **Impact ENE-1:** Would the Project result in wasteful, inefficient, or unnecessary consumption of energy resources?
- **Impact ENE-2:** Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Impact ENE-1: Wasteful, Inefficient, or Unnecessary Consumption of Energy Resources

Impact ENE-1 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.

Impact Analysis

Construction

Project construction would consume energy associated with the use of transportation fuels (e.g., gasoline, diesel fuel). Transportation energy use during construction would come from the transport and use of construction equipment (off-road), delivery and haul trucks (on-road), and construction employee passenger vehicles (on-road). Construction-related transportation energy use depends on the type and number of trips, VMT, fuel efficiency of vehicles, and travel mode. The majority of construction equipment during excavation, site work, building construction, and paving would be gas or diesel powered. The use of fuel by on-road and off-road vehicles would be temporary and would fluctuate according to the phase of construction. Construction fuel use for the Project would cease upon completion of the construction activities.

Table 3.6-2 shows the estimated total and annual energy consumption as a result of the fuel used during Project construction activities. The annual energy consumption was estimated using the CalEEMod CO_2 emissions calculations for the proposed construction activities and application of the U.S. Energy Information Administration's CO_2 emissions coefficients (EIA 2016) to estimate fuel consumption for construction activities. Additional modeling assumptions and more details are provided in Section 3.2, "Air Quality," and Appendix B.

Table 3.6-2 Construction-Related Energy Consumption

Source	Total Energy Requirement (gallons)	Annual Energy Requirement (gallons)[1]	Energy Consumption (MMBtu)
Diesel-powered equipment and vehicles	41,838	1,395	193
Gasoline-powered vehicles	13,530	451	56
Total Construction Energy Requirement	**-**	**-**	**249**

Source: Modeled by AECOM in 2021.

Acronyms: MMBtu = million British thermal units; "-" indicates blank cell.

Notes:

[1] Since construction-related energy demand would cease upon completion of construction, similar to the methodology for GHG emissions, energy demand associated with construction of the Project was amortized over the Project lifetime. The assumed amortization period is 30 years, based on the typically assumed project lifetime based on other air districts (e.g., South Coast Air Quality Management District [2008]).

Based on the anticipated phasing of the Project construction activities, the anticipated equipment and construction work staff, the temporary nature of construction, and the project type, the Project would not include unusual characteristics that would necessitate the use of construction equipment that is less energy-efficient than the equipment used at comparable construction sites. Although the Project would include additional truck trips (compared to construction sites using traditional construction methods) to transport modular units to the project site from the factory in Vallejo, this would be partially offset by a reduction in the number of truck trips for deliveries of wood framing and other materials to the project site.

In addition, construction contractors are required, in accordance with MM-AIR-2 (see Section 3.3.3) and the CARB Airborne Toxic Control Measure for Diesel-Fueled Commercial Motor Vehicle Idling, to minimize the idling time of construction equipment by shutting equipment off when it is not in use or reducing the idling time to 5 minutes. Per MM-AIR-2, construction contractors would also be required to maintain and properly tune all construction equipment in accordance with the manufacturer's specifications. Further, the Project would also ensure that a minimum of 50 percent of the solid waste generated during construction activities would be diverted from landfill disposal as required by the current version of the California Green Building Standards Code. These required practices would limit wasteful and unnecessary energy consumption. Therefore, this impact would be **less than significant**.

Operation

Operation of the Project would result in energy consumption from building operations (e.g., building heating and cooling, lighting, appliances) and transportation fuel (e.g., fuel usage for vehicle trips from residents, employees, and visitors). The analysis estimated the operational building energy demand based on the electricity consumption as provided by CalEEMod. In order to apply the design feature that the Project would not include any natural gas infrastructure, the default natural gas consumption rates were removed from the CalEEMod energy screen. In order to account for the increased electricity consumption that would result from the reduction in natural gas usage, electricity consumption was increased accordingly assuming a conversion factor of 1 kilowatt-hour for 3.142 kilo-British thermal units (kBtu). . The Project would also install solar photovoltaic panels on the rooftop. However, the anticipated renewable energy generated from the photovoltaic panels is unknown at the time of this analysis. Thus, this analysis does not take reduction from energy generated via the solar panels. Transportation fuel demand was estimated based on the estimated annual vehicle miles traveled as provided by CalEEMod (approximately 1,937,342 miles) and EMFAC2021 fleet mix data for Santa Clara County in 2023. Based on EMFAC2021 fleet mix data, the analysis assumed approximately 88 percent of the vehicle trips to/from the Project would be gasoline-fueled, 2 percent would be plug-in hybrid, 5 percent would be diesel-fueled, and 5 percent would be electric. Refer to Appendix B for detailed model inputs, assumptions, and calculations.

The amortized construction-related, total, and net energy requirements associated with the Project are shown in Table 3.6-3. Operation of the Project would result in an annual net increase of approximately 10,363 Million British thermal units (MMBtu), when compared to existing conditions.

Table 3.6-3 Estimated Energy Demand of the Project

Energy Consuming Activity	Energy Requirement	Unit	Annual Energy Consumption (MMBtu)
Construction Diesel Consumption (amortized)	1,395	gal/year	193
Construction Gasoline Consumption (amortized)	451	gal/year	56
Construction Fuel Subtotal (amortized)	**-**	**-**	***249***
Building Electricity Consumption	941,420	kWh/year	3,212
Building Operations Energy Subtotal	**-**	**-**	***3,212***
Transportation Electricity Consumption	1,941	kWh/year	7
Transportation Diesel Consumption	588	gal/year	81
Transportation Gasoline Consumption	60,686	gal/year	7,586
Transportation (Residents, Visitor & Employee Trips) Subtotal	**-**	**-**	**7,674**
Total Project Energy Requirement	-	-	**11,135**
Existing Land Uses Energy Requirement	-	-	772
Net Project Total	**-**	**-**	**10,363**

Notes: "-" indicates blank cell; MMBtu= Million British thermal units; kWh = kilowatt-hours; kBtu = thousand British thermal unit; gal = gallons

Sources: Modeled by AECOM in 2021.

Building operations would account for approximately 29 percent of the total energy consumption. The Project would be required to comply with energy efficiency standards set forth by Title 24 of the California Administrative Code and the Appliance Efficiency Regulations. Title 24 requires that the project meet a number of conservation standards, including installation of water-efficient fixtures and energy-efficient appliances. Title 24 also regulates energy consumption for the heating, cooling, ventilation, and lighting of residential buildings. Furthermore, the Project would comply with the County's 2019 California Green Building Standards Code (CalGreen) Residential Checklist which incorporates the mandatory measures under CalGreen as well as Tier 1 measures. The Tier 1 mandatory measures include requirements such as, requiring that at least 20 percent of the total parking, walking or patio surfaces be permeable, and reducing cement use and construction waste. The County's 2019 Residential Checklist (County 2019) also requires implementation of at least one or two of the Tier 1 elective requirements in the categories of Planning and Design, Water Efficiency & Conservation, Material Conservation and Resource Efficiency, and Environmental Quality. Thus, compliance with Title 24, CalGreen, and the County's CalGreen Residential Checklist would ensure reduction in the use of fuel, water, and energy by the Project.

Operational transportation would be the greatest energy-consuming factor associated with implementation of the Project. However, the Project would create workforce housing for local educators, thereby resulting in a net decrease in transportation energy consumption due to the reduction in worker commute lengths. In addition, because the Project is located only 650 feet away from the California Avenue Caltrain Station, the Project provides opportunities to limit vehicle trips and the associated fuel consumption and would provide features that encourage alternative modes of transportation, such as a bicycle storage room and connecting on-site and off-site pathways. The Project would also include provision for at least ten percent of the parking spaces in the garage to be "electric vehicle-ready," as required by CalGreen 4.106.4.2.

In addition, as described in the BAAQMD 2017 Clean Air Plan, most older buildings do not meet current energy standards (BAAQMD 2017c). Since the Project involves demolition of a building that was constructed in 1956, the Project would also improve the energy efficiency per capita and per square foot (annual building energy consumption per employee and per square foot in the existing office land use is approximately 63 MMBtu/employee and 0.09 MMBtu/square foot; while the Project would have in an annual building energy consumption of 11.6 MMBtu/service population and 0.03 MMBtu/square foot). Thus, the Project would be more energy efficient than the existing uses on the project site. Therefore, the Project would not result in inefficient, wasteful, and unnecessary consumption of energy, and this impact would be **less than significant.**

Impact ENE-2: Conflict with or Obstruct a Renewable Energy or Energy Efficiency Plan

Impact ENE-2 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Impact Analysis

As described above in the discussion of Impact ENE-1, implementation of the Project would result in the development of new land uses that result in an increase in electricity consumption, as well as additional vehicle miles traveled that would result in the consumption of fossil fuels. However, design and construction of buildings would comply with the most recently adopted California Building Energy Efficiency Standards Code and CalGreen. Additionally, the Project objectives incorporate the goals included in the County's Sustainability Master Plan. Specifically, the Project would be all-electric and install photovoltaic solar panels on the rooftop and would also incorporate other sustainability measures consistent with Sustainability Master Plan Goal 1.2 (Decarbonization of Buildings and Facilities), which encourages enhancement of energy efficiency of new buildings. Therefore, the Project would not conflict with the initiatives and strategies included in the Sustainability Master Plan. In addition, as described in Impact ENE-1, the Project would result in less electricity and natural gas consumption per square foot relative to the existing uses on the project site. This would be consistent with the BAAQMD Clean Air Plan goal of maximizing energy efficiency and increasing production of on-site renewable energy such as rooftop solar. In addition, as described in more detail in Section 3.16, "Transportation," the Project would generate VMT per service population lower than the Santa Clara County averages. Thus, the Project would be consistent with overall regional goals included in regional and statewide plans such as the County of Santa Clara Sustainability Master Plan, BAAQMD Clean Air Plan, Plan Bay Area (the Bay Area's Regional Transportation Plan/Sustainable Communities Strategy), and California Air Resources Board Scoping Plan to reduce vehicle miles traveled and thereby, the associated fuel consumption. Therefore, the Project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. This impact is **less than significant**.

3.6.4 Cumulative Impacts and Mitigation

The following discussion analyzes the potential of the Project to contribute to the following cumulative impacts[11] related to energy consumption and energy resources:

- **Impact C-ENE-1:** Contribution to cumulative effects due to wasteful, inefficient, or unnecessary consumption of energy resources or conflict with an applicable state or local plan for renewable energy or energy efficiency.

Cumulative Impact C-ENE-1: Wasteful, Inefficient or Unnecessary Consumption of Energy or Conflict with Energy Plan

The overall cumulative impact for C-ENE-1 would be **less than significant.** No mitigation is required.

Cumulative Context

The study area for the cumulative impacts of energy consumption is the state of California, as standards for fuel efficiency, building codes, and energy conservation standards are promulgated at the state level.

Cumulative Impact Analysis

Past, present, and probable future projects throughout the state would result in the irreversible use of diesel and gasoline resources during construction, as well as the incremental increase in energy consumption from operational building energy and traffic associated with those projects. However, the use of such resources would be subject to the same regulatory framework relating to energy and fuel efficiency as the Project and would be anticipated to become more energy efficient over time as regulatory requirements change and technological advancements are made. In addition, as described above in Impacts ENE-1 and ENE-2, the Project is anticipated to consume less electricity and natural gas per square foot relative to the existing uses on the project site.

Due to the urbanized nature of the City of Palo Alto and surrounding areas, future projects are expected to result in a similar development pattern—while the overall use of electricity and

[11] Note that project-level impacts have been combined for the purposes of cumulative analysis. Cumulative impact C-ENE-1 addresses the same issues as project-level impacts ENE-1 and ENE-2.

natural gas on the site and surrounding areas may increase, the energy use per square foot is expected to decrease due to compliance with modern standards and incorporation of modern technologies and design standards. Specifically, regarding petroleum use during construction, the Project and other future projects would consume energy associated with the off-road equipment, truck trips, and worker vehicle trips. However, construction of the Project and future projects would be temporary. Furthermore, present and future projects in the City would also be required to comply with BAAQMD Basic Construction Measures which would help reduce construction-related fuel usage. During operation of the Project and future projects, increased land use intensity would result in additional vehicles miles traveled in the area. However, over the lifetime of the Project and past, present, and future projects, the fuel efficiency of vehicles is expected to increase. Similarly, with increasingly stringent local and state regulations for energy efficiency in buildings, operational building energy consumption is also expected to decrease. Therefore, the overall cumulative impact relating to energy consumption and consistency with energy plans would be **less than significant.**

3.7 Geology and Soils

This section describes the existing geology, soils, and paleontological resources setting of the project area and evaluates whether the Project would result in adverse effects on these resources. No comments relating to geology and soils were received during the public scoping period in response to the Notice of Preparation.

3.7.1 Environmental Setting

Geology

The project site is in an area of mixed alluvial and floodplain deposits along the western edge of the San Francisco Bay. This area of the City of Palo Alto consists of alluvial fans deposited over time as a result of erosion and subsequent transport of sediments from the Santa Cruz Mountains to the west, and historic floodplain deposits from local creeks and from the Bay itself. The site is approximately 2 miles inland from the San Francisco Bay shoreline and is approximately 32 feet above mean sea level.

Surface Fault Rupture

Geologists have determined that the greatest potential for surface fault rupture and strong seismic ground shaking is from active faults, that is, faults with evidence of activity during the Holocene epoch (the last 11,700 years). Surface rupture is the actual cracking or breaking of the ground surface along a fault during an earthquake, which is generally limited to a linear zone that is only a few yards wide. If surface fault rupture occurs, structures that are located across the fault trace can be torn apart, and pipelines can rupture. The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) was created to help reduce the loss of life and property from an earthquake by prohibiting the construction of structures designed for human occupancy across the traces of active faults.

The project site is not located within an Alquist-Priolo Earthquake Fault Zone (California Geological Survey [CGS] 2006) or within or adjacent to the trace of any other known fault (Jennings and Bryant 2010).

Strong Seismic Ground Shaking

Ground shaking—motion that occurs as a result of energy released during faulting—could potentially result in the damage or collapse of buildings and other structures, depending on the magnitude of the earthquake, the distance to the epicenter, and the character and duration of the ground motion. Other important factors to be considered are the characteristics of the underlying soil and rock and, where structures exist, the building materials used and the workmanship of the structures.

The project site is located in the San Francisco Bay block,[12] which is a seismically active area. The San Francisco Bay block is bounded by several major right-lateral, active faults: the San Andreas fault on the southwest, and the Hayward and Calaveras faults on the northeast.

The U.S. Geological Survey indicates that the estimated probability of one or more magnitude 6.7 earthquakes occurring during the period 2014–2043 in the San Francisco Bay Area is 72 percent (Aagaard et al. 2016). In the Project region, the faults with the highest estimated probability of generating damaging earthquakes are the Hayward (33 percent), Rodgers Creek (33 percent), Calaveras (26 percent), and San Andreas Faults (22 percent). During the period

[12] A block is a large crustal rock mass bounded by faults that moves or behaves as a single unit within a greater tectonically active region.

2014–2043, the probability of an earthquake of magnitude 6.7 or larger occurring along the San Andreas Fault is 22 percent; and is 33 percent along the Hayward or Rodgers Creek Faults. The distance from the project site to the nearest active faults is shown in Table 3.7-1.

Table 3.7-1 Active Faults in the Project Region

Fault Name	Distance and Direction from Project Site
Monte Vista-Shannon Fault	4.6 miles southwest
San Andreas Fault Peninsula Section	9.2 miles west
Hayward Fault	20 miles northeast
San Gregorio Fault	25 miles west
Calaveras Fault	29 miles northeast

Source: Jennings and Bryant 2010; Rockridge Geotechnical 2021a

In addition, there are several faults in the project vicinity where the age of last known activity occurred during the last 1.6 million years (i.e., mid to late Quaternary Period), but the exact age of activity is unknown.[13] Although these faults are not classified as active, they may still be capable of strong seismic ground shaking (CGS 2018). The Stanford Fault is approximately 2,200 feet west of the project site. The Palo Alto and San Jose Faults are approximately 1.1 and 3.1 miles, respectively, east of the project site.

Peak horizontal ground acceleration, which is a measure of the projected intensity of ground shaking from seismic events, can be estimated using a computer model. As part of the geotechnical report, Rockridge Geotechnical (2021a) determined that a peak ground acceleration of 0.79g (g = gravity) would be appropriate for use in seismic-related design and engineering for the Project. This indicates that a very strong level of seismic ground shaking would be anticipated at the project site.

Seismic Settlement/Liquefaction

Liquefaction is the process which causes soil to behave more like a liquid than a solid during an earthquake. During strong ground shaking, water-saturated granular materials are transformed from a solid state into a liquefied state as a result of increased pore-water pressure, resulting in loss of strength. Structures on soil that undergoes liquefaction may settle or suffer major structural damage. Liquefaction is most likely to occur in low-lying areas where the substrate consists of poorly consolidated to unconsolidated water-saturated sediments, recent Holocene-age sediments, or deposits of artificial fill. Additional factors that determine the liquefaction potential are the distance to an active seismic source and the depth to groundwater.

Based on geologic and seismic studies performed by the California Geological Survey (CGS 2006), the project site is not located within a liquefaction hazard zone, nor is it located within an area designated by the Santa Clara County Geologic Hazard Zones maps as a Liquefaction Hazard Zone (County of Santa Clara 2012). However, as required by California Building Standards Code (CBC), Rockridge Geotechnical (2021a) included a liquefaction analysis as part of the geotechnical report prepared for the project site. The results of the liquefaction analysis indicate there are several thin layers between depths of about 15 and 45 feet below ground surface (bgs) that are potentially liquefiable. The potentially liquefiable layers are generally less than 2 feet thick, with the exception of a thicker layer encountered at two of the

[13] Faults can be "age-undetermined" if the fault in question has simply not been studied in order to determine its recency of movement. Faults can also be age-undetermined due to limitations in the ability to constrain the timing of the recency of faulting (CGS 2018).

cone penetration test sites that is 19 to 30 feet bgs. Rockridge Geotechnical (2021a) estimated the total amount of ground settlement associated with liquefaction at the site would be less than 0.75 inch, and differential settlement would be less than 0.5 inch.

Lateral Spreading

Lateral spreading is horizontal/lateral ground movement of relatively flat-lying soil deposits toward a free face such as an excavation, channel, or open body of water; typically lateral spreading is associated with liquefaction of one or more subsurface layers near the bottom of the exposed slope.

There are no open faces at the project site where lateral spreading could occur and, considering the site topography is relatively flat and the potentially liquefiable layers are not continuous, Rockridge Geotechnical (2021a) concluded the risk of lateral spreading is very low.

Slope Stability

The project site has a generally flat topography that would not represent a slope stability hazard. Furthermore, the site is not adjacent to any steep slopes where an off-site landslide could pose a hazard to on-site structures.

Soils

Soil properties influence the development of building sites, including the engineering design, construction techniques, and site maintenance. Soils are made up of different sized particles and are typically described by the dominant and subdominant particle sizes. For example, a silty sand describes a soil that is mostly sand with some silt; whereas a sandy silt describes a soil that is mostly silt with some sand. Soils that are a mixture of sand, silt and clay are called loams. Soils with larger particles (i.e., predominance of sand) are typically free draining, whereas soils with smaller particles (i.e., predominance of clay) are typically poorly drained.

Expansive soils are composed largely of clays, which greatly increase in volume when saturated with water and shrink when dried (referred to as “shrink-swell” potential). Soils with a moderate to high expansion potential can result in cracked foundations, structural distortions, warping of doors and windows, or damage to underground pipelines.

A review of the Natural Resources Conservation Service (NRCS 2020) soil survey data indicates that near-surface soils on the property consist of the Urban Land-Clear Lake Complex, 0 to 2 percent slopes. The Clear Lake portion of this soil complex is poorly drained and is composed of silty clay. Because Urban Land (composed of disturbed and human-transported material) makes up 65 percent of the soil in this complex, details related to NRCS soil properties are not available.

Soil borings conducted for the Project as part of the *Soil Gas Investigation Report* (Partner Engineering and Science, Inc. [Partner] 2020b) encountered predominantly silt and silty clay with various sized gravel to a depth of approximately 5 feet bgs.

Soil borings and cone penetration tests conducted for the geotechnical report (Rockridge Geotechnical 2021a) encountered unconsolidated artificial fill in two locations in the northern portion of the project site next to Park Boulevard. The fill material, which extended to depths of 3–4 feet bgs, was composed of sandy clay. Results of the other three soil borings and cone penetration tests from the middle and the southern end of the project site indicate that near-surface soils are composed of 3–4 feet of clay. The sandy clay and clay materials are underlain by alluvium to the maximum depth explored (i.e., 45 feet). The alluvium consists of medium dense to very dense gravel and sand with varying clay content, along with interbedded layers of stiff to hard clay with varying sand and gravel content. The results of laboratory analyses indicate the near-surface sandy clay and clay are highly expansive.

Paleontological Resources

The project site has been variously mapped as Holocene-age Floodplain Deposits (Brabb et al. 2000) and Holocene-age Alluvium (Graymer et al. 2006). As discussed above, soil borings and cone penetration tests conducted for the geotechnical report (Rockridge Geotechnical 2021a) determined that the project site is underlain by alluvium to the maximum depth explored (i.e., 45 feet bgs). Approximately 3–4 feet of artificial fill is present above the alluvium throughout the project site. Although the precise age of the alluvium that underlies the project site is not known, Pleistocene-age (i.e., approximately 11,700 to 2.6 million years Before Present) alluvium is mapped approximately 1,000 feet west of the project site, and therefore is likely also present underneath the project site, underlying the Holocene-age alluvium at an unknown depth.

Paleontological Sensitivity Assessment

The potential paleontological sensitivity of a project area can be assessed by identifying the paleontological importance of rock units that are exposed there. A paleontologically sensitive rock formation is one that is rated high for potential paleontological productivity (i.e., the recorded abundance and types of fossil specimens, and the number of previously recorded fossil sites) and is known to have produced unique, scientifically important fossils. Exposures of a specific rock formation at any given project site are most likely to yield fossil remains representing particular species or quantities similar to those previously recorded from the rock formation in other locations. Therefore, the paleontological sensitivity determination of a rock formation is based primarily on the types and numbers of fossils that have been previously recorded from that rock unit.

An individual vertebrate fossil specimen may be considered unique or significant if it is identifiable and well preserved, and it meets one of the following criteria:

- a type specimen (i.e., the individual from which a species or subspecies has been described);
- a member of a rare species;
- a species that is part of a diverse assemblage (i.e., a site where more than one fossil has been discovered) wherein other species are also identifiable, and important information regarding life history of individuals can be drawn;
- a skeletal element different from, or a specimen more complete than, those now available for its species; or
- a complete specimen (i.e., all or substantially all of the entire skeleton is present).

The value or importance of different fossil groups varies depending on the age and depositional environment of the rock unit that contains the fossils, their rarity, the extent to which they have already been identified and documented, and the ability to recover similar materials under more controlled conditions (such as for a research project). Marine invertebrates are generally common; the fossil record is well developed and well documented, and they would generally not be considered a unique paleontological resource. Identifiable vertebrate marine and terrestrial fossils are generally considered scientifically important because they are relatively rare. In keeping with the Society of Vertebrate Paleontology (2010) guidelines, all vertebrate fossils are generally categorized as being of potentially significant scientific value.

In its standard guidelines for assessment and mitigation of adverse impacts on paleontological resources, the Society of Vertebrate Paleontology (2010) established four categories of sensitivity for paleontological resources: high, low, no, and undetermined. Areas where fossils have been previously found are considered to have a high sensitivity and a high potential to produce fossils. Areas that are not sedimentary in origin and that have not been known to produce fossils in the past typically are considered to have low sensitivity. Areas consisting of high-grade metamorphic rocks (e.g., gneisses and schists) and plutonic igneous rocks (e.g., granites and diorites) are considered to have no sensitivity. Areas that have not had any previous paleontological resource surveys or fossil finds are considered to be of undetermined sensitivity until surveys are performed. After reconnaissance surveys, a qualified paleontologist can determine whether the area of undetermined sensitivity should be categorized as having high, low, or no sensitivity.

Table 3.7-2 presents the results of the paleontological sensitivity assessment conducted for the project site, based on a review of geologic maps, a literature review, and a paleontological resources records search performed at the University of California, Berkeley Museum of Paleontology (UCMP) on May 27, 2021. The UCMP database indicates there are no previously recorded fossil localities within the project site (UCMP 2021).

Table 3.7-2 Paleontological Sensitivity Assessment

Formation Name and Age	Composition	Likelihood of Fossils	Sensitivity
Artificial Fill (Historic)	Loose to very well consolidated gravel, sand, silt, clay, rock fragments, organic matter, and man-made debris in various combinations	During the excavation process when the fill material was obtained, and during the process of grading and compacting the fill at the imported location, any paleontological resources that may have originally been present would have been destroyed. Furthermore, Holocene deposits contain only the remains of extant, modern taxa (if any resources are present), which are not considered "unique" paleontological resources.	Low
Holocene Alluvium (Present Day to 11,700 years B.P.)	Brown, medium dense to very dense gravel and sand with varying clay content, with interbedded layers of stiff to hard clay with varying sand and gravel content	Holocene deposits contain only the remains of extant, modern taxa (if any resources are present), which are not considered "unique" paleontological resources.	Low
Pleistocene Alluvium (11,700 – 2.6 million years B.P.)	Brown, dense, gravelly and clayey sand or clayey gravel that fines upward to sandy clay	Vertebrate fossil specimens from sediments referable to these deposits have been reported at a variety of locations in Santa Clara County and the greater Bay Area. Fossil specimens include mammoth, Platygonus, ground sloth, bison, and horse (among others).	High

Sources: Brabb et al. 2000; Jefferson 1991; Maguire and Holroyd 2016; UCMP 2021

Acronyms: B.P. = Before Present(

3.7.2 Regulatory Framework

Federal

Earthquake Hazards Reduction Act

In October 1977, the U.S. Congress passed the Earthquake Hazards Reduction Act to reduce the risks to life and property from future earthquakes in the U.S. through the establishment and maintenance of an effective earthquake hazards reduction program. To accomplish this goal, the act established the National Earthquake Hazards Reduction Program (NEHRP). This program was substantially amended in November 1990 by the National Earthquake Hazards Reduction Program Act (NEHRPA), which refined the description of agency responsibilities, program goals, and objectives.

The mission of NEHRP includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improved building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improved mitigation capacity; and accelerated application of research results. The NEHRPA designates the Federal Emergency Management Agency (FEMA) as the lead agency of the program and assigns several planning, coordinating, and reporting responsibilities. Other NEHRPA agencies include the National Institute of Standards and Technology, National Science Foundation, and U.S. Geological Survey.

State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Act (PRC Sections 2621–2630) was passed in 1972 to reduce the hazard of surface faulting to structures designed for human occupancy. The main purpose of the law is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The law addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Alquist-Priolo Act requires the State Geologist to establish regulatory zones known as Earthquake Fault Zones around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning efforts. Before a project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, cities and counties must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (PRC Sections 2690–2699.6) addresses earthquake hazards from non-surface fault rupture, including liquefaction and seismically induced landslides. The act established a mapping program for areas that have the potential for liquefaction, landslide, strong ground shaking, or other earthquake and geologic hazards. The act also specifies that the lead agency for a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

California Building Standards Code

The California Building Standards Commission coordinates, manages, adopts, and approves building codes in California. The CBC (Title 24 of the California Code of Regulations) provides minimum standards for building design in California. The CBC applies to building design and construction in the state and is based on the federal Uniform Building Code (UBC) used widely throughout the country (generally adopted on a state-by-state or district-by-district basis). The

CBC has been modified for California conditions with numerous more detailed or more stringent regulations. Where no other building codes apply, Chapter 29 of the CBC regulates excavation, foundations, and retaining walls.

The State earthquake protection law (California Health and Safety Code, Section 19100 et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. The CBC requires that any structure designed for a project site undergo a seismic-design evaluation that assigns the structure to one of six categories, A–F; Category F structures require the most earthquake-resistant design. The CBC philosophy focuses on “collapse prevention,” meaning that structures are to be designed to prevent collapse during the maximum level of ground shaking that could reasonably be expected to occur at a site. CBC Chapter 16 specifies exactly how each seismic-design category is to be determined on a site-specific basis, based on site-specific soil characteristics and proximity to potential seismic hazards.

Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, as well as the preparation of a preliminary soil report, engineering geologic report, geotechnical report, and supplemental ground-response report. Chapter 18 also regulates the analysis of expansive soils and the determination of depth to the groundwater table. For structures in Seismic Design Category C, Chapter 18 requires analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading. For structures in Seismic Design Categories D, E, and F, Chapter 18 requires these same analyses plus an evaluation of lateral pressures on basement and retaining walls, liquefaction and loss of soil strength, and lateral movement or reduction of the foundation’s soil-bearing capacity.

Chapter 18 also requires that mitigation measures be considered in structural design. Mitigation measures may include stabilizing the ground, selecting appropriate foundation types and depths, selecting appropriate structural systems to accommodate anticipated displacements, or using any combination of these measures. The potential for liquefaction and soil strength loss must be evaluated for site-specific peak-ground-acceleration magnitudes and source characteristics consistent with the design earthquake ground motions. The peak ground acceleration must be determined in a site-specific study, the contents of which are specified in CBC Chapter 18.

Finally, Appendix J of the CBC regulates grading activities, including drainage and erosion control and construction on expansive soils, areas subject to liquefaction, and other unstable soils.

National Pollutant Discharge Elimination System

In California, the State Water Resources Control Board (SWRCB) administers regulations promulgated by the USEPA (55 Code of Federal Regulations 47990) requiring the permitting of stormwater-generated pollution under the NPDES permit program established pursuant to the federal Clean Water Act. In turn, the SWRCB’s jurisdiction is administered through nine regional water quality control boards. Under these federal regulations, an operator must obtain a general permit through the NPDES Stormwater Program for all construction activities with ground disturbance of 1 acre or more. The SWRCB’s statewide Construction General Permit requires preparation of a storm water pollution prevention plan (SWPPP) that addresses control of water pollution, including sediment, in runoff during construction. BMPs must be identified in the SWPPP and implemented during construction to reduce sedimentation into surface waters and to control erosion. The Construction General Permit also includes post-construction stormwater performance standards that address water quality and hydromodification protection. (See Section 3.10, "Hydrology and Water Quality," for more information about the NPDES permit program and SWPPPs.)

California Public Resources Code (PRC Section 5097.5)

This law protects artifacts at paleontological sites, including fossilized footprints, that are situated on public lands, except with the permission of the public agency with jurisdiction over the lands. "Public lands" is defined as lands owned by the state, any city, county, district, authority, or public corporation. Disturbing paleontological resources on public lands is a misdemeanor.

Local

County of Santa Clara Ordinance Code

The Santa Clara County Grading and Drainage Ordinance (County Ordinance Code, Title C, Division C12, Chapter 3) regulates grading and drainage in the County. In general, a grading permit is required when grading affects a watercourse, involves cuts or fills greater than 5 feet in vertical depth, or when the total volume of cut or fill material is 150 cubic yards or more (Chapter 3, Section C12-406). A grading permit is not required for work that is performed by, or under the supervision of, a governmental agency, including the County (Chapter 3, Section C12-407[a]), or for grading associated with a valid building permit (Chapter 3, Section C12-407[b]).

The Santa Clara County Geologic Ordinance (County Ordinance Code, Title C, Division C12, Chapter 4) establishes minimum requirements for the geologic evaluation of land based on proposed land uses and to enable the County to fulfil its duties under state law regarding geologic hazards, including the Alquist-Priolo Earthquake Fault Zoning Act and the Seismic Hazards Mapping Act. The Ordinance requires the County Planning Office and/or the County Geologist to review land development applications, building permit applications and land use proposals to determine if a geologic investigation is required. If required, the geological investigation report shall be reviewed and approved by the County Geologist prior to issuance of the building or grading permit.

City of Palo Alto Grading Permit

The City of Palo Alto Municipal Code, Title 16, Chapter 16.28 regulates grading and erosion and sediment control in the City. As discussed further below in Section 3.11, "Land Use and Planning," the County is sponsoring the Project and the Project would primarily serve a public purpose. Therefore, under state law, the Project is exempt from the City's grading permit requirement.

3.7.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to geology and soils:

- **Impact GEO-1:** Would the Project cause potential substantial adverse effects involving rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides?
- **Impact GEO-2:** Would the Project result in substantial soil erosion or loss of topsoil?
- **Impact GEO-3:** Would the Project be located on unstable soils?
- **Impact GEO-4:** Would the Project be located on expansive soils?

- **Impact GEO-5:** Would the Project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems?
- **Impact GEO-6:** Would the Project destroy a unique paleontological resource or site or unique geological feature?

Impact GEO-1: Seismic Hazards

Impact GEO-1 would be **less than significant**. No mitigation is required.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, the Project may have a significant impact if it would directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

- 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.
- strong seismic ground shaking.
- seismic-related ground failure, including liquefaction.
- landslides.

Impact Analysis

The project site is not located within an Alquist-Priolo Earthquake Fault Zone or within or immediately adjacent to the trace of any other known fault (CGS 2006; Jennings and Bryant 2010). Thus, the Project would not directly or indirectly cause or exacerbate potential adverse effects associated with fault rupture.

The project site is located in a flat area with nearly level topography, and there are no off-site areas with steep slopes adjacent to the project site that could result in on-site landslide hazards. Thus, the Project would not directly or indirectly cause or exacerbate potential adverse effects associated with landslides.

The project site is in a seismically active area, approximately 4.6 miles from the Monte Vista-Shannon Fault and approximately 9.2 miles from the San Andreas Fault (see Table 3.7-1). In addition, the Stanford Fault is approximately 2,200 feet west of the project site. Rockridge Geotechnical (2021a) estimates a peak ground acceleration of 0.79*g* for the project site, which indicates that a very strong level of seismic ground shaking would be anticipated at some point during the next 50 years. Based on the results of a site-specific liquefaction analysis, there are several thin layers between depths of approximately 15 and 45 feet bgs that are potentially liquefiable. Calculated post-liquefaction settlement would be less than 0.75 inch and differential settlement would be less than 0.5 inch over a horizontal distance of 30 feet (Rockridge Geotechnical 2021a).

The Project is required by law to comply with seismic safety standards of the CBC. The CBC requires an evaluation of seismic design that is focused on "collapse prevention," meaning that structures are designed for prevention of collapse for the maximum level of ground shaking that could reasonably be expected to occur at a site. Based on the seismic design category, the CBC requires an analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading, plus an evaluation of lateral pressures on basement and retaining walls, liquefaction and soil strength loss, and lateral movement or reduction in foundation soil-bearing capacity. It also requires that measures to reduce damage from seismic effects be incorporated in structural design. Measures may include ground stabilization, selection of appropriate foundation type and depths, selection of appropriate structural systems to accommodate anticipated displacements, or any combination of these measures.

While complete avoidance of any damage may not be feasible, incorporation of industry-standard seismic design measures in accordance with current building codes would reduce potential impacts from seismic-related ground failure to less-than-significant levels. The site-specific report prepared by Rockridge Geotechnical (2021a) includes the CBC-required analyses along with recommended measures to reduce potential damage from strong seismic ground shaking and liquefaction. Thus, with implementation of the recommended design measures from the geotechnical report, or alternative measures that are determined by a licensed geotechnical engineer to meet the requirements of the CBC, the Project would not directly or indirectly cause or exacerbate potential substantial adverse effects associated with seismic hazards such as strong seismic ground shaking and liquefaction. The impact would be **less than significant**.

Impact GEO-2: Soil Erosion

Impact GEO-2 would be **less than significant**. No mitigation is required.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would result in substantial soil erosion or loss of topsoil.

Impact Analysis

Construction of the Project would require a variety of earthmoving activities, including excavating, trenching, grading, and compacting. Disturbance of existing soil would expose soils to rain events, which could result in erosion. Subsequent soil transport during storm events could result in sedimentation both within and downstream of the project site. Furthermore, earthmoving activities during the summer months could result in wind erosion. Because the Project would disturb more than 1 acre of land, the Developer is required by law to prepare a SWPPP and implement associated BMPs that are specifically designed to reduce construction-related erosion. A Notice of Intent (NOI), along with the SWPPP and BMPs, would be submitted to the San Francisco Bay Regional Water Quality Control Board, in compliance with the statewide Construction General Permit. BMPs that could be implemented to reduce erosion may include silt fences, staked straw bales/wattles, silt fences, geofabric, trench plugs, terraces, water bars, soil stabilizers, mulching, and revegetation of disturbed areas. Construction techniques that could be implemented to reduce the potential for stormwater runoff include minimizing site disturbance, controlling water flow over the construction site, stabilizing bare soil, and ensuring proper site cleanup.

Because the Developer would prepare and implement a SWPPP and implement BMPs designed to control construction-related stormwater runoff and reduce erosion, the impact from construction of the Project on soil erosion or loss of topsoil would be **less than significant.**

Impact GEO-3: Unstable Soils or Geological Units

Impact GEO-3 would be **potentially significant**. With implementation of Mitigation Measure MM-GEO-3 the impact would be reduced to a **less-than-significant** level.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would 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.

Impact Analysis

The fill material at the project site is poorly compacted. If shallow foundations are supported on the fill in its existing condition, the footings could experience differential settlements that would exceed the typical tolerances for conventional spread footings. The preliminary geotechnical report for the project site (Rockridge Geotechnical 2021a) recommended that the footings and/or mat foundation should be deepened to bear on firm native alluvium or that the fill should be over-excavated to competent soil and recompacted.

Rockridge Geotechnical (2021a) also stated that temporary shoring would be required to laterally restrain the sides of the excavation for the proposed building where there is insufficient space to slope-cut the excavations. During excavation, the shoring system is expected to yield and deform laterally, which could cause the ground surface adjacent to the shoring wall to settle. The magnitudes of shoring movements and the resulting settlements are difficult to estimate because they depend on many factors, including the method of installation and the contractor’s skill in the shoring installation. Rockridge Geotechnical (2021a) indicated that the shoring system should be designed by an experienced structural engineer.

Furthermore, the proposed building is bordered to the east by two existing buildings; the building at 200 Sheridan Avenue has two levels of below-grade parking and the building at 260 Sheridan Avenue is at-grade. Rockridge Geotechnical (2021a) preliminarily investigated the depth and horizontal extension of the basement levels, and made the following assumptions: the building at 200 Sheridan Avenue is supported on a shallow foundation system, the estimated top-of-basement slab is approximately 20 feet below the existing grades, and the garage extends approximately 180 feet from the entrance on Park Boulevard). However, it could not be determined if the existing basement wall extends to the property line with the project site or is set back. The report recommended that the lateral extent and depth of the neighboring western wall of the below-grade garage should be determined prior to construction. Where the Project building foundations are located within the zone-of-influence (ZOI) of neighboring basement walls (defined as the zone above an imaginary line projected up at an inclination of 1.5:1 horizontal to vertical from the basement finished floor of the adjacent building), measures may be required to avoid surcharging[14] the neighboring basement walls. Rockridge Geotechnical (2021a, 2021b) included two options for foundation design of the proposed building that are currently under consideration: (1) deepening the conventional footings to gain support on the stiff to hard native soil below the fill, or (2) supporting a portion of the building on deep ground improvement elements.

[14] Surcharging is a load or vertical pressure that is exerted on the ground surface. If a surcharge load is close enough to an existing excavation, it causes a lateral pressure to be exerted in addition to the soil pressure. Too much load exerted by surcharging can destabilize existing foundation walls.

- Option 1 consists of deepening the proposed building foundation to bottom-out below the ZOI line and placing lean concrete in the over-excavation, thereby transferring the proposed building load to a level that is below the ZOI line. Based on current plans, the proposed building set-back from the neighboring buildings, and the assumption that the neighboring basements extend a maximum of two levels below grade with a 3-foot-deep footing (a total of 23 feet below grade), the maximum depth for this excavation would be approximately 17 feet bgs.
- Option 2 consists of supporting the eastern portion of the building that is within the neighboring basement wall ZOI on ground improvement elements gaining support below the ZOI. The most appropriate ground improvement type would likely consist of drilled displacement sand-cement columns, which would consist of unreinforced concrete or sand-cement slurry columns installed with a large drill rig. The displacement sand-cement columns system results in low vibration and noise during installation and generates few drilling spoils that require off-site hauling. Based on current plans and the same assumptions described above in Option 1, the maximum depth for the drilled displacement columns would be approximately 27 feet bgs (10 feet below the ZOI) and spaced about 8 feet on center.

The vertical and lateral extent of the neighboring basements require confirmation under both options. Rockridge Geotechnical (2021a) also recommended that a monitoring program should be established and implemented to evaluate the effects of the construction on the adjacent properties to ensure that destabilization of adjacent building foundations does not occur

Because the proposed building foundations would be constructed in unstable fill material and could result in differential settlement, lateral deformation of excavated slopes, and/or the destabilization of the adjacent building from surcharging (which requires further investigation, engineering, and design), this impact is considered **potentially significant.** Mitigation Measure MM-GEO-3, detailed below, is recommended to address this potentially significant impact.

The following mitigation measures are recommended to reduce impacts from construction in unstable soils and potential destabilization of neighboring building foundations:

MM-GEO-3: Prepare a Subsequent Geotechnical Report and Implement a Monitoring Program During Construction

Prior to the issuance of building permits, the Developer shall retain a licensed geotechnical engineer to prepare a subsequent geotechnical report for the project site to supplement and refine the recommendations in Section 7 of the Geotechnical Investigation prepared by Rockridge Geotechnical (March 25, 2021). The subsequent report shall include underground investigative testing to determine the full horizontal and lateral extent, along with the exact location in relationship to property lines and setbacks, and the foundation type(s), of the neighboring basement walls to the east. The subsequent geotechnical report shall make final recommendations for foundation design of the proposed building once foundation loads and the vertical and lateral extent of the existing neighboring buildings are known. The recommendations of the subsequent geotechnical report shall be incorporated into final project design and implemented during construction.

Underpinning of the neighboring building to the southeast may be needed if excavations would occur adjacent to and extend below the elevation of the bottom of the foundation *for the adjacent structure. To determine the need for underpinning and, if underpinning is needed, to provide information for design of the underpinning system, the subsequent geotechnical report shall determine the configuration and depth of existing foundations that bottom above an imaginary line extending up at an inclination of 1.5:1 (horizontal to vertical) from the proposed excavation. If as-built plans cannot be obtained, test pits shall be excavated prior to construction to determine the foundation type and depth to complete the design for an appropriate underpinning system of the neighboring building to the southeast. As determined by a geotechnical engineer, the underpinning system may consist of end-bearing piers that are designed to gain support by transferring building loads onto firm alluvium.*

A monitoring program shall be implemented during construction to ensure that neighboring basement walls are not destabilized during Project construction. The conditions of existing buildings within 20 horizontal feet from the sides of excavations on the project site shall be photographed and surveyed prior to the start of construction and monitored periodically during construction. In addition, prior to the start of excavation, the contractor shall establish survey points on the shoring system, on the ground surface at critical locations behind the shoring, and on adjacent buildings. These survey points shall be used to monitor the vertical and horizontal movements of the shoring and the ground behind the shoring throughout construction. If the monitoring program detects movement greater than 0.5 inch, construction shall be immediately halted and a geotechnical and structural engineer shall be consulted regarding potential remedies, which may include more aggressive underpinning of the adjacent building. Construction shall not resume until an appropriate remedy sufficient to fully stabilize the adjacent foundation has been presented to and approved by the County and the City of Palo Alto Building Department.

Preparing a subsequent geotechnical report as required by Mitigation Measure MM-GEO-3 would result in a thorough evaluation of the adjacent building foundations and would include final recommendations for proposed foundation design, and for potential supplemental underpinning of adjacent building foundations, to prevent destabilization of neighboring building foundations during project construction. These final recommendations would provide more detailed design information for the two foundation design options identified in the previous geotechnical report (i.e., deeper foundation system or drilled displacement sand-cement columns). In addition, implementation of a construction monitoring program as required by Mitigation Measure MM-GEO-3 would ensure that if ground movement above acceptable engineering standards (i.e., greater than 0.5 inch) is detected, construction would be immediately halted and appropriate remedies determined by a geotechnical and structural engineer, and approved by the County (and the City Building Department if any stabilization work would occur on the neighboring properties), would be implemented. Therefore, implementation of Mitigation Measure MM-GEO-3 would reduce the potentially significant impacts from construction in unstable soils and potential destabilization of neighboring building foundations to **less-than-significant with mitigation.**

Impact GEO-4: Expansive Soils

Impact GEO-4 would be **less-than-significant.** No mitigation is required.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial risks to life or property.

Impact Analysis

Expansive soils are composed largely of clays, which greatly increase in volume when saturated with water and shrink when dried (referred to as "shrink-swell" potential). Soils with a moderate to high expansion potential can result in cracked foundations, structural distortions, and warping of doors and windows. Underground pipelines can also be damaged. As explained previously, the near-surface soils throughout the project site are composed of highly expansive clay.

The adverse effects of expansive soil can be reduced by moisture-conditioning the expansive soil, providing non-expansive soil below slabs, and either supporting foundations below the zone of severe moisture change or by providing a stiff, shallow foundation that can limit deformation of the superstructure as the underlying soil shrinks and swells. Rockridge Geotechnical (2021a) recommends that building slab-on-grade floors should be underlain by at least 18 inches of non-expansive soil, and the non-expansive soil should extend at least 5 feet beyond the perimeter of the proposed building except where constrained by the property line. In addition, exterior concrete flatwork should be underlain by at least 12 inches of non-expansive soil, and this non-expansive soil should extend at least 6 inches beyond the perimeter of the flatwork except where constrained by the property line. The nonexpansive soil may consist of imported appropriate fill material or lime-treated on-site soil. If permeable pavements, tree wells, irrigated landscaped zones, or stormwater infiltration basins would be constructed close to the proposed building, they should incorporate design elements that prevent saturation of the soil adjacent to and below building foundations. Water should not be allowed to collect alongside or beneath the building foundations, pavements, and flatwork. This can be achieved by (1) providing subdrain systems and impermeable liners beneath permeable surfaces, and (2) installing vertical barriers between permeable surfaces underlain by subdrains and non-permeable surfaces underlain by conventional aggregate base.

Finally, Rockridge Geotechnical (2021a) stated that even with the recommended 18 inches of non-expansive soil (including aggregate base layer), exterior slabs may experience some cracking due to shrinking and swelling of the underlying expansive soil. Thickening the slab edges and adding additional reinforcement should be implemented to help control this cracking. Where slabs are adjacent to landscaped areas, thickening the concrete edge will help control water infiltration beneath the slabs. In addition, where slabs provide access to the building, the building entries should be doweled to permit rotation of the slab as the exterior ground shrinks and swells and to prevent a vertical offset at the entries (Rockridge Geotechnical 2021a).

Because the geotechnical report contains appropriate recommendations to reduce potential damage from construction in expansive soil consistent with the CBC and City and County building standards, this impact would be **less than significant**.

Impact GEO-5: Soil Suitability for Septic Systems

Impact GEO-5 would be **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would 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.

Impact Analysis

The Project would not include the use of septic systems or other alternative means of wastewater disposal. Temporary, self-contained sanitary facilities (i.e., portable toilets) would be provided for construction worker use, waste from which would be disposed of off-site by the vendor in accordance with their standard operating procedures and in compliance with all applicable regulations. As discussed further in Section 3.18, “Utilities and Service Systems,” wastewater generated from operation of the proposed apartment building would be discharged to the sanitary system provided by the City of Palo Alto Public Works Department and would be treated at the Regional Water Quality Control Plant. Therefore, the Project would not include any septic systems or alternative wastewater disposal and would have **no impact** related to soil suitability for such systems.

Impact GEO-6: Geological or Paleontological Resources

Impact GEO-6 would be **potentially significant**. With implementation of Mitigation Measure MM-GEO-6 the impact would be reduced to a **less-than-significant** level.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. A “unique paleontological resource or site” is one that is considered significant under the professional paleontological standards described in Section 3.7.1, Environmental Setting, above.

Impact Analysis

Unique geologic features consist of outstanding natural landforms such as mountain peaks, deep scenic canyons and gorges, scenic rock formations, and large waterfalls. There are no unique geologic features within or adjacent to the project site; therefore, no such features would be destroyed by the Project.

The project site consists of Holocene-age artificial fill in the top 3–4 feet bgs, which is underlain by Holocene alluvium. At an unknown depth below the project site, the alluvial material likely transitions from Holocene to Pleistocene age. To be considered a unique paleontological resource, a fossil must be more than 11,700 years old. Holocene deposits contain only the remains of extant, modern taxa (if any resources are present), which are not considered “unique” paleontological resources. Furthermore, artificial fill consists of material that was excavated from other locations, placed at the project site, and then graded and compacted; thus, any unique paleontological resources that may have been present in the original fill source material would have been destroyed during the construction process. Therefore, shallow deposits at the site (artificial fill and Holocene alluvium) are not anticipated to include any unique paleontological resources.

Because of the number of vertebrate fossils recovered from Pleistocene-age alluvium in Santa Clara County and the greater Bay Area, this older formation is considered to be a paleontologically sensitive rock formation (Table 3.7-2). Because the Project requires excavation to depths ranging from 17–27 feet bgs for building footings, and the depth at which Pleistocene-age alluvium is present is unknown, it is conservatively assumed that deep excavation for the building foundations may encounter the paleontologically sensitive Pleistocene alluvium. Therefore, the Project could result in accidental damage to or destruction of unique paleontological resources, and this impact is considered **potentially significant**.

Mitigation Measure MM-GEO-6, detailed below, is recommended to address this potentially significant impact.

The following mitigation measure is recommended to reduce impacts to unique paleontological resources:

MM-GEO-6: Paleontological Awareness Training and Monitoring

To minimize the potential for destruction of or damage to potentially unique, scientifically important paleontological resources during earthmoving activities in the eastern portion of the project site where deep excavation is proposed, the Developer shall implement the measures described below.

- *Prior to the start of earthmoving activities associated with deep excavation for building foundations, all construction personnel involved with excavation activities shall be informed regarding the possibility of encountering fossils, the appearance and types of fossils likely to be seen during construction, and proper notification procedures should fossils be encountered. This worker training shall be prepared by an experienced field paleontologist.*
- *An experienced field paleontologist shall provide full-time construction monitoring during deep excavation activities for the building foundations (i.e., where excavation would occur 17 to 27 feet below the ground surface), and particularly during drilling activities for the drilled displacement columns.*
- *If paleontological resources are discovered during earthmoving activities, all work within 50 feet of the find shall immediately cease and the construction contractor shall notify the County Building Department. The on-site paleontological monitor shall evaluate the resource and prepare a recovery plan based on Society of Vertebrate Paleontology Guidelines (SVP 2010). The recovery plan may include, but is not limited to, a field survey, additional construction monitoring, sampling and data recovery procedures, museum curation for any specimen recovered, and a report of findings. Recommendations in the recovery plan that are determined by the County, as the CEQA lead agency, to be necessary and feasible shall be implemented before construction activities can resume at the location where the paleontological resources were discovered.*

Implementation of Mitigation Measure MM-GEO-6 would reduce the potentially significant impacts on unique paleontological resources because construction workers would be alerted to the possibility of encountering paleontological resources, a qualified paleontologist would monitor deep excavation activities and, in the event that resources were discovered, construction would be halted, fossil specimens would be recovered and recorded and would undergo appropriate curation. With implementation of MM-GEO-6, the impact to paleontological resources would be reduced to **less than significant with mitigation.**

3.7.4 Cumulative Impacts and Mitigation

As discussed in Section 3.7.3 above, the Project would have no impact related to soil suitability for septic systems (Impact GEO-5). Therefore, the Project would not contribute to any potential cumulative impacts for this issue. This section analyzes the potential of the Project to contribute to the following cumulative geology and soils impacts:

- **Impact C-GEO-1:** Contribution to cumulative effects related to strong seismic ground shaking and liquefaction.
- **Impact C-GEO-2:** Contribution to cumulative effects related to substantial soil erosion,
- **Impact C-GEO-3:** Contribution to cumulative effects related to unstable soil.
- **Impact C-GEO-4:** Contribution to cumulative effects related to expansive soils.
- **Impact C-GEO-6:** Contribution to cumulative effects from damage to or destruction of unique paleontological resources.

Cumulative Impact C-GEO-1: Seismic Hazards

The overall cumulative impact for C-GEO-1 would be **less than significant.** No mitigation is required.

Cumulative Context

The geographic context for seismic hazards encompasses the western San Francisco Bay area. The geologic formations and soil types vary widely depending on project location and are site specific. As discussed in Section 3.7.3, the Project would have no impact related to surface fault rupture or landslides and therefore could not contribute to potential cumulative impacts for these issues. Therefore, the context for cumulative impacts for seismic hazards focuses on strong seismic ground shaking and liquefaction.

Cumulative Impact Analysis

All of the cumulative projects are required by law to implement the design and engineering requirements of the CBC, which include an analysis of slope instability, liquefaction, and surface rupture attributable to faulting or lateral spreading, liquefaction and soil strength loss, and lateral movement or reduction in foundation soil-bearing capacity. The CBC also requires that measures to reduce damage from seismic effects be incorporated in structural design. The cumulative projects are also required to comply with either the County or City Building Department regulations, both of which must be at least as stringent as the CBC. Therefore, the overall cumulative impacts related to strong seismic ground shaking and liquefaction would be **less than significant**.

Cumulative Impact C-GEO-2: Soil Erosion

The overall cumulative impact for C-GEO-2 would be **less than significant.**
No mitigation is required.

Cumulative Context

The geographic context for cumulative soil erosion impacts would be limited to those cumulative projects within the Lower Peninsula Watershed that could expose soil to the erosive forces of wind and water, that ultimately could be transported via the storm drainage system or overland sheet flow to Matadero Creek and the San Francisco Bay.

Cumulative Impact Analysis

The Project and all of the cumulative projects that disturb 1 acre or more are required by law to prepare a SWPPP and implement site-specific BMPs that are specifically designed to prevent construction-related erosion. Cumulative projects would also be required to obtain a County or City (as applicable) grading permit, which requires submittal of an erosion control plan for County or City review and approval. Permit conditions would be imposed to reduce potential erosion impacts. Therefore, the overall cumulative impact related to substantial construction-related soil erosion would be **less than significant**.

Cumulative Impact C-GEO-3: Unstable Soils

The overall cumulative impact for C-GEO-2 would be **less than significant.**
No mitigation is required.

Cumulative Context

Soil types vary widely depending on project location and are site specific. The geographic context for unstable soils would be limited to those cumulative projects in the immediate vicinity of the project site, with the potential to combine with Project impacts.

Cumulative Impact Analysis

None of the identified cumulative projects (refer Table 3.1-1) are in the immediate vicinity of the project site, and therefore would not have the potential to result in additional destabilization of the adjacent building foundations. Furthermore, all projects would also be subject to the design and engineering requirements of the CBC, as well as local County and City Building Department regulations. These requirements include an evaluation of soil stability and lateral pressures on basement and retaining walls to ensure appropriate design to address specific site conditions are incorporated into new projects. Therefore, the overall cumulative impact related to unstable soils would be **less than significant**.

Cumulative Impact C-GEO-4: Expansive Soils

The overall cumulative impact for C-GEO-4 would be **less than significant.**
No mitigation is required.

Cumulative Context

The soil types and characteristics vary widely depending on project location and are site specific. Soil types vary widely depending on project location and are site specific. The geographic context for expansive soils would be limited to those cumulative projects in the immediate vicinity of the project site, with the potential to combine with Project impacts.

Cumulative Impact Analysis

None of the identified cumulative projects (refer Table 3.1-1) are in the immediate vicinity of the project site, and therefore would not have the potential to combine with Project impacts to result in additional damage from expansive soils. Furthermore, all projects are required by law to implement the design and engineering requirements of the CBC, which include an analysis of expansive soils for foundations and grading work. The CBC also requires that measures to reduce damage from expansive soils be incorporated in structural design. The cumulative projects are also required to comply with local County and City Building Department regulations, as applicable, which incorporate the CBC requirements. Therefore, the overall cumulative impact related to expansive soils would be **less than significant**.

Cumulative Impact C-GEO-6: Geological Resources

The overall cumulative impact for C-GEO-6 would be **less than significant.**
No mitigation is required.

Cumulative Context

As discussed in Section 3.7.3, the Project would have no impact on unique geologic features and, therefore, could not contribute to cumulative impacts to such resources. The cumulative analysis for impacts to geological resources therefore focuses on paleontological resources. The geographic context for paleontological resources encompasses the San Francisco Bay area. Unique, scientifically-important fossil discoveries are relatively rare, and the likelihood of encountering them is site-specific and is based on the specific geologic rock formations that are present at any given project site. These geologic formations vary from location to location.

Cumulative Impact Analysis

Fossil discoveries resulting from excavation and earthmoving activities associated with development are occurring with increasing frequency throughout the state. The value or importance of different fossil groups varies depending on the age and depositional environment of the rock unit that contains the fossils, their rarity, the extent to which they have already been identified and documented, and the ability to recover similar materials under more controlled conditions (such as for a research project).

The Bay Area region includes Pleistocene-age rock formations such as Alluvial deposits. Due to the large number of vertebrate fossils and plant fossil assemblages that have been recovered from this rock formation, it is considered paleontologically sensitive. Therefore, earthmoving activities associated with the projects considered in this cumulative analysis could damage or destroy unique paleontological resources that may be present in Pleistocene-age Alluvial deposits, and potentially within other paleontologically sensitive rock formations as well. Therefore, the cumulative projects could result in a **significant cumulative impact**.

The Project would require earthmoving activities associated with deep excavation (i.e., 17–27 feet bgs) for building foundations in the eastern portion of the project site. Because the depth at which the on-site Holocene-age alluvium transitions to Pleistocene-age alluvium is unknown, it is conservatively assumed that Project-related excavation could encounter this paleontologically sensitive rock formation. However, the Developer would implement Mitigation Measure MM-GEO-5, which would ensure that the Project would not damage or destroy unique paleontological resources. Therefore, the Project would not result in a cumulatively considerable contribution to a significant cumulative impact; the Project's impact on unique paleontological resources would be cumulatively **less than significant**.

3.8 Greenhouse Gas Emissions

This section describes the existing science related to greenhouse gases (GHGs), describes the existing setting of the project area, and evaluates the potential impacts of the Project related to GHG emissions. Because no single project is large enough individually to result in a measurable increase in global concentrations of GHG emissions, global warming impacts of a project are considered on a cumulative basis.

No comments relating to GHG emissions were received during the public scoping period in response to the Notice of Preparation.

3.8.1 Environmental Setting

Greenhouse Gases and Climate Change

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHGs, to the atmosphere. The primary source of these GHGs is fossil fuel use. The Intergovernmental Panel on Climate Change has identified four major GHGs— water vapor, CO_2, methane (CH_4), and ozone (O_3)—that are the likely cause of an increase in global average temperatures observed in the twentieth and twenty-first centuries. Other GHGs identified by the Intergovernmental Panel on Climate Change that contribute to global warming are nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons (Intergovernmental Panel on Climate Change 2014). The following are the principal GHG pollutants that contribute to climate change and their primary emission sources:

- **Carbon Dioxide (CO_2)** enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and respiration, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (sequestered) when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH_4)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in municipal solid waste landfills.
- **Nitrous Oxide (N_2O)** is produced by both natural and human-related sources. Primary human-related sources of nitrous oxide are agricultural soil management, sewage treatment, mobile and stationary combustion of fossil fuel, and production of adipic and nitric acid. Nitrous oxide is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests.
- **Sulfur Hexafluoride (SF_6)** is commonly used as an electrical insulator in high voltage electrical transmission and distribution equipment such as circuit breakers, substations, and transmission switchgear. Releases of SF_6 can occur during maintenance and servicing as well as from leaks of electrical equipment.
- **Hydrofluorocarbons** and **Perfluorocarbons** are generated in a variety of industrial processes. Although the amount of these gases emitted into the atmosphere is small in terms of their absolute mass, they are potent agents of climate change due to their high global warming potential.

Global warming potential is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to CO_2. The global warming potential of a GHG is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time (i.e., lifetime) that the gas remains in the atmosphere ("atmospheric lifetime"). The reference gas for global warming potential is CO_2; therefore, CO_2 has a global warming potential of 1. The other main GHGs that have been attributed to human activity include CH_4, which has a global warming potential of 28, and N_2O, which has a global warming potential of 265 (USEPA 2017b). For example, one ton of CH_4 has the same contribution to the greenhouse effect as approximately 28 tons of CO_2. GHGs with lower emissions rates than CO_2 may still contribute to climate change because they are more effective at absorbing outgoing infrared radiation than CO_2 (i.e., high global warming potential). The concept of CO_2-equivalents (CO_2e) is used to account for the different global warming potentials of GHGs to absorb infrared radiation.

Although the exact lifetime of any particular GHG molecule is dependent on multiple variables, it is understood by scientists who study atmospheric chemistry that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. GHG emissions related to human activities have been determined as "extremely likely" to be responsible (indicating 95% certainty) for intensifying the greenhouse effect, and leading to a trend of unnatural warming of the Earth's atmosphere and oceans, with corresponding effects on global circulation patterns and climate (CARB 2014a). The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, no single project is expected to measurably contribute to a noticeable incremental change in the global average temperature, or to a global, local, or micro-climate.

GHG Emission Inventories

State

The CARB performs an annual GHG inventory for emissions and sinks[15] of the six major GHGs. California produced 425.3 million metric tons (MMT) CO_2e in 2018 (CARB 2020). As shown in Figure 3.8-1, combustion of fossil fuel in the transportation category was the single largest source of California's GHG emissions in 2018 followed by the industrial and electric power (including in-state and out-of-state sources) categories (CARB 2020).

[15] A sink is a reduction in atmospheric GHGs by storing (sequestering) carbon in another non-gaseous form.

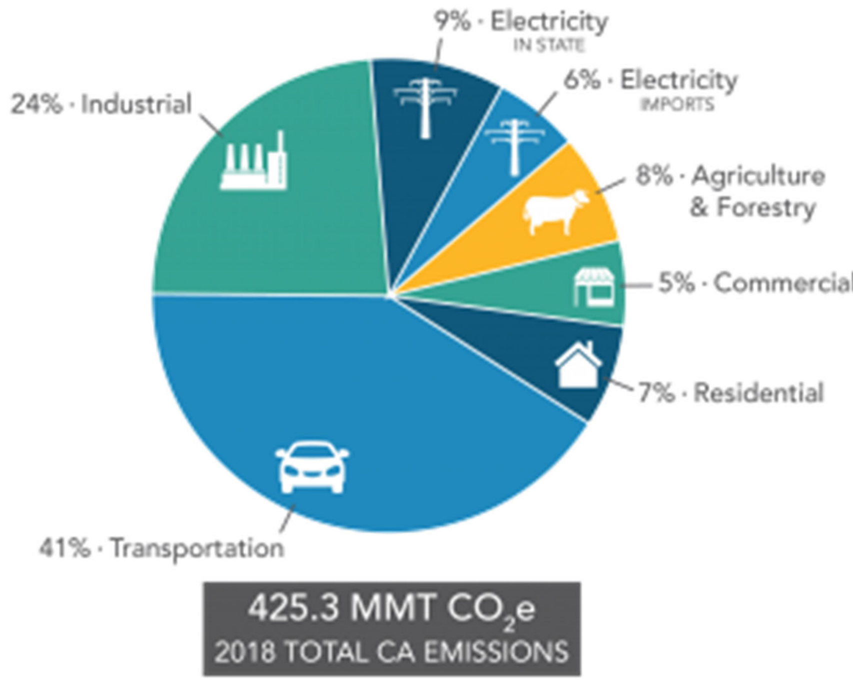

Figure 3.8-1 California 2018 GHG Inventory

Source: CARB 2020.

Regional

The BAAQMD GHG Inventory estimates direct and indirect emissions from sources within the BAAQMD's jurisdiction for the GHGs consistent with those considered for California Global Warming Solutions Act of 2006 (Assembly Bill 32, refer Section 3.8.2, below), including CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (BAAQMD 2015).

Overall, the Bay Area's GHG emissions in 2011 were approximately 86.6 million $MTCO_2e$ (BAAQMD 2015). The transportation sector contributed approximately 39.7 percent of GHG emissions in the Bay Area. The industrial and commercial sector was the second largest contributor with 35.7 percent of total GHG emissions.

Local

In 2019, the County of Santa Clara emitted approximately 108,724 $MTCO_2e$ from municipal operations (buildings, facilities, public lighting and utilities, employee commute, vehicle fleet, solid waste and closed landfill sectors) (County of Santa Clara 2021b). GHG emissions from County operations in 2019 decreased 20 percent from 2015 and 11 percent from 2010 with 61 percent of emissions attributed to employee commute and 26 percent to buildings and facilities (County of Santa Clara 2021a, 2021b).

The County of Santa Clara is in the process of creating a Climate Roadmap 2030 which will outline actions the County and its partners will take to reduce GHG emissions and will also include a countywide GHG emissions inventory and forecast. As shown in Figure 3.8-2, the on-road transportation source was the single largest source of the County's GHG emissions in 2017 followed by electricity and natural gas (County of Santa Clara 2021c).

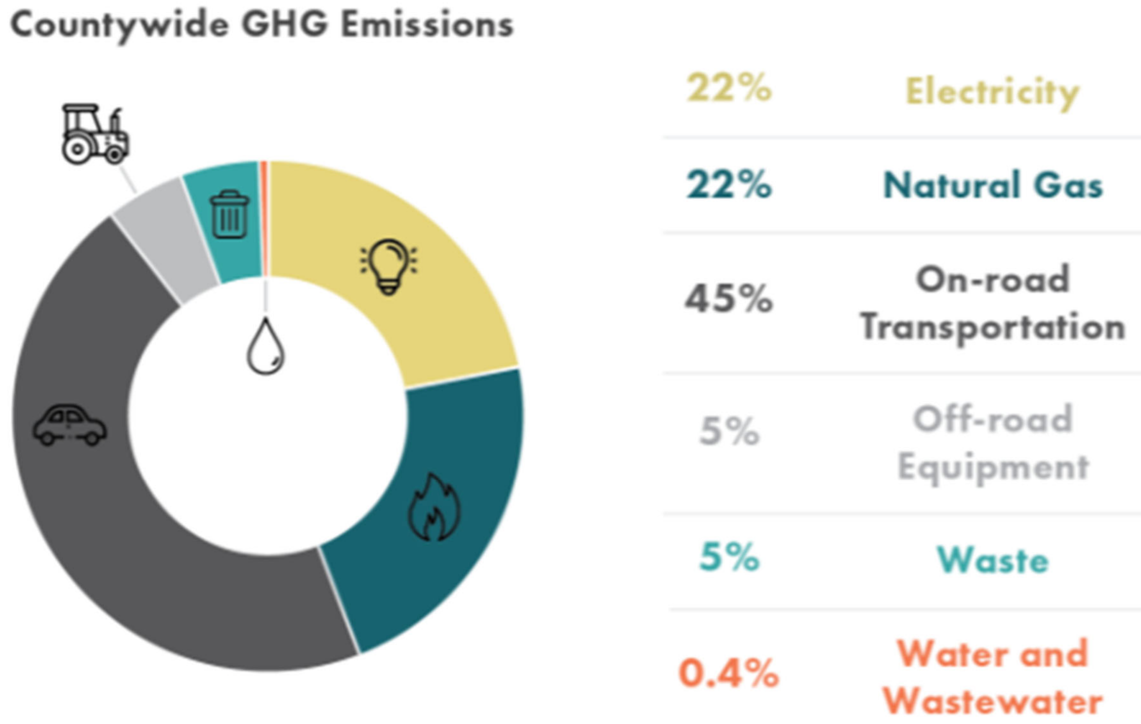

Figure 3.8-2 County of Santa Clara 2017 Countywide GHG Emissions Inventory

Source: County of Santa Clara 2021c.

Project Site and Vicinity

As described in Section 2, Project Description, an approximately 6,800-square-foot single-story office building completed in 1956 and an associated parking area occupy the project site and is used by the County of Santa Clara Office of the Public Defender. As such, existing emissions from the project site include those associated with operation of the office building, which include emissions from area, mobile, energy, waste, and water sources. Area-source emissions are associated with activities such as the use of landscape maintenance equipment. Mobile-source emissions include commute trips by the office employees. Energy-source emissions are associated with building electricity and natural gas consumption. The waste category includes emissions associated with the disposal of solid waste into landfills. Water use emissions include emissions associated supplying and treating water and wastewater. Table 3.8-1 below summarizes the existing GHG emissions associated with operation of the existing office building at the project site.

Table 3.8-1 Existing GHG Emissions at the Project Site

Source/Description	GHG Emissions (MT CO_2e/year)
Area	<0.01
Energy	7.29
Mobile	14.40
Waste	3.18
Water	1.84
Total Annual Emissions	**26.69**

Source: Estimated by AECOM in 2021 using the California Emissions Estimator Model (CalEEMod), version 2020.4.0. See Appendix B for detailed modeling assumptions, outputs, and results.

Acronyms: GHG = greenhouse gas; MT CO_2e/year = metric tons of carbon dioxide equivalent per year

Notes: Energy emissions were estimated using the "historical" energy intensity values provided within CalEEMod which reflect 2005 Title 24 Standards. Since the building was constructed in 1956, prior to the development of the Title 24 Standards, existing energy emissions may actually be higher than those presented in Table 3.8-1. Mobile source emissions were based on information in the Traffic Impact Analysis prepared for the Project (see Appendix E). Waste disposal rates were based on CalEEMod defaults which include land use and overall composition of municipal solid waste in California that is primarily based on CalRecycle data. Totals may not add due to rounding.

3.8.2 Regulatory Framework

Federal

Greenhouse Gas Findings under the Federal Clean Air Act

On December 7, 2009, USEPA made two distinct findings regarding GHG emissions under Section 202(a) of the federal Clean Air Act:

- Endangerment Finding: The Administrator found that the current and projected concentrations of the six key well-mixed greenhouse gases—CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—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 industries or other entities, this action was a prerequisite to finalizing the USEPA's Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles (USEPA 2009).

GHG Emission Standards for Light-Duty and Heavy-Duty Vehicles

On May 7, 2010, the final Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards were published in the Federal Register (USEPA 2010). Phase 1 of the emissions standards required model year 2012 through 2016 vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile, which is equivalent to 35.5 miles per gallon, if the automobile industry were to meet this CO_2 level solely through fuel economy improvements.

On August 28, 2012, the U.S. Department of Transportation and the USEPA issued a joint Final Rulemaking requiring additional federal GHG and fuel economy standards for Phase 2 of the emissions standards for model year 2017 through 2025 passenger cars and light-duty trucks. The standards would require these vehicles to meet an estimated combined average emissions level of 163 grams of CO_2 per mile in model year 2025, which is equivalent to 54.5

miles per gallon, if the improvements were made solely through fuel efficiency. However, on April 2, 2018, the USEPA issued a Mid-term Evaluation Final Determination, which finds that the model year 2022 through 2025 emissions standards are not appropriate and should be revised. This Mid-term Evaluation was not a final agency action; rather, this determination led to the rule making of the Safer Affordable Fuel Efficient Vehicle Rule (USEPA 2018b).

In addition to the standards for light-duty vehicles, the U.S. Department of Transportation and USEPA adopted complementary standards to reduce GHG emissions and improve the fuel efficiency of heavy-duty trucks and buses on September 15, 2011. The Phase 1 standards together form a comprehensive heavy-duty national program for all on-road vehicles rated at a gross vehicle weight at or above 8,500 pounds for model years 2014 through 2018. The standards phased in with increasing stringency in each model year from 2014 through 2018. The USEPA standards adopted for 2018 represented an average per-vehicle reduction in GHG emissions of 17 percent for diesel vehicles and 12 percent for gasoline vehicles (USEPA 2011). Building on the success of the Phase 1 standards, USEPA and the National Highway Traffic Safety Administration finalized Phase 2 standards for medium- and heavy-duty vehicles through model year 2027. The Phase 2 standards are expected to lower CO_2 emissions by approximately 1.1 billion metric tons.

Safer Affordable Fuel Efficient Vehicle Rule
As discussed above in Section 3.3.2, in April 2020, the USEPA and NHTSA finalized the SAFE Vehicles Rule. This final rule was made effective on June 29, 2020. The final rule will increase stringency of CO_2 emissions standards by 1.5 percent each year through model year 2026, as compared with the CO_2 standards issued in 2012, which would have required increases of about 5 percent per year (NHTSA 2020). On January 20, 2021, President Biden signed an Executive Order directing consideration of labor unions, States, and industry views to propose suspension, revision, or rescindment of the SAFE Vehicles Rule (The White House 2021).

State
CARB 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.

Assembly Bill 1493
AB 1493, signed in July 2002, requires CARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with model year 2009. In June 2009, the USEPA Administrator granted a Clean Air Act waiver of preemption to California. This waiver allowed California to implement its own GHG emissions standards for motor vehicles beginning with model year 2009. California agencies worked with federal agencies to conduct joint rulemaking to reduce GHG emissions for passenger car model years 2017 through 2025. However, as discussed under the federal regulatory setting above, the SAFE Part One revokes California's vehicle waiver and authority to set its own emissions standards. On September 19, 2019, the USEPA issued a press release announcing the formal waiver revocation. During the period the federal action is in effect, the CARB will administer the affected portions of its program on a voluntary basis.

Executive Order S-3-05
Executive Order S-3-05, signed in June 2005, proclaimed that California is vulnerable to the impacts of climate change. Executive Order S-3-05 declared that increased temperatures could reduce the Sierra Nevada'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 emissions targets. Specifically, emissions were to be reduced to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below the 1990 levels by 2050. The statewide GHG emissions in 2000 were approximately 466 MMT CO_2e (CARB 2014b). In 2010, overall statewide GHG emissions were approximately 453 MMT CO_2e, achieving the 2010 goal established by Executive Order S-3-05 (CARB 2014b).

Assembly Bill 32

In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.). AB 32 further details and puts into law the mid-term GHG reduction target established in Executive Order S-3-05: reduce GHG emissions to 1990 levels by 2020. AB 32 also identifies CARB as the state agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target. AB 32 also established several programs to achieve GHG emission reductions, including the Low Carbon Fuel Standard and the Cap-and-Trade program. As of 2017, the state has reduced emissions below the revised AB 32 limit of 427 MMT CO_2e.[16]

Senate Bill 32

In 2016, the California State Legislature adopted SB 32 and its companion bill AB 197. SB 32 establishes a climate pollution reduction target of 40 percent below 1990 levels by 2030. AB 197 creates six-year term limits for CARB members, adds two nonvoting lawmakers to the board and creates a new legislative oversight committee. AB 197 also targets climate change programs to "disadvantaged communities" and requires the CARB to consider the social costs of GHG emissions.

CARB Climate Change Scoping Plans

In December 2008, CARB adopted its *Climate Change Scoping Plan: A Framework for Change* (Scoping Plan), which contains the main strategies California will implement to achieve the required GHG reductions required by AB 32 (CARB 2008). The Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of California's GHG inventory. CARB further acknowledges that decisions about 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.

CARB is required to update the Scoping Plan at least once every 5 years to evaluate progress and develop future inventories that may guide this process. CARB approved *First Update to the Climate Change Scoping Plan: Building on the Framework* in June 2014 (CARB 2014a). The Scoping Plan update includes a status of the 2008 Scoping Plan measures and other federal, state, and local efforts to reduce GHG emissions in California, and potential actions to further reduce GHG emissions by 2020.

In November 2017, CARB released the 2017 Climate Change Scoping Plan, which establishes a framework of action for California to reduce statewide emissions by 40 percent by 2030, compared to 1990 levels (CARB 2017b). The 2017 Scoping Plan builds upon the framework established by the 2008 Scoping Plan and the 2014 Scoping Plan Update, while also identifying new, technologically feasible and cost-effective strategies to ensure that California meets its GHG reduction targets.

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[16] For more detail, please see https://ww2.arb.ca.gov/ghg-2020-limit and https://ww2.arb.ca.gov/ghg-inventory-graphs.

Executive Order S-1-07

Executive Order S-1-07, which was signed by then California Governor Arnold Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, at more than 40 percent of statewide emissions. Executive Order S-1-07 establishes a goal that the carbon intensity of transportation fuels sold in California should be reduced by a minimum of 10 percent by 2020. CARB adopted the low carbon fuel standard (LCFS) on April 23, 2009. In November 2015, the Office of Administrative Law approved re-adoption of the LCFS.

Senate Bill 375

SB 375, signed by the Governor in September 2008, aligned regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocations. SB 375 required metropolitan planning organizations to adopt Sustainable Community Strategies that would prescribe land use allocation in that metropolitan planning organization's regional transportation plan. CARB adopted regional GHG targets for passenger vehicles and light trucks for 2020 and 2035 for the 18 metropolitan planning organizations in California. If the combination of measures in the Sustainable Community Strategies would not meet the regional targets, the metropolitan planning organizations must prepare a separate "alternative planning strategy" to meet the targets.

CARB is required to update the targets for the metropolitan planning organizations every 5 years. In June 2017, CARB released updated targets and technical methodology. The updated targets consider the need to further reduce VMT, as identified in the 2017 Scoping Plan Update (for SB 32), while balancing the need for additional and more flexible revenue sources to incentivize positive planning and action toward sustainable communities. Like the 2010 targets, the updated SB 375 targets are in units of percent per capita reduction in GHG emissions from automobiles and light trucks relative to 2005; this excludes reductions anticipated from implementation of State technology and fuels strategies, and any potential future State strategies such as statewide road-user pricing. The proposed targets call for greater per capita GHG emission reductions from SB 375 than are currently in place. For 2035, the proposed targets either match or exceed the emission reduction levels contained in the metropolitan planning organizations' currently adopted Sustainable Community Strategies (discussed below) to achieve the SB 375 targets.

For the next round of Sustainable Community Strategy updates, CARB's updated targets for the Bay Area region are a 10% per capita GHG reduction in 2020 from 2005 levels (compared to 7% under the 2010 target), and a 19% per capita GHG reduction in 2035 from 2005 levels (compared to the 2010 target of 15% (CARB 2018).The updated targets and methodology took effect on October 1, 2018, and Sustainable Community Strategies adopted in 2018 and later would be subject to these new targets (CARB 2018).

Executive Order B-30-15

In April 2015, Governor Edmund Brown issued an executive order establishing a statewide GHG reduction goal of 40 percent below 1990 levels by 2030. The emission reduction target acts as an interim goal between the AB 32 goal (i.e., achieve 1990 emission levels by 2020) and Governor Brown's Executive Order S-03-05 goal of reducing statewide emissions 80 percent below 1990 levels by 2050. In addition, the executive order aligns California's 2030 GHG reduction goal with the European Union's reduction target (i.e., 40 percent below 1990 levels by 2030) that was adopted in October 2014.

Senate Bill 350

California's Renewable Portfolio Standard was established in 2002 under SB 1078 and accelerated in 2006 under SB 107, by requiring that 20 percent of electricity retail sales be served by renewable energy sources by 2010. Subsequent recommendations in California energy policy reports advocated a goal of 33 percent by 2020, and on November 17, 2008, then governor Arnold Schwarzenegger signed Executive Order S-14-08 requiring retail sellers of electricity to serve 33 percent of their load with renewable energy by 2020. In April 2011, SB X1-2 codified Executive Order S-14-08, setting the new Renewable Portfolio Standard targets at 20 percent by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020 for all electricity retailers. In October 2015, Governor Edmund Brown signed SB 350, which extended the Renewable Portfolio Standard target by requiring retail sellers to procure 50 percent of their electricity from renewable energy resources by 2030. This was followed by SB 100 in 2018, which further increased the Renewable Portfolio Standard target to 60 percent by 2030 along with the requirement that all of the state's electricity come from carbon-free resources by 2045.

Executive Order B-55-18

On September 10, 2018, Governor Brown issued Executive Order B-55-18, which establishes a new statewide goal to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. The Executive Order states that this new goal is in addition to the existing statewide targets of reduction GHG emissions.

Regional and Local

CARB also acknowledges that local governments have broad influence and, in some cases, exclusive jurisdiction over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations.

Plan Bay Area 2040

As described above, SB 375 aligned regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocations. SB 375 required metropolitan planning organizations to adopt a sustainable communities strategy that will prescribe land use allocations in that metropolitan planning organization's regional transportation plan. *Plan Bay Area 2040* is the Bay Area's Regional Transportation Plan/Sustainable Community Strategy. *Plan Bay Area 2040* was adopted jointly by ABAG and Metropolitan Transportation Commission (MTC) on July 26, 2017. *Plan Bay Area 2040* lays out a development scenario for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce GHG emissions from transportation (excluding goods movement) beyond the per capita reduction targets identified by CARB. *Plan Bay Area 2040* is a limited and focused update to the 2013 *Plan Bay Area*, with updated planning assumptions that incorporate key economic, demographic, and financial trends from the last several years. *Plan Bay Area 2040* remains on track to meet a 16% per capita reduction of GHG emissions by 2035, and a 10% per capita reduction by 2020 from 2005 conditions (MTC and ABAG 2017). On May 26, 2021, ABAG and MTC released the *Draft Plan Bay Area 2050* for public comment. The Draft Plan Bay Area 2050 focuses on four key issues: the economy, the environment, housing and transportation (MTC and ABAG 2021).

County of Santa Clara – U.S. Cool Counties Climate Stabilization Declaration

In 2007, the County of Santa Clara Board of Supervisors signed the U.S. Cool Counties Climate Stabilization Declaration and established a set of aggressive goals for GHG emissions reductions that would reduce the county's GHG emissions by 80 percent before 2050. By adopting the Declaration, the county agrees to take inventory of County government operations and countywide community GHG emissions as well as reduce County government GHGs by 80 percent below current levels by 2050 through a 10 percent reduction every five years (Cool Counties 2007).

County of Santa Clara – Sustainability Master Plan

In January 2021, the County of Santa Clara Board of Supervisors adopted a Sustainability Master Plan which integrates the County's many existing policies, programs, practices, and Countywide initiatives that promote the three core elements of sustainability: Environment, Economy, and Equity. The Sustainability Master Plan includes eight goals, 30 strategies and 90 targets to monitor the implementation of the County's sustainability vision. The eight goals focus on four priority areas: climate protection and defense, natural resources and environment, community health and well-being, and prosperous and just economy (County of Santa Clara 2021a). The County has committed to achieving carbon neutrality by 2045.

County of Santa Clara – Climate Roadmap 2030

The County is embarking on the process of creating the Climate Roadmap 2030 (Roadmap) which will outline actions the County and partners will take to reduce greenhouse gas emissions. Through the Roadmap, the County hopes to achieve coordinated collaboration to get one step closer to reaching shared sustainability goals. The Roadmap will include a 1) countywide greenhouse gas emissions inventory and forecast, 2) an online interactive map tool that will provide a comprehensive overview of the cities, organizations, institutions, and companies working on climate action in Santa Clara County, 3) community and partner input, and 4) an implementation roadmap (County of Santa Clara 2021c).

Silicon Valley 2.0

Silicon Valley 2.0 (SV 2.0), funded through a grant from the Strategic Growth Council and designed and managed by the County of Santa Clara Office of Sustainability, is a regional effort to minimize the anticipated impacts of climate change within the boundary of Santa Clara County. In May 2015, the County released the Climate Adaptation Guidebook. The Guidebook was designed to provide a recommended set of strategies that can be implemented by individual agencies, cities or regional partnerships to identify potential pathways, technologies, strategies, and policy mechanisms needed to both reduce GHG emissions and increase resiliency in Santa Clara County.

3.8.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to GHG emissions:

- **Impact GHG-1:** Would the Project generate GHG emissions that may have a significant impact on the environment?
- **Impact GHG-2:** Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions?

Impact GHG-1: GHG Emissions

Impact GHG-1 would be **less than cumulatively considerable**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. As discussed previously, a project's global warming impacts are considered on a cumulative basis.

Lead agencies have flexibility to develop their own significance thresholds or to determine significance thresholds on a case-by-case basis. They may also consider thresholds of significance adopted or recommended by other public agencies or experts, provided that the thresholds are supported by substantial evidence. (CEQA Guidelines, Sections 15064, 15064.7.)

The County of Santa Clara has not established thresholds for determining whether a project's GHG emissions would be significant. BAAQMD has adopted the following thresholds for evaluating the operational GHG emissions of land use/development projects:

1. compliance with a qualified GHG reduction strategy;
2. annual emissions less than 1,100 metric tons per year (MT/year) of CO_2e; or
3. emissions below 4.6 MT CO_2e/service population/year (residents + employees).

The BAAQMD thresholds were developed based on AB 32 GHG emissions reduction goals (requirement that statewide GHG emissions be reduced to 1990 levels by 2020) while taking into consideration emission reduction strategies outlined in ARB's 2014 Scoping Plan (BAAQMD 2017a). However, the Project would begin construction in 2022; thus, the Project's GHG emissions should also be analyzed in light of the SB 32 statewide framework (which established a 2030 GHG emissions reduction target of 40 percent below 1990 levels). BAAQMD has initiated an update to its current CEQA Guidelines (2017) to review the thresholds of significance criteria and establish new significance criteria where needed to reflect new requirements in the CEQA Guidelines and to achieve the SB 32 GHG emissions reductions (BAAQMD 2021c). At the time of this analysis, the BAAQMD has not adopted a threshold of significance consistent with SB 32 goals.

Therefore, this analysis uses the BAAQMD GHG threshold of significance of 4.6 MT CO_2e per service population, with appropriate updates to this threshold to focus on relevant emissions sources and consider longer-term (post-2020) State emissions goals.

To achieve the goals of AB 32 and SB 32, which are tied to GHG emission levels of a specific benchmark year (i.e., 1990), California would have to achieve a lower rate of emissions per unit of population (per person) and/or per level of economic activity (e.g., per job) than its current rate. The "per service population" metric represents the rate of emissions needed to achieve a fair share of California's emission reduction mandate. Fair share indicates the level of GHG efficiency that, if applied statewide or to a defined geographic area, such as the project, would meet the State's emissions targets.

The 4.6 MT CO_2e per service population BAAQMD threshold was developed based on dividing the statewide GHG emissions target goal (from applicable land use sectors) by the estimated 2020 population and employment, thereby determining the level of GHG efficiency for projects that would achieve the goals of AB 32. To provide this additional information to put the project-generated GHG emissions in the appropriate statewide context, this analysis updates the service population threshold that would meet the State's 2030 emissions targets.

To develop the service population efficiency metric or threshold for the Project, land use–related sectors in the Scoping Plan were identified, and GHG emissions were separated to tailor the inventory to emission sources relevant to the Project. This exercise was completed to identify the emissions sources over which the Project can have some influence through planning and development approval. Emission sources that would not be produced by the Project were not included in the development of the GHG efficiency threshold. For example, this approach would exclude emissions associated with industrial, agriculture, ships and commercial boats, and other sources not associated with project activities.

Tailoring the reduction target to the specific local context responds to and is consistent with the direction from the California Supreme Court's 2015 decision in *Center for Biological Diversity v. California Department of Fish and Wildlife,*[17] commonly referred to as "Newhall Ranch." In Newhall Ranch, the Court indicated that the use of a state-legislation-based significance threshold could be acceptable, so long as the administrative record supports how this threshold is appropriate for a specific project at a specific location. The following tables and paragraphs provide further detail on tailoring state guidance to local conditions for the Project.

If the Project GHG emissions per service population are less than the efficiency threshold developed with the statewide 2030 target in mind, the impact would be less than cumulatively considerable. Table 3.8-2 presents a revised version of the 1990 statewide emissions that includes only the sectors and subsectors relevant to the Project.

The statewide inventory was tailored to emissions sources that are relevant to the Project so that the Project's emissions in future years can be compared with California's own targets for the relevant land uses for 2030 under SB 32. After culling the emissions sources to those that are relevant for the Project, the second step is developing an appropriate "rate" of emissions. In this case, because the Project is a mixed-use project (with both a residential component and an employment component), "service population" was the selected metric used to convert mass emissions to a rate of emissions.

California has mass emissions targets for future years. State agencies also forecast future residential population and employment for future years. Dividing the mass emissions target by the total residential population and employment yields an emissions "budget" per population plus employment that is consistent with state GHG goals. If a project has a rate of GHG emissions per service population that is equal to, or less than the State's GHG rate for future years, then that project would be consistent with the State's GHG goals.

In this case, if the Project's emissions rates are consistent with the State's goals, it can be concluded that implementation of the Project would make substantial progress toward the State's 2030 goals and would not conflict with the State's 2050 goal. The application of an efficiency-based metric as described herein is consistent with the discussion in CARB's 2017 Scoping Plan (CARB 2017b) of the importance of GHG efficiency in land use planning. The 2017 Scoping Plan provides the following guidance on the application of an efficiency-based metric:

> *Since the statewide per capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the State, it is appropriate for local jurisdictions to derive evidence-based on local per capita goals based on local emissions sectors and population projections that are consistent with the framework used to develop the statewide per capita targets. The resulting GHG emissions trajectory should show a downward trend consistent with the statewide objectives.*

[17] 62 Cal. 4th 204.

Table 3.8-2 Adjusted Statewide Emissions Inventory – Land Use–Related Sectors

Main Sector / Sub-Sector Level 1	Total Emissions (MMT CO_2e/yr) [a]	Adjusted Land Use-Related Emissions (MMT CO_2e/yr)	Notes/Adjustments
Agriculture & Forestry	18.9	0.0	Not included in land use sector
Commercial	14.4	13.9	Excludes National Security emissions from Sub-Sector Level 1
Electricity Generation (Imports)	61.5	61.5	Land use sector includes all emissions
Electricity Generation (In State)	49.0	34.4	Excludes CHP: Industrial from Sub-Sector Level 1
Industrial	105.3	11.7	Industrial emissions excluded from land use sector, except as described in sub-sectors below
CHP: Industrial	*9.7*	*0.0*	*Not included in land use sector*
Flaring	*0.1*	*0.0*	*Not included in land use sector*
Landfills	*7.4*	*7.4*	*Land use sector includes all emissions*
Manufacturing	*32.1*	*0.7*	*Construction emissions from Sub-Sector Level 2 included in land use sector*
Mining	*0.0*	*0.0*	*Not included in land use sector*
Not Specified	*2.7*	*0.0*	*Not included in land use sector*
Oil & Gas Extraction	*14.8*	*0.0*	*Not included in land use sector*
Petroleum Marketing	*0.0*	*0.0*	*Not included in land use sector*
Petroleum Refining	*32.8*	*0.0*	*Not included in land use sector*
Pipelines	*1.9*	*0.0*	*Not included in land use sector*
Wastewater Treatment	*3.6*	*3.6*	*Wastewater treatment emissions are included*
Not Specified	1.3	1.3	Land use sector includes all emissions
Residential	29.7	29.7	Land use sector includes all emissions
Transportation	150.6	140.9	Excludes Aviation, Rail, and Water-borne emissions from Sub-Sector Level 1
Total[b]	**431.0**	**293.5**	**-**

Source: Prepared by AECOM in 2021.
Acronyms: MMT CO_2e/yr = million metric tons of carbon dioxide equivalent per year; CHP = combined heat and power.
Notes:
[a] *California 1990 Greenhouse Gas Emissions Level and 2020 Limit, ARB, available at: http://www.arb.ca.gov/cc/inventory/1990level/1990level.htm*
[b] *Sectors/sub-sectors may not sum exactly due to rounding,*

Table 3.8-3 shows the estimated statewide land use–related GHG emissions per service population through 2030. The GHG emissions target for the Project in 2030 was developed to demonstrate consistency with the State's 2030 target. The State's mass emissions goals for 2030 have been adjusted to focus only on emissions sources relevant to the Project. Then, these mass emissions goals are divided by the State's forecast population and employment in 2030 to create an emissions "budget" per service population (which is residential population +

employment). Therefore, as shown in Table 3.8-3, if the Project does not exceed the emissions per service population of 2.88, this impact would be less than cumulatively considerable.

Table 3.8-3 Local Service Population Efficiency 2030 Target

Factor	Value
State GHG Emissions Target for 2030	176,082,940 MT CO_2e/year
Forecast Population in 2030[1]	41,860,549 residents
Forecast Employment in 2030[2,3]	20,611,658 employees
Total Service Population (SP) in 2030[4]	61,042,493 people
Emissions per Service Population	**2.88 MT CO_2e/year per Service Population**

Source: Estimated by AECOM in 2021, based on Project-specific land uses.

Acronyms: GHG = greenhouse gases; MT CO_2e = metric tons of carbon dioxide equivalent; SP = service population.

Notes:

[1] *Department of Finance (DOF) Total Estimated and Projected Population for California and Counties: July 1, 2010 to July 1, 2060 in 1-year increments. March 2021. Available online at: <http://www.dof.ca.gov/Forecasting/Demographics/projections/>*

[2] *Employee Development Department (EDD) Employment Projections. Available online at: <http://www.labormarketinfo.edd.ca.gov/data/employment-projections.html>. Sorted to remove jobs from: 11-9013 Farmers, Ranchers, and Other Agricultural Managers; 19-1032 Foresters; 19-4041 Geological and Petroleum Technicians; 19-4093 Forest and Conservation Technicians; 45-000 Farming, Fishing, and Forestry Occupations; 47-5000 Extraction Workers; 49-3011 Aircraft Mechanics and Service Technicians; 49-3041 Farm Equipment Mechanics and Service Technicians; 49-9041 Industrial Machinery Mechanics; 49-9043 Maintenance Workers, Machinery; 49-9044 Millwrights; 51-0000 Production Occupations; 53-2000 Air Transportation Workers; 53-4000 Rail Transportation Workers; and 53-5000 Water Transportation Workers.*

[3] *EDD provides 2- and 10-year employment estimates that currently extend to 2028, so the ratio of employment to population estimated in 2028 (i.e., 46%) was applied to the DOF population estimates for 2030 to estimate employment in those years.*

[4] *Service population is the sum of the state's residents and employees.*

After 2030, GHG emissions will continue to decrease due to a mix of voluntary, incentive-based, and regulatory actions, such as tailpipe exhaust requirements and renewable electricity and zero carbon electricity generation requirements. As discussed above, Executive Order S-3-05 established a total GHG emissions target of 80 percent below the 1990 level by 2050. However, as discussed in *Cleveland National Forest Foundation, et al. v. San Diego Association of Governments* (2017), SANDAG has concluded that "there are presently no reliable means of forecasting how future technological developments or state legislative actions to reduce greenhouse gas emissions may affect future emissions in any one planning jurisdiction…lead agencies can only guess how future technical developments or state (or federal or international) actions may affect emissions from the myriad of sources beyond their control." As stated by the Court in this decision, "CEQA does not require analysis of potential impacts from possible future development that are too speculative to evaluate." The Court determined in that case that SANDAG did not abuse its discretion in declining to adopt a 2050 reduction goal. As such, this analysis did not estimate the Project's post-2030 emissions. However, if the Project does not exceed the emissions per service population target derived and discussed above, the Project's GHG emissions would be less than cumulatively considerable; thus, the resulting GHG emissions trajectory would show a downward trend consistent with the statewide objectives.

Construction activities associated with the Project would also generate GHG emissions from the use of construction equipment, haul trucks, and worker vehicles. The BAAQMD has not adopted thresholds for evaluating GHG emissions from construction activities. Nevertheless, the BAAQMD recommends that the lead agency quantify and disclose GHG emissions that would occur during construction and make a determination on the significance of these construction-generated GHG emission impacts in relation to meeting GHG reduction goals

(BAAQMD 2017a). Direct comparison of construction GHG emissions with long-term thresholds would not be appropriate because these emissions cease on completion of construction. Other districts (e.g., South Coast Air Quality Management District [2008]) recommend that construction emissions associated with a project be amortized over the life of the project (typically assumed to be 30 years). Therefore, this analysis includes a quantification of the total construction-related GHG emissions. Those emissions are then amortized over the life of the Project (assumed to be 30 years) and added to the operational emissions associated with the Project for comparison with the BAAQMD threshold and the updated threshold designed for this analysis.

Impact Analysis

Construction

Heavy-duty off-road equipment, materials transport, and worker commutes during construction of the Project would result in exhaust-related GHG emissions. Construction of the Project is anticipated to begin in 2022 and last approximately 15 to 18 months. Construction-related GHG emissions of the Project were estimated using the methodology discussed in Section 3.3, “Air Quality.” Construction of the Project would generate approximately 555 MT CO_2e. As described above, construction-related emissions are amortized over the life of the Project (assumed to be 30 years) and added to the operational emissions (shown in Table 3.8-4 below).

Operation

After construction, day-to-day activities associated with operation of the Project would generate emissions from a variety of sources. The analysis estimated operational GHG emissions from sources such as area, mobile, electricity, solid waste, water and wastewater sources.

Area-source emissions typically include the use of landscaping and maintenance equipment and residential fireplaces. Because the Project’s residential uses would be subject to BAAQMD Regulation 6, Rule 3, which prohibits installation of wood-burning devices in new building construction, any fireplaces (if present) were assumed to be electric (the Project would not include any natural gas infrastructure). Mobile sources would involve vehicle trips associated with residential, recreational, and visitor activities (e.g., work, shopping, and other trips). Project-generated vehicle trips would be the primary source of long-term GHG emissions. The Project would generate approximately 925 daily vehicle trips (considering both the residential and flex space uses of the Project). Energy-related GHG emissions are generated from electricity consumption (the Project building is anticipated to be all-electric). Energy consumption was based on CalEEMod defaults, which assume compliance with 2019 Building Standards. The Project would also install solar photovoltaic panels on the rooftop. However, the anticipated renewable energy generated from the photovoltaic panels is unknown at the time of this analysis. Thus, this analysis does not include any reduction from energy generated via the solar panels. Therefore, the emissions presented in the analysis are conservative. Total annual indoor and outdoor water demand was based on CalEEMod defaults. GHG emissions from solid waste are associated with the decomposition of solid waste, which was also based on CalEEMod defaults and CalRecycle waste generation rates.

The amortized construction-related total and net increase of GHG emissions that are associated with the Project are shown in Table 3.8-4. As shown in the table, operation of the Project would result in a net increase of 674 MT CO_2e per year at buildout of the Project, when compared to existing conditions. This is less than BAAQMD’s significance standard threshold of 1,100 MT CO_2e per year for evaluating a land use/development project's annual operational GHG emissions. The Project also would not exceed the BAAQMD efficiency threshold established under AB 32 of 4.6 MT CO_2e per service population, nor the local service population efficiency 2030 target of 2.88 MT CO_2e. It should also be noted that operational emissions were estimated for the Project's first operational year (2023). As stricter vehicle emissions standards take effect, advancements in engine technology, and turnover in the vehicle fleets, emissions by 2030 would result in lower levels of emissions than shown in Table 3.8-4. Therefore, Project-related GHG emissions during construction and operation would be **less than cumulatively considerable.**

Table 3.8-4 Project Annual GHG Emissions

Description	GHG Emissions (MT CO_2e)
Total Construction GHG Emissions	*555*
Amortized Construction [1]	18
Area	6
Energy[2]	0
Mobile	634
Waste	32
Water	10
Total Project GHG Emissions per year	***701***
Existing GHG Emissions per year	27
Total Net New GHG Emissions per year	**674**
Net GHG Emissions Per Service Population (MT CO_2e/SP) [3]	**2.44**
BAAQMD Total Emissions Threshold (MT CO_2e per year)	1,100
BAAQMD 2020 Efficiency Threshold (MT CO_2e/SP)	4.6
2030 Efficiency Threshold (MT CO_2e/SP)	2.88
Exceeds Thresholds?	No

Notes: Estimated by AECOM in 2021. Additional details provided in Appendix B. Totals may not add due to rounding.

Acronyms: BAAQMD = Bay Area Air Quality Management District; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent; SP = service population;

[1] *Amortized construction-related emissions calculated by dividing the Project's total construction GHG emissions by the operational lifetime of the Project (assumed to be 30 years).*

[2] *The Project is anticipated to be all-electric (no natural gas combustion) and the City of Palo Alto's electricity is 100 percent carbon neutral.*

[3] *Net emissions per service population calculated by dividing the Project's net new emissions by the number of employees and residents assumed for the Project land uses. The analysis assumed the Project would have approximately 273 new residents and 3 new employees.*

Impact GHG-2: GHG Plan, Policy, or Regulation Conflicts

Impact GHG-2 would be **less than cumulatively considerable**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Impact Analysis

California Air Resources Board Scoping Plans

In accordance with State law, CARB developed the State's Climate Change Scoping Plan (2008) and Scoping Plan updates (2014 and 2017) to outline the State's strategy to reduce California's GHG emissions per AB 32 and SB 32. The Project and project objectives would directly support the goals of AB 32 and SB 32. The State's 2017 Scoping Plan update includes VMT reduction goals that call for promotion of land use and community design that reduce VMT, encourage transit-oriented development, and support complete street design policies that prioritize transit, biking, and walking. As discussed in Section 3.16, "Transportation," the Project would generate VMT per service population lower than the Santa Clara County averages. The Project would also be consistent with California's climate vision which includes providing energy-efficient affordable housing near job centers and transit. The Project would incorporate innovative technologies and sustainability measures as well as provide housing that is affordable to a range of incomes from low-income to incomes at or slightly above the area median income. In addition, the Project objectives include incorporation of easily accessible bicycle parking and to encourage the use of alternative forms of transportation to nearby employment and transit.

The Project would also comply with the most current Building Energy Efficiency Standards and CALGreen requirements. The Building Standards and CALGreen requirements include mandatory measures for all new building construction, which would result in energy conservation, and make a major contribution in meeting the State's goals established by AB 32 and SB 32 for reduction in GHG emissions (CEC 2018). In addition, the Project would be all-electric (no natural gas infrastructure), consistent with the State's 2017 Scoping Plan goals of building electrification of end uses in the residential sector. Further, as quantified in Impact GHG-1, the Project would not conflict with the statewide targets established by AB 32 and SB 32. Therefore, the Project would not conflict with Scoping Plan and Scoping Plan updates.

BAAQMD Clean Air Plan and Plan Bay Area

The Project would be consistent with the BAAQMD Clean Air Plan and *Plan Bay Area 2040*. One of the purposes of the BAAQMD's Clean Air Plan is to reduce GHG emissions in the SFBAAB. As discussed in Section 3.3, "Air Quality," consistent with control measures TR9/TCM-D1 and TR9/TCM-D2, which call for expansion and improvement of bicycle and pedestrian facilities serving employment sites, educational and cultural facilities, residential areas, shopping districts, and other activity centers, one of the project objectives is to provide easily accessible bicycle parking to residents. Further, consistent with control measure TR10/TCM-D3, which calls for the promotion and support for land use patterns and infrastructure investments that support high-density, mixed-use, residential and employment development to facilitate walking, bicycling, and transit use, the Project would also encourage the use of alternative forms of transportation to nearby employment and transit and would develop flex space for uses such as a café or other retail or commercial use that could be used by the project residents further reducing potential vehicle trips. Additionally, the Clean Air Plan also includes Building Control Measures, BL1: Green Buildings and BL2: Decarbonize Buildings, which prioritize energy efficiency and renewable energy sources in residential and commercial buildings. One of the Project objectives is to incorporate innovative technologies and sustainability measures that would be partially fulfilled by installation of photovoltaic solar panels on the rooftop. The Project would also be all-electric, which is consistent with the Clean Air Plan goal of decarbonizing the energy system by switching from natural gas to electricity to power, heat, and cool buildings. Similarly, the Project would also include provision for at least ten percent of the parking spaces in the garage to be “electric vehicle-ready,” consistent with Clean Air Plan control measure TR14/MSM-A2, which calls for an expanded regional charging network.

The Project is also consistent with the comprehensive strategy and goals of the *Plan Bay Area 2040* to reduce motor vehicle travel on a per-capita basis by improving the region’s public transit network and promoting bicycling, walking, and ridesharing. As discussed previously, the Project would generate VMT per service population lower than the Santa Clara County averages. In addition, as a project that produces affordable housing near a transit-rich area, the Project would be consistent with and support the goals of *Plan Bay Area 2040* and Clean Air Plan. Therefore, operation of the Project would not conflict with or obstruct implementation of the Clean Air Plan or Plan Bay Area.

County of Santa Clara – Sustainability Master Plan

The Project would be consistent with the applicable community strategies and goals of the County of Santa Clara Sustainability Master Plan. The Project would locate residential and commercial uses in a transit-rich area, provide affordable housing, incorporate sustainability measures, and provide easily accessible bicycle parking to encourage the use of alternative forms of transportation to nearby employment and transit. As a result, the Project would be consistent with Sustainability Master Plan Goals 1.2 (Decarbonization of Buildings and Facilities), 1.3 (Clean, Safe, and Active Transportation), 1.4 (Smart Growth), and 6.3 (Safe and Affordable Housing). Therefore, the Project would not conflict with the initiatives and strategies included in the Sustainability Master Plan. The Project would not conflict with any plans or policies adopted for the purpose of reducing GHG emissions. This impact is **less than cumulatively considerable.**

3.8.4 Cumulative Impacts and Mitigation

This section analyzes the potential of the Project to contribute to the following cumulative GHG impacts:[18]

- **Impact C-GHG-1:** Contribution to cumulative effects related to generation of GHG emissions or conflicts with applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions.

Cumulative Impact C-GHG-1: GHG Emissions or GHG Plan, Policy, or Regulation Conflicts

The overall cumulative impact for C-GHG-1 would be **significant**. However, the Project’s contribution would be **not cumulatively considerable.**

Cumulative Context

As previously described, the geographic scope of consideration for GHG emissions is on a global scale, because such emissions contribute, on a cumulative basis, to global climate change. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires that lead agencies evaluate the cumulative impacts of GHGs, even relatively small additions, on a global basis.

[18] Note that project-level impacts have been combined for the purposes of cumulative analysis. Cumulative impact C-GHG-1 addresses the same issues as project-level impacts GHG-1 and GHG-2.

Cumulative Impact Analysis

The GHG emissions impact analysis above constitutes a cumulative analysis, in that it considers global, statewide, and regional projections of GHG emissions, as well as the contribution of the Project, to GHG emission impacts. Therefore, the significance conclusions reached above for project-level impacts GHG-1 and GHG-2 also constitute the significance conclusions of this EIR with respect to cumulative GHG emissions impacts and the Project's incremental contribution to GHG emissions would be **less than cumulatively considerable.**

3.9Hazards and Hazardous Materials

This section describes the existing hazards and hazardous materials setting of the project site and evaluates whether the Project would result in adverse effects related to these topics. The following comments relating to hazards and hazardous materials were received during the public scoping period in response to the Notice of Preparation (see Appendix A):

- Request for analysis of construction activities on the potential release of volatile organic compounds from the California-Olive-Emerson regional groundwater plume and proper disposal of contaminated groundwater, if encountered during construction.
- The City of Palo Alto also stated that although not part of CEQA, the County would need to coordinate with the Regional Water Quality Control Board, Department of Toxic Substances Control, and/or the County Department of Environmental Health to identify appropriate measures for the safety of future Project residents/users relating to the groundwater plume.

3.9.1 Environmental Setting

Information related to known hazardous materials at the project site and nearby areas was obtained from the following sources:

- *Phase I Environmental Site Assessment*, 231 Grant Avenue, Palo Alto, California 94306 (Partner Engineering and Science, Inc. 2020a)
- *Soil Gas Investigation Report*, 231 Grant Avenue, Palo Alto, California 94306 (Partner Engineering and Science, Inc. 2020b)

The results of these studies are briefly summarized below.

Soil, Groundwater, and Soil-Gas Contamination

A *Phase I Environmental Site Assessment* (Phase I ESA) was prepared by Partner Engineering and Science, Inc. (Partner 2020a) to determine whether any recognized environmental conditions are present at the project site. The term “recognized environmental conditions” means the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment.

The project site was formerly used for residential purposes from sometime prior to 1897 until circa 1960. The project site was developed with a single-story commercial building sometime between 1950 and 1956. Tenants at the project site have included private residents (1987–1965); Annual Reviews Inc Publishers (1956–1967); a cushion manufacturer (1956); Jason Furniture Manufacturing Co (1960); Park Automotive Service Repairs (1965); and County of Santa Clara offices (1970–present).

The only recognized environmental condition identified at the project site was a regional groundwater plume that has been contaminated with chlorinated solvents, which is present underneath the project site and in the project vicinity. Multiple source areas are associated with the plume and multiple responsible parties have been named in the ongoing cleanup of the plume. Identified sources include the Hewlett-Packard Company at 395 Page Mill Road (approximately 0.16 mile southeast of the project site), Varian Medical Systems Inc/Intevac at 601 South California Avenue (approximately 0.32 mile southwest of the project site), and Hewlett-Packard Company at 620–640 Page Mill Road (approximately 0.33 mile south of the project site). These sites are situated hydrologically cross- and up-gradient of the project site and collectively form the regional California-Olive-Emerson Study Area, Perimeter Area, and Off-Site Area, which consist of areas of active regulatory oversight and ongoing investigation and remediation. The Hewlett-Packard site at 620–640 Page Mill Road, along with the groundwater plume, is on the National Priority List, also known as a Superfund site (U.S. Environmental Protection Agency 2021).

The three sites have been treated separately for source area characterization and remediation since the early 1980s, and Hewlett-Packard and Varian have worked cooperatively under the oversight of the San Francisco Bay RWQCB to investigate, monitor, and remediate groundwater that was contaminated with volatile organic compounds in the “Off-Site Area,” which includes the project site. The principal chemicals of concern in soil and groundwater underlying the sites and groundwater underlying the Off-Site Area are chlorinated volatile organic compounds, including tetrachloroethene (PCE), trichloroethene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,1-dichloroethene (1,1-DCE), 1,2-dichloroethene (1,2-DCE), and 1,1-dichloroethane (1,1-DCA). There is a dewatering system associated with the Oregon Expressway Underpass, which is an important physical feature that influences groundwater flow patterns and chemical migration. Based on historical groundwater data, volatile organic compound contamination at levels that exceed cleanup standards are limited to the designated “A Aquifer,” which is approximately 15 to 55 feet bgs.

The project site overlies the contaminated groundwater plume in the Off-Site Area. Two shallow-zone groundwater monitoring wells, identified as F34A and F35B, are located in the southern portion of the project site. The wells were installed at the project site in 1990 and 1991, respectively. The depth to groundwater in these wells was measured at approximately 16.5–17 feet bgs in June 2019 (the most recent monitoring event with data available). According to the analytical results of groundwater samples collected from well F34A in 2019, up to 40 micrograms per liter (µg/L) of TCE, 2.0 µg/L of 1,1-DCA, 1.2 µg/L of 1,1-DCE, and 0.53 µg/L of cis-1,2-DCE were detected in on-site groundwater samples. No other volatile organic compounds were detected in the on-site groundwater samples. The reported concentration of TCE in groundwater beneath the project site exceeds the RWQCB Environmental Screening Level (ESL) of 7.5 µg/L for vapor intrusion concerns from groundwater at commercial properties, as well as the Short-term Action Level for TCE of 20 µg/L in groundwater beneath commercial properties (which in turn triggers the need for indoor air sampling).

A 2015 Additional Vapor Intrusion Assessment performed as part of remedial activities for the Superfund site included indoor air testing within buildings located in the source areas as well as approximately 24 off-site residential and commercial buildings, all of which overlay first-encountered groundwater containing TCE concentrations that exceeded 50 µg/L for residential properties and 100 µg/L for commercial properties. No indoor air samples were collected from the project site; however, the project site, identified as “Building ID 39” in vapor intrusion reports, was included in the study of a Supplemental Assessment Area, which included a broader area of groundwater that was contaminated at lower concentrations (i.e., between 5 and 50 µg/L of TCE). The existing building at the project site was evaluated for property use, construction type, depth to the water table, subsurface lithology, and obvious presence of preferential off-gassing pathways. The project site building and other nearby buildings were then compared with the indoor air sampling results of similar buildings located in areas with higher concentrations of TCE. Based on the results of the comparisons, no unacceptable short- or long-term health risks were expected for building occupants in the Supplemental

Assessment Area from the vapor intrusion pathway. Therefore, the 2015 Additional Vapor Intrusion Assessment concluded that it is unlikely for vapor intrusion to represent a concern at the project site. However, Partner (2020a) stated that vapor intrusion could not be entirely ruled out without direct sampling data. Based on the active regulatory status of the California-Olive-Emerson Study Area and the reported volatile organic compound concentrations detected in the project site groundwater, the regional cleanup case is considered a recognized environmental condition. The Phase I ESA recommended that further studies be conducted related to the potential for vapor intrusion at the project site from the contaminated groundwater plume.

After the Phase I ESA was completed, Partner (2020b) subsequently performed a *Soil and Gas Investigation Report* to evaluate the potential for off-gassing of chlorinated solvents from the contaminated groundwater plume at the project site. Six soil gas samples were analyzed for the presence of chlorinated solvents. TCE was detected in one of the soil gas samples (approximately 40 feet southwest of Park Boulevard in the northern portion of the project site) at a concentration of 110 micrograms per cubic meter ($\mu g/m^{3)}$, which exceeds both the residential ESL of 16 $\mu g/m^3$ and commercial/industrial ESL of 100 $\mu g/m^3$. No other chlorinated solvents were detected in the soil gas samples at concentrations exceeding the applicable ESLs. Partner (2020b) concluded that due to the known regional groundwater impacts, the identified soil gas concentration above the respective ESLs, and the proposed residential use of the subject property, vapor intrusion may pose a hazard for future residents at the project site.

As part of the Phase I ESA, Partner (2020a) also reviewed a variety of environmental records databases to determine if nearby properties included hazardous materials contamination that could affect the project site. The KJ Park (former Campbell-T) site at 2555 Park Boulevard is currently an active cleanup case under the oversight of the San Francisco Bay Area RWQCB. This site is located across the intersection of Park Boulevard and Grant Avenue to the northwest of the project site. This site was formerly operated as a dry-cleaning establishment. Soil was contaminated from a leaking underground storage tank, which was removed in 2017. Total petroleum hydrocarbons (TPH) as Stoddard solvent and naphthalene are the constituents of concern. Groundwater testing indicated that these constituents are not present in groundwater (although constituents from the regional Superfund groundwater plume are present). Soil remediation at the site is ongoing. Since the direction of groundwater flow is to the northeast (away from the project site) and due to the lack of contaminants of concern in off-site/down-gradient samples, Partner (2020a) concluded that this nearby hazardous materials site does not represent an environmental hazard for the project site.

Asbestos and Lead-Based Paint

Due to the age of the existing on-site building (which is scheduled for demolition), there is a potential that asbestos-containing material (ACM) and/or lead-based paint (LBP) are present. Readily visible suspect ACMs and painted surfaces were observed by Partner (2020a) during preparation of the Phase I ESA. Partner recommended that future sampling be performed to confirm the presence or absence of ACMs prior to any demolition activities to prevent potential construction worker health hazards.

Schools

There are no K–12 schools within 0.25 mile of the project site.

Airports

The project site is approximately 2.5 miles southwest of the Palo Alto Airport. Based on a review of the Palo Alto Airport Land Use Compatibility Plan (Santa Clara County Airport Land Use Commission 2016), the project site is not located within the airport influence area, airport noise contours, safety zones, or Federal Aviation Administration Part 77 height restriction areas.

Wildfire

The project site, and the surrounding City of Palo Alto, are located in a Local Responsibility Area (as opposed to a State Responsibility Area), and there are no fire hazard severity zones within the City as designated by the California Department of Forestry and Fire Protection (CAL FIRE 2021). However, as part of the Palo Alto Annex to the Santa Clara County Local Hazard Mitigation Plan (City of Palo Alto 2016b), the City has determined the project site and the surrounding area should be considered a moderate fire hazard. The City has designated small pockets of high fire hazard in areas with higher concentrations of trees. The project site is located in a highly developed and urbanized area comprised of high-density residential, commercial, office, and retail land uses.

3.9.2 Regulatory Framework

Federal

Environmental Protection Agency

The Federal Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act of 1976 (RCRA) established a program administered by USEPA for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. The RCRA was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the “cradle to grave” system of regulating hazardous wastes. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Act.

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for clean up when no responsible party could be identified. CERCLA also enabled the revision of the National Contingency Plan. The National Contingency Plan provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The National Contingency Plan also established the National Priorities List, which is a list of contaminated sites warranting further investigation by the USEPA. CERCLA was amended by the Superfund Amendments and Reauthorization Act on October 17, 1986.

Federal Emergency Management Agency

The primary mission of the Federal Emergency Management Agency is to reduce the loss of life and property and to protect the nation from all hazards, including natural disasters, acts of terrorism, and other man-made disasters, by leading and supporting a risk-based, comprehensive emergency management system of preparedness, protection, response, recovery, and mitigation.

Emergency Planning and Community Right-To-Know Act

The Emergency Planning Community Right-to-Know Act of 1986 was included under the Superfund Amendments and Reauthorization Act (SARA) law and is commonly referred to as SARA Title III. The Act was passed in response to concerns regarding the environmental and safety hazards proposed by the storage and handling of toxic chemicals. The Act establishes requirements for federal, state, and local governments, Indian Tribes, and industry regarding emergency planning and Community Right-to-Know reporting on hazardous and toxic chemicals. SARA Title III requires states and local emergency planning groups to develop community emergency response plans for protection from a list of Extremely Hazardous Substances (40 CFR Appendix B). The Community Right-to-Know provisions help increase the public's knowledge of and access to information on chemicals at individual facilities, their uses, and their release into the environment.

Hazardous Materials Transportation Act

The Hazardous Materials Transportation Act of 1975 was created to provide adequate protection from the risks to life and property related to the transportation of hazardous materials in commerce by improving regulatory enforcement authority of the Secretary of Transportation.

United States Department of Transportation

Transportation of chemicals and hazardous materials are governed by the U.S. Department of Transportation, which stipulates the types of containers, labeling, and other restrictions to be used in the movement of such material on interstate highways.

Occupational Safety and Health Administration

The Occupational Safety and Health Administration is the federal agency responsible for enforcing and implementing federal laws and regulations pertaining to worker health and safety. The administration's Hazardous Waste Operations and Emergency Response regulations require training and medical supervision for workers at hazardous waste sites (29 CFR Section 1910.120). Additional regulations have been developed regarding exposure to lead (29 CFR Section 1926.62) and asbestos (29 CFR Section 1926.1101) to protect construction workers.

State

Department of Toxic Substances Control

The California Department of Toxic Substances Control (DTSC) has primary regulatory responsibility, with delegation of enforcement to local jurisdictions that enter into agreements with the State agency, for the management of hazardous materials and the generation, transport and disposal of hazardous waste under the authority of the Hazardous Waste Control Law. Since August 1, 1992, DTSC has been authorized to implement the state's hazardous waste management program for California Environmental Protection Agency (CalEPA). DTSC may also oversee soil and groundwater testing and control measures for potential vapor intrusion.

California Occupational Safety and Health Administration

California Occupational Safety and Health Administration assumes primary responsibility for developing and enforcing workplace safety regulations within California. Regulations pertaining to the use of hazardous materials in the workplace (Title 8 of the CCR) include requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and preparation of emergency action and fire prevention plans. The California Occupational Safety and Health Administration enforces hazard communication program regulations that contain training and information requirements, including procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees at hazardous-waste sites. The hazard communication program requires that employers make Safety Data Sheets available to employees, and requires documentation of informational and training programs for employees.

The California Occupational Safety and Health Administration regulations also include requirements for protective clothing, training, and limits on exposure to hazardous materials. The California Occupational Safety and Health Administration also enforces occupational health and safety regulations specific to lead and asbestos investigation and abatement. These regulations equal or exceed their federal counterparts. Specific worker safety measures for excavation hazards (e.g., falling or cave-in of excavation walls) are described in the Title 8 CCR Section 1541.

State Water Resources Control Board and San Francisco Bay Regional Water Quality Control Board

The SWRCB was established in 1967. The San Francisco Bay RWQCB is authorized by the SWRCB to enforce provisions of the Porter-Cologne Water Quality Control Act of 1969. This act gives the San Francisco Bay RWQCB authority to require groundwater investigations when the quality of groundwater or surface waters of the state is threatened and to require remediation of the site, if necessary. The RWQCB has regulatory authority over construction dewatering and may also oversee soil and groundwater testing and control measures for potential vapor intrusion.

California Air Resources Board

CARB oversees implementation of and compliance with the National Emission Standard for Hazardous Air Pollutants for asbestos, and investigates all related complaints, as specified by California Health and Safety Code Section 39658 (b)(1). Notification of CARB and CalEPA is required for demolition and renovation where asbestos-containing materials may be present. CARB reviews and investigates each notification; and if it is determined that a structure contains asbestos-containing materials, demolition or renovation of the structure must be compliant with National Emission Standards for Hazardous Air Pollutants for demolition and renovation (40 CFR 61.145).

Lead-Based Paint, CCR Title 17

Title 17, Division 1, Chapter 8, of the CCR requires that work on any structure built prior to January 1, 1978 use lead-safe practices. Such practices include containment of the work area and cleaning of the work area after project completion. CCR Chapter 8 also covers accreditation of training providers and certification of individuals to perform lead abatement. The California Occupational Safety and Health Administration provides construction and general industry lead standards in Title 8 of the CCR, which contains occupational health requirements for lead abatement. DTSC regulations for hazardous waste are provided in CCR Title 22, Division 4.5. Demolition or renovation of structures with lead-based paint would be required to comply with procedures in CCR Title 22.

Cortese List, California Government Code Section 65962.5

The provisions of Section 65962.5 of the California Government Code are commonly referred to as the “Cortese List” (after the legislator who authored the legislation that enacted it). The Cortese List is a planning document used by state and local agencies to comply with CEQA’s requirement to provide information about the location of hazardous-materials release sites. Government Code Section 65962.5 requires CalEPA to develop an updated Cortese List at least annually. DTSC is responsible for a portion of the information contained on the Cortese List. Other state and local government agencies, including the SWRCB and RWQCBs, are required to provide additional information for the Cortese List about releases of hazardous materials.

In addition, Section 65962.5 requires all project applicants to consult the Cortese List and determine whether any site-specific project is within a hazardous materials site on the list. If so, the project applicant is required to notify the lead agency in writing prior to the issuance of a building permit, so the lead agency can determine the appropriate course of action (which generally would include preparation of Phase I and (if necessary) Phase II environmental site assessment, along with site-specific remediation).

Senate Bill (SB) 1082 – California Environmental Protection Agency's Unified Program

In 1993, Senate Bill 1082 gave CalEPA the authority and responsibility to establish a unified hazardous waste and hazardous materials management and regulatory program, commonly referred to as the Unified Program. The purpose of this program is to consolidate and coordinate six different hazardous materials and hazardous waste programs, and to ensure that they are consistently implemented throughout the state. The Unified Program is overseen by CalEPA with support from DTSC, RWQCBs, the Office of Emergency Services (OES), and the State Fire Marshal. The six programs are:

- Hazardous Materials Release Response Plans and Inventories (Business Plans)
- California Accidental Release Prevention Program
- Underground Storage Tank Program
- Aboveground Petroleum Storage Act Program
- Hazardous Waste Generator and Onsite Hazardous Waste Treatment (tiered permitting) Programs
- California Uniform Fire Code: Hazardous Material Management Plans and Hazardous Material Inventory Statements

State law requires county and local agencies to implement the Unified Program. The agency in charge of implementing the program is called the Certified Unified Program Agency (CUPA). The Santa Clara County Department of Environmental Health, Hazardous Materials Compliance Division, is the designated CUPA for the county for all areas other than the cities of Santa Clara, Gilroy, and Sunnyvale. In addition to the CUPA, other local agencies, such as the City of Palo Alto, help to implement the Unified Program.

Local

Bay Area Air Quality Management District

BAAQMD Regulation 11, Rule 2, adopted December 15, 1976, regulates hazardous pollutants from asbestos demolition, renovation, and manufacturing activities. The purpose of the rule is to control emissions of asbestos to the atmosphere during demolition, renovation, milling and manufacturing and establish appropriate waste disposal procedures. The rule sets out specific procedures to be followed and methods for reducing hazards from asbestos-containing materials during such activities.

Santa Clara County Department of Environmental Health and Palo Alto Fire Department

The Santa Clara County Department of Environmental Health (2013), Hazardous Materials Compliance Division, serves as the local CUPA for Palo Alto and regulates hazardous waste, aboveground petroleum storage and risk management plans, hazardous materials business plans and chemical inventories, risk management plans, and underground storage tanks. The County Department of Environmental Health may also oversee soil and groundwater testing and control measures for potential vapor intrusion.

The Palo Alto Fire Department, Hazardous Materials Division, works cooperatively with the Santa Clara County Department of Environmental Health to regulate hazardous materials in the City.

Emergency Response or Emergency Evacuation Plans

There are several regional and local emergency plans that cover the Project area, including the *Palo Alto Annex to the Santa Clara Operational Area Hazard Mitigation Plan* (City of Palo Alto 2017b), and the *Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area* (Association of Bay Area Governments 2010). These plans provide an overview to emergency operations within the City, County, and San Francisco Bay Area. They identify emergency response policies, describe the responses, identify lead agencies and organizations, and assign specific roles and responsibilities to departments, agencies, and community partners. These plans strive to facilitate emergency response and recovery activities in an efficient and effective way.

3.9.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to hazards and hazardous materials:

- **Impact HAZ-1:** Would the Project create a significant hazard through the routine transport, use, or disposal of hazardous materials or reasonably foreseeable upset and accident conditions involving the release of hazardous materials?
- **Impact HAZ-2:** Would the Project emit hazardous emissions or handle hazardous emissions within a quarter mile of a school?
- **Impact HAZ-3:** Would the Project create a significant hazard to the public or the environment due to the site being a known hazardous materials site?
- **Impact HAZ-4:** Would the Project result in airport-related safety or noise hazards?
- **Impact HAZ-5:** Would the Project impair implementation of an emergency response plan or emergency evacuation plan?
- **Impact HAZ-6**: Would the Project expose people or structures to significant risk from wildland fires?

Impact HAZ-1: Use or Release of Hazardous Materials

Impact HAZ-1 would be **less than significant**. No mitigation is required.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials; or the reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment.

Impact Analysis

Construction

Project-related demolition and construction would involve the use of heavy equipment and vehicles containing fuel, oil, and grease, as well as use and transport of these materials. Fluids such as oil or grease could leak from construction vehicles or could be released inadvertently in the event of an accident, potentially releasing petroleum compounds laden with metals and other pollutants. Given the size and nature of the Project, there is low likelihood that substantial quantities of hazardous materials would be stored at the site during construction, and the types and amounts of hazardous materials used for the Project would be similar to other construction projects in the County and City of Palo Alto. These materials would not be acutely hazardous.

As part of the Phase I ESA, Partner (2020a) identified the potential presence of ACMs in drywall, floor tiles, and floor tile mastic in the existing building on the project site. Demolition of this building would therefore require the handling and disposal of ACMs, which are a hazardous building material. If ACMs were to become friable during the demolition process, adverse human health hazards could occur.

As indicated in Section 3.9.2, “Regulatory Framework,” there is an established, comprehensive framework independent of the CEQA process that is intended to reduce the risks associated with the use, transport, and disposal of hazardous materials, including hazardous building materials such as ACM. Transportation of hazardous materials on area roadways is regulated by the California Highway Patrol and the California Department of Transportation. The use and disposal of hazardous materials is heavily regulated at both the federal and state level; these regulations are promulgated and enforced by agencies such as the USEPA, the SWRCB and DTSC, the local Certified Unified Program Agency, California Division of Occupational Safety and Health and the BAAQMD.

As discussed in more detail in Section 3.10, “Hydrology and Water Quality,” coverage under the SWRCB’s Construction General Permit would be obtained for the Project, which would require preparation and implementation of a SWPPP. The SWPPP would include best management practices, including the following and/or similar measures to minimize the risk of accidental spills of hazardous materials during construction:

- Hazardous Spill Prevention. Vehicles and equipment would be maintained in proper working condition to minimize potential fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. Service/maintenance vehicles would carry materials to absorb leaks or spills. Servicing, refueling, and staging of construction equipment would take place only at designated areas where a spill would not flow to drainages. Equipment washing, if needed, would occur only in designated locations where water would not flow into drainage channels. Hazardous spills would be cleaned up immediately and contaminated soil would be properly disposed of at a licensed facility.

As discussed in Section 2.4, “Construction Phasing, Equipment, and Personnel,” before performing demolition activities at the project site, the County or its contractors would retain appropriately-qualified personnel to perform a comprehensive building materials survey for hazardous materials including asbestos-containing materials, lead-based paint, electrical equipment containing polychlorinated biphenyls (PCBs), and fluorescent tubes containing mercury vapors and lights. If any hazardous materials are found, construction worker health and safety regulations and hazardous materials removal and disposal protocols would be implemented in accordance with applicable federal and state standards, including the California Division of Occupational Safety and Health regulations for worker safety and the BAAQMD Regulation 11, Rule 2. The Project contractor would comply with all local, state, and federal requirements regarding hazardous materials and such materials would be disposed of in an approved facility.

Implementation of the SWPPP and associated BMPs, and adherence to regulations which were enacted to protect humans and the environment from accidental release or other hazards associated with the use, transportation, and disposal of hazardous materials, including the handling and disposal of hazardous building materials, would limit potential impacts from Project construction to a **less-than-significant** level.

Operation

Project operation would involve the use and storage of small amounts of hazardous substances such as paints, solvents, and cleaners associated with maintenance, cleaning, and landscaping services at the site, as well as household use of small quantities of commercially available products. None of these substances would be acutely hazardous. Building tenants and maintenance staff would be required to use, store, and dispose of these materials properly in accordance with label directions. Therefore, the use, transport and disposal of such substances is not anticipated to pose a substantial hazard to the public or the environment and this impact would be **less than significant.**

Impact HAZ-2: Hazardous Emissions near Schools

Impact HAZ-2 would result in **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

Impact Analysis

There are no K-12 schools within one-quarter mile of the project site. Thus, the Project would not result in hazardous emissions within a quarter mile of a school. There would be **no impact**.

Impact HAZ-3: Hazards from Cortese-List Sites

Impact HAZ-3 would be **potentially significant**. With implementation of mitigation measures MM-HAZ-3A, MM-HAZ-3B, MM-HAZ-3C, MM-HAZ-3D and MM-HAZ-3E, the impact would be reduced to **less than significant with mitigation.**

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would 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 create a significant hazard to the public or the environment.

Impact Analysis

Construction

As discussed in detail in Section 3.9.1, "Environmental Setting," there is a contaminated groundwater plume beginning at approximately 16.5 to18 feet bgs and extending to a depth of approximately 55 feet bgs underneath the project site and the surrounding area to the south-southwest. The contaminated plume is part of the designated California-Olive-Emerson Study Area, Perimeter Area, and Off-Site Area, which consist of areas of active regulatory oversight and ongoing investigation and remediation by multiple parties and agencies. The California-Olive-Emerson contaminant plume is a Superfund site, and therefore is on the Cortese list. There are two groundwater monitoring wells at the project site, near the Birch Street frontage, which would not be impacted by Project construction. The most recent sampling results from 2019 indicate that several volatile organic compounds (TCE; 1,1-DCA; 1,1-DCE; and cis-1,2-DCE) are present in the groundwater underneath the project site at levels that exceed the relevant ESLs (Partner 2020a).

The Project would not obtain drinking or irrigation water from any on-site or nearby groundwater wells. However, Project-related construction would involve excavation to depths ranging from 17 to 27 feet bgs. Soil borings obtained at the project site in February of 2020 for the geotechnical report prepared by Rockridge Geotechnical (2021a) encountered groundwater at depths ranging from 20 to 23 feet bgs. The historic high groundwater level at the project site (from 2006) is 15 feet bgs (Rockridge Geotechnical 2021b). Therefore, project-related excavation activities could encounter contaminated groundwater, which could result in human health and environmental hazards from direct contact with volatile organic compounds. Therefore, the impact from construction at a site overlying a Cortese-listed groundwater plume would be **potentially significant.**

Mitigation measures MM-HAZ-3A, MM-HAZ-3B, MM-HAZ-3C, and MM-HAZ-3D detailed below, are recommended to address this potentially significant construction-related impact.

MM-HAZ-3A: Perform Site Assessment and Implement Associated Recommendations

Prior to the issuance of a building permit, the Developer shall obtain regulatory oversight from either the County of Santa Clara Department of Environmental Health, the San Francisco Bay Regional Water Quality Control Board, or the California Department of Toxic Substances Control (the "Selected Regulatory Agency"). The Developer shall consult with the Selected Regulatory Agency to identify the requirements needed for a Site Assessment and Conceptual Site Model to ensure adequate characterization of the soil, groundwater, and soil gas at the project site. The Site Assessment and Conceptual Site Model shall examine and discuss all potential exposure pathways, including the following:

- *dermal—physical contact with contaminated soil and groundwater;*
- *inhalation—indoor air quality and dust generated by construction activities and potential vapor intrusion; and*
- *surface and groundwater—potential for overland flow from construction dewatering to enter surface waters, and to percolate into clean groundwater that is not part of the current contaminated groundwater plume.*

The Site Assessment and Conceptual Site Model shall evaluate potential hazards to both construction workers and future site residents and employees during the operational phase, and shall make recommendations governing soil re-use or disposal, and construction dewatering requirements, during construction.

The Developer shall provide the results from the completed Site Assessment and Conceptual Site Model to the Selected Regulatory Agency for review and approval. Once the Selected Regulatory Agency approves the completed Site Assessment and Conceptual Site Model, the Developer shall prepare a Site Management Plan that describes the Developer's plan to manage all of the identified risks and shall submit the Site Management Plan to the Selected Regulatory Agency for review and approval.

The Developer shall incorporate all elements of the approved Site Management Plan into the construction contractor specifications in accordance with Mitigation Measures MM-HAZ-3B and MM-HAZ-3C, and shall inform preparation of a site-specific health and safety plan in accordance with Mitigation Measure MM-HAZ-3D.

MM-HAZ-3B: Obtain Permit for Construction Dewatering of Contaminated Groundwater (as Necessary) and Implement Appropriate Treatment Measures Prior to Discharge

If construction dewatering at the project site is necessary, the Developer shall obtain a permit for construction dewatering of potentially contaminated groundwater from the San Francisco Bay RWQCB. The Developer shall comply with all requirements of the RWQCB permit and shall include all of the RWQCB permit requirements in the construction contractor specifications. An appropriate method for storing the groundwater prior to discharge shall be employed (as determined by a registered environmental engineer retained specifically for the Project in coordination with the Selected Regulatory Agency).

MM-HAZ-3C: Incorporate Standards for HazMat Training and the Proper Handling and Disposal of Contaminated Soils into the Project's Construction Specifications

Based on the results of the Site Assessment and Conceptual Site Model that are completed pursuant to Mitigation Measure MM-HAZ-3A, the Developer shall require specifications and procedures to be followed by the construction contractor for potential contact with contaminated groundwater, and the safe handling, treatment, and disposal of excavated soils from the project site (if soils are found to be contaminated), consistent with all applicable federal, State, and local requirements. The following provisions shall be included in the project's construction specifications:

- *All construction workers who will be involved with ground disturbance shall be trained in Hazardous Waste Operations and Emergency Response (HAZWOPER) as related to contaminated groundwater, and as related to contaminated soil if any is found to be present based on the results of the Phase II investigation.*
- *If the results of the Site Assessment and Conceptual Site Model indicate that contaminated soil is present, then the Developer shall retain a licensed engineering contractor with a Class A license and hazardous substance removal certification to perform any soil removal from the project site. A California-licensed engineer shall provide field oversight on behalf of the Developer, to document the origin and destination of all removed materials. If necessary, removed materials shall be stockpiled temporarily and covered with plastic sheeting, pending*

relocation, segregation, or off-site hauling. To protect groundwater and surface water quality, contaminated soils shall not be stored on-site during the winter rainy season (i.e., November through April). All materials shall be disposed at an appropriately licensed landfill or facility.

- *The Developer shall provide the County Facilities and Fleet Department and Selected Regulatory Agency with documentation verifying that all of these requirements have been met.*

MM-HAZ-3D: Prepare and Implement a Site-Specific Health and Safety Plan.

To protect the health of construction workers and the environment, the Developer shall prepare and implement a site-specific Health and Safety Plan (HASP). The HASP shall be prepared in accordance with State and federal Occupational Safety and Health Administration (OSHA) regulations (29 CFR 1910.120) and shall be approved by a certified industrial hygienist. Copies of the HASP shall be made available to construction workers for review during their orientation training and/or during regular health and safety meetings. The HASP shall identify potential hazards (including contaminated groundwater, and the potential for stained or odiferous soils at any location where earthmoving activities would occur), chemicals of concern, personal protective equipment and devices, decontamination procedures, the need for personal or area monitoring, and emergency response procedures. The HASP shall be consistent with all applicable components of the Site Management Plan approved by the Selected Regulatory Agency pursuant to Mitigation Measure MM-HAZ-3A.

Preparing a Site Management Plan and Conceptual Site Model as required by Mitigation Measure MM-HAZ-3A would result in a thorough evaluation of the specific constituents and their concentrations in groundwater, soil, or soil-gas at or underneath the project site, and would include recommendations for Project construction to reduce environmental and human health hazards. Obtaining a construction dewatering permit and implementing proper groundwater containment, treatment, and discharge measures during construction dewatering as required by Mitigation Measure MM-HAZ-3B would reduce environmental hazards from on-site and off-site surface water and clean groundwater contamination. Incorporating requirements for proper construction worker personnel training related to contaminated groundwater (and contaminated soil, if applicable) along with procedures for appropriate disposal of any contaminated soil as required by Mitigation Measure MM-HAZ-3C, and implementation of a HASP to protect construction personnel as required by Mitigation Measure MM-HAZ-3D, would reduce environmental and human health hazards from contact, handling, and disposal of contaminated groundwater and soil. Therefore, implementation of Mitigation Measures MM-HAZ-3A through MM-HAZ-3D would reduce the potential hazards from construction at a Cortese-listed site to **less than significant with mitigation.**

Operation

Groundwater contamination from the regional Superfund plume has migrated beneath the project site, as discussed above. The plume is being investigated and remediated by others under RWQCB jurisdiction (i.e., the County of Santa Clara is not responsible for remediation). However, volatile organic compounds present in the groundwater could migrate upward through soil pores and potentially could impact indoor air quality in the proposed new building, through vapor intrusion[19]. An analysis was performed to evaluate the potential for off-gassing of chlorinated solvents from the contaminated groundwater plume at the project site (Partner 2020b). Of the six soil gas samples that were analyzed, TCE was detected in one of them (approximately 40 feet southwest of Park Boulevard in the northern portion of the project site) at a concentration that exceeds both the residential and commercial/industrial ESLs. No other constituents of concern were detected at concentrations exceeding the applicable ESLs. Partner (2020b) concluded that due to the known regional groundwater impacts, TCE soil gas concentration at a level above the respective ESLs, and the proposed residential use of the subject property, vapor intrusion may pose a hazard for future residents at the project site. The presence of the new building could also alter the way in which soil vapors migrate through the subsurface, which could potentially affect existing vapor intrusion risks for adjacent properties. Therefore, this impact is considered **potentially significant**.

Mitigation measure MM-HAZ-3E, detailed below, is recommended to address this potentially significant operational impact.

MM-HAZ-3E: Install Vapor Barrier and Perform Periodic Indoor Air Quality Testing, if required

The Developer shall install a Vapor Intrusion Mitigation System (VIMS) or other engineering controls, if required by the Selected Regulatory Agency. The design, installation, and operation of the VIMS and all periodic indoor air quality testing shall comply with all requirements of the Selected Regulatory Agency.

If required by the Selected Regulatory Agency, installation of a vapor barrier and subsequent indoor air quality testing, pursuant to Mitigation Measure MM-HAZ-3E, would protect the health of future building occupants because it would substantially reduce the potential for harmful chemicals to migrate through the soil and off-gas inside the new building. Therefore, implementation of Mitigation Measure MM-HAZ-3E would reduce the potential hazards from Project operation at a Cortese-listed site to **less than significant with mitigation.**

Impact HAZ-4: Airport-related Hazards

Impact HAZ-4 would result in **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would result in a safety hazard or excessive noise for people residing or working in the project area 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.

Impact Analysis

The project site is approximately 2.5 miles southwest of the Palo Alto Airport, and is not located within the airport influence area, airport noise contours, safety zones, or Federal Aviation Administration Part 77 height restriction areas (Santa Clara County Airport Land Use Commission 2016). Thus, there would be **no impact.**

[19] Vapor intrusion occurs when chemical vapors migrate from a subsurface source (such as contaminated groundwater) through the soil into an overlying building. These chemical vapors can degrade indoor air quality, sometimes to the point of posing risks to human health and safety. Factors that can affect the migration of soil vapors include soil type, foundation type and condition, and presence of preferential pathways such as more porous backfill surrounding underground utility pipes.

Impact HAZ-5: Emergency Response or Evacuation Plan Impairment

Impact HAZ-5 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

Impact Analysis

Construction

Construction of the Project would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan. The *Palo Alto Annex to the Santa Clara Operational Area Hazard Mitigation Plan* (City of Palo Alto 2017b) and the *Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area* (Association of Bay Area Governments 2010) do not identify specific evacuation routes, but rather, define responsibilities among the multitude of interested and affected agencies and organizations and identify general response strategies.

All construction activities and staging would occur on the project site, except for the street frontages immediately adjacent to the site. Construction workers would be expected to park in public parking lots within a quarter mile of the project site. As discussed in Section 2.3.2, "Construction Staging, Haul Routes, and Traffic Control," one-way traffic controls and temporary closure of on-street parking would be required on Grant Avenue between Park Boulevard and Birch Avenue throughout the majority of the construction period, and Grant Avenue would likely need to be closed periodically during the construction period to allow for crane mobilization and/or concrete pours, including for 4 to 8 weeks during crane setting of modular units. Lane closures on Birch Avenue (northbound side of median only) and Park Boulevard may also be required occasionally, including two days each for crane setting of the far southwest and far southeast modular units, respectively. Oversized vehicles would be used to haul the modular units to the site, which could temporarily impede traffic flow on highways and local roads.

As described in Section 2.4.2, before the start of construction activities, the County and/or its construction contractor would prepare and implement a traffic control plan as part of the Project, in consultation with the City of Palo Alto, and would require oversized vehicle permit(s) to be obtained from the City and Caltrans for the transportation of the modular units. The traffic control plan would include public notice regarding the Project construction schedule, road closures, and alternative routes; require scheduling of construction-related deliveries during off-peak hours (where feasible); and notification of emergency providers in advance of construction so that alternative routes can be planned for ahead of time.

Therefore, with implementation of the TCP and acquisition of required encroachment and oversized vehicle permits, construction of the Project would not substantially impede access for emergency vehicles and personnel and would not impede emergency evacuation routes or emergency plans created by local or regional agencies. Thus, Project construction would have a **less than significant impact** on emergency response or evacuations.

Operation

As described in Chapter 2, "Project Description," the Project would be designed according to fire code requirements for appropriate emergency ingress and egress. Project operation would not involve any permanent roadway lane closures. Therefore, Project operation would provide appropriate on-site access for emergency vehicles and personnel and would not impede emergency evacuation routes or emergency plans created by local or regional agencies. Thus, there would be **no impact.**

Impact HAZ-6: Wildland Fire Hazards

Impact HAZ-6 would result in **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

Impact Analysis

The project site is not within or near a CAL FIRE State Responsibility Area. The City of Palo Alto, including the project site, is designated as a Local Responsibility Area, and not in or near high or very high fire severity zones (CAL FIRE 2021). The project site is in a developed, urban area in the City of Palo Alto, and is designated as a moderate fire hazard area (City of Palo Alto 2017b). As discussed in detail in Section 3.14, Public Services and Recreation, adequate fire protection services for the project site are available and would continue to be provided by the City of Palo Alto Fire Department. Thus, the Project would not expose people or structures to hazards from wildland fires, and there would be **no impact.**

3.9.4 Cumulative Impacts and Mitigation

As discussed in Section 3.9.3 above, the Project would have no impact related to hazardous emissions near schools (Impact HAZ-2), airport-related hazards (Impact HAZ-4), or exposure to wildland fire (Impact HAZ-6). Therefore, the Project would not contribute to any potential cumulative impacts for these issues. This section analyzes the potential of the Project to contribute to the following cumulative hazardous materials impacts:

- **Impact C-HAZ-1:** Contribution to cumulative effects related to hazards from routine transport, use or disposal and accidental releases of hazardous materials.
- **Impact C-HAZ-3:** Contribution to cumulative effects related to hazards from known hazardous materials sites.
- **Impact C-HAZ-5:** Contribution to cumulative effects related to impairment of an emergency response plan.

Cumulative Impact C-HAZ-1: Use or Release of Hazardous Materials

The overall cumulative impact for C-HAZ-1 would be **less than significant**.
No mitigation is required.

Cumulative Context

With respect to hazards from the use or release of hazardous materials, the geographic context would be limited to those cumulative projects in the vicinity of the project site, with the potential to result in hazardous emissions exposure to the same populations that would potentially be exposed by hazardous material use for the Project. Due the fact that health effects from hazardous substances can result from both short- or long-term exposures, the temporal context for cumulative effects relating to hazardous materials would include any past, present, or probable future projects.

Cumulative Impact Analysis

The potential for hazardous materials issues to occur is specific to each project site and is dependent on the nature of prior activities both on- and off-site; therefore, hazardous materials issues generally do not combine to form cumulative impacts. All cumulative projects, including the 231 Grant Avenue Project, are required to comply with local, state, and federal regulations for transport, use, disposal, and accidental release of hazardous materials, including requirements related to hazardous materials used during construction or operation and handling and disposal of hazardous building materials such as ACMs and lead-based paints. Application of these regulations is mandatory; therefore, the overall cumulative impact from the use or release of hazardous materials would be **less than significant.**

Cumulative Impact C-HAZ-3: Hazards from Cortese-List Sites

The overall cumulative impact for C-HAZ-3 would be **less than significant with mitigation**. No additional mitigation is required above that identified in Section 3.9.3.

Cumulative Context

The geographic context for this cumulative impact analysis is limited to those cumulative projects in the vicinity of the project site, with the potential to disturb or remobilize existing contaminants associated with the existing regional groundwater plume or other Cortese-listed sites in proximity to the project site. Due the fact that health effects from hazardous substances can result from both short- and long-term exposures, the temporal context for cumulative effects relating to hazardous materials would include any past, present, or probable future projects.

Cumulative Impact Analysis

As discussed within Section 3.9.3, a contaminated groundwater plume originating from a nearby Superfund site is present beneath the ground surface within a radius of approximately 0.3 mile south-southeast of the project site, and underlies both the Public Safety Building under construction at 350 Sherman Avenue and the project site. Contamination is being remediated by a variety of parties with regulatory oversight from several agencies. The County of Santa Clara is not responsible for remediation. The EIR prepared for the Public Safety Building at Sherman Avenue found that impacts from construction in the vicinity of the contaminated groundwater plume would be less-than-significant with incorporation of mitigation measures. Any other sites considered in this cumulative analysis that may be contaminated with hazardous materials would be evaluated and remediated on a case-by-case basis, with mitigation measures recommended as needed to reduce potential impacts. For the Project, the County would implement Mitigation Measures MM-HAZ-3A through MM-HAZ-3E, which would reduce Project-related environmental and human health hazards during construction, and would require incorporation of Project design methods to prevent human health hazards from indoor air quality issues during Project operation related to potential off-gassing from the contaminated groundwater plume. Furthermore, any measures necessary to protect construction and operation related to human health and the environment at other cumulative project sites would be confined to those specific sites and would not be additive in nature. Therefore, the overall cumulative impact from construction and operation in a known hazardous materials site would be **less than significant with mitigation.** No additional mitigation is required above that identified for the Project-level analysis in Section 3.9.3.

Cumulative Impact C-HAZ-5: Emergency Response or Evacuation Plan Impairment

The overall cumulative impact for C-HAZ-5 would be **less than significant**.
No mitigation is required.

Cumulative Context

The geographic context for cumulative impacts from impairment of emergency response plans would be limited to those cumulative projects in the immediate vicinity of the project site, with the potential to result in temporary or permanent disruption to the same roading network that the Project would temporarily impact. The temporal context for cumulative effects relating to impairment of emergency response plans would be limited to those projects which have construction periods that could overlap with the Project's construction schedule.

Cumulative Impact Analysis

The only known past, present or reasonably foreseeable project in the immediate vicinity of the project site that would have an overlapping construction period with the Project would be the Public Safety Building that is currently under construction at 350 Sherman Avenue. Construction of the Public Safety Building and associated parking garage may result in intermittent closure of streets surrounding Parking Lots C-6 and C-7 during construction. The streets potentially affected could include portions of Sherman Avenue, Birch Street, Ash Street, and Jacaranda Lane. To a lesser degree, construction activities associated with the Public Safety Building could also result in intermittent reduced service on Park Boulevard. Construction of the Project would also result in lane closures that could impede emergency vehicles on local streets adjacent to the project site, including portions of Birch Street and Park Boulevard. However, a traffic control plan for the Project would be implemented as described in Section 2.3.2, "Construction Staging, Haul Routes, and Traffic Control," to minimize the disruption to local traffic on streets adjacent to the project site. Furthermore, the project site is in an urbanized area of Palo Alto where the street grid pattern provides alternate travel routes throughout the City, including the areas around the Public Safety Building site and the project site where temporary land closures may be required. For the reasons listed above, the overall cumulative impact to emergency response and access would be **less than significant**.

3.10 Hydrology/Water Quality

This section describes the existing hydrology and water quality setting of the project area and evaluates whether the Project would result in adverse effects on these resources. No comments relating to hydrology and water quality were received during the public scoping period in response to the Notice of Preparation.

3.10.1 Environmental Setting

Hydrology

The project site is within the City of Palo Alto, in the Lower Peninsula Watershed, which covers approximately 98 square miles. There are several small creeks in the watershed that flow eastward from the Santa Cruz Mountains into southwest San Francisco Bay and its tidal wetlands. As the streams flow out of the Santa Cruz foothills and onto the alluvial plains, they become wider and less steep, and typically have been modified and/or channelized to accommodate residential and commercial land uses, which extend right up to the top of the channel banks. The lowest stream reaches in the watershed were extended and straightened into flood control channels that direct flow out through the Baylands and into south San Francisco Bay. Historically, these channels were distributaries on the alluvial plain. Today, some reaches in the lower watershed have a buffer of riparian vegetation, while other reaches are concrete trapezoidal channels without any riparian zone (San Francisco Estuary Institute and The Aquatic Science Center 2017). The project site is within the Matadero Creek Subwatershed. Matadero Creek, approximately 1,700 feet to the southeast, is the closest surface water feature to the project site.

The alluvial plains of the Bay Area, where the project site is located, have a Mediterranean climate that is marine-influenced. Palo Alto has an average annual high temperature of 70.3 fahrenheit (°F) and average annual low temperature of 46.8°F. Most of the rainfall occurs between November and March. The mean annual precipitation in Palo Alto is 16 inches, and it occurs entirely as rainfall (i.e., snowmelt does not affect runoff in Palo Alto) (Schaaf & Wheeler 2015a).

Flooding, Tsunami and Seiche

The project site is approximately 2 miles west of San Francisco Bay, and is approximately 32 feet above mean sea level. Most of the streets in Palo Alto have traditional curb and gutter-lined streets which limit the rate of stormwater runoff before it reaches a storm drainage catch basin. Local storm drains are designed to convey runoff from a 10-year storm. In addition to storm drains, flood protection is provided to Palo Alto by San Francisquito Creek, Matadero Creek, Barron Creek, Adobe Creek, and the Palo Alto Flood Basin. The creeks and flood basin are designed to convey runoff from a 100-year storm (Schaaf & Wheeler 2015a).

The project site is not located in a 100-year flood zone as designated by the Federal Emergency Management Agency (FEMA 2009). The project site is designated by FEMA as Zone X (shaded), which is an area of moderate flood hazard that is generally located between the 100- and 500-year flood zones. Zone X (shaded) is defined as the 0.2% annual exceedance probability (AEP) flood hazard, areas of 1% AEP with average flood depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% AEP flood. Flood insurance is not required for facilities or uses within FEMA Zone X.

A tsunami is an ocean wave usually created by undersea fault movement or by a coastal or submerged landslide. As the displaced water moves to regain equilibrium, waves are formed and radiate across the open water. When the waveform reaches the coastline, it quickly raises the water level, with accompanying high water velocities that can damage structures and sweep away objects and people. The project site is not in a tsunami inundation zone (California Emergency Management Agency and California Geological Survey 2019).

A seiche occurs when a standing wave sets up on rivers, reservoirs, ponds, and lakes when seismic waves from an earthquake pass through the area. Because they occur in an enclosed waterbody, standing waves continue to slosh back and forth over a period of time that may range from a few minutes to several hours. The nearest waterbody with potential for seiches is the San Francisco Bay, approximately 2 miles east of the project site, and 32 feet lower in elevation.

Surface Water Quality

Water quality in the San Francisco Bay and its tributaries is regulated primarily by the San Francisco Bay RWQCB, which has established narrative and numeric standards for Matadero Creek, Mayfield Slough, and the South San Francisco Bay in its *Water Quality Control Plan for the San Francisco Bay Basin* (San Francisco Bay RWQCB 2019).

Table 3.10-1 lists the existing and potential beneficial uses designated in the San Francisco Bay Basin Plan for surface waters that could receive runoff from the Project. Applying the San Francisco Bay Water Board’s “tributary rule,” the beneficial uses of any specifically identified water body generally apply to all its tributaries. In some cases, a beneficial use may not be applicable to the entire body of water; in these cases, the San Francisco Bay Water Board’s judgment regarding water quality control measures necessary to protect beneficial uses will be applied. In addition, beneficial uses of streams that only have intermittent flows must also be protected throughout the year (San Francisco Bay RWQCB 2019).

Section 303(d) of the Clean Water Act (CWA) requires states to identify waters where the permit standards, any other enforceable limits, or adopted water quality standards are still unattained. The CWA requires states to develop total maximum daily loads (TMDLs) to improve the water quality of impaired water bodies. TMDLs are the quantities of pollutants that can be safely assimilated by a water body without violating water quality standards. TMDLs are developed for impaired water bodies to maintain beneficial uses as designated in the applicable Basin Plan, achieve water quality objectives, and reduce the potential for future water quality degradation. NPDES permits for water discharges must consider the pollutants for which a water body is listed as impaired.

Matadero Creek is on the CWA Section 303(d) list of impaired water bodies for diazinon (TMDL approved 2007) and trash. South San Francisco Bay is on the CWA Section 303(d) list for chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, dioxin compounds, furan compounds, invasive species, mercury (TMDL approved 2008), PCBs and dioxin-like PCBs (TMDLs approved 2010), and selenium (State Water Resources Control Board 2017).

Table 3.10-1 Beneficial Uses of Surface Waters in the Project Area

Beneficial Use	Water Bodies in Project Area with Existing Beneficial Use
Industrial Process Supply	San Francisco Bay, Lower
Commercial and Sport Fishing	San Francisco Bay, Lower
Shellfish Harvesting	San Francisco Bay, Lower
Cold Freshwater Habitat	Matadero Creek
Estuarine Habitat	Mayfield Slough San Francisco Bay, Lower
Fish Migration	Matadero Creek Mayfield Slough San Francisco Bay, Lower
Rare & Endangered Species Preservation	Matadero Creek Mayfield Slough San Francisco Bay, Lower
Fish Spawning	Matadero Creek San Francisco Bay, Lower
Warm Freshwater Habitat	Matadero Creek
Wildlife Habitat	Matadero Creek Mayfield Slough San Francisco Bay, Lower
Water Contact Recreation	Matadero Creek Mayfield Slough San Francisco Bay, Lower
Non-Contact Water Recreation	Matadero Creek Mayfield Slough San Francisco Bay, Lower
Navigation	San Francisco Bay, Lower

Source: Adapted from San Francisco Bay RWQCB 2019.

Stormwater Drainage

Stormwater runoff in the City of Palo Alto is conveyed through a storm drain network and discharged to one of several creeks or San Francisco Bay through a combination of pump stations and gravity outfalls.

The Matadero drainage area (which includes the project site) is approximately 8.43 square miles, and is bounded by University Avenue to the north, U.S. 101 to the east, and Barron Creek to the south. Stormwater flow drains primarily into Matadero Creek, with some flow draining into San Francisquito Creek. The Matadero drainage area includes four pump stations (Matadero, San Francisquito, Colorado, and Embarcadero underpass), and approximately 55 miles of drainage pipelines (Schaaf & Wheeler 2015a).

A stormwater drainage line is present directly underneath the project site, heading southeast where it ties into a pipeline in Page Mill Road. From there, stormwater flows east along Page Mill Road, and then south along Park Boulevard to an outfall on Matadero Creek. Matadero

Creek discharges into Mayfield Slough (east of U.S. 101) and thence into the South San Francisco Bay (Schaaf & Wheeler 2015a).

Groundwater

The project site is in the Santa Clara Valley Groundwater Basin (Basin No. 2-009.02). Groundwater flows from the edges of the basin along the mountain fronts, where a combination of natural and artificial recharge enters the aquifers, to the pumping centers in the central part of the basin and to the San Francisco Bay. Groundwater inflow occurs as recharge, subsurface flow along the northern coastal boundary of the southern San Francisco Bay, and water derived from aquifer storage. Groundwater recharge occurs from infiltration of precipitation in excess of runoff and evaporation, streamflow infiltration, and artificial recharge. Groundwater outflow occurs as evapotranspiration, stream flow, discharge through well pumping, and subsurface flow to the San Francisco Bay (Hanson et al. 2004).

The main groundwater aquifer consists of upper and lower levels. The upper aquifer is composed of Holocene- and Mid to Late Pleistocene-age deposits. The lower aquifer is composed of Early Pleistocene- and Pliocene-age deposits. Regional faults, such as Silver Creek, Evergreen, and Monte Vista-Shannon, serve as barriers to water movement in the aquifer (Hanson et al. 2004).

The Santa Clara Valley Groundwater Basin is managed by the Santa Clara Valley Water District (the District). Although most of the groundwater pumped from the basin is a result of District-managed recharge programs, the basin provides some groundwater supply resulting from the percolation of rainfall in the recharge areas and natural seepage through local creeks and streams. In addition, the groundwater basin serves as an extensive conveyance network, allowing water to move from the recharge areas to individual groundwater wells. The groundwater basin also provides some natural filtration of surface water as it percolates through the soil and rock. Finally, the groundwater basin provides water storage, allowing water to be carried over from the wet season to the dry season and from wet years to dry years. Due to the District’s comprehensive groundwater management programs, the basin is in long-term balance (Santa Clara Valley Water District 2016).

The Santa Clara Valley Groundwater Basin is a high-priority basin as designated by the California Department of Water Resources (DWR) under the Sustainable Groundwater Management Act (SGMA); however, this basin is not in a state of critical overdraft (DWR 2019). The Santa Clara Valley Water District serves as the Groundwater Sustainability Agency for this basin. The District’s 2016 Groundwater Management Plan was submitted to DWR as an Alternative Groundwater Sustainability Plan under the SGMA (Santa Clara Valley Water District 2016).

Soil borings obtained at the project site in February of 2020 for the geotechnical report prepared by Rockridge Geotechnical (2021a) encountered groundwater at depths ranging from 20 to 23 feet bgs. The historic high groundwater level at the project site (from 2006) is 15 feet bgs (Rockridge Geotechnical 2021b).

3.10.2 Regulatory Framework

Federal

Clean Water Act

The primary federal law governing water quality is the Clean Water Act, enacted in 1972. The Act provides for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. The Clean Water Act emphasizes technology-based control strategies and requires discharge permits to allow use of public resources for waste discharge. The Act also limits the amount of pollutants that may be discharged and requires wastewater to be treated with the best treatment technology economically achievable regardless of receiving water conditions. The control of pollutant discharge is established through NPDES permits that contain effluent limitations and standards. The USEPA has delegated responsibility for implementation of portions of the Clean Water Act, such as Sections 303 and 402 (discussed below), to the SWRCB.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act is the basic water quality control law for California. The Porter-Cologne Water Quality Control Act authorizes the state to implement the provisions of the Clean Water Act and establishes a regulatory program to protect the water quality of the state and the beneficial uses of state waters.

The act requires project proponents whose projects would result in discharge of wastes that could affect the quality of the state's water to file a report of waste discharge with the appropriate RWQCB. The Porter-Cologne Water Quality Control Act also requires that the SWRCB or a RWQCB adopt basin plans for the protection of water quality. Basin plans are updated and reviewed every 3 years and provide the technical basis for determining waste discharge requirements (WDRs), taking enforcement actions, and evaluating clean water grant proposals. As required by the Porter-Cologne Water Quality Control Act and the CWA, basin plans include the following information:

- designated beneficial water uses;
- water quality objectives needed to protect the designated beneficial water uses; and
- strategies and time schedules for achieving the water quality objectives.

RWQCBs designate beneficial uses for all water body segments in their jurisdictions, and then set criteria necessary to protect these uses. Consequently, the water quality objectives developed for particular water segments are based on the designated use and vary depending on such use. Basin Plans specify region-wide and water body-specific beneficial uses. RWQCBs set numeric and narrative water quality objectives for constituents of concern for surface waters in their regions. Specific objectives for concentrations of chemical constituents are applied to bodies of water based on their designated beneficial uses.

Clean Water Act Section 303(d) and Total Maximum Daily Loads

California adopts water quality standards to protect beneficial uses of waters of the state as required by Section 303(d) of the federal Clean Water Act and the state Porter-Cologne Water Quality Control Act. The SWRCB identifies waters failing to meet standards for specific pollutants, which are then state-listed in accordance with CWA Section 303(d). If it is determined that waters of the state are impaired for one or more constituents, and the standards cannot be met through point-source or nonpoint-source controls (NPDES permits or WDRs), the CWA requires the establishment of TMDLs. Implementation of this program in the Bay Area is conducted by the San Francisco Bay RWQCB. To identify candidate water bodies for TMDL analysis, a list of water quality-impaired segments is generated by the SWRCB. These stream or river segments are impaired by the presence of pollutants and are more sensitive to disturbance because of this impairment.

In addition to the impaired water body list required by Clean Water Act Section 303(d), Section 305(b) requires states to develop a report assessing statewide surface water quality. For the current listing cycles, the State Water Board has combined its 303(d) list and the 305(b) report into the 2014 and 2016 California Integrated Report (SWRCB 2017), which was approved by the USEPA in 2018. The 2018 Integrated Report is still in process.

Clean Water Act Section 402—National Pollutant Discharge Elimination System

The 1972 amendments to the Federal Water Pollutant Control Act established the NPDES permit program to control discharges of pollutants from point sources (Section 402). The 1987 amendments to the CWA created a new section of the act devoted to stormwater permitting (Section 402[p]). USEPA has granted primary administration and enforcement of the provisions of the CWA and NPDES to the SWRCB and the nine RWQCBs. NPDES is the primary federal program that regulates point-source and nonpoint-source discharges to waters of the United States. CWA Section 402 also includes WDRs for dewatering activities.

NPDES permit regulations have been established for broad categories of discharges, including point source municipal waste discharges and nonpoint source stormwater runoff. NPDES permits generally identify limits on the concentrations and/or mass emissions of pollutants in effluent discharged into receiving waters; prohibitions on discharges not specifically allowed under the permit; and provisions that describe required actions by the discharger, including industrial pretreatment, pollution prevention, self-monitoring, and other activities.

In November 1990, USEPA published regulations establishing NPDES permit requirements for municipal and industrial stormwater discharges. Phase I of the permitting program applied to municipal discharges of stormwater in urban areas where the population exceeded 100,000 persons.[20] Phase II of the NPDES stormwater permit regulations became effective in March 2003 and required small municipality areas of less than 100,000 persons to develop stormwater management programs.

National Pollutant Discharge Elimination System Construction General Permit

The SWRCB's statewide NPDES Permit, Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2009-009-DWQ as amended by Order Nos. 2010-0014-DWQ and 2012-0006-DWQ) (Construction General Permit), is applicable to all construction activities that would disturb 1 acre of land or more (SWRCB 2012). Construction activities subject to the general construction activity permit include clearing, grading, stockpiling, and excavation. Dischargers are required to eliminate or reduce non-stormwater discharges to storm sewer systems and other waters.

Through the NPDES and WDR process, the SWRCB and its RWQCBs seek to ensure that the construction and post-construction conditions at a project site do not cause or contribute to direct or indirect impacts on water quality (i.e., pollution and/or hydromodification) upstream and downstream. To comply with the requirements of the Construction General Permit, project

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[20] Phase I also applies to storm water discharges from a large variety of industrial activities, including general construction activity if the project would disturb more than 5 acres.

applicants must file a Notice of Intent with the SWRCB to obtain coverage under the permit; prepare a SWPPP; and implement inspection, monitoring, and reporting requirements appropriate to the project's risk level as specified in the SWPPP. The SWPPP must include a site map, describe construction activities and potential pollutants, and identify BMPs that would be employed to prevent soil erosion and discharge of other construction-related pollutants that could contaminate nearby water resources, such as petroleum products, solvents, paints, and cement. Construction activities subject to the general construction activity permit include clearing, grading, stockpiling, and excavation. Dischargers are required to eliminate or reduce non-stormwater discharges to storm sewer systems and other waters. The permit also requires dischargers to consider the use of post-construction permanent BMPs that will remain in service to protect water quality throughout the life of the project. All NPDES permits also have inspection, monitoring, and reporting requirements.

The San Francisco Bay RWQCB also has the authority to issue waivers to WDRs for "low threat" discharge activities that have minimal potential for adverse water quality effects when implemented according to prescribed terms and conditions. This includes minor discharges of uncontaminated groundwater during construction dewatering, which is regulated by the San Francisco Bay RWQCB under the Construction General Permit.

Sustainable Groundwater Management Act

In 2014, the California Legislature enacted a three-bill law (AB 1739, SB 1168, and SB 1319), known as the Groundwater Management Act. The Act was created to provide a framework for the sustainable management of groundwater supplies, and to strengthen local control and management of groundwater basins throughout the state with little state intervention. The Sustainable Groundwater Management Act is intended to empower local agencies to adopt groundwater sustainability plans that are tailored to the resources and needs of their communities, such that sustainable management would provide a buffer against drought and climate change, and ensure reliable water supplies regardless of weather patterns.

The Sustainable Groundwater Management Act and corresponding regulations require that each high- and medium-priority groundwater basin is operated to a sustainable yield, balancing natural and artificial groundwater recharge with groundwater use to ensure undesirable results such as chronic lowering of groundwater levels, loss of storage, water quality impacts, land subsidence, and impacts to hydraulically connected streams do not occur. The Sustainable Groundwater Management Act is considered part of the statewide, comprehensive California Water Action Plan that includes water conservation, water recycling, expanded water storage, safe drinking water, and wetlands and watershed restoration. The Act protects existing surface water and groundwater rights and does not affect current drought response measures.

California's 515 groundwater basins are classified into one of four categories: high-, medium-, low-, or very low-priority based on components identified in the California Water Code Section 10933(b). Basin priority determines which provisions of California Statewide Groundwater Elevation Monitoring and the Sustainable Groundwater Management Act apply in a basin. In 2019, the DWR completed the first phase of responses to comments and final re-prioritization of groundwater basins in Phase I, along with draft prioritizations of groundwater basins included in Phase II (DWR 2019.

The Sustainable Groundwater Management Act requires that local agencies form one or more groundwater sustainability agencies (GSAs) within 2 years (i.e., by June 30, 2017). Agencies located within high- or medium-priority basins must adopt a groundwater sustainability plan (GSP) or Alternative GSP. The time frame for adoption of GSPs in basins determined by DWR to be in a condition of “critical overdraft” is by January 31, 2020; all other high and medium priority basin have until January 31, 2022. Local agencies will have 20 years to fully implement GSPs after the plans have been adopted. Intervention by the SWRCB would occur if a GSA is not formed by the local agencies, and/or if a GSP is not adopted or implemented. GSPs are not required for low- and very low-priority groundwater basins.

GSPs must define the sustainable yield of the basin, identify what would constitute undesirable results in the basin, and identify the projects and actions (including monitoring) that will be implemented to ensure the basin is managed to avoid undesirable results. DWR evaluates the GSP and provides the GSA with an assessment of the plan and any necessary recommendations every 5 years following its establishment. Reports by the GSA that include monitoring data and information are due annually to DWR. GSAs may choose to submit an Alternative GSP, which may consist of an existing groundwater management plan that demonstrates a reasonable expectation of achieving sustainability within 20 years. An Alternative GSP may also consist of a basin adjudication with existing governance and oversight, or a 10-year analysis of basin conditions showing sustainable operations with no undesirable results such as subsidence, saltwater intrusion, or degraded water quality.

Local

County Grading and Drainage Ordinance

The County of Santa Clara Ordinance Code, Title C, Division C12, Chapter 3, regulates grading and drainage in unincorporated Santa Clara County and on lands owned or leased by the County. A drainage permit is required if a project would create more than 2,000 square feet of new impervious area or change the existing drainage pattern on the property, unless approved pursuant to a grading permit issued by the County. A drainage permit requires submittal of site-specific drainage plans and erosion control plans, and drainage calculations prepared by a licensed civil engineer.

County Drainage Manual

Section C12-562 of the County Drainage Ordinance requires drainage structures and devices required by the Ordinance to be designed and constructed in accordance with the County Drainage Manual. This manual provides a framework for the various hydraulic and hydrologic analyses necessary to plan and design storm drainage and flood control facilities. The manual includes multiple design standards, methods of analyses, and engineering tools required for the planning and design of stormwater drainage systems and flood control facilities. The manual requires all projects subject to the County Drainage Ordinance to be designed such that the stormwater runoff generated from the 10-year design storm is conveyed in the storm drainage system (underground pipes and/or stable open channels) and the stormwater runoff generated from the 100-year design storm is safely conveyed away from the project site without creating and/or contributing to downstream or upstream flooding conditions (County of Santa Clara 2007).

Santa Clara Valley Urban Runoff Pollution Prevention Program

The project site lies within the jurisdiction of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP). SCVURPPP is an association of the County of Santa Clara, the Santa Clara Valley Water District and the 13 cities and towns in Santa Clara County that are in the jurisdiction of the San Francisco Bay RWQCB (including the City of Palo Alto). The SCVURPPP has an NPDES/WDR permit to discharge stormwater from municipal separate storm sewer systems (MS4 Permit) issued by the San Francisco Bay RWQCB (Order No. R2-2015-0049) (San Francisco Bay RWQCB 2015).

The MS4 Permit requires the SCVURPPP and its members agencies (including the County of Santa Clara and the City of Palo Alto) to reduce pollutants in stormwater discharges to the maximum extent practicable and to effectively prohibit non-stormwater discharges. The MS4 Permit contains requirements for implementing urban runoff controls consistent with the TMDLs that apply to specific watershed boundaries. Member agencies must meet the provisions of the Municipal Regional Stormwater Permit by ensuring that new development and redevelopment mitigate water quality impacts to stormwater runoff both during the construction and operation of projects.

The Program's Permit Provision C.3 contains requirements for controlling the potential impacts of land development on stormwater quality and flow (SCVURPPP 2016). Project proponents are required to incorporate site design measures, pollutant source controls, specific treatment control measures, hydromodification management measures, and operations and maintenance requirements, all of which are specifically intended to reduce erosion and the transport of sediment and other pollutants in stormwater. Project proponents are also required to incorporate planning for Green Stormwater Infrastructure as part of the *Santa Clara Basin Stormwater Resource Plan* (SCVURPPP 2019). Green Stormwater Infrastructure projects use vegetation, soils, and natural processes to capture stormwater and dry weather runoff from impervious surfaces throughout the urban landscape. Green Stormwater Infrastructure helps to reduce the quantity of pollutants and runoff entering the storm drain system, recharge groundwater and augment potable water supply, and reduce local flooding.

City of Palo Alto Drainage Design Standards

The City of Palo Alto Drainage Design Standards (Schaaf & Wheeler 2015b) require submittal of drainage calculations for city approval (including hydrology and hydraulic calculations and drainage plans) for new subdivisions, development, redevelopment, or site improvements, as deemed necessary by the City Engineer. Design flows must be calculated using the methods described in the 2007 Santa Clara County Drainage Manual. The Drainage Design Standards include requirements for stormwater detention and retention and pump station criteria. In addition, the Drainage Design Standards include criteria for all new development in the Palo Alto watershed related to stormwater management (including low impact development [LID] practices), erosion and sediment control, and water quality.

Site design requirements related to water quality are provided in the Stormwater Handbook produced by the SCVURPPP (SCVURPPP 2016). Site design measures may include reducing the size of impervious areas, rainwater harvesting and use, and tree preservation and planting.

3.10.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to hydrology and water quality:

- **Impact HYD-1:** Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?
- **Impact HYD-2:** Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge?
- **Impact HYD-3:** Would the Project substantially alter drainage patterns resulting in erosion or siltation, flooding, pollution, or redirection of flood flows?
- **Impact HYD-4:** Would the Project risk release of pollutants in flood, tsunami, or seiche hazard zones?

- **Impact HYD-5:** Would the Project conflict with a water quality control plan or sustainable groundwater management plan?

Impact HYD-1: Water Quality Standard Violations

Impact HYD-1 would be **potentially significant**. With implementation of Mitigation Measure MM-HAZ-3B the impact would be reduced to a **less-than-significant** level.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.

Impact Analysis

Construction

Project construction activities would require vegetation removal, excavation, grading, material stockpiling, and staging that would temporarily disturb surface soils. These activities would expose soil to the erosive forces of wind and water. The soil ultimately could be transported via the storm drainage system or overland sheet flow to Matadero Creek and the San Francisco Bay, increasing turbidity and degrading water quality.

The potential for accidental releases of chemicals also would be present during construction. If released, substances such as fuels, oils, paints, concrete, and solvents could be transported to the storm drain system and/or groundwater in stormwater runoff, wash water, or dust-control water, potentially reducing the quality of the receiving waters. Erosion and construction-related wastes would have the potential to degrade water quality and beneficial uses, if they were to enter runoff and flow into waterways, potentially altering the dissolved oxygen content, temperature, pH, suspended sediment, turbidity levels, and/or nutrient content of receiving waters, or causing toxic effects on the aquatic environment. Therefore, project construction activities without proper stormwater management measures could violate water quality standards or otherwise substantially degrade water quality.

The Project would comply with the provisions of the SWRCB's Construction General Permit (SWRCB 2012). The Construction General Permit regulates stormwater discharges for construction activities under the federal CWA. The Construction General Permit applies to all land-disturbing construction activities that would disturb 1 acre or more. The Developer would submit a Notice of Intent to discharge to the San Francisco Bay RWQCB and would prepare and implement an SWPPP, including BMPs to minimize those discharges.

Pursuant to the Construction General Permit, the Developer would eliminate or reduce non-stormwater discharges to storm sewer systems and other waters; implement permanent post-construction BMPs that would remain in service to protect water quality throughout the life of the project; implement construction and operational design features and BMPs specifically intended to reduce the potential for downstream hydromodification; implement BMPs designed to prevent accidental spills of hazardous materials during the construction phase to the maximum extent practicable, and include procedures for immediate cleanup if any releases occur. These measures, which are mandatory for the Project because it would disturb more than 1 acre of land, would protect water quality from degradation associated with erosion or accidental spills during construction, as required by the San Francisco Bay Basin Plan.

However, short-term construction dewatering may be necessary during excavation for the Project in the eastern portion of the project site, particularly if drilled displacement columns are installed as part of the building foundation system. As discussed in detail in the Environmental Setting of Section 3.9, “Hazards and Hazardous Materials,” and Impact HAZ-3, Project-related deep excavation could encounter the existing groundwater plume that is contaminated with volatile organic compounds, which emanates from a nearby Superfund site. Project-related discharge of this contaminated groundwater, without proper containment and treatment, could result in contamination of both surface waters and off-site clean groundwater that is not part of the plume, thereby violating San Francisco Bay RWQCB water quality standards. Therefore, this impact is considered **potentially significant**.

Mitigation Measure MM-HAZ-3B, detailed in Section 3.9.3, “Hazards and Hazardous Materials,” is recommended to address this potentially significant impact.

> ***Implement MM-HAZ-3B: Obtain Permit for Construction Dewatering of Contaminated Groundwater [as Necessary] and Implement Appropriate Treatment Measures Prior to Discharge.*** *See Section 3.9.3 for full details of this measure.*

Obtaining a construction dewatering permit and implementing proper groundwater containment, treatment, and discharge measures during construction dewatering as required by Mitigation Measure MM-HAZ-3B would reduce the potential for downstream surface water contamination and resulting water quality degradation. Therefore, implementation of Mitigation Measure MM-HAZ-3B would reduce the construction-related impacts of the Project from violation of water quality standards to **less-than-significant with mitigation**.

Operation

During the Project’s operational phase, the project site would continue to drain to the existing drainage system that discharges to Matadero Creek. The County would continue to implement the requirements of the MS4 Permit issued by the San Francisco Bay RWQCB, which requires the SCVURPPP and its member agencies (including the County of Santa Clara and the City of Palo Alto) to reduce pollutants in stormwater discharges to the maximum extent practicable and to effectively prohibit non-stormwater discharges. Therefore, Project operation would result in **less-than-significant** impacts on surface water and groundwater quality and would not violate water quality standards.

Impact HYD-2: Groundwater Supply and Recharge

Impact HYD-2 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Impact Analysis

Construction

Water that is necessary for construction activities (e.g., for dust control) would be supplied by trucks and would not require the use of groundwater. In February 2020, groundwater was present at the project site at depths ranging from 20 to 23 feet bgs (Rockridge Geotechnical 2021a). The historic high groundwater level at the project site (from 2006) is 15 feet bgs (Rockridge Geotechnical 2021b). The majority of the project site would be excavated to approximately 5 feet bgs and therefore is not anticipated to encounter groundwater. However, in the eastern portion of the project site, excavation would occur up to a maximum depth of between 17 and 27 feet bgs, depending on the foundation design. Therefore, groundwater may be encountered during excavation in the eastern portion of the project site. The site clearing, grading and excavation phase of construction is anticipated to last up to 6 weeks, with deep excavations only occurring for a portion of that period. Therefore, any construction dewatering that may be necessary at the site would be minor and short-term.

Because the Project would not use groundwater as a source of water supply, and only a small amount of water would be removed for short-term construction dewatering, construction of the Project would result in a **less-than-significant** impact related to decreases in groundwater supplies or interference with groundwater recharge.

Operation

As discussed in more detail in Section 3.18, “Utilities and Service Systems,” the City of Palo Alto, including the project site, receives its potable water supply from the San Francisco Public Utilities Commission, from Sierra Nevada snowmelt delivered through the Hetch Hetchy water distribution system. The Project would not include the use of groundwater for water supply. The two existing on-site groundwater wells are not permitted as a source of water supply; rather, they are used only for monitoring the regional contaminated groundwater plume that is present underneath the project site and the surrounding area (see Section 3.9, “Hazards and Hazardous Materials,” for additional information related to the groundwater plume).

Most of the project site is currently developed with an existing building and paved parking lots, with a total impervious surface area of 40,018 square feet (i.e., approximately 80 percent of the project site). Implementation of the Project would result in a minor increase (1,240 square feet) in the impervious surface area to 41,258 square feet compared to pre-project conditions (i.e., an approximately 3 percent increase in impervious area over existing conditions). The remaining area, approximately 10,314 square feet, would consist of irrigated landscape areas; applied irrigation water throughout this area would continue to percolate through the soil to replenish groundwater. Therefore, only a minor decrease in the existing groundwater recharge capability at the project site would occur.

Because the Project would not use groundwater as a source of water supply, and would result in only a minor decrease in the pervious area available for groundwater recharge, operation of the Project would have a **less-than-significant** impact related to decreases in groundwater supplies or interference with groundwater recharge.

Impact HYD-3: Alteration of Drainage Patterns

Impact HYD-3 would be **less than significant**. No mitigation is required.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would 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:

- result in substantial erosion or siltation on- or off-site,
- substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite,
- 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.

- impede or redirect flood flows.

Impact Analysis

Construction

Construction of the Project would include demolition, excavation, trenching, and grading activities that would alter the existing on-site drainage patterns on the site. However, the proposed earthworks would not involve the alteration of a stream or river and would not result in substantial redirection of stormwater or flood flows to adjacent properties. Preparation of the SWPPP and implementation of the associated BMPs designed to reduce erosion and siltation as required by the Construction General Permit (discussed in more detail under Impact HYD-1, above) would protect water quality as required by the San Francisco Bay Basin Plan and would minimize the potential for substantial erosion or siltation. Therefore, construction-related impacts from the alteration of drainage patterns would be **less than significant.**

Operation

As discussed for Impact HYD-2, above, the Project would result in a minor increase in impervious surfaces (1,240 square feet) for a total impervious surface area of 41,258 square feet. This in turn would result in a minor increase (approximately 3 percent) in stormwater runoff compared to existing conditions. However, a City stormwater drainage line is located underneath the project site, and the Project would install the required tie-in to that existing line. The County would utilize the *Santa Clara County Drainage Manual* (County of Santa Clara 2007) to calculate stormwater runoff and design an appropriate on-site system designed to appropriately detain and pre-treat stormwater using LID methods.

The County would continue to implement the requirements of the MS4 Permit issued by the San Francisco Bay RWQCB, which requires the SCVURPPP and its member agencies (including the County of Santa Clara and the City of Palo Alto) to reduce pollutants in stormwater discharges to the maximum extent practicable and to effectively prohibit non-stormwater discharges. Minor non-point source pollutants at the project site (i.e., small amounts of herbicides and insecticides to maintain the landscaping) would be controlled by adhering to manufacturer's use and disposal recommendations, and by the County's continued compliance with the SCVURPPP's MS4 Permit.

In addition, the County's Integrated Pest Management and Pesticide Use Ordinance (County of Santa Clara Ordinance Code, Division B28), which applies to lands owned by the County, strictly regulates what pesticides may be used and allows only the least hazardous pesticides to be used to control pests as a last resort.

The project site is not classified as a FEMA 100-year flood hazard zone. An existing building is currently present at the project site, and because substantial flooding at the project site is unlikely to occur, operation of the proposed new building would not impede flood flows.

For the reasons stated above, operation of the Project would result in **less-than-significant** impacts related to alteration of drainage patterns or increased impervious surface area.

Impact HYD-4: Release of Pollutants due to Inundation

Impact HYD-4 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would risk release of pollutants due to project inundation.

Impact Analysis

Construction

The project site is not located in a tsunami inundation zone (California Emergency Management Agency and California Geological Survey 2019). Given the distance of the project site from the San Francisco Bay, and the project site's topographical elevation (31 feet above mean sea level), tsunamis and seiches would not represent a hazard at the site.

The project site is not within a 100-year (1% AEP) flood hazard zone, but is within Zone X (shaded), which could be subject to moderate flood hazards, such as a 0.2% AEP flood hazard or a 1% annual exceedance probability flood with average depths of less than 1 foot (FEMA 2009). Thus, inundation of the project site is possible, but the likelihood of substantial flooding at the site is extremely low. Therefore, construction-related impacts on the risk of pollutant release due to inundation of the site would be **less than significant.**

Operation

Project operation would only involve the storage of minor amounts of hazardous materials such as fertilizers and pesticides to maintain the on-site landscaping, along with household cleaning materials used by on-site residents. Because the risk of substantial flooding at the project site is extremely low as described above, Project operation would have a **less-than-significant** impact on the risk of pollutant release due to inundation of the site**.**

Impact HYD-5: Water Quality Control Plan or Sustainable Groundwater Management Plan Conflicts

Impact HYD-5 would be **potentially significant**. With implementation of Mitigation Measure MM-HAZ-3B the impact would be reduced to a **less-than-significant** level.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Impact Analysis

For the reasons discussed previously in Impact HYD-2, construction and operation of the Project would not obstruct implementation of the Santa Clara Valley Water District's Alternative Groundwater Sustainability Plan. However, because construction dewatering may be necessary for deep excavation at the project site, this dewatering may encounter the existing groundwater plume that is contaminated with volatile organic compounds. Without proper containment and treatment, discharge of the contaminated groundwater could result in surface water contamination with volatile organic compounds, which would conflict with the provisions of the San Francisco Bay Basin Plan. Therefore, this impact is **potentially significant.**

Mitigation Measure MM-HAZ-3B, detailed in Section 3.9.3, "Hazards and Hazardous Materials," is recommended to address this potentially significant impact. Obtaining a construction dewatering permit and implementing proper groundwater containment, treatment, and discharge measures during construction dewatering as required by Mitigation Measure MM-HAZ-3B would reduce potential downstream surface water contamination, and the resulting potential for water quality degradation, and therefore the Project would not conflict with the San Francisco Bay Basin Plan. Therefore, implementation of Mitigation Measure MM-HAZ-3B would reduce this construction-related impact to **less-than-significant with mitigation**.

3.10.4 Cumulative Impacts and Mitigation

This section analyzes the potential of the Project to contribute to the following cumulative water quality and hydrology impacts:[21]

Impact C-HYD-1: Contribution to cumulative effects related to violation of water quality standards, decrease in groundwater recharge, alteration of drainage patterns, increase in stormwater runoff, exceedance of stormwater drainage capacity, degradation of water quality from flood inundation, and conflicts with a water quality control plan.

Cumulative Impact C-HYD-1: Cumulative Hydrology Impacts

The overall cumulative impact for C-HYD-1 would be **less than significant**. No mitigation is required.

Cumulative Context

The geographic context for cumulative impacts related to violations of water quality standards and substantial degradation of water quality is the Lower Peninsula Watershed.

Cumulative Impact Analysis

Past and present development within the Lower Peninsula Watershed has contributed to several of the smaller creeks in the watershed, including Matadero Creek, being listed as Section 303(d) impaired waterbodies and has contributed to impairment of the San Francisco Bay. However, implementation and requirements of the Basin Plan, the NPDES permits, and the SCVURPPP have helped to address water quality in the Lower Peninsula Watershed.

As discussed for Impact HYD-1 in Section 3.10.3, the Project would comply with the provisions of the SWRCB's NPDES Construction General Permit, which regulates stormwater discharges for construction activities and requires implementation of a SWPPP and appropriate BMPs to prevent violations of water quality standards and substantial degradation of water quality. All present and future foreseeable development projects that would disturb 1 acre or more would also be required to comply with the Construction General Permit. Cumulative projects that involve more than 100 cubic feet of cut and fill are required to obtain a County or City of Palo Alto (as applicable) excavation and grading permit, which requires submittal of an erosion control plan and drainage plan for County or City review and approval. Permit conditions would be imposed to reduce potential erosion impacts.

Pursuant to the Construction General Permit, the Project and foreseeable development projects would be required to eliminate or reduce non-stormwater discharges to storm sewer systems and other waters; implement permanent post-construction BMPs that would remain in service to protect water quality throughout the life of the project; implement construction and operational design features and BMPs specifically intended to reduce the potential for downstream hydromodification; implement BMPs designed to prevent accidental spills of hazardous materials during the construction phase to the maximum extent practicable, and include procedures for immediate cleanup if any releases occur.

All of the cumulative projects would also be required to implement the requirements of the SCVURPPP's MS4 Permit, incorporating site design measures, specific treatment measures, hydromodification management measures, and operations and maintenance requirements, all

[21] Note that project-level impacts have been combined for the purposes of cumulative analysis. Cumulative impact C-HYD-1 addresses the same issues as project-level impacts HYD-1 through HYD-6.

of which are specifically intended to reduce erosion and the transport of sediment and other pollutants in stormwater.

The cumulative projects would be required to design and engineer stormwater drainage systems according to County and City of Palo Alto requirements so that stormwater runoff does not exceed drainage system capacity and flooding does not occur, and where such projects are located in 100-year flood zones would be required to store hazardous materials out of the floodplain based on City and County General Plans, Municipal Codes, Stormwater Drainage Design Manuals, and Standard Specifications.

The eastern portion of the City of Palo Alto is urbanized and is primarily covered with impervious surfaces (e.g., buildings, parking lots, and roadways). Therefore, the cumulative projects in this area would likely result in only minor changes in impervious surfaces at any individual project site. However, the western portion of the City and other lands within the Lower Peninsula Watershed consist of the foothills and mountains of the Santa Cruz Range, where the level of development is moderate to low, respectively. Therefore, larger expanses of land are available for groundwater recharge in the watershed. Past, present, and reasonably foreseeable future projects, including the Project, when considered together would result in an increase in the total area of impervious surfaces and therefore a decrease in the area available for rainfall to provide groundwater recharge.

However, the Santa Clara Valley Water District's Alternative Groundwater Sustainability Plan (Santa Clara Valley Water District 2016) accounts for cumulative decreases in regional recharge resulting from future development that is projected in the general plans of jurisdictions within the Santa Clara Valley Groundwater Basin. The basin is currently in balance (in terms of groundwater supply vs. groundwater demand). Chapter 5 of the District's Alternative Groundwater Sustainability Plan sets forth the District's groundwater sustainability goals and includes policies and basin management strategies designed to ensure that groundwater supplies are managed to optimize water supply reliability.

Any cumulative projects that would encounter contaminated groundwater from the plume associated with the California-Olive-Emerson Superfund site, such as the Public Safety Building that is currently under construction at 350 Sherman Avenue and the Project, would have potential to result in contamination of both surface waters and off-site clean groundwater that is not part of the plume. However, the EIR prepared for the Public Safety Building recommended mitigation measures and compliance with RWQCB requirements to reduce these potential impacts. Similarly, for the Project, the Developer would implement Mitigation Measure MM-HAZ-3B, which would result in appropriate containment and treatment of contaminated groundwater obtained through dewatering prior to discharge, in addition to compliance with San Francisco Bay RWQCB construction dewatering permit terms and conditions.

Because the cumulative projects are required by law to implement a SWPPP and BMPs (or a stormwater drainage plan with BMPs that meets County requirements), and to comply with the SCVURPPP's MS4 Permit, and because compliance with RWQCB construction dewatering permit conditions and implementation of project-specific mitigation measures to address contaminated dewatering water would be required for any projects excavating within the existing groundwater plume, the overall cumulative impact on hydrology and water quality would be **less than significant with mitigation**. No additional mitigation measures, other than MM-HAZ-3B, would be required to address cumulative impacts of the Project.

3.11 Land Use and Planning

This section describes the existing land use and setting of the project area and evaluates whether the Project would result in adverse effects to land use and planning. The following comments relating to land use and planning were received during the public scoping period in response to the Notice of Preparation (see Appendix A):

- The City of Palo Alto provided a Comprehensive Plan conformity analysis discussing the Project's consistency with the Comprehensive Plan's land use designation of the project site and consistency of the Project with the City's Housing Element and Land Use Element. The County reviewed and considered the comments provided by the City of Palo Alto and those comments have been addressed in Impact LUP-2.
- Recognition that the Project is a critical and needed housing complex for educator workforce employees that will serve as a model for other communities and demonstrate how partnerships can create much needed housing.

3.11.1 Environmental Setting

The project site is County-owned property but is within the incorporated area of the City of Palo Alto. The project site is designated in the City of Palo Alto Comprehensive Plan (City of Palo Alto 2017a) as Major Institution, Special Facilities (MISP). The existing office building currently houses the County of Santa Clara Office of the Public Defender.

Across Grant Avenue from the project site is the County of Santa Clara Courthouse and parking lot, which is also designated as MISP. Surrounding areas are designated as Regional/Commercial and Multi-Family Residential, with properties fronting Sheridan Avenue between Park Boulevard and Birch Street containing an outdoor café, multifamily residential housing, and an office building. Areas to the east and west of Grant Avenue and south of Birch Street in the vicinity of the project site are predominantly multifamily residential housing. Office buildings and multifamily residential housing are north of the project site along Park Boulevard. The California Avenue commercial area is approximately 0.1 feet northwest of the project site and this area is designated as Regional/Community Commercial.

3.11.2 Regulatory Framework

Federal

There are no relevant federal regulations regarding land use and planning applicable to the Project.

State

There are no relevant state regulations regarding land use and planning applicable to the Project.

Local

County of Santa Clara General Plan policies relating to specific development projects only apply to unincorporated areas of the County. Because the project site lies within the incorporated area of the City of Palo Alto, there are no County General Plan policies applicable to the projects site.

In addition, the project site is on County-owned property and the County is generally not subject to City of Palo Alto general plan policies and land use designations, City zoning, or other City building and development regulations for projects that primarily serve a public purpose, such as the Project. Therefore, there are no relevant local General Plan or zoning regulations applicable to the Project. However, there are other County ordinances that apply to all lands owned or leased by the County, regardless of whether those lands are in the unincorporated area or within city limits.

3.11.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to land use and planning:

- **Impact LUP-1:** Would the Project physically divide an established community?
- **Impact LUP-2:** Would the Project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Impact LUP-1: Physically Divide a Community

Impact LUP-1 would be **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would physically divide an established community.

Impact Analysis

Construction

Construction activities would require complete closure of Grant Avenue for four to eight weeks and periodic lane closures on Birch Avenue and Park Boulevard. While such closures would temporarily disrupt travel patterns in the immediate vicinity of the project site, such disruption would be short-term and confined to an approximately one-block area, and the grid-pattern of streets in the area provide multiple alternative routes. As such, these temporary disruptions are not anticipated to have lasting effects on connectivity between existing multifamily residential neighborhoods along Grant Avenue, Birch Avenue, or Park Boulevard, or to the California Avenue commercial area or Caltrain station. In addition, as discussed in Section 2.4.2, “Construction Staging, Haul Routes, and Traffic Control,” the County and/or its construction contractor would prepare and implement a traffic control plan as part of the Project, in consultation with the City of Palo Alto. The traffic control plan would require the contractor to communicate with affected residents and landowners about the project, including identification of detours and alternative routes that may be available. Therefore, construction of the Project would not physically divide an established community, and **no impact** would occur.

Operation

The Project would develop 110 residential units, flex space that could be utilized as a café or other retail or commercial use, and public open space consisting of outdoor plazas on an existing parcel of land. No permanent road closures or changes to the existing roading network are proposed as part of the Project. The proposed land uses are compatible with the existing development in the surrounding area and would not introduce a use or physical feature that would create a barrier, divide, or separate adjacent uses. Therefore, **no impact** associated with physical division of an established community would occur due to operation of the Project.

Impact LUP-2: Land Use Plan, Policy, or Regulation Conflicts

Impact LUP-2 would be **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would 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.

For an impact to be considered significant under this threshold, any inconsistency would also need to result in a significant adverse change in the environment not already addressed in the other resource sections of this EIR.

Impact Analysis

The project site is on County-owned property, within the limits of the City of Palo Alto. Generally, cities and counties are exempt from each other's land use regulations for projects that primarily serve a public purpose. Although it is not required that the County consider Palo Alto's land use designation of the project site or consistency with the City's Comprehensive Plan, a brief discussion of the Project's consistency with the City's Comprehensive Plan is provided below, for informational purposes. The Palo Alto Comprehensive Plan designates the project site as Major Institution, Special Facilities (MISP). The definition of the MISP in the City's Land Use Element states that "Consistent with the Comprehensive Plan's encouragement of housing near transit centers, higher density multi-family housing may be allowed in specific locations." The project site also lies within the boundaries of the California Avenue Pedestrian and Transit Oriented Development (PTOD) Combining District as designated in the City's General Plan Housing Element (City of Palo Alto 2014). The purpose of a PTOD is "to allow higher density residential dwellings on commercial, industrial and multi-family parcels within a walkable distance of the California Avenue Caltrain station, while protecting low density residential parcels and parcels with historical resources that may also be located in or adjacent to this area."[22]

The City provided comments during the Project's scoping period (see Appendix A) which stated that construction of a multi-family housing project in this location and other common space associated with the multi-family residential use appears to be consistent with the City's land use designation at this site.

In addition, the City determined that the Project's goals and general program description appear to be consistent with overarching goals outlined in the Comprehensive Plan's Housing Element and Land Use Element, which encourage housing production. In particular, the City stated that the Project appears to be consistent with the Comprehensive Plan because it would increase housing production in a transit rich location, would create more affordable housing options for teachers and public employees, and would utilize new strategies to help increase housing density and diversity within the City.

As explained above, County of Santa Clara General Plan policies applicable to specific development projects apply only to the unincorporated areas of the County and are therefore not applicable to the project site. The County would comply with all applicable County ordinances with respect to this County-owned property.[23] Therefore, the Project would not

[22] Palo Alto Municipal Code, § 18.34.010.

[23] Applicable County ordinances address various issues including noise (Div. B11, Ch. VIII), nonpoint source pollution (Div. B11.5), integrated pest management (Div. B28), the various County building codes (Title C, Div. C3, C-4, C-7, C-9, C-11, and C-14), geologic hazards (Div. C15), and tree preservation and removal (Div. C16).

conflict with an applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect, and **no impact** would occur.

3.11.4 Cumulative Impacts and Mitigation

As discussed in Section 3.11.3 above, the Project would have no impact related to physical division of an established community (Impact LUP-1) or conflicts with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect (Impact LUP-2). Therefore, the Project would not contribute to any potential cumulative impacts to land use and planning.

3.12 Noise and Vibration

This section describes the existing noise setting of the project area and evaluates whether the Project would result in adverse effects related to noise and vibration. **Appendix D** of this EIR contains the results of noise monitoring and modeling conducted in support of this analysis. No comments relating to noise or vibration were received during the public scoping period in response to the Notice of Preparation.

3.12.1 Environmental Setting

Acoustic Fundamentals

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound, as described in more detail below, is mechanical energy transmitted through a medium (e.g., air) in the form of a wave from its source.

Sound Properties

A sound wave is introduced into a medium by a vibrating object. The source could be vibrating vocal cords, soundboard of a guitar, diaphragm of a radio speaker, or vibrating parts of machinery or equipment. Regardless of the source creating the sound wave, the particles of the medium through which the sound moves vibrate in a back-and-forth motion at a given frequency (i.e., pitch).

The frequency of a wave is determined by how often the particles vibrate when a wave passes through the medium. It is measured as the number of complete back-and-forth vibrations of a particle per unit of time. If a particle of air undergoes 1,000 longitudinal vibrations in 2 seconds, then the frequency of the wave would be 500 vibrations per second. Frequency, or pitch, is commonly quantified in cycles per second, or Hertz (Hz). For sounds normally heard in the environment, low frequencies (below 250 Hz) and high frequencies (above 10,000 Hz) are generally less audible than the frequencies in between.

In addition to the frequency of the sound wave, its amplitude (i.e., loudness or the energy transported by the wave) is important to what the human ear hears. A high-energy wave is characterized by high amplitude; a low-energy wave is characterized by low amplitude. The energy transported by a wave is directly proportional to the square of the amplitude of the wave. In other words, a doubling of the amplitude of a wave corresponds to a quadrupling of the energy transported by the wave. A tripling of the amplitude of a wave corresponds to a ninefold increase in the amount of energy transported by the wave.

Sound and the Human Ear

Because of the ability of the human ear to detect a wide range of sound pressure fluctuations, sound pressure levels are expressed in logarithmic units called decibels (dB). Because the human ear is not equally sensitive to all sound frequencies, a specific frequency-dependent rating scale was devised to relate noise to human sensitivity. The A-weighted dB (dBA) scale is used to approximate the sensitivity of the human ear and is used by most authorities for regulation of environmental noise. Figure 3.12-1 illustrates dBA values for typical indoor and outdoor noise sources.

Figure 3.12-1 Typical Noise Levels of Common Activities

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	**70**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**60**	
		Large business office
Quiet urban daytime	**50**	Dishwasher in next room
Quiet urban nighttime	**40**	Theater, large conference room (background)
Quiet suburban nighttime		
	30	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

Source: Caltrans 2013.

Acronyms: dBA = A-weighted decibels; mph = miles per hour

It is generally accepted that for environmental noise exposure the average healthy ear can barely perceive changes of 3 dB or less (increase or decrease) and that a change of 5 dB is readily perceptible (Caltrans 2013). A noise level that increases by 10 dB is typically perceived as being about twice as loud as what was previously heard, and a noise level that decreases by 10 dB is perceived as being about half as loud.

Sound Propagation

As sound (noise) propagates from the source to the receptor, the attenuation—the manner of noise reduction over distance—depends on such factors as acoustical energy diminishing over distance (energy spreading), surface characteristics, atmospheric conditions, and the presence of physical barriers. Energy spreading describes the attenuation attributable to the pattern in which sound travels from the source to the receptor. Sound travels uniformly outward from a point source (e.g., construction equipment) in a spherical pattern with an attenuation rate, generally, of 6 dBA per doubling of distance (dBA/DD). In other words, sound decreases by 6 dBA each time the distance between the noise source and the receptor is doubled. From a line source (e.g., traffic noise along a road), sound travels uniformly outward in a cylindrical pattern with an attenuation rate, generally, of 3 dBA/DD.

The characteristics of the surface between the source and the receptor may further absorb and/or reflect sound, thus resulting in a different attenuation rate. "Hard surfaces, such as pavement, would not absorb the wave energy, but "soft" surfaces, such as vegetation-covered ground, can absorb a portion of the sound energy and only the remaining energy travels to the receptor. Atmospheric conditions such as wind speed, temperature, and humidity may also affect noise levels. Furthermore, the presence of a barrier between the source and the receptor may attenuate noise levels. The actual amount of attenuation depends on the barrier size and the frequency of the noise. A noise barrier may be any natural or human-made feature, such as a hill, tree, building, wall, or berm (Caltrans 2013).

Noise Descriptors

The proper descriptor for noise from a specific source depends on the spatial and temporal distribution, duration, and fluctuation of the noise. The following are the noise descriptors most often encountered when dealing with traffic, community, and environmental noise (Caltrans 2013):

- L_{max} (maximum noise level): The maximum instantaneous noise level during a specific period of time. The L_{max} may also be referred to as the "peak (noise) level."
- L_{min} (minimum noise level): The minimum instantaneous noise level during a specific period of time.
- L_n (statistical descriptor): The noise level exceeded "n" percent of a specific period of time.
- L_{eq} (equivalent noise level): The average noise level that describes the cumulative noise exposure from all sources as a constant sound level containing the same overall sound energy as the actual varying sound energy for a specified period of time.
- L_{dn} (day-night noise level): The 24-hour L_{eq} with a 10 dBA "penalty" for the noise-sensitive hours between 10:00 p.m. and 6:00 a.m. The L_{dn} attempts to account for the fact that noise during this specific period of time is a potential source of disturbance because it would occur during normal sleeping hours.
- CNEL (community noise equivalent level): The CNEL is similar to the L_{dn} described above, but with an additional 4.77 dBA "penalty" for the noise-sensitive hours between 7:00 p.m. and 10:00 p.m., which are typically reserved for relaxation, conversation, reading, and television. If using the same 24-hour noise data, the CNEL is typically about 0.5 dBA higher than the L_{dn}.

Negative Effects of Noise on Humans

Negative effects of noise exposure include physical damage to the human auditory system; interference with speech, communications, sleep and other routine interactions; and disease. Exposure to noise may result in physical damage to the auditory system, which may lead to gradual or traumatic hearing loss. Gradual hearing loss is attributable to sustained exposure to moderately high noise levels over a period of time, while traumatic hearing loss is attributable to sudden exposure to extremely high noise levels over a short period. Both gradual and traumatic hearing loss may result in permanent hearing damage.

In addition, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal may be considered dangerous.

Noise may also contribute to diseases associated with stress, such as hypertension, anxiety, and heart disease. The degree to which noise contributes to such diseases depends on the noise frequency, bandwidth, level, and exposure time (Caltrans 2013). In an occupational setting, hearing protection is typically required where employee noise exposures equal or exceed an 8-hour time-weighted average of 85 dBA and above (Title 8 CCR Section 5097).

Vibration

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides) and human activity (explosions; traffic; and operation of machinery, trains, or construction equipment). Vibration sources may be continuous (e.g., operating factory machinery) or transient (e.g., explosions). The effects of groundborne vibration include movement of building floors, rattling of windows, shaking of items that sit on shelves or hang on walls, and rumbling sounds. In extreme cases, vibration can damage buildings, although this is not a factor for most projects.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. RMS is a measurement of the effective energy content in a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (FTA 2018; Caltrans 2013). PPV and RMS vibration velocity are normally described in inches per second (in/sec). Potential structural or architectural damage due to vibration depends on the type of building as well as to the nature of the vibration and surrounding soil conditions. For modern commercial and newer residential buildings, potential damage would not be expected from vibrations of less than 0.5 in/sec PPV, whereas vibration levels above 0.3 in/sec PPV could cause potential damage in some older residential buildings (Caltrans 2020).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response to vibration. The response of the human body to vibration relates well to average vibration amplitude. Therefore, vibration impacts on humans are evaluated in terms of RMS vibration velocity, and like airborne sound impacts on humans, vibration velocity can be expressed as vibration decibels (VdB).[24]

Vibration levels below 65 VdB are typically not perceptible to humans, whereas vibration levels above 75 VdB are distinctly perceptible (FTA 2018). Human annoyance from groundborne vibration often occurs when vibration exceeds the threshold of perception by only a small margin. A vibration level that causes annoyance can be well below the damage threshold for normal buildings. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

Existing Conditions

Sensitive Land Uses

Noise-sensitive land uses are those uses where quiet is essential to the purpose of the land use. Such land uses include residences and buildings where people normally sleep (hospitals, hotels), and uses such as schools, libraries, theaters, and houses of worship, where it is

[24] Vibration levels described in VdB are referenced to 1 microinch per second.

important to avoid interference with such activities as speech, meditation, and concentration on reading material.

Noise-sensitive land uses near the project site include the multifamily residential apartment building on the adjacent parcel immediately southeast of the project site (200 Sheridan Avenue) and other multifamily residences to the northeast of Park Avenue and southwest of Birch Street. The boundary of the adjacent multifamily residential property is approximately 80 feet from the center of the project site at its closest point. The apartment building on that property is a four-story building that is setback approximately 10 feet from the project site boundary and has exterior balconies on the three upper levels that directly overlook the project site. A 6-foot high masonry wall and a row of Italian cypress trees along the site boundary provides some visual screening for the lower level units. There is also a ground-level outdoor common use area and exterior pool in the southern portion of the residential property immediately adjacent to the common property line.

Vibration sensitive uses near the project site include residents of the adjacent apartment described above, as well as the Courthouse Plaza office building at 260 Sheridan Avenue and the Palo Alto Courthouse building at 270 Grant Avenue.

Existing Noise Sources

The existing noise environment near the project site is influenced primarily by vehicular traffic using local roadways immediately adjacent to the site (Park Boulevard, Grant Avenue, Birch Street) and the nearby Oregon Expressway, approximately 200 feet east of the project site. Other noise sources in the project vicinity include arterial and collector routes such as Alma Street (500 feet north), El Camino Real (1,000 feet south), and Page Mill Road (650 feet south) as well as the Caltrain rail corridor and passenger station approximately 450 feet northeast of the project site. The Palo Alto Airport is located approximately 2.5 miles to the northeast (Santa Clara County Airport Land Use Commission 2016).

Ambient Noise-Level Surveys

Ambient noise levels in the vicinity of the project site were measured between Wednesday, February 3, 2021, and Thursday, February 4, 2021 at the locations shown in Figure 3.12-2. Three short-term measurements (15 minutes) and one long-term measurement (24 hours), were conducted to document the existing noise environment in the project area[25].

The long-term noise measurement (LT-1) was made within the project site, approximately 50 feet west of the multifamily residential apartment building on the adjacent property. The short-term measurements (ST-1, ST-2, and ST-3) were made along the project site boundaries. Noise sources identified during the monitoring period include traffic, trains, parking activities, neighborhood activities, birds, and wind.

[25] Long-term (LT) measurements are typically conducted to measure noise levels continuously over a relatively long period of time (usually 24 hours or more) to determine the day, evening, and night (CNEL/L_{dn}) levels for the site and the affected vicinity. Short-term (ST) measurements are spot checks in the study area and are typically conducted for about 10–20 minutes during the daytime when ambient traffic noise is highest.

Figure 3.12-2 Ambient Noise Measurement Sites

Source: Prepared by AECOM in 2021.

Table 3.12-1 summarizes the measurements of ambient noise levels at each survey location, and Figure 3.12-3 shows the measured long-term noise levels at LT-01 over the 24-hour monitoring period. Hourly average noise levels at LT-01 ranged from 52 to 58 dBA L_{eq} during the day, and from 39 to 57 dBA L_{eq} at night. The hourly average noise level reached up to 58 L_{eq} during the 8:00 am hour on Thursday, February 4th. The day-night average noise level during the monitoring period was 60 dBA L_{dn}. Short-term noise levels measured at ST-01, ST-02 and ST-03 ranged from 58 to 60 dBA L_{eq}.

Table 3.12-1 Summary of Ambient Noise-Level Survey Results

Survey Site	Survey Start Time and Date	Survey Period	L_{dn}/ CNEL (dB)	Daytime L_{eq} (dB)	Daytime L_{max} (dB)	Nighttime L_{eq} (dB)	Nighttime L_{max} (dB)
LT-01	15:00 on February 3rd, 2021	24 hours	55	58	88	52	55
ST-01	14:32 on February 4th, 2021	20 minutes	N/A	58.5	69.8	N/A	N/A
ST-02	14:55 on February 4th, 2021	20 minutes	N/A	59.3	76.9	N/A	N/A
ST-03	15:16 on February 4th, 2021	20 minutes	N/A	58.8	71.3	N/A	N/A

Source: Data compiled by AECOM in 2021. See Appendix D.

Acronyms: NA = not applicable periods for short-term measurements; CNEL = community noise equivalent level; dB = decibels; L_{dn} = day-night average noise level; L_{eq} = equivalent noise level; L_{max} = maximum instantaneous noise level during a specific period of time; LT = long term; ST = short term

Notes: Daytime noise hours are 7am to 10pm and nighttime noise hours are 10pm to 7am.

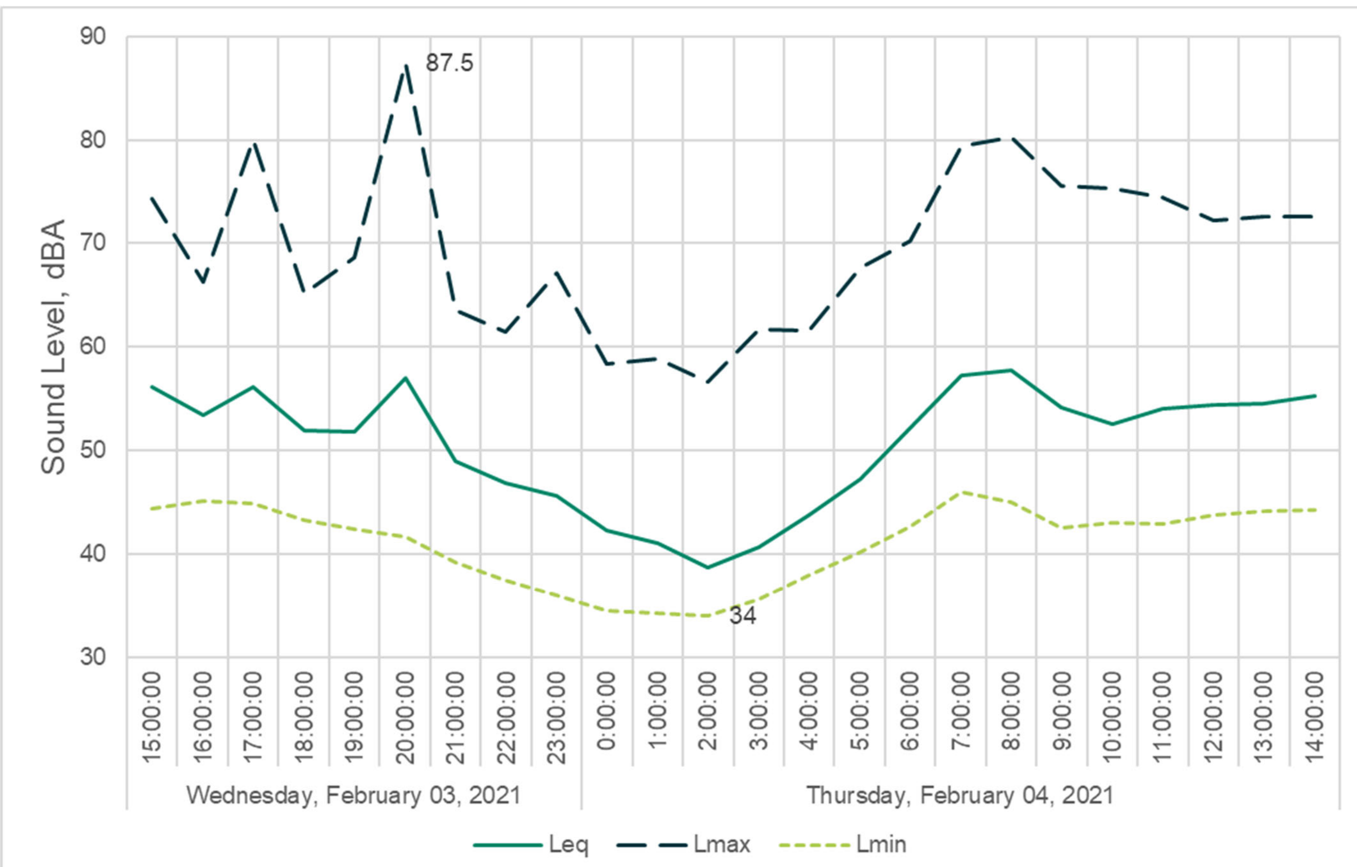

Figure 3.12-3 Hourly Measured Noise Levels at Sample Site LT-01

Source: Measured by AECOM in 2021. See Appendix D.

Acronyms: dBA = A-weighted decibels; L_{eq} = equivalent noise level; L_{max} = maximum instantaneous noise level; Lmin = minimum instantaneous noise level.

Existing Vibration

The existing vibration environment, like the noise environment, is dominated by transportation-related vibration. Rail and heavy truck traffic can generate groundborne vibration, which varies considerably depending on vehicle type, weight, speed, and pavement conditions. However, groundborne vibration levels generated from vehicular traffic are not typically perceptible outside of the road right-of-way. The primary source of existing groundborne vibration in the vicinity of the project site is the vehicular traffic along the surrounding roadways. Existing residences, commercial, and office buildings in the project area are typically set back approximately 30 feet from the center of adjacent roadways. Based on FTA data, a large rubber-tired vehicle, such as a bus, operating at 30 miles per hour (mph) would generate groundborne vibration of approximately 68 VdB (RMS re: 1 microinch per second) at a distance of 30 feet (FTA 2018), as shown in Figure 3.12-4. Greater speeds result in greater vibration levels, with a doubling of speed resulting in an increase of approximately 6 VdB (FTA 2018). The posted speed limit on local roads immediately adjacent to the project site is 25 mph, therefore, use of FTA's reference values yields a conservative estimate of vibration levels.

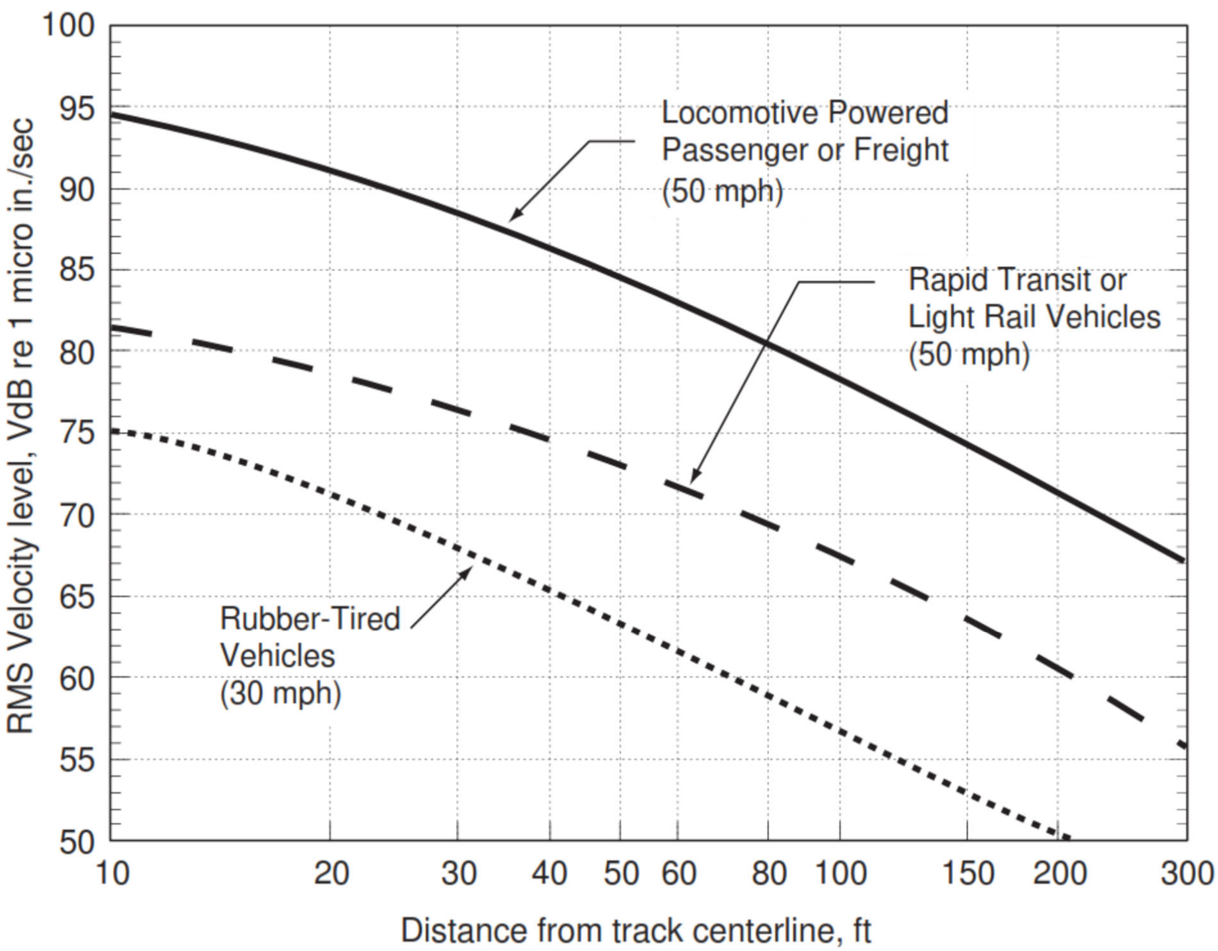

Figure 3.12-4 Generalized Ground-Surface Vibration Curves

Source: FTA 2018.

Acronyms: mph = miles per hour; RMS = root-mean-square; VdB = velocity decibel; in/sec = inch per second; ft = feet.

3.12.2 Regulatory Framework

Federal

Although not directly applicable to many projects, the research that supported the development of federal community noise standards is broadly applicable in understanding human response to different noise levels and is summarized below for the reader's edification.

U.S. Environmental Protection Agency

The federal Noise Control Act of 1972 (Public Law 92-574) established a requirement that all federal agencies administer their programs to promote an environment free of noise that would jeopardize public health or welfare.[26] Although the USEPA was given a major role in disseminating information to the public and coordinating federal agencies, each federal agency retains authority to adopt noise regulations pertaining to agency programs.[27]

In 1974, in response to the requirements of the federal Noise Control Act, the USEPA identified indoor and outdoor noise level limits to protect public health and welfare (communication disruption, sleep disturbance, and hearing damage). Outdoor and indoor noise exposure limits of 55 dB L_{dn} and 45 dB L_{dn}, respectively, are identified as desirable to protect against speech interference and sleep disturbance for residential, educational, and healthcare areas. The sound-level criterion identified to protect against hearing damage in commercial and industrial areas is 70 dB 24-hour L_{eq} (both outdoors and indoors).

Federal Highway Administration

The Federal Highway Administration (FHWA) regulations (23 CFR 772) specify procedures for evaluating noise impacts associated with federally funded highway projects and determining whether these impacts are sufficient to justify funding noise abatement. The FHWA noise abatement criteria are based on worst hourly L_{eq} sound levels, not 24-hour average values (e.g., L_{dn} or CNEL). The worst-hour L_{eq} criteria for residential, educational, and healthcare facilities are levels that approach or exceed 67 dB outdoors and 52 dB indoors. The worst-hour L_{eq} criterion for commercial and industrial areas are levels that approach or exceed 72 dB (outdoors).

Federal Transit Administration

FTA procedures for the evaluation of noise from transit projects are specified in the guidance document entitled, "Transit Noise and Vibration Impact Assessment Manual" (FTA 2018). The FTA noise impact threshold is a sliding scale based on existing noise exposure and land use of sensitive receivers. The basic concept of the FTA noise impact criteria is that more project noise is allowed in areas where existing noise is relatively low. However, in areas where existing noise exposure is relatively high, the tolerance for sensitive receivers to accept increases above the existing noise exposure decreases. For example, in an area with an existing noise level of 55 dBA, the allowable increase in noise level is 3 dBA, resulting in a total future noise impact threshold of 58 dBA. For an area with an existing noise level of 60 dBA, the allowable increase in noise level is only 2 dBA, resulting in a total future noise impact threshold of 62 dBA.

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[26] The U.S. Environmental Protection Agency (USEPA) was given the responsibility for providing information to the public regarding identifiable effects of noise on public health and welfare, publishing information on the levels of environmental noise that will protect the public health and welfare with an adequate margin of safety, coordinating federal research and activities related to noise control, and establishing federal noise emission standards for selected products distributed in interstate commerce. The Noise Control Act also directed that all federal agencies comply with applicable federal, State, interstate, and local noise control regulations.

[27] The EPA can, however, require other federal agencies to justify their noise regulations in terms of the Noise Control Act policy requirements.

The FTA manual also includes construction vibration criteria at which a risk of building damage or human annoyance may occur.

State

California Occupational Noise Regulations

Title 8 CCR Section 5097 requires employers to administer an effective hearing conservation program, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level of 85 decibels measured on the A-scale (slow response) or, equivalently, a dose of fifty percent, which may include monitoring of noise levels in the workplace, an audiometric testing program for employees.

State of California General Plan Guidelines

In 1971, the State required cities and counties to include noise elements in their general plans (Government Code Section 65302 et seq.). The State of California General Plan Guidelines (OPR 2017) identify guidelines for the noise elements of local general plans, including a sound level/land-use compatibility chart. The noise element guidelines identify the "normally acceptable" range of noise exposure for low-density residential uses as less than 60 dB L_{dn}, and the "conditionally acceptable" range as 55–70 dB L_{dn}. The "normally acceptable" range for high-density residential uses is identified as below 65 dB L_{dn}, and the "conditionally acceptable" range is identified as 60–70 dB L_{dn}. For office and commercial land uses, levels below 70 dB L_{dn} are considered "normally acceptable," and levels of 67.5–77.5 dB L_{dn} are considered "conditionally acceptable." Overlapping noise level ranges are intended to indicate that local conditions (existing sound levels and community attitudes toward dominant sound sources) should be considered in evaluating land use compatibility at specific locations.

State law intended that noise elements guide policymakers in making land use determinations and in preparing noise ordinances that would limit exposure of their populations to excessive noise levels. In 1984, State noise element provisions were revised to recognize guidelines prepared by the Office of Noise Control of the California Department of Health Services and to analyze and quantify, "to the extent practicable, as determined by the legislative body," noise from the following sources: highways and freeways; primary arterials and major local streets; passenger and freight on-line railroad operations and ground rapid transit systems; commercial, general aviation, heliport, helistop, and military airport operations, aircraft overflights, jet engine test stands, and other ground facilities and maintenance functions related to airport operation; local industrial plants, including, but not limited to, railroad classification yards; and other ground stationary noise sources identified by local agencies as contributing to the community noise environment. As described in the draft update to the General Plan Guidelines, OPR acknowledges that the Department of Health Services Office of Noise Control no longer exists, and the guidelines have been incorporated into the General Plan Guidelines for Noise Elements (OPR 2017).

Local

County of Santa Clara General Plan provisions relating to noise only apply to unincorporated areas of the County. Because the project site lies within the City of Palo Alto, there are no County General Plan provisions applicable to the Project.

County of Santa Clara Noise Ordinance

The County Noise Ordinance, in Division B11, Chapter VII, of the County of Santa Clara Ordinance Code, would apply to the Project because it is on County-owned land.

Under the ordinance, no person may operate or cause to be operated any source of sound at any location within the unincorporated territory of the County or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by the person, which causes the noise level when measured on any other property either incorporated or unincorporated, to exceed the noise standard for that land use as specified in Table B11-152 of the ordinance (Table 3.12-2 below) for a cumulative period of more than 30 minutes in any hour; or

- The noise standard plus five dB for a cumulative period of more than 15 minutes in any hour; or
- The noise standard plus ten dB for a cumulative period of more than five minutes in any hour; or
- The noise standard plus 15 dB for a cumulative period of more than one minute in any hour; or
- The noise standard plus 20 dB or the maximum measured ambient, for any period of time.

The noise standards described below in Table 3.12-2 are adapted from Table B11-152 of the County's Noise Ordinance.

Table 3.12-2 County Noise Ordinance Noise Limits

Receiving Land Use Category	Daytime Noise Standard (7:00 A.M. – 10:00 P.M.)	Nighttime Noise Standard (10:00 P.M. – 7:00 A.M.)
One- and Two-Family Residential	55 dBA	45 dBA
Multiple-Family Dwelling, Residential Public Space	55 dBA	50 dBA
Commercial	65 dBA	60 dBA
Light Industrial, Heavy Industrial	75 dBA	70 dBA

Source: County of Santa Clara Noise Ordinance, Table B11-152.

Acronyms: dBA = A-weighted sound levels

Notes: Levels not to be exceeded more than 30 minutes in any hour. The above noise limits are reduced by 5 decibel (dB) if the noise contains a steady whine, screech, hum, music or speech, but are increased by 5 dB if the noise source and noise receptor are in different zoning districts.

However, for construction and demolition activities, the noise standards in Section B11-154(6) apply in lieu of the noise standards in Table B11-152 (Section B11-156(d)). Section B11-154(6) contains several prohibitions, including the following:

- Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekdays and Saturday hours of 7:00 p.m. and 7:00 a.m., or at any time on Sundays or holidays, that the sound therefrom creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance. This section will not apply to the use of domestic power tools as specified in Subsection 11 of the Ordinance.
- Where technically and economically feasible, construction activities will be conducted in a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedule (Table 3.12-3):

Table 3.12-3 County Noise Ordinance Construction Noise Limits

Threshold	Single- and Two-Family Residential Area	Multifamily Residential Area	Commercial Area
Daytime threshold for Mobile Equipment	75 dBA	80 dBA	85 dBA
Daytime threshold for Stationary Equipment	60 dBA	65 dBA	70 dBA
Nighttime/Weekend threshold for Mobile Equipment	50 dBA	55 dBA	60 dBA
Nighttime/Weekend threshold for Stationary Equipment	50 dBA	55 dBA	60 dBA

Source: Adapted from County of Santa Clara Noise Ordinance, Section B11-154(b)(6)(2).

Acronyms: dBA = A-weighted sound levels

Notes: Daytime thresholds = Daily, except Sundays and legal holidays 7:00 a.m.—7:00 p.m. Nighttime/Weekend thresholds = Daily, 7:00 p.m. to 7:00 a.m. and all day Sunday and legal holidays. Thresholds for mobile equipment represent maximum noise levels for nonscheduled, intermittent, short-term operation (less than ten days) of mobile equipment. Thresholds for stationary equipment represent maximum noise levels for repetitively scheduled and relatively long-term operation (periods of ten days or more) of stationary equipment.

Section B11-154(b)(7) of the County Noise Ordinance also prohibits operating or permitting the operation of any device that creates a vibrating or quivering effect that:

a. Endangers or injures the safety or health of human beings or animals;
b. Annoys or disturbs a person of normal sensitivities; or
c. Endangers or injures personal or real properties.

The ordinance defines the vibration perception threshold as “the minimum ground or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by direct means as, but not limited to, sensation by touch or visual observation of moving objects. The perception threshold will be presumed to be a motion velocity of 1/100 inches per second over the range of one to 100 Hz.”

The Director of the County Department of Environmental Health may grant a variance from any provision of the County Noise Ordinance by issuing a variance permit pursuant to Section B11-157.

City of Palo Alto Municipal Code

The County would not require a development permit nor any other planning approval from the City of Palo Alto and is therefore not subject to the City’s Municipal Code requirements. Nonetheless, the City’s standards have been provided for informational and disclosure purposes.

Chapter 9.10 of the City of Palo Alto Municipal Code (PAMC), the Noise Ordinance, regulates noise within the city. PAMC Sections 9.10.030 and 9.10.040 prohibit the production of noise from any machine or device on residential property that would result in noise levels more than 6 dB above local ambient noise levels outside the property plane, and on commercial or industrial property that would result in noise levels more than 8 dB above the local ambient noise level at any point outside of the property plane.

Section 9.10.060(b) of the PAMC restricts construction activities to the hours of 8:00 a.m. to 6:00 p.m. Monday through Friday and 9:00 a.m. to 6:00 p.m. on Saturday. Construction is prohibited on Sundays and holidays (New Year’s Day, Martin Luther King Day, Washington’s Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veteran’s Day, Thanksgiving Day, and Christmas Day).

Construction, demolition, or repair activities must meet the following standards:

- No individual piece of equipment shall produce a noise level exceeding 110 dBA at a distance of 25 feet. If the device is housed in a structure on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible [Section 9.10.060(b)(1)]
- The noise level at any point outside of the property plane of the project shall not exceed 110 dBA [Section 9.10.060(b)(2)]
- The holder of a valid construction permit for a construction project in a non-residential zone shall post a sign at all entrances to the construction site upon commencement of construction, for the purpose of informing all contractors and subcontractors, their employees, agents, material men, and all other persons at the construction site, of the basic requirements of this chapter [Section 9.10.060(b)(3)]

City of Palo Alto 2030 Comprehensive Plan

The City's Comprehensive Plan Natural Environment Element establishes land use compatibility categories for community noise exposure (Table 3.12-4). For residential uses, the City identifies noise levels up to 60 dBA L_{dn} as normally acceptable and noise levels between 60 and 75 dBA L_{dn} as conditionally acceptable (City of Palo Alto 2017a).

Table 3.12-4 Palo Alto Land Use Compatibility for Community Noise Environments

Land Use Type:	Normally Acceptable Exterior Noise Exposure L_{dn} or CNEL (dB)	Conditionally Acceptable Exterior Noise Exposure L_{dn} or CNEL (dB)	Unacceptable Exterior Noise Exposure L_{dn} or CNEL (dB)
Residential, Hotel and Motels	50-60	60-75	75+
Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds	50-65	65-80	80+
Schools, Libraries, Museums, Hospitals, Personal Care, Meeting Halls, Churches	50-60	60-75	75+
Office Buildings, Business Commercial, and Professional	50-70	70-80	80+
Auditoriums, Concert Halls, and Amphitheaters	N/A	50-75	75+
Industrial, Manufacturing, Utilities, and Agriculture	50-70	75+	N/A

Source: City of Palo Alto 2017a.

Acronyms: CNEL = community noise equivalent level ;dB = decibel; L_{dn} = day-night average noise level

3.12.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to noise:

- **Impact NOI-1:** Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in excess of applicable standards?
- **Impact NOI-2:** Would the Project result in generation of excessive groundborne vibration or groundborne noise levels?
- **Impact NOI-3:** Would the Project expose people to excessive noise levels from nearby airports?

Impact NOI-1: Ambient Noise Levels

Impact NOI-1 would be **significant and unavoidable**. Mitigation Measure MM-NOI-1 is recommended but would not reduce the impacts to a less than significant level.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would generate a substantial temporary or permanent increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

The project site lies within the incorporated area of the City of Palo Alto, but is owned by the County. The surrounding land parcels, including existing noise-sensitive land uses (nearby residences) are in the City. Therefore, the standards used for this assessment reflect both the County's and City's noise regulations. A significant noise impact would be identified if the Project exceeds the more stringent of the City or County noise standards.

For construction-related noise, an impact would be considered significant if:

- construction activities would occur outside of allowable construction hours of 8:00 a.m. to 6:00 p.m. Monday through Friday and 9:00 a.m. to 6:00 p.m. on Saturday.[28]
- an individual piece of construction equipment would exceed 110 dBA at a distance of 25 feet.[29]
- construction-generated noise levels would exceed 110 dBA at any point outside the property plane.[30]
- short-term (mobile) daytime construction noise would exceed 80 dBA at the nearest multifamily residential property or 85 dBA at the nearest commercial property.[31]
- long-term (stationary) daytime construction noise would exceed 65 dBA at the nearest multifamily residential property or 85 dBA at the nearest commercial property.[32]

For operation-related noise, an impact would be considered significant if:

- noise levels at the nearest multifamily residential property boundary would exceed:
  - 60 dBA (daytime) or 55 dBA (nighttime) for more than 30 minutes in any hour; [33] or
  - 88 dBA (daytime)[34] or 75 dBA (nighttime)[35] for any duration.
- the existing ambient noise levels[36] at the nearest sensitive receptor would be increased by more than 5 dBA. Per Table 3.12-2 of this EIR, the existing ambient noise levels measured in the project vicinity are 58 dBA L_{eq} (daytime) and 52 dBA L_{eq} (nighttime).

[28] City of Palo Alto Municipal Code Section 9.10.060(b).
[29] City of Palo Alto Municipal Code Section 9.10.060(b)(1).
[30] City of Palo Alto Municipal Code Section 9.10.060(b)(2)
[31] County Noise Ordinance Section B11-154(6) threshold for mobile equipment (defined as nonscheduled, intermittent, short-term operation, less than ten days).
[32] County Noise Ordinance Section B11-154(6) threshold for stationary equipment (defined as repetitively scheduled and relatively long-term operation, periods of ten days or more). There are no single-family residential properties in the vicinity therefore only multi-family and commercial properrty thresholds are shown.
[33] County Noise Ordinance Section B11-152(a)(2)(a). Thresholds are increased 5 dBA from those specified in Table B11-152 of the ordinance because the adjacent properties are in a different zone to the project site.
[34] County Noise Ordinance Section B11-152(a)(2)(e). Per Section B11-152(a)(3), because the daytime ambient noise level exceeds the daytime "noise standard plus 20 dBA" noise limit, the maximum allowable noise level should be the maximum ambient noise level, which is 88 dBA for daytime, per measured noise levels described in Table 3.12-2 of this EIR. Daytime is 7am to 10pm.
[35] County Noise Ordinance Section B11-152(a)(2)(e). 75 dBA is the "noise standard plus 20 dBA", adjusted by 5 dBA because the adjacent property is in a different zone to the project site. Nighttime is 10pm to 7am.
[36] King and Gardiner Farms, LLC v. County of Kern et al. (2020) 45 Cal.App.5th 814.

Impact Analysis

Construction

The Project would generate noise during the construction period from sources such as worker vehicles and haul trucks traveling to and from the project site, and heavy machinery and equipment operating on the site. These construction noise sources are discussed below and compared to the applicable thresholds for construction detailed above.

Construction Traffic

Table 3.12-5 shows the estimated construction traffic for each phase of construction. The most traffic-intensive phase of Project construction would be Phase 5 (interior finishes/landscaping) with up to 65 peak hour vehicle trips.

Table 3.12-5 Estimated Construction Traffic by Phase

Construction Phase	Number of Peak Hour Worker Commute Trips[1]	Average Number of Daily Truck Trips[2]	Average Number of Peak Hour Truck Trips[3]	Average Passenger-Equivalent Peak Hour Trips[4]
Site Clearing, Grading, and Excavation	15	72	9	33
Underground Utilities	15	negligible[5]	negligible[5]	15
Ground Floor Concrete Work	30	18	2	34
Modular Placement, Wood Framing and Structural Connections	30	9	1	32
Interior Finishes/ Landscaping	65	negligible[5]	negligible[5]	65

Source: Calculated by AECOM in 2021.

Notes:

1. *It is conservatively assumed that all workers would arrive at the worksite within the same hour in the morning and would leave within the same hour in the afternoon. Worker numbers provided by Developers (see Table 2.4-1).*
2. *Average daily truck trips were generally calculated by dividing the total number of truck trips for each phase (from Table 2.4-2) divided by the number of workdays in the phase (from Table 2.4-1). For Phase 3, a truck trip estimate was not provided by the Developers so CalEEMod default assumptions for daily truck trips (9 round trips per day) were used. For Phase 4, it is conservatively assumed that the truck trips for delivery of modular units would occur over a shorter 4-week (24 workday) period not the entire 11-week phase.*
3. *Peak hour truck trips were calculated by dividing the daily truck trips by an 8-hour workday.*
4. *Truck trips were converted to passenger car-equivalent trips by applying a passenger car-equivalent factor of 2.0 then added to number of worker commute trips.*
5. *Although there would be some truck trips for deliveries of materials during Phases 2 and 5, the number of daily trips would be low and would be distributed throughout the workday, resulting in a negligible contribution to peak-hour traffic.*

As discussed under “Environmental Setting” above, traffic volumes would need to double in order to result in a 3 dBA change in noise levels, which would be an incremental change that can barely be perceived (Caltrans 2013). As discussed in Section 3.16, “Transportation,” existing traffic volumes ranges from approximately 150 to 300 vehicles per hour on Sherman, Grant, and Sheridan Avenues; between 500 and 800 vehicles per hour on Park Boulevard, Birch Street, Page Mill Road, and California Avenue; and more than 3,000 vehicles per hour on Oregon Expressway and El Camino Real. The additional 65 construction-related vehicle trips per hour generated during the most traffic-intensive phase of Project construction would therefore not double existing traffic volumes on any local roads and, therefore, would not cause a perceptible increase in traffic noise during the construction period.

Construction Equipment

As described in Section 2, Project Description, construction activities would generally occur between the hours of 8:00 a.m. to 6:00 p.m. Monday through Friday and 9:00 a.m. to 6:00 p.m. on Saturday and would therefore mostly comply with the construction hour requirements of both the City and County Noise Ordinances. However, it may be necessary on limited occasions for some construction activities to occur prior to 8:00 a.m. or after 6:00 p.m. These limited occasions could include:

- 5:00 a.m. starts may be required on approximately 8 to 10 days during Phase 3 (Ground Floor Concrete Work) to accommodate ready-mix concrete trucks for major concrete pours.
- 7:00 a.m. starts may be required on approximately 20 to 30 days during Phases 2 (Underground Utilities) and 3 (Modular Placement/Setting, Wood Framing and Structural Connections) in order to mobilize the crane for temporary use. Note that for longer-term crane use (e.g., during the setting/placement of modular units), Grant Avenue would be closed to allow for the crane to remain mobiliized, avoiding the need for early starts during that period.
- Early morning or evening work on approximately 15 to 20 days (not necessarily continuous) during Phase 2 (Underground Utilities) and Phase 5 (Interior Finishes/Landscaping) may be required for utility connections, to accommodate utility company schedules. This work could include heavy equipment to move trench plates and/or concrete trucks to place concrete for encasement of utilities.

An exception permit from the City (PAMC Section 9.10.070) would be required for any construction activities outside of the City's permissible construction hours and a variance from the County (County Noise Ordinance, Section B11-157) would be required for any construction activities outside the County's permissible construction hours. The majority of construction activities, including the most noise-intensive activities which are discussed further below, would occur during the daytime hours allowed by the City and County ordinances.

To estimate the combined noise generated by construction equipment for each phase of construction, the FHWA Roadway Construction Noise Model (FHWA 2006) was applied, based on the equipment list for each construction phase provided by the Project developer. The Roadway Construction Noise Model is the FHWA's national model for the prediction of construction noise. With respect to construction equipment, the model assumes the loudest pieces of equipment for each phase would be operating simultaneously from the geographic center of the project site, to calculate a combined average (L_{eq}) noise level for each phase at a reference distance of 50 feet, as summarized in Table 3.12-6. The table also shows the calculated noise levels for each phase of construction at a distance of 80 feet, which is the approximate distance from the center of the project site to the nearest site boundary (with the adjacent multifamily residential property at 200 Sheridan Avenue). As explained previously, actual construction equipment use would vary both spatially and temporally throughout each phase of construction; therefore, actual noise levels experienced on adjacent properties would also fluctuate over time. Furthermore, the model does not account for shielding from existing fences, structures, or vegetation.

Table 3.12-6 Estimated Noise Levels for Combined Construction Equipment by Phase

Construction Phase	Noise Level of Loudest Equipment at 50 Feet (L_{max})	Combined Noise Level (L_{eq}) at 50 Feet	Combined Exterior Noise Level (L_{eq}) at Nearest Residential Boundary (80 Feet)[1]	Estimated Interior Noise Level (L_{eq})[2]	*Exterior Noise Level Threshold*[3]
Site Clearing, Grading, and Excavation	84 dBA	84 dBA	**80 dBA***	60 dBA	*65 dBA*
Underground Utilities	79 dBA	77 dBA	**73 dBA***	53 dBA	*65 dBA*
Ground Floor Concrete Work	81 dBA	80 dBA	**76 dBA***	56 dBA	*65 dBA*
Modular Placement, Wood Framing and Structural Connections	81 dBA	75 dBA	**71 dBA***	51 dBA	*65 dBA*
Interior Finishes/ Landscaping	81 dBA	75 dBA	**71 dBA***	51 dBA	*65 dBA*

Source: Calculated by AECOM in 2021 using FHWA Roadway Construction Noise Model (FWHA 2006) and reference noise levels for equipment from FTA 2018. See Appendix D for detailed noise modeling results.

Acronyms: L_{max} = maximum noise level; L_{eq} = equivalent noise level; dBA = A-weighted decibels

Notes:

1. *Values shown in **bold with asterisk*** indicate that multifamily residential thresholds would be exceeded, as discussed further within the text and note 3.*
2. *Interior noise levels based on a 20 dBA noise reduction from exterior to interior, which is typical of standard construction with doors and windows closed.*
3. *Threshold shown is for long-term (stationary) construction noise at the boundary of a multifamily residential property, from County Noise Ordinance. The threshold at the boundary with a commercial property is 5 dBA greater (i.e., 70 dBA).*

As shown in Table 3.12-6, Phase 1 (site clearing, grading and excavation) would generate the loudest noise levels during Project construction. This phase would last approximately 6 weeks. The noisiest pieces of equipment proposed for use during any of the construction phases would be the roller, which could generate up to 85 dBA L_{max} at 50 feet, and the truck tractor and hollow stem auger, both of which generate up to 84 dBA L_{max} at 50 feet (FWHA 2006). Assuming a standard noise attenuation factor of 6 dBA per doubling of distance, this equates to a noise level of 91 or 90 dBA L_{max} at 25 feet distance respectively, which are below the City's threshold of 110 dBA at a distance of 25 feet for any single piece of construction equipment [City of Palo Alto Municipal Code Section 9.10.060(b)(1)].

At the nearest property boundary, 80 feet from the center of the project site, construction equipment would result in a combined equivalent noise level of between 71 to 80 dBA L_{eq} for all construction phases (totaling 15 to 18 months). These predicted noise levels are well below the City's threshold of 110 dBA for construction noise measured at any point outside the property plane [City of Palo Alto Municipal Code Section 9.10.060(b)(3)]. However, the County's threshold for long-term (stationary) construction noise at a multifamily residential boundary (65 dBA) would be exceeded by 6 to 15 dBA, and the County's threshold for long-term (stationary) construction noise at a commercial boundary (70 dBA) would be exceeded by 1 to 10 dBA.

The "worst case" scenario for noise generation from construction equipment for residents of the adjacent apartments would be when construction equipment is being used close to the site boundary, such as during excavation or drilling of deep foundation supports in the eastern corner of the site, which could result in an excavator or drill rig being operated as close as 12 feet away from the closest balcony of the apartment building, and demolition of the existing office building which is as close as 25 feet from the closest balcony. Table 3.12-7 presents the estimated noise levels generated from these activities, which could be up to 89 dBA L_{eq} at the closest residential balcony to these construction activities. These noise levels would exceed the County's threshold for "short term" (mobile) construction by up to 9 dBA. Interior noise levels within the closest residential apartments to the building demolition or deep foundation work could be up to 63 or 69 dBA, respectively.

Table 3.12-7 Estimated Noise Levels for Specific Construction Activities

Equipment/Activity	Reference Noise Level at 50 Feet (L_{max})	Reference Noise Level at 50 Feet (L_{eq})	Distance[1]	Exterior Noise Level at Closest Balcony (L_{eq})[2]	Estimated Interior Noise Level (L_{eq})[3]	*Exterior Noise Level Threshold[4]*
xcavator (deep foundation)	81 dBA	77 dBA	12 feet	**89 dBA***	*69 dBA*	*80 dBA*
ollow Stem Auger (deep foundation)	84 dBA	77 dBA	12 feet	**89 dBA***	*69 dBA*	*80 dBA*
xcavator (demolition of building)	81 dBA	77 dBA	25 feet	**83 dBA***	*63 dBA*	*80 dBA*

Source: Calculated by AECOM in 2021 using reference noise levels for equipment from FHWA 2006 and FTA 2018, and standard attenuation rate for point source noise of 6 dBA per doubling of distance. See Appendix D for detailed noise modeling results.

Acronyms: L_{max} = maximum noise level: L_{eq} = equivalent noise level. dBA = A-weighted decibels

Notes:

1. *Minimum distance between equipment and closest sensitive receptor.*
2. *Values shown in **bold with asterisk*** indicate that multifamily residential thresholds would be exceeded, as discussed further within the text..*
3. *The manner in which buildings in California are constructed generally provides a reduction of exterior-to-interior noise levels of approximately 20 dBA with closed windows (Caltrans 2013).*
4. *Threshold shown is for short-term (mobile) construction noise at the boundary of a multifamily residential property, from County Noise Ordinance. The threshold for short-term (mobile) construction noise at the boundary with a commercial property is 5 dBA greater (i.e., 85 dBA).*

As demonstrated in Tables 3.12-6 and 3.12-7, construction noise would exceed the County's established thresholds for both mobile and stationary construction equipment, and would result in a temporary increase in ambient noise levels for nearby receptors, particularly for residents in those apartments in close proximity to and directly overlooking the construction activities.

Summary of Construction Noise Impacts

Because Project construction equipment would generate noise at levels that substantially exceed the County's daytime standards for construction-related noise at adjacent multifamily residential property boundaries, the impact would be **potentially significant**.

Mitigation Measure MM-NOI-1 is recommended to reduce this potentially significant impact.

MM-NOI-1: Construction Noise Reduction Measures

The Developer shall include the following measures in contractor specifications for the Project, and such measures shall be implemented during all construction phases:

A. *In accordance with Chapter 9.10 of the City of Palo Alto Municipal Code, the hours of construction, including the loading and unloading of materials and truck movements, shall generally be limited to between the hours of 8 a.m. and 6 p.m. Monday through Friday, and between 9 a.m. and 6 p.m. on Saturday. No construction activities shall be permitted on Sundays or holidays. In limited instances where adherence to the allowable hours of construction is not feasible, the contractor shall apply for an exception permit from the City of Palo Alto (and, if the proposed construction work would occur prior to 7 a.m. or after 7 p.m., a variance* *from the County noise ordinance) and adhere to any conditions imposed. In addition, the Developer shall give advance notice of such instances to the owners and occupants of the all residential properties within 50 feet of the project site and provide the contact details of the dedicated disturbance coordinator (see MM-NOI-1b).*

B. *A disturbance coordinator shall be designated for the duration of the construction period, and this person's number shall be conspicuously posted around the project site and in all construction notifications. The disturbance coordinator shall receive complaints about construction disturbances and, in coordination with the County, shall determine the cause of the complaint and implement feasible measures to alleviate the problem.*

C. *The following noise minimization measures shall be implemented:*

- *Construction equipment shall be properly maintained and all internal combustion engine driven machinery with intake and exhaust mufflers and engine shrouds, as applicable, shall be in good condition. During construction, all equipment, fixed or mobile, shall be operated with closed engine doors and shall be equipped with properly operating and maintained mufflers, consistent with manufacturers' standards.*
- *Construction equipment shall be operated in a manner to reduce or avoid high levels of noise emissions (e.g., to the extent practical, lower—rather than drop—loads into trucks or onto platforms to reduce noise-generating impacts of contacting surfaces).*
- *"Quiet" models of construction equipment, particularly air compressors, generators, pumps, and other stationary noise sources, shall be selected and used on site. For example, oil-cooled air compressors shall be used in lieu of air-cooled compressors.*
- *Electrical power, rather than diesel equipment, shall be used to power tools and any temporary structures, such as construction trailers.*
- *Staging areas and stationary noise-generating equipment, such as compressors, shall be located as far away from noise-sensitive uses as feasible.*
- *Idling times of equipment shall be minimized by either shutting equipment off when not in use or reducing the maximum idling time to 5 minutes.*
- *Where available, mobile construction equipment shall have smart back-up alarms that automatically adjust the sound level of the alarm in response to ambient noise levels. Alternatively, back-up alarms shall be disabled and replaced with human spotters to ensure safety when mobile construction equipment is moving in the reverse direction.*
- *All noise from workers' radios shall be controlled to a point that they are not audible at sensitive receptors near construction activity.*

D. *Temporary sound barriers using sound blankets and/or an engineered acoustic barrier shall be installed and maintained along the boundaries of the construction site. The barriers shall be kept in place throughout all phases of the construction period, except during periods when they would interfere with construction activities in* *the vicinity. For street-frontages (Park Boulevard, Grant Avenue, and Birch Street), the barrier shall be at least 8 feet in height. For the rear (southeast) boundary of the site the barrier shall be at least 16 feet in height. Alternatively, if the owner and tenants of the buildings on the adjacent properties agree, temporary sound barriers may be installed on individual balconies and windows of the adjacent buildings in lieu of the property-line barrier previously described.*

Implementation of MM-NOI-1A would require the construction contractor to adhere to the City's allowable construction hours wherever feasible, so that construction noise predominantly occurs during daytime hours and therefore would not disturb people during normal sleeping hours. For the limited occasions when earlier starts morning starts or late evening work are required for logistical reasons, the contractor would need to obtain an exception permit and provide advance notice to nearby sensitive receivers. MM-NOI-1B would require that a disturbance coordinator be appointed to investigate noise complaints and implement additional measures, where feasible, to address them. MM-NOI-1C would require the contractor to take measures to minimize unnecessary or particularly annoying noise sources during construction. MM-NOI-1D would reduce the transmission of noise beyond the project site by providing a physical barrier between the sources of construction noise and nearby receptors.

The installation of temporary sound barriers and/or sound blankets between construction activities and adjacent sensitive receptors typically provide an estimated 10 to 15 dBA L_{eq} attenuation (FHWA 2006, FTA 2018), where the barriers completely obstruct the line of sight between the noise source and the receptor and are installed in accordance with industry best practices. If feasible to construct temporary sound barriers or blankets at the site to achieve this anticipated level of attenuation, noise levels at the property boundary from general construction activities on the site would be reduced to between 65 and 70 dBA L_{eq}, which is still at or above the County's 65 dBA standard for long-term (stationary) construction noise. The noise levels from "worst case" construction activities immediately adjacent to the property boundary would be reduced to between 74 to 79 dBA L_{eq}, which would be below the County's threshold for short-term construction noise.

However, due to the height and proximity of the adjacent apartment and office buildings to the construction site, it would not be technically or economically feasible to construct sound barriers high enough to completely obstruct the line of sight to all sensitive receptors. The required heights of the barriers specified in MM-NOI-1 are the maximum heights that are likely to be feasible at the site given the available space, engineering design factors (e.g., the type of support system required to adequately support the barrier and associated wind loading), and logistical factors (e.g., to facilitate site access, allow crane reach, etc.)(Mercy Housing and Abode Communities, 2021b). Therefore, although the noise barriers required by MM-NOI-1B would substantially reduce the level of construction noise received by residents and workers within these buildings, particularly for those on lower floors, noise levels that exceed the County thresholds could still occur.

Given the above considerations, although the implementation of MM-NOI-1A through MM-NOI-1D would substantially reduce construction noise impacts to nearby sensitive receptors, construction activities would still cause a substantial temporary increase in ambient noise levels above applicable significance standards. Therefore, even with implementation of MM-NOI-1A through MM-NOI-1D, the construction noise impact would be **significant and unavoidable.**

Operation

Operation of the Project would generate noise associated with use of Project-generated traffic, delivery and trash/recycling trucks, outdoor courtyards, and mechanical equipment. These operational noise sources are discussed in detail below and compared to the applicable thresholds for operational noise described above.

Project-Generated Traffic

As described in the Traffic Impact Assessment prepared for the Project (Appendix E), conversion of the project site from a small office building to a 110-unit mixed use building would result in a net increase of 145 average daily trips, compared to existing conditions. This Project-related traffic volume would be distributed along the surrounding roadways adjacent to the project site.

The average hourly traffic volume for local roadway segments, as well as the calculated "existing plus project" hourly traffic volume, are shown in Table 3.12-8 below. As shown, Project-related traffic would increase the existing volumes along the studied segments between 0 and approximately 6 percent. A doubling of traffic volume is generally accepted to produce a 3-dBA increase in noise, which is barely perceptible by human hearing (Caltrans 2013). The Project would not double the existing traffic volume of any nearby roadways; therefore, there would be an imperceptible increase in traffic-related noise.

Table 3.12-8 Existing and Existing Plus Project Peak-Hour Traffic Volumes

Roadway	Existing Traffic Volume (vehicles per hour)	Existing Plus Project Traffic Volume (vehicles per hour)	Percent Increase	Estimated Increase in Noise Level due to Traffic Volume
Park Boulevard	793	826	4.2%	0.2 dBA
Page Mill Road	571	604	5.8%	0.2 dBA
Sherman Avenue	159	159	0.0%	0 dBA
Birch Street	686	713	3.9%	0.2 dBA
Sheridan Avenue	289	297	2.8%	0.1 dBA
Grant Avenue	161	163	1.2%	0.1 dBA
El Camino Real	3,905	3,907	0.1%	0 dBA
Oregon Expressway	3,214	3,249	1.1%	0 dBA
California Avenue	508	508	0.0%	0 dBA
Middlefield Road	1,698	1,703	0.3%	0 dBA

Source: Compiled by AECOM 2021 based on data from Traffic Impact Analysis, see Appendix E.

Delivery and Trash/Recycling Trucks

Noise from delivery trucks and trash/recycling hauling trucks would generate short-term, temporary, periodic noise near the project site. Delivery and trash/recycling hauling trucks would access the project site via adjacent roadways and may periodically idle on adjacent roadways while performing duties. The average noise level for a single idling truck is estimated at 80 dBA L_{eq} at a distance of 10 feet (BridgeNet 2008). Garbage trucks have been measured at 65 dBA L_{eq} at a distance of 50 feet while idling and up to 80 to 90 dBA while emptying dumpsters (DSA Engineers 2003).

While trucks serving the project site would contribute to the overall noise environment, estimated noise from idling trucks would not be substantially louder than existing conditions, as the existing project site and surrounding neighborhood is already served by trash/recycling and delivery trucks. The frequency of mail and package deliveries would be expected to increase compared to existing conditions due to the proposed residential uses, which would generate more demand for delivery services. However, the existing conditions have an open surface parking lot exposing sensitive receptors to noise, while the Project has a double driveway entry to the parking garage that can accommodate typical mail/package delivery vehicles. The Project's driveway design positions the delivery vehicles under the upper floors of the building, creating a physical noise barrier that the existing site does not have. Even if some delivery trucks choose to idle on Grant Avenue rather than accessing the lobby through the parking garage, the proposed four-story building would act as a physical noise barrier between the trucks and adjacent sensitive receptors.

As such, noise from delivery and trash trucks would be consistent with existing noise levels and would not significantly contribute to an increase in ambient noise levels at sensitive receptors near the project site.

Outdoor Courtyards

Conversations and music from residents using the three proposed outdoor courtyards may be audible at nearby sensitive receptors, such as the adjacent apartment building at 200 Sheridan Avenue. Conversational noise when 20 people are talking simultaneously is approximately 63 dBA at 3 feet (City of Los Angeles 2014). The proposed courtyards would be at least 8.5 feet from the rear property boundary. Assuming an attenuation level of 6 dBA per doubling of distance, conversations would be approximately 54 dBA at the adjacent residential property boundary. Therefore, noise levels would not exceed the County's residential noises standards (60 dBA daytime or 55 dBA nighttime). Conversational noise levels would also be less than the ambient noise level already experienced at these receptors (58 dBA), and therefore would not exceed the City's noise standard of 5 dBA above existing ambient levels.

The level of noise generated from music played within the outdoor courtyards would depend on the volume the music is being played. Music would be subject to the PAMC noise ordinance requirements, specifically, Section 9.10.040, which states that "no person shall produce, suffer or allow to be produced by any machine or device, or any combination of same, on residential property, a noise level more than 6 dB above the local ambient at any point outside of the property plane." Nearby residents could call the City's code enforcement division if disturbed by music or other machine-produced noise occurring within the courtyards or elsewhere on the project site. Section B11-154(b) of the County Noise Ordinance also generally prohibits noise from radios, instruments, loudspeakers or similar devices that creates a noise disturbance across a residential or commercial property line between 10:00 p.m. and 7:00 a.m., or exceeds the standards in Section B11-152 at any time. Violations of the County Noise Ordinance are enforced by the County Department of Environmental Health.

Mechanical Equipment

Mechanical equipment includes HVAC equipment and exhaust fans, which are typically located on the roof of a building or within an interior mechanical room. Per the Project plans, mechanical units would be located in four locations on the roof of the proposed new building, the closest of which is approximately 28 feet from the nearest residential property boundary. Garage exhaust units would also be located on the building roof, approximately 95 feet from the closest residential property boundary.

The proposed HVAC equipment to be installed at the project site has a reference noise level of approximately 59 dBA at a distance of 5 feet. Based on a standard noise attenuation rate of 6 dBA per doubling of distance from stationary equipment, this noise level would attenuate to approximately 44 dBA L_{eq} at the boundary of the project site (28 feet). Such noise levels would be below both the County's daytime (60 dBA) and nighttime (55 dBA) standards for operational noise at residential site boundaries and would also comply with the City's noise standard of no more than 5 dBA above ambient levels because it would be below the existing daytime (58 dBA) and nighttime (52 dBA) ambient noise levels at the nearest sensitive receptor.

Summary of Operational Noise Impacts

As discussed above, Project-generated operational noise sources such as use of operational traffic, delivery and garbage trucks, outdoor courtyards, and mechanical equipment would not cause a substantial increase in noise levels that would exceed applicable City or County thresholds, and would not result in an increase above existing ambient noise levels of more than 5 dBA. Therefore, the operational noise impact of the Project would be **less than significant**.

Impact NOI-2: Groundborne Vibration

Impact NOI-2 would be **significant and unavoidable**. Mitigation measure MM-NOI-2 is recommended but would not reduce the impacts to a less than significant level.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would generate excessive groundborne vibration or groundborne noise levels.

The City of Palo Alto has not adopted specific numerical thresholds for groundborne vibration impacts. The County Noise Ordinance prohibits any device that creates a vibrating or quivering effect that:

- Endangers or injures the safety or health of human beings or animals;
- Annoys or disturbs a person of normal sensitivities; or
- Endangers or injures personal or real properties.

The County Noise Ordinance specifies the vibration perception threshold as a motion velocity of 0.01 in/sec over the range of one to 100 Hz but does not define at what level annoyance or disturbance of humans would occur, or at what level property damage might occur.

The Federal Transit Administration (FTA) has developed criteria that are commonly applied as an industry standard to determine the impacts of construction vibration relative to structural damage and human annoyance, as presented in Table 3.12-9 and Table 3.12-10, respectively (FTA 2018).. For structural damage, the level of vibration that would cause a significant impact to structures depends on the structure type and condition. For human annoyance, the level of vibration that would cause a significant impact depends on the land use type and the frequency of vibration events.

Table 3.12-9 Construction Vibration Damage Criteria

Structure and Condition	Peak Vibration Threshold (in/sec PPV)	Approximate Vibration Level (VdB)
Reinforced-concrete, steel or timber (no plaster)	0.5	102
Engineered concrete and masonry (no plaster)	0.3	98
Non-engineered timber and masonry buildings	0.2	94
Buildings extremely susceptible to vibration damage	0.12	90

Source: FTA 2018, adapted from Table 7-5.

Acronyms: in/sec = inches per second; PPV = peak particle velocity, VdB = vibration decibels

Table 3.12-10 Indoor Groundborne Vibration Criteria

Land Use	Peak Vibration Threshold for Frequent Events (in/sec PPV)	Peak Vibration Threshold for Occasional Events (in/sec PPV)	Peak Vibration Threshold for Infrequent Events (in/sec PPV)
Buildings where vibration would interfere with interior operations.	65 VdB	65 VdB	65 VdB
Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB
Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB

Source: FTA 2018, adapted from Table 6-3
Acronyms: in/sec = inches per second; PPV = peak particle velocity

Impact Analysis

Construction

Project construction activities have the potential to result in varying degrees of temporary and short-term ground vibration, depending on the specific construction equipment used and the operations involved. In general, vibration-induced structural damage occurs only when certain types of construction activity (e.g., pile driving, heavy earthmoving) and heavy truck travel occur very close to existing structures. Vibration-induced disruption/annoyance could occur during more common types of construction activity (e.g., demolition, use of heavy earthmoving equipment, hauling of material) at a greater distance from the area of activity.

Groundborne vibration impacts from the Project were estimated based on existing documentation of vibration levels produced by specific construction equipment and the distance of sensitive receptors from the given source. The estimates represent a conservative estimate of the maximum vibration levels anticipated—actual vibration levels would fluctuate over time depending on the type and location of the equipment used on site.

As described in Section 2.4.1, on-site construction equipment would include vibratory rollers, vibratory plate compactors, excavators, jackhammers, and heavy trucks being loaded with demolition debris, which would operate throughout the project site during Phase 1 of Project construction, including in close proximity to the boundary of the adjacent residential and office building properties, during general site preparation and foundation excavation. A hollow stem drill rig may also be utilized in order to drill displacement columns to support the eastern foundation of the new building.

In later phases of construction, small vibratory plate compactors would be used to compact the building footings and utility trenches, and a mobile crane and large crawler crane would be used, which would be predominantly operated on or adjacent to the staging area in the Grant Avenue right-of-way and for short periods within the Park Boulevard and Birch Street rights-of-way. Table 3.12-11 lists the groundborne vibration levels associated with typical construction equipment at a distance of 25 feet.

Table 3.12-11 Typical Construction Equipment Vibration Levels

Equipment	Reference Vibration Level PPV at 25 feet (in/sec)	Reference Vibration Level Lv at 25 feet (in VdB)
Impact Pile Driver[1]	0.644 (1.518)	104 (112)
Sonic Pile Driver[1]	0.170 (0.734)	93 (105)
Vibratory Roller	0.21	94
Large Bulldozer/Hoe Ram	0.089	87
Drill	0.089	87
Truck	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Source: FTA 2018, Caltrans 2020.

Acronyms: in/sec = inches per second; Lv = velocity level in decibels, based on the root mean square velocity amplitude; PPV = peak particle velocity; VdB = velocity decibels.

Notes: 1. Vibration levels shown for pile drivers are typical values, with upper range values in parentheses.

The nearest sensitive uses to the project site include the multifamily residential apartment building at 200 Sheridan Avenue and the Courthouse Plaza office building at 260 Sheridan Avenue, both of which are approximately 8 feet from the rear boundary of the project site. The Palo Alto Courthouse building is approximately 65 feet from the project site boundary and approximately 50 feet from the Grant Avenue right-of-way (which would be used as a staging area during project construction, including for large trucks and cranes).

The estimated maximum vibration levels for each of the sensitive receptors are shown in Table 3.12-12. As described previously, the threshold of significance for human annoyance depends on land use type and the frequency of vibration events. Construction-generated vibration is typically considered to be a “frequent” event (thresholds for occasional and infrequent events are typically applied for activities with a limited number of defined events, such as passing trains or blasting). Therefore, the threshold for human annoyance at the apartment building (residential use) is 72 VdB, whereas the threshold for human annoyance at the Courthouse Plaza (office building with predominantly daytime use) is 75 VdB. The threshold for structural damage at the apartment building, Courthouse Plaza office building and Palo Alto Courthouse would be 0.5 in/sec PPV as these are modern steel and reinforced-concrete buildings.

Table 3.12-12 Estimated Vibration Levels for Sensitive Receptors

Vibration Source	Sensitive Receptor	Distance between Source and Receptor	Estimated PPV at receptor (in/sec)	Estimated Lv at receptor (VdB)	Threshold for structural damage (in/sec PPV)	Threshold for human annoyance (VdB)
Drill Rig	Apartment Building	12 feet	0.268	**97***	*0.5*	*72*
Drill Rig	Courthouse Plaza	12 feet	0.268	**97***	*0.5*	*75*
Drill Rig	Palo Alto Courthouse	230 feet	0.003	58	*0.5*	*75*
Jackhammer	Apartment Building	8 feet	0.138	**94***	*0.5*	*72*
Jackhammer	Courthouse Plaza	8 feet	0.138	**94***	*0.5*	*75*
Jackhammer	Palo Alto Courthouse	65 feet	0.008	67	*0.5*	*75*
Large Excavator	Apartment Building	8 feet	0.352	**102***	*0.5*	*72*
Large Excavator	Courthouse Plaza	8 feet	0.352	**102***	*0.5*	*75*
Large Excavator	Palo Alto Courthouse	65 feet	0.021	**75***	*0.5*	*75*
Small Excavator	Apartment Building	8 feet	0.012	70	*0.5*	*72*
Small Excavator	Courthouse Plaza	8 feet	0.012	70	*0.5*	*75*
Small Excavator	Palo Alto Courthouse	65 feet	0.001	46	*0.5*	*75*
Trucks	Apartment Building	8 feet	0.300	**101***	*0.5*	*72*
Trucks	Courthouse Plaza	8 feet	0.300	**101***	*0.5*	*75*
Trucks	Palo Alto Courthouse	50 feet	0.027	**77***	*0.5*	*75*
Large Crane	Apartment Building	100 feet	0.011	69	*0.5*	*72*
Large Crane	Courthouse Plaza	100 feet	0.011	69	*0.5*	*75*
Large Crane	Palo Alto Courthouse	50 feet	0.031	**78***	*0.5*	*75*
Vibratory Roller	Apartment Building	8 feet	**1.160***	**109***	*0.5*	*72*
Vibratory Roller	Courthouse Plaza	8 feet	**1.160***	**109***	*0.5*	*75*
Vibratory Roller	Palo Alto Courthouse	65 feet	0.050	**82***	*0.5*	*75*

Source: calculated by AECOM 2020, based on reference values from FTA 2018, Caltrans 2020.

*Notes: Vibration levels for large and small excavators are conservatively based on reference values for large and small bulldozers, respectively, as reference values were not available for all equipment types. Similarly, vibration levels for a crawler crane are conservatively based on reference values for a large bulldozer due to lack of equipment-specific reference values. Values shown in **bold with asterisk*** indicate that applicable thresholds would be exceeded, as discussed further in the text.*

Acronyms: in/sec = inches per second; Lv = velocity level in decibels, based on the root mean square velocity amplitude; PPV = peak particle velocity; VdB = velocity decibels.

As shown in Table 3.12-12, vibration levels of up to 1.160 in/sec PPV or 109 VdB could be experienced at the adjacent apartment building and Courthouse Plaza office building during construction, with the most intense vibrations occurring during the operation of large vibratory equipment such as vibratory rollers, which could be operated right up to the site boundary. These levels of vibration could exceed the threshold for potential building damage for the apartment building and the Courthouse Plaza office building (0.5 in/sec PPV). Operation of other construction equipment is not anticipated to cause vibration levels that would exceed the relevant thresholds for potential building damage, but operation of trucks, large excavators, and drill rigs in proximity to the rear property boundary could also exceed the threshold for human annoyance for both the apartment (72 VdB) and office building (75 VdB).

The highest levels of vibration that would be experienced at the Palo Alto Courthouse would be up to 0.050 in/sec PPV or 82 VdB which would occur during operation of large vibratory equipment on the project site. Vibration at these levels would not exceed the applicable threshold for potential building damage (0.5 in/sec PPV), but could exceed the 75 VdB threshold for human annoyance. Operation of trucks and large cranes in the Grant Avenue right-of-way and large excavators on the project site could also exceed the 75 VdB threshold for human annoyance at the Palo Alto Courthouse.

Actual vibration levels within the buildings would be reduced from the estimates in Table 3.12-12, due to coupling loss provided by the heavy structure of these buildings. Coupling loss, also known as connection loss, is the reduction in vibration levels that occurs when energy is transferred from one medium to another. Coupling loss is usually expressed in the same units—such as decibels—as in the originating medium. The general rule is the heavier the building construction, the greater the coupling loss. According to FTA, the coupling loss for a large masonry building would be approximately 10 VdB. However, even accounting for coupling loss, construction-related vibration experienced within the adjacent apartment and office buildings could still exceed the applicable thresholds for human annoyance by more than 20 VdB. This impact would be temporary and sporadic, occurring only during the operation of certain equipment in certain areas of the project site, and would mostly occur during Phase 1 (site clearing, grading, and excavation) of Project construction.

Because construction-related vibration may exceed the applicable thresholds for potential building damage and human annoyance at the Courthouse Plaza office building and adjacent multifamily apartment building, and the threshold for human annoyance at the Palo Alto Courthouse, this impact would be **potentially significant**.

Mitigation Measure MM-NOI-2 is recommended to reduce this potentially significant impact.

MM-NOI-2: Vibration Reduction Measures

The Developer shall include the following measures in its contractor specifications, and such measures shall be implemented by the Contractor(s) during construction:

A. *The owners and occupants of the residential apartment building at 200 Sheridan Avenue and owners and tenants of the Courthouse Plaza office building at 260 Sheridan Avenue) and other vibration sensitive uses within 50 feet of heavy construction activity shall be notified of the construction schedule, as well as the name and contact information of the project disturbance coordinator identified under MM-NOI-1B.*

B. *Operation of vibratory equipment, such as vibratory rollers or vibratory plate compactors, shall not be undertaken outside of the City's allowable construction hours specified in MM-NOI-1A.*

C. *Operation of vibratory equipment, such as vibratory rollers or vibratory plate compactors, shall not be undertaken within a 15 feet buffer zone around existing buildings on adjacent residential and commercial properties, unless:*

   - *The equipment is operated in "static mode" with all vibratory functions turned off; or*

- *Realtime vibration monitoring is undertaken at the adjacent buildings during all use of vibratory equipment within the buffer zone, and vibratory equipment usage is stopped, or operated in "static mode" if vibration levels exceed 0.49 in/sec PPV at those buildings; or*
- *A qualified acoustic consultant is retained by the contractor to review and revise the buffer zone distance based on site-specific conditions and vibration levels generated by the actual equipment used at the site, such that vibration levels at the adjacent buildings shall not exceed 0.49 in/sec PPV during any construction activities.*

Implementation of mitigation measure MM-NOI-2 would require the contractor to limit the use of large vibratory equipment to daytime hours, so that it would not disturb people during normal sleeping periods, and would limit the use of large vibratory equipment in close proximity to adjacent vibration-sensitive receptors so that the threshold for potential building damage is not exceeded. In addition, MM-NOI-2 would require affected sensitive receptors to be informed ahead of time so that they can make arrangements/take actions to reduce their exposure to vibration if desired, and provides a point of contact if they have concerns or complaints during construction. However, even with implementation of MM-NOI-2, operation of heavy equipment at the project site could result in vibration levels at nearby buildings that exceed the threshold for human annoyance. Therefore, this impact is considered **significant and unavoidable**.

Operation

Operation of the Project would not introduce new vibration-generating sources or activities in the project area. Therefore, Project operation would have **no impact** related to vibration.

Impact NOI-3: Airport Noise

Impact NOI-3 would be **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, 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 2 miles of a public airport or public use airport, may have a significant impact if it would expose people residing in the project area to excessive noise levels.

Impact Analysis

As discussed in the environmental setting, the Palo Alto Airport is located approximately 2.5 miles to the northeast of the project site. Because the Project is not within the vicinity of a private airstrip or an airport land use plan and is not within 2 miles of a public airport or public use airport, there would be **no impact**.

3.12.4 Cumulative Impacts and Mitigation

As discussed in Section 3.12.3 above, the Project would have no impact in relation to airport noise (Impact NOI-3). Therefore, the Project would not contribute to any potential cumulative impacts for this issue. This section analyzes the potential of the Project to contribute to the following cumulative noise and vibration impacts:

- **Impact C-NOI-1:** Contribution to cumulative effects related to noise.
- **Impact C-NOI-2:** Contribution to cumulative effects related to vibration.

Cumulative Impact C-NOI-1: Noise

The cumulative impact for C-NOI-1 would be **significant and unavoidable**.

Cumulative Context

The geographic context for analysis of cumulative impacts related to noise and vibration is the immediate Project vicinity. Noise and vibration are localized occurrences and attenuate rapidly with distance. For construction noise and vibration, the cumulative context would be limited to those cumulative projects that would have overlapping construction periods with the Project. For operational noise, the cumulative context would include any cumulative projects that introduce noise-generating equipment that could be heard by the same sensitive receptors as the Project's operational noise, or that would increase traffic levels on the same local streets as Project-generated traffic.

Cumulative Impact Analysis

Construction

The only cumulative project identified in Section 3.1.2 in the immediate vicinity of the project site is the Public Safety Building (PSB) project at 250 Sherman Avenue, approximately 400 feet to the northwest. Because the construction period for the PSB building would overlap with Project construction, sensitive receptors between the two construction sites, such as the residential apartment buildings on Birch between Grant and Sherman could be subjected to combined construction noise from both projects.

Anticipated unmitigated construction noise at these residential apartment buildings during the loudest phase of Project construction would be up to approximately 67 dB for the northernmost building and up to approximately 69 dB for the southernmost building.[37]

The EIR for the PSB project determined that anticipated unmitigated noise levels at the northernmost of the residential buildings (100 feet from PSB building site) could be up to 76 dB during the "vertical construction" phase for the PSB building (City of Palo Alto 2018a).[38] Applying a standard attenuation rate of 6 dBA per doubling of distance, estimated unmitigated construction noise at the southernmost of the residential buildings (200 feet from PSB building site) would be up to 70 dB.

Because decibels are logarithmic units, noise levels cannot be added or subtracted by ordinary arithmetic means. For example, combining two identical noise sources would not result in a doubling of noise level, but rather would increase the noise level by 3 dB; and if two unequal noise sources are combined, the increase in noise level depends on the difference between the two (Caltrans 2013). Table 3.12-13 shows the estimated noise levels at the two residential apartment buildings on Birch Street between Grant and Sherman from each project and the resulting combined noise level.

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[37] Calculated using combined construction noise of 84 dB at 50 feet for the site clearing, grading and excavation phase (per Project-level analysis in Section 3.12.3), adjusted for distance from the center of the Project site (370 feet for the northernmost building and 290 feet for the southernmost building) using a standard attenuation rate of 6 dB per doubling of distance.

[38] Construction of the Public Safety Building began in June 2021 and is anticipated to be completed in summer 2023. The Project is scheduled to begin construction in summer of 2022 and therefore would only overlap with the "vertical construction" phase of the PSB project.

Table 3.12-13 Estimated Cumulative Construction Noise at Sensitive Receptors

Sensitive Receptor	Estimated Unmitigated Noise Level from Project Construction	Estimated Unmitigated Noise Level from PSB Building Construction	Estimated Unmitigated Combined Noise Level from Both Projects[1]	*County Threshold for Multifamily Residential Property[2]*
Apartments at Birch and Sherman	67 dB	76 dB	**77 dB***	*65 dB*
Apartments at Birch and Grant	69 dB	70 dB	**73 dB***	*65 dB*

Source: Calculated by AECOM in 2021.

Acronyms: PSB = Public Safety Building; dB = decibel.

Notes:

1. *Calculated using decibel addition methodology from Caltrans 2013, using unmitigated construction noise estimates from Section 3.12.3 (for Project) and from City of Palo Alto 2018a (for PSB building), adjusted for distance using standard attenuation rate of 6 dB per doubling of distance. Values shown in* ***bold with asterisk**** *indicate that County thresholds would be exceeded, as discussed further within the text.*
2. *Threshold shown is for long-term (stationary) construction noise at the boundary of a multifamily residential property, from County Noise Ordinance.*

As shown in Table 3.12-13, the combined unmitigated exterior noise levels at the two Birch Street apartment buildings would be up to 73 to 79 dB. These levels are below the City's threshold of 110 dBA for construction noise; but are above the County's threshold of 65 dB for long-term (stationary) construction equipment of 65 dB. The overall cumulative impact of construction noise is therefore **potentially significant**.

Both the Project and PSB project would be subject to mitigation measures that would reduce construction noise. However, due to uncertainty regarding the efficacy of the mitigation measures, this cumulative impact is conservatively identified as **significant and unavoidable**.

Operation

For operational noise, none of the cumulative projects are close enough that mechanical equipment or other permanent noise-generating sources introduced to those project sites would be perceptible at the 231 Grant Avenue project site. However, operational traffic associated with the PSB project, as well as vehicle trips from other cumulative development in the area would use the same streets, and an incremental increase of noise levels along roadways would be expected. Table 3.12-14, below, shows the existing and anticipated cumulative traffic volumes on local roadways, both with and without the Project.

As previously described, a doubling of traffic volumes (i.e., an increase of 100 percent) is generally required to result in a perceptible increase in traffic-related noise. Table 3.12-14 shows that the increase in traffic volumes on most local roadways due to all cumulative projects (including the Project) would be less than 20 percent above existing traffic volumes, with an increase of up to 65 percent on Sherman Avenue[39]. Because traffic under cumulative conditions would not double (i.e., the increase is less than 100 percent), there would not be a perceptible increase in traffic-related noise due to cumulative conditions. Therefore, the overall cumulative impact would be **less than significant.**

[39] As shown in Table 3.12-14, traffic volumes on Sherman Avenue would be the same under cumulative conditions with and without the Project, therefore the 65 percent increase in cumulative traffic on Sherman Avenue is not due to the Project.

Table 3.12-14 Existing and Cumulative Peak-Hour Traffic Volumes

Roadway	Existing (vph)	Cumulative without Project (vph)	Cumulative Plus Project (vph)	Total Cumulative Increase over Existing (%)[1]	Estimated Increase in Traffic Noise Level[2]
Park Boulevard	793	873	908	15%	0.6 dBA
Page Mill Road	571	635	668	17%	0.7 dBA
Sherman Avenue	159	263	263	65%	2.2 dBA
Birch Street	686	779	806	17%	0.7 dBA
Sheridan Avenue	289	315	323	12%	0.5 dBA
Grant Avenue	161	177	179	11%	0.5 dBA
El Camino Real	3,905	4,373	4,418	13%	0.5 dBA
Oregon Expressway	3,214	3,562	3,597	12%	0.5 dBA
California Avenue	508	550	550	8%	0.3 dBA
Middlefield Road	1,698	1,786	1,791	5%	0.2 dBA

Source: Traffic Impact Analysis, see Appendix E.

Acronyms: vph = vehicles per hour; % = percentage

Notes: 1. Percentage increase of cumulative plus project volumes above existing volumes. 2. Estimated increase in traffic noise from cumulative plus project conditions, compared to existing conditions.

Cumulative Impact C-NOI-2: Vibration

The overall cumulative impact for C-NOI-2 would be **significant and unavoidable**.

Cumulative Context

The geographic context for analysis of cumulative impacts related to vibration is the immediate Project vicinity. Vibration is a localized occurrence that attenuates rapidly with distance.

Cumulative Impact Analysis

The only cumulative project identified in Section 3.1.2 in the immediate vicinity of the project site is the PSB project at 250 Sherman Avenue, approximately 400 feet to the northwest. Vibration-sensitive receptors between the two construction sites, such as the Palo Alto Courthouse, could be subjected to vibration from both projects. However, although the overall construction periods for the two projects would overlap, the most intensive vibration activities for the PSB project would occur during earlier phases of construction (demolition and site grading/excavation) which would not overlap with construction of the Project (City of Palo Alto 2018). Therefore, vibration from the two projects would not combine.

However, because the Project would cause significant and unavoidable vibration impacts during construction that could not be reduced to a less-than-significant level by implementation of mitigation measures, the overall cumulative impact would also be **significant and unavoidable**.

3.13 Population and Housing

This section describes the existing setting of the project area related to population and housing and evaluates whether the Project would result in adverse effects on population and housing. The following comments relating to population and housing were received during the public scoping period in response to the Notice of Preparation:

- Recognition that the Project is a critical and needed housing complex for educator workforce employees that will serve as a model for other communities and demonstrate how partnerships can create much needed housing.
- Support for teachers and educators to be able to live within the community they serve.

In addition, several comments were received during the City of Palo Alto City Council study session held on February 8, 2021 that expressed general support for the provision of educator workforce housing in the community.

3.13.1 Environmental Setting

Population

The California Department of Finance estimates the City of Palo Alto's total population increased from 64,403 in 2010 to 69,226 in 2020, or a 7.5 percent increase over the 10-year period (California Department of Finance 2020). The population growth rate in the City is at a lower rate than that of Santa Clara County as a whole, which had a growth rate of approximately 10.1 percent from 2010 to 2020. It has been projected that the City of Palo Alto's total population will increase to 86,510 in 2040 and Santa Clara County's total population will increase to 2,538,320 (ABAG and MTC 2018). The City determined that implementation of the General Plan would not induce population growth that was unplanned for or would exceed regional projections for 2030, such as ABAG (City of Palo Alto 2017a).

Housing

The estimated total number of housing units in the City of Palo Alto was 29,298 in 2020, with an average household size of 2.48 persons per unit (California Department of Finance 2020). In the City of Palo Alto, single-family housing units (both detached and attached) account for approximately 60.1 percent of the total housing stock while multi-family units, such as apartments, account for approximately 38.9 percent of the total housing stock. The City's current vacancy rate of 5.6 percent is higher than the County's vacancy rate of 4.3 percent[40] (California Department of Finance 2020). Government Code 65584.01(b)(1)(E) specifies that a vacancy rate for a healthy rental housing market is no less than 5 percent. However, vacancy rates for owner-occupied housing is unspecified in the statute. Generally, a lower vacancy rate often means that households are having difficulty finding housing within their price range; a higher vacancy rate may indicate an oversupply of units. The City has a higher proportion of available housing units compared to the County.

In addition, the number of rental vacancies has increased due to the COVID-19 pandemic and accompanying economic disruption. However, vacancy rates are expected to recover as workers return to the office and unemployment rates decrease (Wall Street Journal 2021; ABC 7 News 2021).

[40] Vacancy rate unspecified to rental and/or owner-occupied homes.

ABAG projects the total households in the City of Palo Alto would be approximately 32,940 in 2040. Santa Clara County's total households is projected to be 860,810 units in 2040. The City of Palo Alto would have approximately 3.83 percent of the total households in Santa Clara County in 2040 (ABAG and MTC 2018).

Employment

ABAG estimates total jobs in the City of Palo Alto would grow from 121,740 jobs in 2020 to 126,510 jobs in 2040. This represents a total increase of 4,770 jobs, and a growth of 3.92 percent or approximately 239 jobs per year. During the same 20-year period, the number of jobs in Santa Clara County is projected to grow by 15.1 percent, from 1,120,420 jobs in 2020 to 1,289,870 jobs in 2040, or approximately 8,473 jobs per year. As of 2020, the total employed residents in the city and the county are 45,215 and 977,955, respectively (ABAG and MTC 2018).

3.13.2 Regulatory Framework

Federal

There are no relevant federal regulations regarding population and housing applicable to the Project.

State

Regional Housing Needs Assessment

California Housing Law (California Government Code Section 65580 to 65589.8) mandates that local governments shall include an assessment of existing and future housing needs and an inventory of resources and constraints relevant to meeting these needs in the Housing Element of their respective General Plan. Local governments, through Councils of Government, quantify the need for housing within each region in a process known as the RHNA.

Local

Association of Bay Area Governments

ABAG is the regional planning agency for the San Francisco Bay Area, which is composed of the nine counties including Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. ABAG is required by California Housing Law (California Government Code Section 65580 to 65589.8) to complete a RHNA, in collaboration with the California Department of Housing and Community Development, to determine the number of housing units to meet the housing needs of people at all income levels.

3.13.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to population and housing:

- **Impact POP-1:** Would the Project directly or indirectly induce substantial unplanned population growth in an area?
- **Impact POP-2:** Would the Project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Impact POP-1: Growth Inducement

Impact POP-1 would be **less than significant impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project is considered to have a significant impact on population and housing if it would induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).

Impact Analysis

Construction

Construction of the Project would begin in 2022 and is anticipated to last approximately 15 to 18 months. Worker numbers would vary throughout construction, with an estimated average of 65 daily construction employees during the most intensive phase of construction. The source of the construction labor force is unknown at this time, but workers would likely come from the local labor pool and it is not anticipated that workers would relocate to Palo Alto from other areas. Therefore, construction of the Project would not induce population growth and there would be **no impact**.

Operation

The Project would include 110 new residential units. Assuming an average of 2.48 residents per unit[41], there would be an increase of 273 permanent residents.[42] The housing units are anticipated to be developed by 2024 and would represent approximately 3 percent of the housing growth expected in Palo Alto by 2040[43]. However, the 273 new residents resulting from the Project would result in a minimal increase in the City's future growth forecasts.

The project site is located within the "California Avenue" priority development area (PDA) in Palo Alto (MTC 2020). PDAs are locally-identified infill opportunity areas located near public transit, that are planned for developing more housing, employment opportunities, and community amenities. While the Project would lead to a very small increase in the City's population, the Project would be consistent with overall planned growth in the City and region.

The majority of new residents would likely relocate from other areas within the Bay Area. However, the Project would create an opportunity for locally-employed teachers, school employees, and public safety employees to live closer to their jobs in Santa Clara and San Mateo Counties, and be located near transit, community services, and existing infrastructure. Siting development in PDAs can help minimize physical impacts on the environment, such as through reductions in VMT and greenhouse gas emissions, in addition to minimizing any development impacts on the environment by locating new development in an existing community rather than in undeveloped areas, further from existing resources in urban areas.

In addition, as acknowledged by the City of Palo Alto in their comments provided during the scoping period (see Appendix A), the Project would be consistent with the following goals and

[41] Average Household Size per CDOF City/County Population and Housing Estimates (CDOF 2020).
[42] This is considered a conservative estimate of population generated by the Project, as the 2.48 residents per housing unit is a citywide average for all housing types, whereas the Project would create multifamily residential units with a high proportion of studio and 1-bedroom units, which would likely have a lesser number of residents per unit than the citywide average.
[43] Based on 2020 housing stock (29,298 units) and projected 2040 housing stock (32,940 units), 3,642 housing units are anticipated to be built in Palo Alto by 2040.

policies outlined in the City's Housing Element and Land Use and Community Design Element (City of Palo Alto 2014; 2017a):

- Program L2.4.7: Explore mechanisms for increasing multi-family housing density near multimodal transit centers.
- Policy L-2.5: Support the creation of affordable housing units for middle to lower income level earners, such as City and school district employees, as feasible.
- Policy H2.1: Identify and implement strategies to increase housing density and diversity, including mixed-use development and a range of unit styles, near community services. Emphasize and encourage the development of affordable and mixed income housing to support the City's fair share of the regional housing needs and to ensure that the City's population remains economically diverse.
- Program H2.1.2: Allow increased residential densities and mixed-use development only where adequate urban services and amenities, including roadway capacity, are available.

ABAG's RHNA allocation for the City for the 2015-2023 Housing Element Update is 1,988 units, assigned to various income levels. The Project would contribute approximately 13.7% of housing units toward the City's RHNA by creating housing units in accordance with the City's RHNA allocation. The City is currently preparing an update to its Housing Element, which will plan for growth in the City between 2023 and 2031. The Project would supply housing to employed local teachers, full-time school district employees, and other public safety employees that are already employed within the local area, allowing them to live within closer proximity to their existing workplaces. Therefore, the Project is not expected to significantly increase the number of jobseekers such that the jobs-housing balance would be affected.

The café or other retail or commercial use of the proposed approximately 1,100 square feet of "flex space" at the project site would generate approximately three new employees on site[44], plus an on-site manager would be employed to manage the residential apartments. According to ABAG, the current employment in Palo Alto in 2020 was 121,740 and is anticipated to increase to 126,510 jobs by 2040. The four new employees resulting from the Project would be negligible compared to the estimated employment in Palo Alto by 2040, and in any case, it is anticipated employees would likely come from the local labor pool and would not relocate to Palo Alto from other areas and, therefore, would not increase the demand for new housing.

The Project is located in an already-urbanized area and would not include any oversized infrastructure or extension of roadways or other services that might indirectly induce growth in the area. For these reasons, the Project would not induce substantial unplanned growth in the City of Palo Alto, and the impact would be **less than significant**.

Impact POP-2: Displacement of People or Housing

Impact POP-2 would be **no impact**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, the Project is considered to have a significant impact on population and housing if it would displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

[44] Based on the City's Downtown Development Cap: Summary of Business and Employment Density Survey, median employment density for retail uses range from 430 square feet to 900 square feet. Using the most conservative of this range (430 square feet per employee), the 1,200 square feet of non-residential uses at the project site could generate up to 3 employees (Dyett & Bhatia 2014).

Impact Analysis

The existing office building currently accommodates the County's Office of the Public Defender, which has approximately ten full-time staff, and is also used by several community groups for meetings and related functions. This building would be demolished as part of the Project, and the Public Defender's office and the community groups would likely be relocated to other existing County facilities or other facilities in the area. The relocation of such activities would not require the construction of new housing. The Project would not remove or displace existing residents or housing that would necessitate construction of replacement housing elsewhere, as there are no existing residents or housing units on the project site. Therefore, there would be **no impact.**

3.13.4 Cumulative Impacts and Mitigation

As discussed in Section 3.13.3 above, the Project would have no impact related to displacement of people or housing (Impact POP-2). Therefore, the Project would not contribute to any potential cumulative impacts for this issue. This section analyzes the potential of the Project to contribute to the following cumulative population and housing impacts:

- **Impact C-POP-1:** Would the Project directly or indirectly induce substantial unplanned population growth in an area?

Cumulative Impact C-POP-1: Growth Inducement

The overall cumulative impact for C-POP-1 would be **potentially significant**. The Project's contribution to the overall cumulative impact would be **less than cumulatively considerable**. No mitigation is required.

Cumulative Context

The geographic context for analysis of cumulative impacts related to population and housing is the City of Palo Alto city limits.

Cumulative Impact Analysis

The City's 2015-2023 Housing Element identified a jobs/housing balance at 3.05 jobs per employed resident, which is skewed to the jobs side of the ratio. This indicates that adequate housing is not available to meet the needs of workers in the City. The existing jobs/housing imbalance, which is a result of past and present projects, is considered a **potentially significant** cumulative impact.

As described above, the Project would result in an increase of 110 residential units, which represents approximately 0.33 percent of the housing growth expected in Palo Alto by 2040 and would provide four new jobs. Therefore, implementation of the Project would provide more housing than jobs, which would help to improve the balance of jobs and housing in the City. The Project's contribution to the jobs/housing imbalance would be beneficial and would not further skew the balance toward jobs. Therefore, the Project's contribution to the overall cumulative impact would be **less than cumulatively considerable**.

3.14 Public Services and Recreation

This section describes the existing public services and recreation setting of the project area and evaluates whether the Project would result in adverse effects to public services and recreation. The following comments relating to public services and recreation were received during the public scoping period in response to the Notice of Preparation:

- Request that the Project include some public space and green space.

In addition, concerns regarding the general lack of existing recreation/park facilities in the neighborhood were raised by local residents during the City of Palo Alto City Council study session held on February 8, 2021.

3.14.1 Environmental Setting

Fire Protection Services

The City of Palo Alto Fire Department (PAFD) provides fire protection and suppression, and emergency medical services to the City of Palo Alto, including the project site. The PAFD is currently staffed with over 114 personnel. From January 2020 to June of 2020, PAFD responded to a total of 3,603 calls for service, a 21 percent decrease from the same time during the previous year, likely resulting from the start of the COVID-19 pandemic (City of Palo Alto 2020a).

The project site would be served by Fire Station #2 at 2675 Hanover Street, approximately 1.0 mile southwest of the project site. Station #2 houses three assigned fire personnel. Response from this station is currently provided with a fire engine and ambulance which are cross staffed. The estimated current travel time from this station to the project site is approximately 5 minutes or less (Schneider, pers. comm., 2021).

Police Protection Services

The City of Palo Alto Police Department (PAPD) provides police service within the City of Palo Alto limits. The PAPD provides service from one central police station at 275 Forest Avenue. The PAPD is currently staffed with over 150 personnel including police lieutenants, police agent/officers, public safety dispatchers, investigative service staff, administrative staff, and one police chief. In 2019, PAPD received 51,417 calls for service ranging from serious in-progress crimes to non-criminal dispute mediation (City of Palo Alto 2020c).

The PAPD's Field Services Division includes all uniformed patrol personnel, including officers who respond to emergency and non-emergency calls for service. The Patrol Division, within the Field Services Division, is the largest workgroup in the Department and consists of two lieutenants, ten sergeants, and ten teams staffed with three to five officers/agents (City of Palo Alto 2020c). In addition to the Patrol Division, the Field Services Division includes specialized functions such as the Emergency Medical Team, Field Training Program, SWAT Team, Crisis Negotiations Team, Canine Program, Bike Team, Range Team, and Reserve Officer Program.

Schools

The project site is within the Palo Alto Unified School District (PAUSD). PAUSD comprises 12 elementary schools, 3 middle schools, and 2 high schools serving students in the City of Palo Alto, portions of the towns of Los Altos and Portola Valley, and the Stanford University campus. Enrollment for the 2019-2020 school year for the entire PAUSD was 11,745 students: 4,852 elementary school students (grades K-5); 2,689 middle school students (grades 6-8); and

4,204 high school students (grades 9-12) (California Department of Education 2020).The project site is within the attendance boundary for Escondido Elementary School, Greene Middle School (formerly David S. Jordan Middle School), and Palo Alto High School (City of Palo Alto 2021a).

In 2015, Escondido Elementary School had a design capacity of 621 students; Greene Middle School had a design capacity of 1,100 students; and Palo Alto High School had a design capacity of 2,300 students (City of Palo Alto 2016a). Enrollment for the 2019-2020 school-year for Escondido Elementary School was 547 students; Greene Middle School was 955 students; and Palo Alto High School was 2,177; therefore, all schools are operating below design capacity (California Department of Education 2021a; 2021b; 2021c). The PAUSD collects school impact fees of $3.79 per square foot for residential construction, and $0.61 per square foot of commercial construction (City of Palo Alto 2021b).

Parks

The City of Palo Alto Open Space and Parks Division provides parks, recreational facilities, and other public spaces to Palo Alto. The City of Palo Alto includes approximately 4,000 acres of open space, including the 1,940-acre Baylands Preserve. The Open Space and Parks Division maintains over 162 developed acres of urban park lands including baseball fields, tennis courts, dog runs, and a lawn bowling green (City of Palo Alto 2021c).

Existing parks within a half-mile of the project site include the following:

- Sarah Wallis Park, approximately 500 feet southwest from the project site on Grant Avenue, across Birch Street (202 Ash Street at Grant Avenue). Sarah Wallis Park is a 0.3-acre mini park that includes green space, benches and public art. This park provides a peaceful spot for locals and workers in the community (City of Palo Alto 2021c).
- Bowden Park, approximately 0.3 mile north of the project site on a parcel bound by Alma Street, North California Avenue, High Street, and Oregon Avenue. This 2.0-acre park includes green space, a playground, picnic areas, benches, and a perimeter path.
- Peers Park, approximately 0.5 mile northwest of the project site (1899 Park Boulevard). Peers Park is a 4.7-acre park in the Evergreen Park neighborhood that features many athletic fields including tennis courts, a basketball court, and soccer fields. This park also includes picnic tables, playgrounds, a field house, and restrooms.
- Stanford/Palo Alto Community Playing Fields, approximately 0.5-mile northwest of the project site (El Camino Real and Page Mill Road). The Stanford/Palo Alto Community Playing Fields are 5.9 acres and include two turf soccer/rugby fields open to the public for adult and youth use with lights, a practice area, and picnic tables.

With these four recreation areas, the nearest being less than a quarter mile away, the project site is considered relatively well served with park and recreational facilities, according to the City's Parks Trails Natural Open Space & Recreation Master Plan. The project site is not within a "park search area," which are areas identified by the City as being in greatest need for expansion of recreational facilities. Additionally, the project site is in an area where community indoor recreation centers are within a half mile or less walking distance (City of Palo Alto 2017d).

Other Public Facilities

Library services are provided by the Palo Alto City Library. Palo Alto's public library system is composed of five libraries and an eBranch online library: Children's, Downtown, College

Terrace, Mitchell Park, and Rinconada. The closest library branch is College Terrace at 2300 Wellesley Street, approximately 2,000 feet southwest of the project site.

In 2019, approximately 1,000,000 people visited the City's library branches. However, in 2020 that number dropped to approximately 600,000 visitors, most likely attributed to the COVID-19 pandemic (City of Palo Alto 2020b). Between 2006 and 2015, all City libraries were renovated to expand services and collections (City of Palo Alto 2017c).

3.14.2 Regulatory Framework

Federal

There are no relevant federal regulations regarding public services applicable to the Project.

State

California Division of Occupational Safety and Health (Cal/OSHA)

In accordance with the California Code of Regulations, Title 8, Sections 1270 ("Fire Prevention") and 6773 ("Fire Protection and Fire Equipment"), the Cal/OSHA has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, requirements for the sizing of fire hoses, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all firefighting and emergency medical equipment.

California Fire Code (CFC)

The CFC is found within Chapter 9 of the CCR Title 24. It is adopted by the California Building Standards Commission, based on the International Fire Code (IFC), and contained within the CBC. The 2016 CFC became effective January 1, 2017. The CFC establishes the minimum requirements to safeguard the public health, safety and general welfare from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises, and to provide safety and assistance to fire fighters and emergency responders during emergency operations.

California Health and Safety Code (HSC)

State fire regulations are set forth in Sections 13000 et seq. of the California HSC, which includes regulations for building standards (as set forth in the CBC), fire protection and notification systems, fire protection devices such as extinguishers, smoke alarms, childcare facility standards, and fire suppression training.

Essential Services Building Act

The Essential Services Building Act of 1986, found in Chapter 2, Section 16000 of the California Health and Safety Code, applies to fire stations, police stations and other public facilities that respond to emergencies. It is intended to ensure that essential services buildings are capable of providing essential services to the public after a disaster, are designed and constructed to minimize fire hazards and are capable of resisting, insofar as practical, the forces generated by earthquakes, gravity, and winds. In addition, nonstructural components vital to the operation of essential services buildings must be able to resist, insofar as practical, the forces created by earthquakes, gravity, fire, and wind.

Senate Bill 50 (SB 50)

The California Legislature passed SB 50 in 1998, which authorized school districts to impose impact fees on developers of new residential, commercial, and industrial construction to offset impacts of increased school capacities. SB 50 was codified in California Government Code sections 65995.5 through 65997.

Pursuant to Government Code sections 65995.5 through 65995.7, school districts may collect fees to offset the costs associated with increased school enrollment as a result of development. Three levels of development fees may be levied upon new construction. Level 1 fees are the maximum amount of fees that can be imposed on new development as set by the State Allocation Board. In general, Level 2 and Level 3 fees apply to new residential construction only. Both Level 2 and Level 3 funds only may be levied if the school districts have conducted and adopted a school facility needs analysis. Specifically, Government Code 65997 establishes a State preemption of school mitigation. Under the terms of this statute, payment of school development fees is considered, for the purposes of CEQA, to mitigate in full any impacts to school facilities associated with a development project. Government Code 65997(b) restricts the ability of local agencies to deny project approvals on the basis that public school facilities (e.g., classrooms and auditoriums) are inadequate.

The PAUSD collects school impact fees on new residential and commercial development within the PAUSD's boundaries.

Quimby Act

The Quimby Act (California Government Code Section 66477) authorizes local governments to preserve parkland and open space in the state. The Quimby Act allows local governments to establish ordinances requiring developers of new subdivisions to dedicate parks, pay a fee in lieu of parkland dedication, or perform a combination of the two, at the discretion of the local government.

Local

County of Santa Clara General Plan policies relating to public services and recreation only apply to unincorporated areas of the County. Because the project site lies within the incorporated area of the City of Palo Alto, there are no County General Plan policies applicable to the Project.

In addition, the project site is on County-owned property and the County is generally not subject to City of Palo Alto general plan policies and land use designations, City zoning, or other City regulations for public projects such as the Project. Therefore, there are no relevant local regulations regarding public services and recreation applicable to the Project.

3.14.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to public services:

- **Impact PSR-1:** Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities?
- **Impact PSR-2:** Would the Project increase the use of existing recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?
- **Impact PSR-3:** Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Impact PSR-1: Demand for Public Services

Impact PSR-1 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection, police protection, schools, parks, or other public facilities.

Impact Analysis

Construction

Project construction could result in a small, temporary increase in the demand for fire suppression, emergency medical, and police services due to the temporary presence of construction personnel in the area. Project staffing levels for construction would vary with on-site activities but are not expected to exceed on average 65 construction workers at any one time. The total construction period for the Project is anticipated to last approximately 15 to 18 months. Federal and state worker safety regulations would be adhered to in order to minimize the likelihood of workplace injuries and accidents requiring emergency medical attention.

Typical fire and safety precautions would be taken, such as prohibiting on-site fires; reporting any fires, even if they have been extinguished; discarding any smoking materials in approved containers; maintaining access to emergency vehicles; and maintaining access to fire hydrants, emergency water tanks, and emergency turnouts. Such activities would not necessitate construction of new fire protection or other public facilities or affect emergency response times. This impact would be **less than significant.**

Operation

Fire Protection

The Project would consist of multifamily residential uses and a retail/café or other commercial use that would increase demand for PAFD protection services and facilities. As discussed in Section 3.13, "Population and Housing," the Project would increase the number of residents in the area by an estimated 273 persons. However, the Project site is an infill site that is within an area already served by PAFD, would not introduce structures, activities, or uses that pose unusual or atypical firefighting requirements, and thus would not affect PAFD's response times or other performance objectives and would not result in the construction of new or expansion of existing fire protection facilities based on the demand generated by the project (Schneider, pers. comm., 2021).

In addition, incorporation of all California Fire Code and County requirements into Project designs would reduce the dependence on PAFD fire department equipment and personnel by reducing fire hazards. This impact would be **less than significant.**

Police Protection

As discussed above, the Project would consist of multifamily residential uses and a retail/café or other commercial use that would increase demand for PAPD protection services and facilities. The additional population and proposed land uses at the site are not anticipated to generate a substantial increase in demand for police protection services.

The PAPD provides service from one central police station at 275 Forest Avenue, which the City has previously acknowledged is unable to adequately serve existing and future needs due to the lack of available space and the building's inability to meet current seismic, security, survivability, accessibility, and regulatory code requirements applicable to an "essential services facility" under State law (City of Palo Alto 2018a). In February 2021, the City Council voted to approve construction of a new police headquarters at 250 Sherman Avenue that is to be completed in 2023 (City of Palo Alto 2021d). Because the new Public Safety Building would be operational prior to the Project's completion, and because the Project would not substantially increase demand for police protection in the area, this impact would be **less than significant.**

Schools

Using student yield factors of 0.23 elementary school students per residential unit, 0.12 middle school students per residential unit, and 0.15 high school students per residential unit,[45] the potential development of 110 residential units could generate approximately 25 new elementary students, 13 middle school students, and approximately 17 new high school students. This yield is a general estimate and actual student generation could be different based on the residential unit types and the occupying households. Due to the types of residential units at the Project (24 studio units, 61 1-bedroom units, and 25 2-bedroom units), the Project would likely generate fewer school students than 110 standard residential units, therefore the estimates above are considered conservative.

The project site is within the attendance zone boundaries of Escondido Elementary School, Greene Middle School (formerly David S. Jordan Middle School), and Palo Alto High School; therefore, it would normally be expected that the majority of students living at the project site would attend these schools. However, given that the Project would cater to staff from a number of local school districts and their families, it is acknowledged that some students living at the project site may attend the school at which their family member works, rather than the local school within which their residence is considered "in- zone," via an intra- or inter-district transfer agreement. Therefore, the estimated number of new school enrollments generated by the Project provided above is considered a conservative estimate.

The City projects a decline in both its elementary and middle school student enrollment through its planning horizon of 2026/27, and a decline in its high school enrollment after 2020 through 2026/27 (City of Palo Alto 2017a). Based on these projections, Escondido Elementary School, Greene Middle School, and Palo Alto High School would have sufficient capacity to meet the demands of project-generated students without requiring the construction of additional facilities; and the Project would not result in a shortfall of elementary, middle, or high school services or facilities. Additionally, pursuant to SB 50, the developer of the Project would be required to pay all applicable State-mandated school impact fees to PAUSD. The California Legislature has declared that payment of applicable school impact fees is deemed to be full and adequate mitigation under CEQA for impacts on school facilities (California Government Code Section 65996). This impact would be **less than significant.**

Parks/Other Public Facilities

The impacts of the Project in relation to parks and recreational facilities is discussed under impacts PSR-2 and PSR-3 below; therefore, this discussion focuses on impacts to other public facilities such as libraries or other government services. The Project would increase the

[45] Based on Palo Alto Unified School District "moderate" (higher) estimated student enrollment rates, per the City's Comprehensive Plan Update Supplement to the Draft EIR (City of Palo Alto 2017c).

number of residents in the area by an estimated 273 persons, which is expected to increase demand for other public facilities such as libraries. However, the increase in demand would be dispersed among the various public facilities in the City, and in context of the overall City-wide demand would not be considered substantial enough that expansion or construction of facilities would be required. This impact would be **less than significant.**

Impact PSR-2: Existing Recreational Facilities

Impact PSR-2 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would 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.

Impact Analysis

Construction

Construction workers for the Project would likely come from the local labor pool and would not be expected to relocate to the City from other areas for the 17-month duration of construction. Therefore, there would be no increased use of existing parks or recreational facilities during construction that might cause or accelerate substantial physical deterioration of these facilities. There would be **no impact** to existing recreational facilities from Project construction.

Operation

As discussed in Section 3.13, Population and Housing, the Project would result in an increase in population by approximately 273 residents, which would increase the use of existing park and recreational facilities in the vicinity of the project site, including those listed above in the "Environmental Setting."

The Project would provide approximately 10,000 square feet of usable private open space, which equates to approximately 91 square feet per unit. The proposed private open space would include three landscaped courtyards and a connecting pathway on the second floor, providing a variety of passive and active facilities for resident use, such as dining areas with tables and barbeque grills, seating and lounge areas, ping pong and shuffleboard tables, a children's play area, and a dog run. The Project would also include approximately 5,800 square feet of public open space, including three outdoor plazas. The proposed public and private open space at the Project site would partially, but not fully, serve the increased demands for open space and park facilities generated by the Project.

The four nearest parks to the project site total approximately 12.9 acres in available park space. Residents are expected to use the nearby park and recreation facilities, in addition to the larger community parks such as Rinconada, Mitchell, and Greer parks, as well as regional open space areas offered in the City such as the nearby Baylands Preserve. As a result, the increased recreational demand by residents would be dispersed among existing parks and recreational facilities, as well as the proposed on-site open space areas, thereby minimizing substantial impacts on a single existing recreational area.

Given the proximity of available recreational areas, in addition to the Project's proposed open space areas, the Project is not anticipated to result in increased recreational use such that substantial physical deterioration of existing parks and other recreational facilities would occur. The Project would have a **less than significant** impact on existing recreational facilities.

Impact PSR-3: New Recreational Facilities

Impact PSR-3 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Impact Analysis

Construction

The Project would construct approximately 15,800 square feet of combined public and private open space including features such as outdoor courtyards for use by residents and outdoor public plazas. Impacts resulting from construction of these features, in combination with the other Project features, are addressed throughout this EIR. Although the Project would have potentially significant impacts on air quality, biological resources, cultural resources, geology, hazardous materials, hydrology, noise, transportation, and tribal cultural resources, such potentially significant impacts would arise from construction of the Project as a whole, and not specifically due to construction of recreational features at the project site. The construction of recreational features as part of the Project would not cause any additional potentially significant impacts nor increase the severity of Project impacts. Therefore, the construction of recreational facilities as part of the Project would have a **less than significant** impact.

Operation

As discussed in Section 3.13, the Project is not anticipated to induce substantial unplanned growth in the Palo Alto. Additionally, the increased recreational demand by residents would be dispersed among the nearby parks, existing open space areas, and proposed open space areas, thereby minimizing substantial impacts on a single recreation or open space area. As such, operation of the Project would not result in a substantial increase in demand for parks and recreational facilities that would require expansion of existing recreational facilities or construction of new facilities. Therefore, this impact would be **less than significant.**

3.14.4 Cumulative Impacts and Mitigation

This section analyzes the potential of the Project to contribute to the following cumulative public service and recreation impacts:[46]

- **Impact C-PSR-1:** Would the Project contribute to cumulative effects related to the provision of, or need for, new or physically altered governmental facilities, the construction of which could cause significant environmental impacts?
- **Impact C-PSR-2:** Would the Project contribute to cumulative effects related to increased use, or the construction or expansion of recreational facilities?

[46] Note that project-level impacts have been combined for the purposes of cumulative analysis. Cumulative impact C-PSR-2 addresses the same issues as project-level impacts PSR-2 and PSR-3.

Cumulative Impact C-PSR-1: Public Services

The overall cumulative impact for C-PSR-1 would be **less than significant.**

Cumulative Context

The geographic context for analysis of cumulative impacts related to public services is the City of Palo Alto city limits, and PAFD, PAPD, and PAUSD service areas.

Cumulative Impact Analysis

The EIR prepared for the City's Comprehensive Plan Update considered cumulative impacts to public services from current and future planned development within the City associated with buildout of the Comprehensive Plan (City of Palo Alto 2017a). The EIR concluded that buildout in accordance with the Comprehensive Plan would result in less-than-significant cumulative impacts with respect to fire and police protection services, library services, and school facilities. Furthermore, all of the cumulative projects would be evaluated at a project-level to determine the increase in demand for public services that would result in the need for new or physically altered governmental facilities.

The PAFD has completed and is undergoing improvements to its facilities (such as improvements to Fire Station 1, replacement of Fire Station 3, and planned replacement of Fire Station 4) to ensure PAFD can adequately serve existing and future demand. Additionally, this Project and all of the cumulative projects would be subject to federal, state, regional, and local regulations that would prevent physical impacts from the construction of additional fire protection facilities.

Annual City reviews and monitoring of law enforcement services and performance metrics (including dispatch response times) conducted by the City of Palo Alto would help to ensure that the PAPD would continue to adequately meet the demands of the City and is able to accommodate growth not only by the Project but from throughout the City. The planned new police headquarters will help accommodate existing and future needs. Additionally, per SB 50, payment of school impact fees is deemed to be full and adequate mitigation under CEQA for impacts on school facilities. Therefore, the overall cumulative impact to public services would be **less than significant.**

Cumulative Impact C-PSR-2: Existing or New Recreational Facilities

The overall cumulative impact for C-PSR-2 would be **less than significant with mitigation**, and the Project's contribution would be **less than cumulatively considerable.**

Cumulative Context

The geographic context for analysis of cumulative impacts related to recreational facilities is the City of Palo Alto city limits.

Cumulative Impact Analysis

Cumulative development projects with City of Palo Alto would include open space and be required to pay applicable in-lieu fees and/or impact fees for the creation of new or physically altered parks and recreation facilities to the extent feasible (City of Palo Alto 2017a). The City of Palo Alto projected in its Comprehensive Plan Update that the population in the City and sphere of influence would increase approximately 21 percent between 2014 and 2030. The EIR prepared for Palo Alto's Comprehensive Plan Update considered this population increase and concluded that cumulative impacts to parks and recreation facilities would be less than significant through compliance with the City's Municipal Code, which requires the provision of recreational space or payment of applicable park impact fees.

The Comprehensive Plan EIR also found that the construction of new recreational facilities to meet future cumulative demand could have potentially significant impacts, but that these impacts would be reduced to less than significant with mitigation through inclusion of policies within the Comprehensive Plan requiring the evaluation and mitigation of construction impacts from recreational facility construction and expansion. Therefore, the Project would have a **less than cumulatively considerable** contribution to the cumulative impact.

3.15 Transportation

This section describes the existing transportation systems, the existing conditions for the major transportation facilities in the vicinity of the site, including the roadway network, transit service, and bicycle and pedestrian facilities. Also, the section describes the regulatory environment relevant to the Project site and vicinity, the potential impacts of the Project related to transportation, the operating condition of roadways, public transit, and bicycle and pedestrian movement in the project vicinity and other areas affected by project trips.

The following comments relating to transportation were received during the public scoping period in response to the Notice of Preparation (see Appendix A):

- Concern regarding potential impacts from new curb cuts on Park Boulevard to bicycles using the existing bike route.
- Concern that the Project may contribute to residents' concerns regarding volume and speed of traffic in the area, and request to consider traffic calming measures if appropriate.
- Concern regarding cumulative impacts of construction from the Project and the City's Public Service Building construction.
- Request that information regarding number of truck trips, wide loads, etc. associated with the modular construction method be included as part of the environmental analysis.
- The City of Palo Alto stated that oversized vehicle and encroachment permits would be required, and that a Traffic Control Plan would need to be submitted for the City's review and approval prior to construction.
- The City of Palo Alto stated that its adopted thresholds for VMT may differ from the County's thresholds and requested that the City's thresholds be used in-lieu of, or in addition to, the County's thresholds.
- The City of Palo requested that a separate local traffic analysis be prepared (outside of CEQA) so that the local impacts of the proposed development can be understood in accordance with the City of Palo Alto's Local Transportation Impact Analysis Policy and the City's Comprehensive Plan, even though level of service analysis is not required under CEQA in accordance with SB 743.[47]

In addition, several comments were received during the City of Palo Alto City Council study session held on February 8, 2021 that expressed concern regarding potential parking and traffic impacts of the Project.

3.15.1 Environmental Setting

Information presented below regarding the existing transportation setting is based on the Traffic Impact Analysis prepared for the Project, which is attached as Appendix E.

Existing Roadway Network

Regional access to the project area is provided by US-101 and I-280:

- US-101 – This eight-lane north-south freeway connects San Francisco to San Jose, with a posted speed limit of 65 mph. It has three mixed-flow lanes in both directions, as well as

[47] This separate traffic impact assessment is provided in Appendix E-2.

one carpool lane in each direction which operates from 5 am to 9 am and 3 pm to 7 pm on weekdays. US-101 is under the jurisdiction of Caltrans. Access to the freeway from the project site is provided via ramps at Oregon Expressway Interchange.

- I-280 – This north-south freeway also connects San Francisco and San Jose. It has four mixed-flow lanes in each direction in the vicinity of the project although a short section in the southbound direction drops to three lanes between the Page Mill Road On/Off Ramps. Access to the freeway from the project site is provided via ramps at Page Mill Road Interchange.

Local access to the project area is provided by Oregon Expressway, Page Mill Road, El Camino Real, and California Avenue, described below. Direct access to the project site is from Grant Avenue and Park Boulevard. Additional details regarding the existing road network is provided in Appendix E.

- Oregon Expressway – This east-west 4-lane divided expressway connects El Camino Real to US-101, providing accesses to local residential areas in between. Oregon Expressway has a posted speed limit of 35 mph and connects to Page Mill Road west of El Camino Real. Project site access to/from eastbound Oregon Expressway is via Park Boulevard and the short section of Page Mill Road. Project access to westbound Oregon Expressway is via Birch Street. The existing peak-hour traffic volume in the vicinity of the project site is approximately 3,200 vehicles per hour.
- El Camino Real – Also known as SR 82, El Camino Real is a major north-south arterial extending from the San Francisco area to San Jose with a posted speed limit of 35 mph. It provides direct access to adjacent parcels in both directions. Grant Avenue provides direct access to the project site from El Camino Real. The existing peak-hour traffic volume in the vicinity of the project site is approximately 3,900 vehicles per hour.
- Page Mill Road – This east-west roadway extends from Skyline Boulevard west of the project site to just east of El Camino Real, where it transitions to Oregon Expressway, with a short section of the roadway that continues to the California Avenue Transit Station. Page Mill Road is a 4-lane divided arterial road between El Camino Real and I-280. The posted speed limit is 50 mph between I-280 and Foothill Expressway and reduces to 35 mph between Foothill Expressway and El Camino Real. The existing peak-hour traffic volume in the vicinity of the project site is 571 vehicles per hour.
- California Avenue – This east-west collector roadway extends from Amherst Street in the west to Park Boulevard. It is primarily 2-lanes undivided with class 2 bike lanes in both directions between Amherst Street and El Camino Real. On-street parking is provided along California Avenue with a posted speed limit of 25 mph. The existing peak-hour traffic volume in the vicinity of the project site is 508 vehicles per hour.
- Grant Avenue – This east-west local roadway connects El Camino Real to Park Boulevard. It is primarily 2-lanes undivided with on-street parking allowed on both sides, except fronting the project site between Birch Street and Park Boulevard where it is one-way eastbound with angle parking on the northern side only. It has a posted speed limit of 25 mph and provides direct access to the project site via two existing driveways. The existing peak-hour traffic volume in the vicinity of the project site is 161 vehicles per hour. The portion of Grant Avenue that runs between the project site and the Court building at 270 Grant Avenue is not a public street.

- Park Boulevard – This roadway starts at the intersection of El Camino Real and Serra Street to the north and extends south to connect with Whitclem Drive. In the project vicinity, it is a north-south 2-lane undivided roadway. On-street parking is provided between California and Sheridan Avenues with a 2-hour limit. In the project vicinity, Park Boulevard is designated as a collector road with a posted speed limit of 25 mph. It provides direct access to the project site via an existing driveway. The existing peak-hour traffic volume in the vicinity of the project site is 793 vehicles per hour.
- Birch Street – This north-south local street extends from Oregon Expressway north to College Avenue, with its northern continuation offset to the east. Between Oregon Expressway and California Avenue, it is a 2-lane divided roadway with on-street parking and is designated as a collector road with a posted speed limit of 25 mph. There are no existing driveways providing access from northbound Birch Street to the project site. The existing traffic volume in the vicinity of the project site is 686 vehicles per hour.

Bicycle Facilities

Bicycle facilities can be classified according to the following definitions:

- Class I (bike path): a paved trail that is separate from roadways.
- Class II (bike lane): a restricted right-of-way designated for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and cross flows by pedestrians and motorists permitted.
- Class III (bike route): a right-of-way designated by signs or permanent markings indicating the roadway is shared by pedestrians and motorists.
- Bike Boulevards: streets prioritized for bicycle use through advisory warnings to motorists, traffic calming measures, and guidance to encourage bicycle use over less attractive routes.

There are no Class I bike paths in the project area. In the immediate vicinity of the project site, Class II bike lanes are provided along both sides of Park Boulevard, as far south as Lambert Avenue, beyond which Park Boulevard is designated as a bike boulevard. A Class III bike route is provided along the section of California Avenue between El Camino Real and the Caltrain corridor, with Class II bike lanes to the south of El Camino Real and north of the Caltrain corridor. In addition, bicycles are allowed on El Camino Real and Oregon Expressway (VTA 2018). A map of the existing bicycle network in the project vicinity is presented in **Appendix E** (refer Figure 3-2 of the appendix).

Pedestrian Facilities

Sidewalks are located on both sides of Grant Avenue, Park Boulevard, and Birch Street, surrounding the project site. Marked crosswalks are provided at all approaches of the Grant Avenue/Park Boulevard intersection and at all approaches of the Grant Avenue/Birch Street intersection.

Existing Transit Service

The project site is approximately one-third of a mile from the California Avenue Transit Station for Caltrain. Caltrain runs between 4:30AM to midnight on weekdays, serving commuters between San Francisco and Gilroy. On the weekends, services are only between San Francisco and Diridon Station in San Jose, with shuttle bus service to Tamien Station. The California Transit Station is also a stop for the VTA Line 89 bus as well as the California

Avenue Foothill Express (CAFX) Shuttle by Stanford Research Park. Due to the COVID-19 global pandemic, the CAFX Shuttle services is on hold until further notice.

The project site is approximately one-third of a mile from bus stops along El Camino Real. These bus stops serve VTA Lines 22, 89, 522, and the Stanford Marguerite Shuttle Line Research Park. Another bus stop about half a mile from the project site along Page Mill Road serves several VTA express services and the Dumbarton Express DB1.

Details of the different public transit service schedules and routes are presented in **Appendix E-1** (refer Table 3-1 and Figure 3-1 of the appendix).

3.15.2 Regulatory Framework

Federal

There are no relevant federal regulations regarding transportation applicable to the Project.

State

Congestion Management Program

California Statute, Government Code 65088 requires that all urbanized counties in California prepare a Congestion Management Program in order to obtain each county's share of the increased gas tax revenues. The legislation requires that each Congestion Management Program contain the following five mandatory elements: 1) a system definition and traffic level of service standard element; 2) a transit service and standards element; 3) a trip reduction and transportation demand management element; 4) a land use impact analysis program element, and 5) a capital improvement element. The Santa Clara County Congestion Management Program includes the five mandated elements and three additional elements, including a county-wide transportation model and database element, annual monitoring and conformance element, and a deficiency plan element.

The intent of the Congestion Management Program legislation is to develop a comprehensive transportation improvement program among local jurisdictions that will reduce traffic congestion and improve land use decision-making and air quality.

Senate Bill 743

SB 743, which became effective September 2013, amended CEQA to change the way transportation impacts are evaluated. It directs OPR to establish new criteria for determining the significance of transportation impacts that "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses."

Specifically, SB 743 directs OPR to prepare, develop, and transmit to the California Natural Resources Agency for certification and adoption proposed changes to the CEQA Guidelines to replace automobile delay—as described solely by LOS or similar measures of vehicular capacity or traffic congestion—with VMT as the recommended metric for determining the significance of transportation impacts. The intent of the change is to appropriately balance the needs of congestion management with statewide goals related to infill development, the promotion of public health through active transportation, and the reduction of greenhouse gas emissions.

SB 743 requires OPR to identify new metrics for identifying and mitigating transportation impacts for CEQA purposes (PRC Section 21099(b).) In December 2018, the Secretary of

Natural Resources adopted CEQA Guidelines implementing SB 743 (effective July 1, 2020), and OPR issued its VMT guidance *Technical Advisory on Evaluating Transportation Impacts in CEQA*.

CEQA Guidelines Section 15064.3(a) describes VMT as “the amount and distance of automobile travel attributable to a project.” There are many ways to evaluate VMT, and a lead agency has discretion to choose the most appropriate methodology(ies) for evaluating a project’s VMT impacts (e.g., total VMT, per capita VMT, household VMT, qualitative analyses, and other methodologies). (CEQA Guidelines Section 15064.3.) VMT is usually calculated using the Origin-Destination VMT method, which measures the full distance of motorized vehicle-trips with one end within the project site. When assessing a residential project, a common methodology is to divide the project’s VMT by the number of residents expected to occupy the project to determine the VMT per capita of the project. When assessing an office or industrial project, a common methodology is to divide the project’s VMT by the number of employees expected to occupy the project to determine the VMT per employee of the project. When assessing a retail, hotel, or school project, the project’s total VMT, as opposed to a per-capita or per-employee VMT metric, is usually employed. The total VMT for the region with and without the project is calculated. The difference between the two scenarios is the net change in total VMT that is attributable to the project. Construction-related travel is not included in VMT because it is temporary.

Local

Santa Clara Valley Transportation Authority

The VTA is an independent special district that provides transportation options throughout Santa Clara Valley, and oversees several transportation programs such as the Congestion Management Program, Bicycle Program, and Pedestrian Program.

The Congestion Management Program describes the VTA’s strategies for addressing congestion problems and monitoring compliance. It contains level of service (LOS) standards for highways and arterials, multimodal performance standards, a capital improvement program, and a travel demand management (TDM) program (VTA 2017a). Although the primary focus of the congestion management program was originally envisioned as reducing congestion and thus improving mobility for persons and freight, it recognizes the inextricable links between transportation, land use, and air quality. Over time, congestion management programs in the Bay Area have evolved to emphasize an overall reduction in single-occupant vehicle trips and an increase in pedestrian, bicycle, and transit mode share in addition to managing congestion.

The VTA’s Santa Clara Countywide Bicycle Plan synthesizes other local and County plans into a comprehensive 20-year cross-county bicycle corridor network and expenditure plan (VTA 2018). The Plan includes a planned bicycle network of approximately 950 miles of cross county bicycle corridors, including ten “bicycle superhighways,” 280 new and improved bicycle connections, and a countywide effort to provide bicycle education and encouragement programs. Several of these planned improvements are located within the vicinity of the project site, including:

- Potential bicycle/pedestrian bridge across Caltrain corridor at Stanford Avenue/Seale Avenue
- Priority Cross County Bicycle Corridor along Park Boulevard between Castilleja Avenue and Meadow Drive

- Non-priority Cross County Bicycle Corridors along Page Mill / Oregon Expressway, El Camino Real, and California Avenue.

The VTA's Pedestrian Program works to make walking a safer, more comfortable option for County residents and visitors, and recognizes that a safe and comfortable walking environment is important for everyone, but particularly important for transit riders and people with mobility impairments. The Pedestrian Program supports walking through countywide planning, development of pedestrian design guidelines and best practices, and focused studies. The VTA's Pedestrian Access to Transit Plan (VTA 2017b) identifies twelve Focus Areas in Santa Clara County with high VTA bus ridership and high need for pedestrian infrastructure improvements and 165 capital projects that can improve pedestrian access to transit in these Focus Areas.

County of Santa Clara VMT Policy

The County of Santa Clara has not yet adopted a VMT policy.

City of Palo Alto VMT Policy

The City of Palo Alto adopted VMT thresholds of significance for CEQA analysis in June 2020. The CEQA thresholds of significance for transportation impacts are consistent with the Transportation Element of the City's Comprehensive Plan (City of Palo Alto 2017a).

Consistent with CEQA Guidelines Section 15064.3, the City of Palo Alto has adopted the thresholds of significance described in Table 3.15-1. In addition, certain projects may qualify for VMT screening based on criteria presented in Table 3.15-2. Projects screened from requiring a VMT analysis would be considered to have no VMT impact under the CEQA Guidelines Section 15064.3.

Table 3.15-1 City of Palo Alto VMT Thresholds of Significance by Project Type

Land Use / Project Type	Threshold of Significance
1. Residential Projects	A proposed project exceeding a level of 15% below existing (baseline) County home-based VMT per resident may indicate a significant transportation impact.
2. Office Projects	A proposed project exceeding a level of 15% below existing (baseline) regional home-based work VMT per employee may indicate a significant transportation impact.
3. Retail Projects	A proposed project that results in a net increase in total (boundary) VMT may indicate a significant transportation impact.
4. Mixed-Use Projects	Each component of a proposed mixed-use project should be evaluated independently and apply thresholds of significance for each project type separately (i.e., residential, office, and retail).
5. Other Project Types	The City will either develop an ad hoc (i.e., project specific) VMT threshold for a unique land use type or apply the most applicable of the above thresholds depending on project characteristics.
6. Redevelopment Projects	Where a proposed project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project may cause a less than significant transportation impact. If the redevelopment project leads to a net overall increase in VMT, it may cause a significant transportation impact if proposed new residential, office, or retail land uses would individually exceed their respective thresholds.

Source: City of Palo Alto 2020.

Acronyms: VMT = vehicle miles traveled

Table 3.15-2 City of Palo Alto VMT Screening Criteria

Land Use / Project Type	Screening Criteria
1. Small Development	Projects that generate fewer than 110 trips per day. This may equate to non-residential projects of 10,000 sq. ft., or less and residential projects of 20 units or less.
2. Projects in Low-VMT Areas[1]	Residential and office projects located in low-VMT areas that have similar features (i.e., density, mix of uses, transit accessibility) as existing developments in these areas.
3. Projects in Proximity to Major Transit Stops	Projects that are located within a half mile of an existing or planned high-quality transit corridor or major transit stations, and meet the following additional criteria: (1) is high density (minimum floor area ratio of 0.75), (2) does not exceed parking requirements, (3) is consistent with *Plan Bay Area 2040* (http://2040.planbayarea.org/), and (4) does not replace affordable units with smaller numbers of moderate- or above moderate-income units.
4. Affordable Housing	100% affordable housing projects in infill locations.
5. Local-Serving Retail[2]	Retail projects of 10,000 sq. ft. or less.
6. Transportation Projects	Roadway, transit, bicycle and pedestrian projects that do not lead to a measurable increase in vehicle travel.

Source: City of Palo Alto 2020.

Acronyms: CEQA = California Environmental Quality Act; City = City of Palo Alto; OPR = Office Planning and Research; sq ft = square feet; VMT = vehicle miles traveled

Notes:

1. *Residential projects located in areas where baseline VMT is 15 percent below the existing county average per resident and office projects located in areas where baseline VMT is 15 percent below the existing regional average per employee could be considered to be in low-VMT areas and presumed to have a less than significant VMT impact.*
2. *OPR indicates that local-serving retail up to 50,000 square feet may be presumed to create less-than-significant VMT impact. However, local-serving retails and lots in Palo Alto are typically smaller. Thus, Palo Alto adopts 10,000 square feet as the City's local-serving retail screening criteria, which also constitutes a small project that would be screened out under CEQA.*

City of Palo Alto Traffic Management Plan Requirements

The City of Palo Alto requires that a draft traffic control plan, consistent with its requirements for Traffic Control Plan submission, be included in every permit application submitted to the City of Palo Alto Public Works Department for projects that involve work within the City right-of-way (City of Palo Alto 2016c). Traffic control plans must be approved prior to the start of work within the City right-of-way. The City's Public Works Department and the Planning and Community Environment Department - Transportation Division may require additional measures of traffic control or time-of-work restrictions on a case-by-case basis.

City of Palo Alto Bicycle + Pedestrian Transportation Plan

The *City of Palo Alto Bicycle + Pedestrian Transportation Plan* (City of Palo Alto 2012a) contains the policy vision, design guidance, and specific recommendations to guide public and private investments in active transportation (pedestrian and bicycle) facilities and related programs in the City of Palo Alto. The Plan includes several improvements to the City's bicycle network, several of which, including the "bicycle boulevard" on Park Boulevard, have already been implemented since the Plan was adopted. Key objectives of the Plan relate to increasing the rate of cycle commuting; converting discretionary vehicle trips into walking and bicycle trips to reduce GHG emissions; developing a core network of shared paths, bikeways, and traffic-calmed streets to promote healthy, active living; planning, constructing, and maintaining "complete streets" that are safe and accessible to all; and promoting efficient, sustainable and creative use of public resources.

3.15.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to transportation:

- **Impact TRA-1:** Would the Project conflict with a program plan, ordinance or policy addressing the circulation system?
- **Impact TRA-2:** Would the Project conflict with CEQA Guidelines related to vehicle miles traveled?
- **Impact TRA-3:** Would the Project substantially increase traffic-related hazards?
- **Impact TRA-4:** Would the Project result in inadequate emergency access?

Impact TRA-1: Transportation Plan or Program Conflicts

Impact TRA-1 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

Significant impacts to transit services would occur if the Project would create demand for public transit service that exceeds the provided or planned capacity, disrupts existing transit services or facilities, conflicts with a planned transit facility, or conflicts with policies adopted by the City, VTA, or Caltrans for their respective facilities in the study area.

Significant impacts on pedestrian and bicycle facilities would occur if the Project would create a hazardous condition that does not currently exist for pedestrians and bicyclists or otherwise interfere with pedestrian accessibility to the site and adjoining areas, conflict with an existing or planned pedestrian or bicycle facility, or conflict with policies related to bicycle and pedestrian activity adopted by the City, VTA, or Caltrans for their respective facilities in the study area.

Because VMT is now the preferred methodology for assessing transportation impacts under CEQA, programs, plans, ordinances and policies related to LOS are not considered as part of the impact analysis under CEQA, even though such standards are still present in the City’s Comprehensive Plan and the VTA’s CMP. An intersection LOS and delay assessment has been prepared for the Project so that the City can evaluate other non-CEQA transportation impacts of the Project, such as congestion. The LOS Transportation Impact Assessment is attached to this EIR for informational purposes (see Appendix E-2), but thresholds relating to LOS or traffic delay are not used to determine the significance of transportation-related environmental impacts in this EIR.

Impact Analysis

Construction

Project construction would temporarily disrupt roadway, transit, pedestrian, and bicycle traffic in the vicinity of the project site due to temporary lane and roadway closures. No bus stops would be directly affected by temporary road closures during construction; however, temporary diversion of the CAFX bus route may be required during the limited closures on Park Boulevard. As discussed in Section 2.4.2 of this EIR, a construction traffic management plan would be established and implemented in accordance with City requirements, which would include identification of alternative routes and detours for all modes and would require signage and barriers to warn, direct and guide traffic of all modes through the affected area. Such temporary disruptions and diversions of transit, pedestrian and bicycle traffic would not conflict with currently adopted goals or policies relating to the circulation system. The impact would be **less than significant.**

Operation

Roadways

The Project would not include any permanent changes to roadways in the project area and would not implement or install any facilities that could negatively impact the existing or planned roadway infrastructure. The Project would not conflict with any goals or policies[48] relating to roadways, and would support goals relating to travel demand management and reducing single-occupant vehicle trips, due to the provision of new residential uses within a transit priority area and provision of bicycle infrastructure, as discussed below.

Transit

According to the Metropolitan Transportation Commission, in 2018 (the latest year for which data was available) approximately 4.1 percent of Santa Clara County residents commuted by public transit (MTC 2020). Therefore, it is anticipated that the Project would generate approximately 11 new transit riders. This small number of new transit passengers would be distributed across multiple existing bus routes, shuttles, and Caltrain, which are expected to be able to accommodate this small ridership increase. Based on observations of existing use, the existing bus and shuttle services and Caltrain would continue to have adequate capacity to serve the project vicinity and the new transit users from the Project are not expected to adversely affect public transit services.

In addition, the Project would not implement or install any transit impeding facilities that could negatively impact the existing or planned transit infrastructure. The Project would not conflict with any goals or policies relating to transit. Rather, it would support those goals relating to encouraging increased transit use, by providing new residential uses within a transit priority area.

The Transportation Impact Assessment prepared for the Project (**Appendix E-1**), assessed the effect of Project-generated traffic on movements made by existing transit services at various intersections in the project area. For the majority of transit movements, the increased traffic associated with the Project would result in delays to bus services of less than 1 second per intersection compared to existing conditions (see Table 4-1 in **Appendix E-1**), with some intersections experiencing a decrease in delay for transit movements.[49] The following three traffic movements undertaken by transit services would experience a delay of longer than 1 second:

- Northbound through movement at the El Camino Real / Oregon Expressway / Page Mill Road intersection, which would increase delay for the VTA's 22 and 522 bus lines in the AM peak hour by 1.2 seconds;

[48] Per SB 743, policies related to level of service were not considered within this CEQA analysis.

[49] Decreases in traffic delay for some transit movements is likely due to anticipated changes in the timing of traffic signals to accommodate the prevailing traffic volumes (e.g., a longer green signal for prevailing traffic) which would result in shorter delays for prevailing traffic (including transit movements in the prevailing traffic direction).

- Eastbound left movement at the El Camino Real / Oregon Expressway / Page Mill Road intersection, which would increase delay for the Marguerite Line RP in the AM peak hour by 2.1 seconds; and
- Westbound left movement at the Birch Street/Sheridan Avenue intersection, which would increase delay for the CAFX Line in the AM peak hour by 6.7 seconds.

Because the total delay increase expected for each of these bus services as a result of the Project would be only a few seconds, the Project would not cause a noticeable change in transit travel time.

Pedestrian Facilities

Operation of the Project would increase the number of pedestrians using local sidewalks and crosswalks due to the approximately 273 new residents at the project site, but the existing pedestrian network is expected to accommodate the increased usage of sidewalks without adverse impacts. In addition, the Project would not conflict with any goals or policies relating to the pedestrian network, and would support those goals relating to converting discretionary vehicle trips into walking and bicycle trips to reduce GHG emissions, due to the provision of new residential uses in close proximity to local-serving retail and commercial uses.

Bicycle Facilities

According to the Santa Clara Countywide Bicycle Plan, bicycle commute rates in Palo Alto are approximately 9.2 percent (VTA 2018). Therefore, it is anticipated that the Project would generate approximately 22 new bicycle commuters during AM and PM peak hours. The Project would also generate recreational/non-commute bicycle trips, which are anticipated to be concentrated outside of peak commute hours. Based on the observations of current usage, the existing bicycle facilities in the project vicinity would be sufficient to meet the expected increased demand of the Project.

Operation of the Project would not interfere with existing or planned bicycle facilities such as the “bicycle boulevard” identified on Park Boulevard in the City’s Bicycle and Pedestrian Transportation Plan (City of Palo Alto 2012a) and VTA’s Countywide Bicycle Plan (VTA 2018). Further, the Project would not conflict with currently adopted goals or policies addressing the bicycle circulation system. Instead, it would support several of the goals and policies that relate to encouraging and increasing bicycle use, due to the provision of short- and long-term bicycle storage facilities as part of the Project.

Summary of Operational Impacts

Project operation would not adversely affect existing or planned roadways and facilities for alternative modes of travel (i.e., transit, pedestrian, and bicycle transportation) and would not conflict with any applicable programs, plans, ordinances, or policies addressing the circulation system. The operational impact would be **less than significant.**

Impact TRA-2: Vehicle Miles Traveled

Impact TRA-2 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would conflict or be inconsistent with CEQA Guidelines Section 15064.3(b), which states that land use “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.” According to OPR’s Technical Advisory on Evaluating Transportation Impacts a 15 percent reduction in VMT per capita from existing development is "generally achievable" and supportive of State goals to reduce greenhouse gas emissions (OPR 2018). However, lead agencies are allowed to set their own VMT standards based on substantial supporting evidence (CEQA Guidelines Section 15064.3(b)(4).)

The County of Santa Clara has not yet adopted a VMT policy. Given that the project site is within the City of Palo Alto and would primarily use City streets, the County is therefore using the City's VMT policy and adopted thresholds of significance to analyze the Project.

In accordance with threshold 4 of the City's VMT thresholds of significance, each component of a proposed mixed-use project should be evaluated independently and apply thresholds of significance for each project type separately (i.e., residential, office, and retail).

For retail uses, the City considers that a project would have a less than significant VMT impact if it is a local-servicing retail use of 10,000 SF or less (City Screening Criteria 5, in Table 3.15-2). For retail uses that do not meet the screening criteria, the City considers that retail use may have a significant VMT impact if it would result in a net increase in total (boundary) VMT).

For residential uses, the City considers that a project would have a less than significant VMT impact if it is located in a "low-VMT area" and has similar features (density, mix of uses, transit accessibility) as existing developments in the area (City Screening Criteria 2, in Table 3.15-2). The City has not mapped "low-VMT" areas, but rather defines them as areas where the baseline VMT is 15 percent below the existing county average per resident. For residential uses not meeting the screening criteria, the City considers that residential use may have a significant VMT impact if it would exceed a level of 15 percent below the existing countywide home-based VMT per resident (City VMT Threshold 1, in Table 3.15-1). The Santa Clara Countywide VMT Evaluation Tool (VTA 2020) indicates that the 2020 countywide average for Home-Based VMT per Capita is 13.33, which means the applicable significance threshold for the residential component of the Project is 11.33.

Impact Analysis

The proposed 1,100 square feet of proposed flex space, potentially to be used for retail services like a small eatery or coffee shop, would qualify as small local-serving retail of less than 10,000 square feet. As such, the retail component of the Project meets the City's screening criteria #5 and, therefore, a significant VMT impact would not be anticipated for the retail component of the Project.

Using the Santa Clara Countywide VMT Evaluation Tool, the existing (baseline) Home-Based VMT per Capita for the project area is 6.05 (refer **Appendix E-1**, in particular Appendix D of that appendix). This is significantly lower than the applicable threshold of 11.33 (i.e., 15 percent less than the countywide average of 13.33), meaning that the project site is within a "low-VMT area." Because the project site is within a low-VMT area, and because the Project would have a similar density, mix of uses, and transit accessibility as other existing developments in the area, the Project meets the City's Screening Criteria 2 and, therefore, a significant VMT impact would not be anticipated for the residential component of the Project.

Because both the retail and residential components of the Project would meet the City's screening criteria for VMT analysis, the Project would be screened out from further analysis and the VMT impact would be **less than significant.**

Although the retail and residential portions of the Project meet the City's screening criteria, VMT for the Project was still calculated using the Santa Clara Countywide VMT Evaluation

Tool, for information only. Based on the key Project characteristics, the calculated VMT rate for the Project would be 5.45 VMT per capita. This is also significantly lower than the applicable threshold of 11.33 (i.e., 15 percent less than the countywide average of 13.33).

Impact TRA-3: Traffic Safety Hazards

Impact TRA-3 would be **potentially significant**. With implementation of mitigation measure MM-TRA-3, the impact would be reduced to **less than significant with mitigation**.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

Impact Analysis

Construction

While Project construction would introduce additional traffic movements, including oversized haul vehicles, to the local road network, construction traffic is common throughout the City and is not considered an "incompatible use."

Construction of the Project would not involve any permanent geometric design features. Temporary changes to the road network, such as one-way traffic controls or temporary lane or road closures and associated detours would be designed and implemented according to the City's temporary traffic control standards, and therefore would not be expected to cause hazardous geometric design features. As discussed in Section 2.4.2, the contractor would prepare and implement a traffic control plan as part of the Project, in consultation with the City of Palo Alto, and would obtain the necessary encroachment permits and oversized vehicle permits required for the Project. With implementation of the Traffic Control Plan and adherence to all conditions of approval of necessary encroachment and oversized vehicle permits, the impact of Project construction on traffic safety would be **less than significant**.

Operation

The Project would have two vehicular access points (driveways)—one each on Birch Street and Park Boulevard—that would provide access to the proposed street-level parking garage. The new access on Park Boulevard would be located approximately 25 feet north of the existing project site access, which would be removed as part of the Project along with the three existing access points on Grant Avenue. The proposed access on Birch Street would be new. Therefore, there would be a net decrease of two vehicular access points for the project site as a result of the proposed development. The proposed driveway width for both accesses is 20 feet, which meets the City's minimum design requirement for multifamily residential parking,[50] and therefore, would not be considered a hazardous geometric design feature.

The removal of the three existing accesses on Grant Avenue would reduce the potential for conflicts between traffic exiting the project site and vehicular, bicycle or pedestrian traffic using Grant Avenue.[51]

The new access on Birch Street would be a 'right-in-right-out' configuration due to the existing center divider and would introduce a new potential point of conflict for existing northbound Birch Street traffic or pedestrians using the adjacent sidewalk. On-street parking is allowed

[50] City of Palo Alto Municipal Code, Section 18.54.070, Table 5

[51] As previously explained, the portion of Grant Avenue between Birch Street and Park Bourlvard is not a public street.

along Birch Street on the same side as the project site. Vehicles parked in close proximity to the new driveway could potentially limit the site distance for vehicles exiting the project site, or for vehicles traveling northbound on Birch Street to see vehicles waiting to exit the garage.

All traffic movements would be possible at the relocated Park Boulevard access. On-street parking is not currently allowed on Park Boulevard adjacent to the proposed driveway, due to the presence of the southbound Class II bike lane. Therefore, there is no potential for parked vehicles to limit sight distance for vehicles exiting the site, or for vehicles or bicycles traveling along Park Boulevard. The Project would not introduce any hazardous design features that would impede cyclists and would not result in any increase in the number of vehicle access points that would cross the southbound bicycle lane on Park Boulevard. However, the Project would increase the potential for conflicts between cyclists and vehicles due to the increased traffic volumes that would cross the southbound bicycle lane when entering or exiting the Park Boulevard driveway.

Replacement street trees are proposed on both Birch Street and Park Boulevard (and Grant Avenue), which could also limit site distance from the proposed driveways if not placed in accordance with City guidelines. It is assumed that the tree permit required from the City would include provisions relating to the placement of all street trees to minimize the impact on site distance for vehicles exiting the project site.

Because the Project would introduce a new vehicular access point on Birch Street that would increase the potential for pedestrian-vehicle conflicts and which may have limited sight distances due to existing on-street vehicle parking in proximity to the driveway; and because increased traffic volumes using the relocated Park Boulevard driveway would increase the potential for bicycle-vehicle conflicts due to increased traffic volumes, the Project could substantially increase traffic hazards. The impact would be **potentially significant.**

Mitigation Measure MM-TRA-3 is recommended to reduce this potentially significant impact.

MM-TRA-3A: Pedestrian/Bicycle Warning System

The Developer shall require that an audio warning be installed at all parking garage exits to warn cyclists and pedestrians when a vehicle is approaching the garage exit. Warning signs reminding exiting motorists to watch out and yield to pedestrians and cyclists shall also be provided in the garage before/near the egress.

MM-TRA-3B: Maximize Site Distance

The Developer shall work with the City of Palo Alto to limit on-street parking in the immediate vicinity of the proposed site access point on Birch Street, and to locate proposed street trees on the Birch Street and Park Boulevard so that the sight distance for vehicles exiting the project site meets City requirements.

With implementation of MM-TRA-3A, pedestrians and cyclists using sidewalks and bike paths adjacent to the project site would be given an audible warning when vehicles are exiting the parking garage, which would reduce the potential for pedestrian-vehicle or bicycle-vehicle conflicts on both Park Boulevard and Birch Street.

With implementation of MM-TRA-3B, sight distances from the parking garage driveways would meet City requirements, which would reduce the potential for increased traffic conflicts at the driveway to a similar level to other developments in the area. With implementation of MM-TRA-3A and MM-TRA-3B, the impact would be **less than significant with mitigation**.

Impact TRA-4: Emergency Access

Impact TRA-4 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would result in inadequate emergency access.

Impact Analysis

Construction

As discussed in Section 2.4.2, “Construction Haul Routes, Staging, and Traffic Control”, construction of the Project would require one-way traffic controls on Grant Avenue between Birch Street and Park Boulevard throughout the majority of the 15- to 17-month construction period. This section of Grant Avenue, which is not a public street, would also need to be closed periodically during the construction period to allow for crane mobilization and/or concrete pours, including a full closure for 4 to 8 weeks during crane setting of modular units. Lane closures on Birch Avenue (northbound side of median only) and Park Boulevard may also be required occasionally, including two days each for crane setting of the far southwest and far southeast modular units, respectively.

The proposed temporary disruptions to the local road network could potentially cause inadequate emergency access. However, as discussed in Section 2.4.2, the contractor would prepare and implement a traffic control plan as part of the Project, in consultation with the City of Palo Alto. The traffic control plan would include provisions to maintain emergency access to all adjacent and nearby properties and would require notification to emergency providers in advance of construction so that alternative routes can be planned ahead of time. Therefore, with implementation of the Traffic Control Plan, construction of the Project would not result in inadequate emergency access to the project site or nearby properties, and the impact would be **less than significant.**

Operation

As discussed previously, the Project would have two vehicular access points (driveways)—one each on Birch Street and Park Boulevard—that would provide access to the proposed street-level parking garage. The proposed driveway width for both accesses is 20 feet, which meets the City’s minimum design requirement for multi-family residential parking,[52] and is sufficient width for emergency vehicles, such as ambulances, to access the garage. The Project is typical of other mixed-use developments within the area and would not introduce any unusual conditions for emergency access.

The project would be required to conform to the City’s traffic and safety regulations that specify adequate emergency access measures. In addition, the project site would be required to meet the standards set forth by the Palo Alto Fire Department including adequate access for firefighting personnel and equipment. Adherence to City of Palo Alto requirements would mean that the Project would not result in inadequate emergency access. Therefore, this impact would be **less than significant**.

[52] City of Palo Alto Municipal Code, Section 18.54.070, Table 5

3.15.4 Cumulative Impacts and Mitigation

This section analyzes the potential of the Project to contribute to the following cumulative transportation impacts: [53]

- **Impact C-TRA-1:** Contribution to cumulative effects related to conflict with applicable transportation plan or program.
- **Impact C-TRA-2:** Contribution to cumulative effects related to vehicle miles traveled.
- **Impact C-TRA-3:** Contribution to cumulative effects related to traffic-related hazards and emergency access.

Cumulative Impact C-TRA-1: Transportation Plan or Program Conflicts

The overall cumulative impact for C-TRA-1 would be **potentially significant**, but the contribution of the Project would be **less than cumulatively considerable**.

Cumulative Context

The cumulative context for analysis of conflicts with transportation-related plans or programs is the City of Palo Alto. As previously described, impacts to LOS or traffic delay are no longer considered to be significant environmental impacts under CEQA (PRC Section 21099(b)(2); CEQA Guidelines Section 15064.3) and the Project would not result in any permanent alterations to roadways or otherwise introduce components that may conflict with planned improvements to the road network; therefore, this discussion of cumulative impacts focuses on plans and programs relating to transit, bicycle, and pedestrian circulation systems.

Cumulative Impact Analysis

Pedestrian and Bicycle

The EIR prepared for the City's Comprehensive Plan Update considered cumulative impacts to pedestrian and bicycle facilities from current and future planned development within the City associated with buildout of the Comprehensive Plan. The EIR concluded that buildout in accordance with the Comprehensive Plan would increase demand for pedestrian and bicycle facilities, but that the increased demand would be met by existing or planned facilities, as the City would continue to implement its Bicycle and Pedestrian Transportation Plan.

The Traffic Impact Analysis prepared for the Project (**Appendix E-1**) also considered impacts of "Cumulative plus Project" conditions on pedestrian and bicycle facilities, and concluded that the existing and proposed facilities would be adequate to satisfy the added demand from the cumulative conditions.

Therefore, the overall cumulative impact to pedestrian and bicycle facilities would be **less than significant.**

Transit

The EIR prepared for the City's Comprehensive Plan Update considered cumulative impacts to transit facilities from current and future planned development within the City associated with buildout of the Comprehensive Plan. The EIR concluded that buildout in accordance with the Comprehensive Plan would not create demand for transit services that cannot be met by current or planned services. However, the EIR did identify a significant and unavoidable impact

[53] Note that project-level impacts have been combined for the purposes of cumulative analysis. Cumulative impact C-TRA-3 addresses the same issues as project-level impacts TRA-3 and TRA-4.

to the operation of transit systems within the City as a result of congestion from the associated increase in traffic from Comprehensive Plan buildout at intersections used by transit services. The overall cumulative impact to transit services within the City is therefore **potentially significant.** However, none of the intersections for which a significant cumulative impact was identified in the Comprehensive Plan EIR are intersections that would be affected by the Project, the contribution of the Project to the overall cumulative transit impact would be **less than cumulatively considerable**.

Cumulative Impact C-TRA-2: Vehicle Miles Traveled

The overall cumulative impact for C-TRA-2 would be **less than significant**. No mitigation is required.

Cumulative Context

The cumulative context for analysis of VMT impacts would be the City of Palo Alto.

Cumulative Impact Analysis

The EIR for the City's Comprehensive Plan Update indicates that future buildout under the Comprehensive Plan would reduce total VMT per capita within the City compared to 2015 baseline conditions. The overall cumulative VMT impact of past, present, and foreseeable future development is therefore considered to be **less than significant**.

Furthermore, as discussed in the Project-level analysis above, implementation of the Project would result in a VMT per capita of 5.45, which is less than the existing baseline for the project area of 6.05 VMT per capita. Therefore, the Project would contribute to an overall reduction in VMT, and therefore would not contribute to any regional VMT increases.

Cumulative Impact C-TRA-3: Traffic Safety Hazards and Emergency Access

The overall cumulative impact for C-TRA-3 would be **potentially significant**. With implementation of Mitigation Measure MM-C-TRA-3, the cumulative impact would be **less than significant with mitigation**.

Cumulative Context

The geographic context for analysis of cumulative traffic safety and emergency access impacts is the local Project vicinity. The potential for cumulative traffic-safety and emergency access impacts is limited to those cumulative projects that would generate additional traffic on the same local roads during the Project construction period, or that would introduce additional safety hazards that would impact the same pedestrian and cyclist network as the Project.

Cumulative Impact Analysis

None of the cumulative projects identified in Section 3.1.2 would introduce permanent changes to the road network that would cause increased potential for traffic hazards or permanently obstruct emergency access in the project vicinity. However, the construction period for the nearby PSB project would overlap with Project construction. Therefore, construction-related traffic and road closures associated with the PSB project could cause additional detours, lane or road closures, and other temporary impacts to the local pedestrian and bicycle network that could combine with Project impacts. The overall cumulative impact could be **potentially significant**.

Mitigation Measure MM-C-TRA-3 is recommended to reduce this potentially significant impact to traffic safety and emergency access.

MM-C-TRA-3: Coordination of Construction Traffic Plans

The Developer and its construction contractor for the 231 Grant Educator Workforce Housing project shall consult with the City of Palo Alto and its construction contractor for the Public Safety Building project to coordinate the Construction Traffic Management Plans for both projects such that:

- *Temporary lane and/or road closures and detour routes do not conflict;*
- *Notification to local residents, bicycle and pedestrian advocacy groups, and the Valley Transit Authority are coordinated and clearly identify locations and periods of road closures, alternative routes, and other pertinent information; and*
- *Emergency access is maintained to all properties in the vicinity of both projects throughout the combined construction period.*

3.16 Tribal Cultural Resources

This section describes the existing tribal cultural resources and evaluates whether the Project would result in adverse effects on tribal cultural resources. Pertinent details relating to tribal cultural resources are taken from Section 3.5, “Cultural Resources,” and are repeated below along with additional details regarding the ethnographic context.

Tribal cultural resources are defined as sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either included or determined to be eligible for inclusion in the California Register of Historical Resources or included in a local register of historical resources, or a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant. A cultural landscape that meets these criteria is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape. Historical resources, unique archaeological resources, or non-unique archaeological resources may also be tribal cultural resources if they meet these criteria.

No comments relating to tribal cultural resources were received during the public scoping period in response to the Notice of Preparation.

3.16.1 Environmental Setting

As described in Section 3.5, archival research, historical map analysis, and an archaeological survey were undertaken for the project site, which also examined the potential for Native American archaeological or ethnographic resources within the project site and a 0.25-mile study area. No Native American archaeological or ethnographic resources were identified within the project site as a result of the records search. Two previously recorded Native American archaeological resources (P-43-000617 and P-43-02626) were identified within a 0.25-mile radius of the project site, as discussed in Section 3.5. No evidence of potential Native American archaeological resources was identified as a result of the survey.

Consultation

On March 9, 2021, the County of Santa Clara contacted the NAHC to request the AB 52 Tribal Consultation list and a Sacred Lands File search. Ms. Sarah Fonseca responded on March 19, 2021, with a letter stating that “the result of any Sacred Lands File check conducted through the NAHC was negative.” Pursuant to Public Resources Code Section 21080.3.1(c), the NAHC also provided a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the Project.

All NAHC correspondence and government consultation documents are on file with the County. The County Planning Department received a general request from Tamien Nation of the Greater Santa Clara County on March 25, 2021, requesting formal notice and information on proposed projects for which the County is the CEQA lead agency, pursuant to AB 52. This tribe, and the other tribes that the NAHC identified as traditionally and culturally affiliated with the geographic area of the Project were sent letters by the County on June 8, 2021 and July 29, 2021, informing them of the Project.

On September 6, 2021, the County received a letter from the Tamien Nation requesting tribal consultation and the consultation process commenced on September 14, 2021. Input from this consultation has been incorporated into the analysis within this section and in the development of mitigation measures.

Ethnography and Tribal Cultural Resources

Based on a compilation of ethnographic, historical, and archaeological data, the study area is located within the ancestral territory of the Puichon, who are believed to have spoken the Ramaytush dialect of the Costanoan language (Milliken et al. 2009). Ramaytush, Chochenyo, and Tamyen are the three dialects that compose the San Francisco Bay Costanoan language However, due to similarities between the Costanoan dialects, and the fact that very little direct evidence exists about each of the tribelets, it is also possible that the Puichun (along with their nearby neighbors the Olpen at the headwaters of San Francisquito Creek) spoke the Tamyen dialect recorded at Mission Santa Clara. According to Milliken et al (2009:89):

> *It is really impossible to determine where the Ramaytush dialect ended and the more southerly Tamyen dialect began, because the only Ramaytush sample ever recorded came from an Aramai man from the north [near Pacifica], and the precise homelands of the individuals who supplied the information for surviving Tamyen vocabularies and texts have not been documented. It is likely that the Puichuns and Olpens spoke San Francisco Bay Costanoan dialects along a clinal path between Ramaytush and Tamyen...*

At the time of European contact, the Puichon lived along the bayshore at San Francisquito Creek, where the Peninsula gives way to the open Santa Clara Valley (Milliken et al. 2009). The precise pre-mission distribution of these dialects can only be hypothesized, however, because existing language samples were gathered after the majority of native people were moved to the missions. Detailed evidence about ethnographic cultural practices in the Costanoan language family area is extremely sparse. However, using the early diaries and reports of Spanish explorers, missionaries, and government officials and mission ecclesiastical registers and the work of early twentieth-century field ethnographers, such as J.P. Harrington, Milliken et al. (2009) provide a fairly comprehensive ethnographic study of the San Francisco Bay Costanoan speakers, which includes the Puichon tribal area.

Milliken (2007) described the Puichon in his ethnographic study of the San Francisco Bay Costanoan tribal groups as follows:

> *The Puichon were the largest local tribe on the west shore of San Francisco Bay. Their lands were along lower San Francisquito Creek and lower Stevens Creek, now the areas of Palo Alto, Los Altos, and Mountain View. Their San Francisquito Creek village of Ssipùtca was mentioned six times in the Mission Dolores baptismal records. At Santa Clara they were lumped into the "San Bernardino" district with other* people *from the west of Mission Santa Clara. Some of them were identified more specifically as being from the rancheria of San Francisquito… Puichon people went to mission Dolores between 1781 and 1794 and to Mission Santa Clara between 1781 and 1805. (Milliken 2007, cited in Leventhal et al. 2010)*

At the time of Spanish entry, the native people of the San Francisco Peninsula did not refer to themselves as Costanoans or Ohlones. What mattered was local tribe and extended family membership. Most early Franciscan missionaries called the local tribes rancherias (a word they also applied to individual villages), but one scribe at Mission Dolores called the multi-village local tribes of the San Francisco Peninsula "nations" (Milliken et al. 2009). No early diarists clearly described the intricacies of political organization and group decision making among San Francisco Bay multi-village groups. Early Spanish explorers and missionaries occasionally identified male village or local tribe leaders and bestowed upon them the title of capitán (captain). Captains seem to have been responsible for community coordination and dispute settlement, but their decisions were probably constrained by a myriad of unwritten cultural rules (Milliken et al. 2009).

All of the contact-period people of west-central California made their living primarily by harvesting the plant and animal resources of their local environments (Milliken et al. 2009). They augmented local produce with foods and tool-making resources received in trade from their neighbors. A sexual division of labor existed. In general, women harvested plant foods, involving an astounding variety of seeds, nuts, fruits, and roots (including corms and bulbs), while men augmented the food supply by fishing and hunting for large and small game. No detailed studies were ever carried out on specific subsistence patterns in any Costanoan language family area because the early Spanish explorers and settlers who witnessed those practices made no more than passing comments about them (Milliken et al. 2009).

European contact and missionization drastically affected the Costanoan society, with both San Francisco de Asís and Santa Clara de Asís missions receiving members of Puichon villages (Milliken 1995). Today, the descendants of Costanoan speakers, who are sometimes referred to (or refer to themselves) as Ohlone or Ohlone/Costanoan retain a strong presence in the San Francisco Bay Area and are interested in their history and prehistoric past.

Recent scholarship surrounding the identity of California Indians during missionization and secularization has focused on how native identity was not static, but was transformed in a colonial environment, as it was based on an existing cultural framework (Peelo et al. 2018). Although the Native population was severely decimated by the time of secularization, during the mid-1830s, the surviving missioned Costanoan Indians continued to live and work in several areas within the Santa Clara Valley as well as on the various rancherias and California Ranchos surrounding each of the Bay Area Missions, such as San Juan Bautista Rancheria, Santa Ysabel Rancharia, and San Antonio Rancheria, with aspects of their languages and culture remaining intact (Leventhal et al. 2010; Tamien Nation 2021).

The following section provides a very brief ethnohistory of Costanoan speakers during missionization, secularization and the rancho period, the early American period, and into today. Modern descendants of Costanoan speakers are often referred to, or refer to themselves, as Ohlone/Costanoan.

In response to the diminution of their labor-force, the Franciscan fathers and civil authorities directed Spanish soldiers to bring in new converts from outlying tribal areas. The Coast Miwok, Bay and Plains Miwok, Yokut, Patwin, and Esselen speaking peoples from villages located east, north and south of the Bay Area missions became the new cohort of neophytes as laborers, and they intermarried with the surviving Ohlone-speaking peoples. Such intermarriage patterns were already established between neighboring North Valley Yokuts, Coast, Bay and Plains Miwok, Patwin and Costanoan/Ohlone speaking elites during the late pre-contact and contact periods (Leventhal et al. 2010).

At the missions, intermarriage apparently continued to subtly reinforce sociopolitical hierarchies and older surviving elite families. Even under the triple assault of religious conversion, ecological and economic transformation, and demographic collapse, indigenous political leadership and resistance did not disappear (Leventhal et al. 2010).

The Spanish crown had decided to secularize the missions as early as 1813, but the struggle for Mexican independence intervened. Between 1834 and 1836, the Mexican Republic enacted legislation that terminated the missions and proposed to divide mission properties among the missionized indigenous peoples. Yet this division of land and resources did not fully occur in the San Francisco Bay region. Instead, the local families of Spanish-Mexican descent, known as Californios, proceeded to make formal claims upon most of the property owned by missions Santa Clara and San Jose. Large cattle ranchos were created and the Californios established themselves as neo-feudal lords (Leventhal et al. 2010).

Although Mexican law decreed that half of all the mission-held lands were to be given to the formerly missionized indigenous peoples, no such lands were formally granted with the exception of three or four individual land grants to several Ohlone Indian families. Most Indians left the missions to become manual laborers, domestics and vaqueros on neighboring Californio-owned ranchos (Leventhal et al. 2010).

Many of the formerly missionized Indians, who had previously labored in the mission's fields and cared for the livestock, were hired on as vaqueros by the new Californio estate-owners, who continued the tradition of controlling indigenous peoples on and near the old mission lands. Yet, many of the formerly missionized Indians who worked on these ranchos opted in some cases to move to the most remote areas of the back-country within their ancestral homelands (Leventhal et al. 2010).

The military invasion of California by the United States in 1846 and the subsequent Gold Rush (1849), followed by statehood in 1850, ushered in a new period of genocide against indigenous Californians. Laws barred indigenous Californians from voting, from giving testimony in court, and from bringing lawsuits. At the same time, American laws in most cases refused to recognize the validity of the land titles for the Californios' ranchos. Coupled with a crippling drought afflicting central California during the 1860s, most of the Californios could not afford to maintain their land bases and were driven off their South and East Bay estates. New American owners most likely expelled the remaining indigenous peoples from the land (Leventhal et al. 2010).

As Milliken et al. (2009) indicate that, for many Ohlone/Costanoans, survival into the American period was dependent on remaining quiet about one's Indianness, which often meant passing as Mexican. Some individuals, however, including ancestors of the Tamien Nation, shared their language with early twentieth century academics in order to help preserve this knowledge for the future (Kirschner 2021).

Despite having to frequently hide their identities, gatherings of family and friends bolstered Ohlone/Costanoan individuals through the early and mid-twentieth century (Milliken et al. 2009). The elders who participated in these support networks transmitted native cultural traditions in both overt and covert ways. Mid-twentieth-century Ohlone/Costanoan family and community networks and gathers provided more than social and economic support. They also served as the foundation for a cultural renaissance that developed in the latter part of the century, when being Indian no longer carried stigma (Milliken et al. 2009). In the mid-1960s, Ohlone/Costanoans began to make their political and cultural presence known publicly and have continued to do so in an ever-increasing number of venues (Milliken et al. 2009).

Ohlone/Costanoan peoples continue to participate in events or activities that further develop California Indian cultural traditions and the unique traditions of their own specific ancestors, including language restoration programs and cultural expression (e.g., traditional songs and dance, basket making, fishing, cultivating native plants) that are passed down to future generations (Milliken et al. 2009; Tamien Nation 2021).

3.16.2 Regulatory Framework

Federal

For this Project, there are no federal regulations of relevance to tribal cultural resources.

State

Assembly Bill AB 52

AB 52 (effective July 1, 2015) added PRC Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3 to CEQA, relating to consultation with California Native American tribes, consideration of “tribal cultural resources,” and confidentiality. AB 52 provides procedural and substantive requirements for lead agency consultation with California Native American tribes and consideration of effects on tribal cultural resources, as well as examples of mitigation measures to avoid or minimize impacts to tribal cultural resources. AB 52 establishes that if a project may cause a substantial adverse change in the significance of a tribal cultural resource, that project may have a significant effect on the environment. Lead agencies must avoid damaging effects to tribal cultural resources, when feasible, and shall keep information submitted by tribes confidential.

AB 52 requires a lead agency to consult with California Native American tribes that are traditionally and culturally affiliated with the geographic area of the proposed project, if the tribe requested to the lead agency, in writing, to be informed by the lead agency of proposed projects in that geographic area and the tribe requests consultation. Section 21080.3.1.(d) states that within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the proposed project location and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

Senate Bill SB 18

Enacted on March 1, 2005, SB 18 (California Government Code Sections 65352.3 and 65352.4) requires cities and counties to notify and consult with California Native American tribal groups and individuals regarding proposed local land use planning decisions for the purpose of protecting traditional tribal cultural places (sacred sites), prior to adopting or amending a general plan or designating land as open space. Tribal groups or individuals have 90 days to request consultation following the initial contact.

The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early planning stage, for the purpose of protecting, or mitigating impacts to cultural places. The consultation and notice requirements apply to adoption and amendment of both general plans (Government Code Section 65300 et seq.) and specific plans (Government Code Section 65450 et seq.). Specifically, Government Code Section 65352.3 requires local governments, prior to making a decision to adopt or amend a general plan, to consult with California Native American tribes identified by the NAHC for the purpose of protecting or mitigating impacts to cultural places. As previously discussed, the NAHC is the State agency responsible for the protection of Native American burial and sacred sites.

Local

County of Santa Clara

County Ordinance Code Sections B6-18 through B6-20 set forth the procedures to be followed in the event of an encounter with human skeletal remains or artifacts and discovery of a Native American burial site.

Upon discovering or unearthing any burial site as evidenced by human skeletal remains, the person making such discovery shall immediately notify the County Coroner. Upon determination by the County Coroner that the remains are Native American, the coroner shall contact the California NAHC, pursuant to Health and Safety Code Section 7050.5 (c) and the County Coordinator of Indian Affairs.

No further disturbance of the site may be made except as authorized by the County Coordinator of Indian Affairs in accordance with the provisions of state law and this ordinance. The County Coordinator of Indian Affairs shall contact the California NAHC and assist in contacting persons believed to be most likely descendants. Within 24 hours following receipt of information that a Native American burial site has been discovered or unearthed, the County Coordinator of Indian Affairs shall conduct inspection of the site in accordance with the provisions set forth in PRC Section 5097.98. Any agreement reached in accordance with PRC Section 5097.98 shall be presented to the County Engineer. The County Engineer shall issue a permit setting forth the conditions of the agreement to be met by the owner of the property.

Such conditions of the permit shall be in furtherance of the intent of this ordinance and shall be formulated by a Costanoan Advisory Committee appointed by the County Board of Supervisors and shall consist of three persons of Costanoan descent, two professional archeologists with fieldwork experience and with a degree in archaeology and one person with a background in civil engineering.

The process involves the County Engineer, the County Coroner, the County Coordinator of Indian Affairs, the NAHC, and advisory committee made up of three persons of Costanoan descent, two professional archaeologists, and a person with background in civil engineering. These professionals contribute to the determination of how to handle archaeological resources discovered.

City of Palo Alto

The City of Palo Alto has no specific regulations regarding tribal cultural resources. However, archaeological and historical resources covered under City of Palo Alto policies (discussed in Section 3.5.2) may also be considered tribal cultural resources and, thus, afforded the same protections.

3.16.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to tribal cultural resources:

- **Impact TCR-1:** Would the Project cause a substantial adverse change in in the significance of an as-yet unidentified tribal cultural resource?

Impact TCR-1: Tribal Cultural Resources

Impact TRC-1 would be **potentially significant**. With implementation of MM-CUL-2, the impact would be reduced to **less than significant with mitigation.**

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would cause a substantial adverse change in the significance of an as yet unidentified tribal cultural resource.

PRC Section 21074 defines a tribal cultural resource 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 that is listed or eligible for listing on the California Register for Historical Resources or in a local register of historical resources as defined in PRC Section 5020.1(k), or is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC Section 5024.1(c). In applying the criteria in Section 5024.1(c), the lead agency shall consider significance of the resource to the relevant California Native tribe.

Impact Analysis

Construction

As discussed in Sections 3.5.1 and 3.16.1, no archaeological resources or previously documented tribal cultural resources have been identified within the project site as a result of the NWIC records search, NAHC Sacred Lands File search, or archaeological survey. Two prehistoric resources have been identified within 0.25-mile of the project site.

Although no tribal cultural resources were identified as part of the background research for this Project, records maintained by the NWIC and the NAHC are not exhaustive and negative results do not preclude the presence of tribal cultural resources at the project site. Representatives of the Tamien Nation have indicated that they consider the project area to be potentially sensitive for tribal cultural resources.

The project site is mapped as Holocene-age fine-grained alluvial fan and basin deposits (Qhff) by Witter et al. (2006), suggesting that the surficial landform is young enough that there is a potential for buried prehistoric resources that may not be visible at the surface. However, the project site is located relatively far from perennial water (approximately 0.38-mile west of the historical alignment of Matador Creek) which has been demonstrated as one of the key indicators of prehistoric archaeological site potential. Together, these factors indicate a moderate sensitivity for buried prehistoric archaeological or tribal cultural resources within the project site.

The previous historic-period development of the project site (described in Section 3.5.1) has likely diminished the sensitivity of the project site in the areas where development occurred (e.g., in extant and non-extant building footprints). Therefore, the project site is considered to have a low to moderately sensitive for harboring as-yet unidentified buried prehistoric archaeological and tribal cultural resources.

Given that the Project consists of ground disturbance in a highly urban setting, it is unlikely that as-yet identified tribal cultural resources could be impacted by the Project. However, as discussed in Section 3.5, there is the potential for the Project to impact as-yet unidentified buried archaeological resources, which may also be potentially eligible as tribal cultural resources under CEQA.

Under the Project, the horizontal footprint is beyond the extant building within the Project parcel and the maximum vertical footprint (27 feet below ground surface) is likely outside of areas of previous ground disturbance. Therefore, it is possible that as-yet unidentified *in situ* prehistoric and historic-period archaeological deposits could be encountered during Project-related ground disturbance; though this potential is considered unlikely, given the considerations discussed above. Because there is the potential for impacts to as-yet to be identified tribal cultural and/or archaeological resources that may also be potentially eligible as tribal cultural resources, the impact would be **potentially significant**.

Mitigation Measure MM-CUL-2 is recommended to address this potentially significant impact.

> ***MM-CUL-2: Inadvertent Discovery Procedures. See Section 3.5.3 for full details of this measure.***

Mitigation measure MM-CUL-2, requiring that that construction workers receive cultural resources awareness training and specifying procedures be followed in the event that tribal cultural resources are encountered during ground disturbance, is recommended to reduce impacts to subsurface tribal cultural resources on the project site. This mitigation measure would require a qualified tribal cultural resources monitor to be present during those construction activities with the potential to disturb as-yet unidentified resources, and require stoppage of work within the area of any find(s), consultation with tribal representatives, and either avoidance of the find, if feasible, or implementation of recommendations from a qualified archaeologist, in consultation with tribal representatives and the County, regarding the treatment and disposition of the find to reduce potential adverse impacts to the resource. Therefore, with implementation of MM-CUL-2, Project impacts to tribal cultural resources would be reduced to **less than significant with mitigation**.

Operation

Operation of the Project would not involve any further ground disturbance and, therefore, would not have a substantial adverse effect on potential buried tribal cultural resources. There would be **no impact**.

3.16.4 Cumulative Impacts and Mitigation

This section analyzes the potential of the Project to contribute to the following cumulative tribal cultural resource impacts:

- **Impact C-TCR-1:** Contribution to cumulative effects on tribal cultural resources.

Cumulative Impact C-TCR-1: Tribal Cultural Resources

The overall cumulative impact for C-TRC-1 would be **potentially significant.** Implementation of mitigation measure MM-CUL-2 would reduce the Project's contribution to **less than significant with mitigation**.

Cumulative Context

The cumulative context for tribal cultural resources addresses the impacts of the Project along with other closely related past, present, and probable future projects, and specifically focuses on local planned developments within the City of Palo Alto that could potentially change the environment by affecting tribal cultural resources.

Cumulative Impact Analysis

According to CEQA, the importance of tribal cultural resources is the value of the resource to California Native American tribes culturally affiliated with the project area. Past, present, and future development, in conjunction with the Project, would have the potential to cumulatively impact tribal cultural resources. Such impacts would be **potentially significant**; however, each of the cumulative projects would be subject to its own environmental review under CEQA, either at a project-level or as part of a programmatic CEQA analysis, and therefore appropriate mitigation measures to avoid or reduce potential impacts to tribal cultural resources such as MM-CUL-2 would be required, similar to the Project. With implementation of such mitigation measures, the cumulative effects on tribal cultural resources would be reduced to less than significant. Therefore, the overall cumulative impact would be **less than significant with mitigation**.

3.17 Utilities/Service Systems

This section describes the existing Utilities and Service Systems setting of the project area and evaluates whether the Project would result in adverse effects on Utilities and Service Systems. No comments relating to Utilities and Service Systems were received during the public scoping period in response to the Notice of Preparation.

3.17.1 Environmental Setting

The City of Palo Alto runs its own community-owned utilities, including water, wastewater, electricity, natural gas, and fiber optic.

Water Supply

The City of Palo Alto Utilities provides water service to the City of Palo Alto, including the project site. The City receives 100 percent of its potable water supply from the San Francisco Public Utilities Commission (SFPUC) through Sierra Nevada snowmelt delivered through the Hetch Hetchy water distribution system. The City also participates in various regional recycle water planning initiatives, with the City providing approximately 818 acre-feet of recycled water used in 2015.

The City of Palo Alto prepares an urban water management plan every 5 years, to project future demand and evaluate the adequacy of existing and projected supply. The City's 2015 Urban Water Management Plan describes how current and future water resources and demands within its service area will be managed to provide an adequate and reliable water supply. The City has an annual potable water supply of 17.07 million gallons per day (MGD) or 19,118 acre-feet per year (AF/Y) per its Individual Supply Guarantee from the SFPUC. The City's total annual water demand for SFPUC water in 2015 was 10,724 acre-feet, with a resulting surplus of 8,394 acre-feet of potable water supply. The City projects that water demand will fluctuate over the urban water management plan (UWMP) planning horizon (through 2035) with a maximum projected demand of 11,882 AFY, which is approximately 62 percent of the City's Individual Supply Guarantee (City of Palo Alto Utilities 2016).

SFPUC's Water System Improvement Program includes water supply goals and objectives to ensure it meets at least 80% of customer demands during periods of water shortage. However, during single and multiple dry years, the SFPUC would impose water restrictions, as stated in its the Water Shortage Allocation Plan. As the City is entirely reliant on the reliability of SFPUC's regional water supply system, the City will implement its Water Shortage Contingency Plan and deploy action plans depending on the severity of the drought. The City also maintains several critical interconnections with neighboring water utilities including East Palo Alto, City of Mountain View, Stanford University, and Purissima Hills Water District, that can be activated during critical events to ensure water supplies are not impacted and to provide mutual aid to neighboring communities (City of Palo Alto Utilities 2016).

Wastewater

The City of Palo Alto owns and manages its wastewater collection systems in the area. Wastewater treatment services within the City and at the project site are provided by the City of Palo Alto Public Works Department and wastewater is treated at the Regional Water Quality Control Plant (RWQCP) in the City of Palo Alto, which is also managed by the City of Palo Alto Public Works Department. The RWQCP treats wastewater from Palo Alto, Stanford University, Los Altos, Los Altos Hills, Mountain View, and the East Palo Alto Sanitary District. In 2018, the RWQCP's average dry weather influent flow was 16.8 MGD (City of Palo Alto 2019). The

RWQCP has an average dry weather flow operation capacity of 39 MGD and an average wet weather flow capacity of 80 MGD (City of Palo Alto 2016a). Average dry weather flow (approximately 16.8 MGD in 2018) is well below design capacity. According to the City, the RWQCP does not experience any major treatment system constraints and capacity is sufficient for current dry and wet weather loads and for future load projections through 2035 (City of Palo Alto 2012b).

Storm Drainage

The public storm drain system is owned, operated, and maintained by the City of Palo Alto. It consists of approximately 107 miles of pipeline and 2,750 catch basins, 800 manholes, and six pump stations (City of Palo Alto 2006). The various components of the storm drain system function collectively to collect, convey, and discharge stormwater runoff to the San Francisco Bay via one of four local creeks: San Francisquito, Matadero, Barron, and Adobe Creek (City of Palo Alto 2016a). The existing stormwater system contains curb gutters along Grant Avenue, Birch Street, and Park Boulevard adjacent to the project site.

Solid Waste

The City of Palo Alto contracts with GreenWaste of Palo Alto for waste and recycle collection, transportation, and processing services. Residential and commercial recycling is transferred and processed at the GreenWaste Material Recovery Facility located in the City of San Jose. Mixed construction and demolition debris is processed at the Zanker Material Processing Facility in the City of San Jose. All solid waste is collected and processed at the Sunnyvale Materials Recovery and Transfer Station in Sunnyvale and the majority of non-recyclable solid waste is transferred to Kirby Canyon Landfill in the City of San Jose. Kirby Canyon Landfill is a Class III municipal landfill that is permitted to accept mixed municipal solid waste, construction and demolition debris, green materials, and industrial refuse. According to the California Department of Resources Recycling and Recovery (CalRecycle), the Kirby Canyon Landfill has a permitted maximum daily disposal capacity of 2,600 tons per day (tpd), a total maximum permitted capacity of 36.4 million cubic yards, and a remaining permitted capacity of approximately 16.2 million cubic yards. The Kirby Canyon Landfill has an estimated closure date of December 31, 2059 (CalRecycle 2021).

The California Integrated Waste Management Act of 1989 requires local agencies to implement source reduction, recycling, and composting that would result in a minimum of 50 percent diversion of solid waste from landfills, thereby extending the life of landfills. In 2019 Palo Alto's diversion rate was 81 percent, well above the State-mandated rate of 50 percent (City of Palo Alto 2021f).

Electricity and Natural Gas

The City of Palo Alto Utilities supplies electricity and natural gas throughout the city, including the project site. The City intakes energy from PG&E's transmission system. As of 2013, the City of Palo Alto Utilities derives majority of its electric power from renewable energy sources and is 100 percent carbon-neutral by offsetting the non-renewable portion of its portfolio with renewable energy certificates (City of Palo Alto 2016a).

3.17.2 Regulatory Framework

Federal

There are no federal regulations related to utilities and service systems relevant to the Project.

State

California Integrated Waste Management Act of 1989

The California Integrated Waste Management Act (AB 939) was signed into law on September 29, 1989. The Act requires all California cities, counties, and approved regional solid waste management agencies that are responsible for enacting plans and implementing programs to divert 25 percent of their solid waste by 1995 and 50 percent by year 2000. Later legislation mandates that the 50 percent diversion requirement be achieved every year. The California Department of Resources Recycling and Recovery oversees and provides assistance to local governments as they develop and implement plans to meet the mandates of AB 939, AB 341, and subsequent legislation. Local assistance staff serves as a liaison between local governments and the department and its program areas, providing input for the development of policies concerning local planning and implementation issues.

CALGreen Building Code

CCR Title 24, Part 11, known as the CALGreen Code, is designed to reduce various environmental impacts by providing guidelines and requirements on the following categories; planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; and, environmental quality.

With regards to solid waste, the CALGreen Code requires that at least 50 percent of weight of non-hazardous job site debris generated by new construction be recycled, reused, or otherwise diverted from landfill disposal. The CALGreen Code requires submission of plans and verifiable post-project documentation to demonstrate compliance.

Local

City of Palo Alto Construction and Demolition Debris Diversion Program

The City of Palo Alto's Construction & Demolition Debris Diversion Program was based off of the California Green Building Code and is included in the City's municipal code (Chapter 16.14) to encourage the recovery of debris from construction and demolition projects. The City requires a minimum of 80% construction waste reduction for all residential projects.

3.17.3 Project Impacts and Mitigation

This section addresses the following potential impacts relating to utilities and service systems:

- **Impact UTI-1:** Would the Project require new or expanded utility services that could cause significant environmental effects?
- **Impact UTI-2:** Would the Project have sufficient water supplies available?
- **Impact UTI-3:** Would the Project result in determination of inadequate wastewater treatment capacity?
- **Impact UTI-4:** Would the Project generate solid waste in excess of local standards or capacity of local infrastructure?
- **Impact UTI-5:** Would the Project comply with solid waste management and reduction statutes and regulations?

Impact UTI-1: New or Expanded Utility Services

Impact UTI-1 would be **less than significant** No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.

Impact Analysis

Construction

As discussed below for Impacts UTI-2 and UTI-3, Project construction would not generate substantial demand for water supplies and would not generate substantial volumes of wastewater. Construction would also not require connecting to, or the construction of, new or expanded water, wastewater treatment, storm drainage, electric, natural gas, or telecommunications facilities. There would be **no impact.**

Operation

As discussed below for Impacts UTI-2 and UTI-3, operation of the Project would not generate substantial demand for water supplies or generate substantial volumes of wastewater. The Project would connect to existing water, wastewater, stormwater, and other utilities infrastructure located adjacent to the project site. No improvement work is anticipated for the existing utilities adjacent to the project site. Construction of new connections to existing utilities would result in the potentially significant environmental impacts identified in relevant sections throughout this document, in connection with discussions of the impacts of overall site development. Mitigation measures are identified for potentially significant construction-related impacts to ensure that those impacts would be reduced to a less-than-significant level. There are no additional significant impacts beyond those comprehensively considered throughout the other sections of this document. This impact would be **less than significant.**

Impact UTI-2: Water Supply Availability

Impact UTI-2 would be **less than significant.** No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if there would not be sufficient water supplies available to serve the project and probable future development during normal, dry and multiple dry years.

Impact Analysis

Construction

During Project construction, minimal water would be needed for activities such as soil compaction and dust control. This water would be obtained from the City's existing water supply and the additional water use would be short-term and negligible compared with the available water quantities. Therefore, Project construction would not generate demand for significant volumes of water that would exceed the available supply. This impact would be **less than significant.**

Operation

The Project would utilize water for landscaping, residential, and commercial/cafe purposes. Because the Project would have less than 500 new residential units, it does not meet the definition of "project" under California Water Code (CWC) Section 10912 and, therefore, would not require preparation of a Water Supply Assessment (WSA) pursuant to SB 610 and SB 221. The Project would be required to implement measures described in Chapter 4 of the 2019 CALGreen Code (Title 24, Part 11 of the California Code of Regulations) to reduce indoor demand for potable water and reduce landscape water usage.

Development of the Project would increase demand for potable water due to the introduction of residential and commercial uses to the site. Assuming that water use is approximately 120 percent of wastewater generation (13,500 gallons per day), the Project would demand approximately 16,200 gallons per day of water, or approximately 18 AFY (see Table 3.17-1 under Impact UTI-3 below for estimated wastewater generation calculations). This equates to less than 0.1 percent of the City's Individual Supply Guarantee of 19,118 AFY.

Under normal year water supply conditions, the City will have sufficient supplies to meet projected future water demands but could face shortages during severe or prolonged drought conditions. During single and multiple-dry years, the City would respond based on the severity of the drought and the Project would comply with the City's Water Shortage Contingency Plan. Because the water demand estimated for the Project could be accommodated by the existing water supplies identified in the City's 2015 UWMP and would comply with mandatory water conservation regulations, sufficient water supplies are available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years. This impact would be **less than significant.**

Impact UTI-3: Wastewater Treatment Capacity

Impact UTI-3 would be **less than significant.** No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would result in a determination by the wastewater treatment provider that serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

Impact Analysis

Construction

During construction, portable restrooms would be provided for construction workers. Wastewater from portable restrooms would be disposed of at an appropriately licensed local facility with adequate capacity to accommodate project needs. Therefore, the Project construction would not generate significant volumes of wastewater that would exceed the capacity of the wastewater treatment provider or exceed applicable treatment requirements. There would be **no impact.**

Operation

Project operation would generate wastewater from toilets, sinks, washing machines, dishwashers, and potential leaks associated with the 110 proposed residential units, as well as from commercial or café activities associated with the "flex space". New wastewater lines serving the proposed buildings would connect to the existing wastewater infrastructure to accommodate the project's wastewater generation.

Estimated wastewater generation for the Project is given in Table 3.17-1 below. Palo Alto's Utilities UWMP does not list wastewater generation factors. As a result, wastewater generation rates from the City of Los Angeles were used to estimate the amount of wastewater that would be generated by the Project. As shown in Table 3.17-1, the Project would generate approximately 13,500 gallons per day of wastewater. This increase would be less than 0.04 percent of the total capacity of the RWQCP (39 million gallons per day) and approximately 0.06 percent of the average available capacity (22.2 million gallons per day). Therefore, there would be sufficient wastewater capacity to serve the project site. The Project would not exceed wastewater treatment requirements or require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities. The Project would not result in a substantial physical deterioration of public wastewater facilities. Therefore, impacts would be less than significant.

Table 3.17-1 Estimated Wastewater Generation from Project Operation

Source	Generation Factor[1]	Estimated Wastewater Use
24 Studio Residential Units	80 gpd per unit	**1,920 gpd**
61 One-Bedroom Residential Units	120 gpd per unit	**7,320 gpd**
25 Two-Bedroom Residential Units	160 gpd per unit	**4,000 gpd**
1,100 SF Flex Space (café)	280 gpd per 1,000 SF	**308 gpd**
Total Project Wastewater Generation	**NA**	**13,548 gpd**

Source: Calculated using generation factors from City of Los Angeles 2006.

Notes: 1. Palo Alto's Utilities UWMP does not list wastewater generation factors, therefore City of Los Angeles factors were used to calculate wastewater generation. This approach is consistent with recent CEQA analysis within the City (City of Palo Alto 2018b).

Acronyms: gpd = gallons per day; SF = square feet; NA = not applicable

Additionally, wastewater generated by the Project would be typical of residential and commercial developments in the area and would not require special treatment or otherwise exceed wastewater treatment requirements of the San Francisco Bay RWQCB. Therefore, this impact would be **less than significant.**

Impact UTI-4: Solid Waste Capacity

Impact UTI-4 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would 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.

Impact Analysis

Construction

Project construction would require demolition of the existing office building and would generate various construction-period wastes, including scrap lumber, scrap finishing materials, various scrap metals, and other recyclable and nonrecyclable construction-related wastes. The volume of demolition debris generated during construction is estimated at approximately 3,000 cubic yards.

The 2019 CALGreen Code (Title 24, Part 11 of the California Code of Regulations) requires all construction contractors to reduce construction waste and demolition debris by 65%. Code requirements include preparing a construction waste management plan that identifies the materials to be diverted from disposal by efficient usage, recycling, reuse on the project, or salvage for future use or sale; determining whether materials will be sorted on-site or mixed; and identifying diversion facilities where the materials collected will be taken. The Code also specifies that the amount of materials diverted should be calculated by weight or volume, but not by both. In addition, the Code requires that 100% of trees, stumps, rocks, and associated vegetation and soils resulting primarily from land clearing be reused or recycled. Solid waste collected from the project site that could not be reused or recycled would be hauled to the Kirby Canyon Landfill in the City of San Jose.

As discussed above, Kirby Canyon Landfill has a total maximum permitted capacity of 36.4 million cubic yards. Therefore, the approximately 3,000 cubic yards of Project-generated demolition debris represents less than 0.01 percent of total capacity. As such, the Project would be unlikely to generate solid waste that would exceed the capacity of any receiving landfill or in excess of State or local standards. This impact would be **less than significant.**

Operation

As discussed in Section 3.13, "Population and Housing", the 110 residential units provided by the Project are estimated to house approximately 273 residents and the 1,100 SF of "flex space" would be used as a café or other retail or commercial use. Project operation would result in increased long-term generation of solid waste due to the increased number of residents and employees at the site. Table 3.17-2 shows the estimated volume of solid waste that would be generated by the Project, using typical solid waste generation rates.

Table 3.17-2 Estimated Solid Waste Generation from Project Operation

Source	Generation Factor	Estimated Solid Waste Generation
273 Residents	3.7 lbs/day per resident	**1,010 lbs/day**
3 Flex Space Employees	12.1 lbs/day per employee	**36.3 lbs/day**
Total Solid Waste Generation	**NA**	**1,046.3 lbs/day**

Source: Calculated using generation factors from CalRecycle 2019 (residential) and Cascadia Consulting Group 2006 (restaurant). Solid waste generation rates for café use were not available, therefore the generation rate for restaurant use was applied to the "flex space". Generation rates for retail stores (4.7 pounds per day per employee) and other non-restaurant commercial uses are lower than for restaurant use (12.1 pounds per day), therefore use of the restaurant generation rate is considered a conservative approach.

Acronyms: lbs/day = pounds per day; NA = not applicable

The total estimated amount of solid waste generation by the Project would be approximately 1,050 pounds per day, which equates to approximately 0.525 tons per day. Project-generated solid waste would therefore represent approximately 0.02 percent of Kirby Canyon landfill's daily maximum permitted throughput (2,600 tons per day). Therefore, the landfill would be able to accommodate waste generated by the Project, and operational impacts related to landfill capacity would be **less than significant.**

Impact UTI-5: Solid Waste Statutes and Regulations

Impact UTI-5 would be **less than significant**. No mitigation is required.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would not comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

Impact Analysis

Construction

Project construction would not conflict with or interfere with the State or City's ability to implement its adopted solid waste management programs and policies. The Project would comply with all statutes and regulations related to solid waste, including the 2019 California Green Building Standards Code (Title 24 CCR Part 11), the City's Construction & Demolition Debris Diversion Program, and submittal of a Waste Management Plan. This impact would be **less than significant.**

Operation

Project operation would not conflict with or interfere with the State or City's ability to implement its adopted solid waste management programs and policies. The Project would comply with all statutes and regulations related to solid waste, including 2019 California Green Building Standards Code (Title 24 CCR Part 11), AB 939, and AB 341. This impact would be **less than significant.**

3.17.4 Cumulative Impacts and Mitigation

This section analyzes the potential of the Project to contribute to the following cumulative utility and service system impacts:

- **Impact C-UTI-1:** Contribution to cumulative effects relating to new or expanded utility services?
- **Impact C-UTI-2:** Contribution to cumulative effects relating to sufficient water supplies available?
- **Impact C-UTI-3:** Contribution to cumulative effects relating to inadequate wastewater treatment capacity?
- **Impact C-UTI-4:** Contribution to cumulative effects relating to generation of solid waste in excess of local standards or capacity of local infrastructure?
- **Impact C-UTI-5:** Contribution to cumulative effects relating to solid waste management and reduction statutes and regulations?

Cumulative Impact C-UTI-1: New or Expanded Utility Services

The overall cumulative impact for C-UTI-1 would be **less than significant**.
No mitigation is required.

Cumulative Context

The geographic context for analysis of cumulative impacts related to utilities and service systems is the City of Palo Alto city limits.

Cumulative Impact Analysis

All future projects would be evaluated at a project-level to determine increase in demand for utilities that would result in relocation or construction of new utilities. The EIR prepared for the City's Comprehensive Plan Update considered cumulative impacts to utilities from current and future planned development within the City associated with buildout of the Comprehensive Plan. The EIR concluded that buildout in accordance with the Comprehensive Plan would not require new or expanded utility services that would result in significant impacts. Therefore, the overall cumulative impact to utilities and service systems would be **less than significant**.

Cumulative Impact C-UTI-2: Water Supply Availability

The overall cumulative impact for C-UTI-2 would be **less than significant**.
No mitigation is required.

Cumulative Context

The geographic context for analysis of cumulative impacts related to water supply is the City of Palo Alto city limits.

Cumulative Impact Analysis

All future projects would be evaluated at a project-level to determine the cumulative increase in demand for water use. While these future projects would contribute to additional water supply demands, they would be subject to the same water conservation efforts, water efficiency measures, and water supply improvements to balance supply and demand as this project. In addition, the City indicates it would have sufficient water supply to meet demand in normal, single dry, and multiple dry years. Based on the water supply demand anticipated under buildout of the City's 2030 Comprehensive Plan, there would be sufficient water supplies to serve demand generated by residents within Palo Alto. Therefore, the overall cumulative impact to water supply would be **less than significant**.

Cumulative Impact C-UTI-3: Wastewater Treatment

The overall cumulative impact for C-UTI-3 would be **less than significant**.
No mitigation is required.

Cumulative Context

The geographic context for analysis of cumulative impacts related to wastewater treatment is the RWQCP service area.

Cumulative Impact Analysis

All future projects would be evaluated at a project-level to determine the increase in demand for wastewater treatment service. Based on the wastewater treatment demand anticipated under buildout of the City's 2030 Comprehensive Plan, the existing RWQCP wastewater facilities would have adequate capacity to serve demand generated by residents within Palo Alto. Therefore, the overall cumulative impact on wastewater treatment capacity would be **less than significant.**

Cumulative Impact C-UTI-4: Solid Waste Capacity

The overall cumulative impact for C-UTI-4 would be **less than significant**.
No mitigation is required.

Cumulative Context

The geographic context for analysis of cumulative impacts related to solid waste capacity is the City of Palo Alto city limits.

Cumulative Impact Analysis

All future projects would be evaluated at a project-level to determine the increase in demand for solid waste services. Projects that would exceed available landfill capacity would not be approved without appropriate mitigation or plans to address disposal of solid waste. Based on the generation of solid waste anticipated under buildout of the City's 2030 Comprehensive Plan, existing solid waste facilities would have adequate capacity to serve demand generated by future development within Palo Alto. Therefore, the overall cumulative impact on solid waste capacity would be **less than significant.**

Cumulative Impact C-UTI-5: Solid Waste Regulations

The overall cumulative impact for C-UTI-5 would be **less than significant**.
No mitigation is required.

Cumulative Context

The geographic context for analysis of cumulative impacts related to solid waste regulations is the City of Palo Alto city limits.

Cumulative Impact Analysis

All future projects would be required to comply with relevant solid waste statutes and regulations, which have been adopted to protect the environment. The EIR for the City's Comprehensive Plan identified a potentially significant cumulative impact related to compliance with solid waste management laws and statutes, because the specific Comprehensive Plan policies relating to solid waste management had not been finalized. Mitigation Measures were included in the EIR, requiring that the Final Comprehensive Plan include policies promoting recycling and conservation in accordance with applicable solid waste regulations. Such policies were included within the adopted Comprehensive Plan, therefore future development under buildout of the Comprehensive Plan would not have a significant impact in relation to solid waste regulations. The overall cumulative impact from future development within the City would therefore be **less than significant.**

3.18 Environmental Topics for which No Impacts were Identified

This section provides a brief discussion of several environmental topics which, due to the nature of the project site and/or the nature of the Project, would have no potential for environmental impact and, thus, no cumulatively considerable impact. Because no impacts were identified, and no comments relating to any of these topics were received during the public scoping period in response to the Notice of Preparation, a full description of the environmental setting, regulatory framework, and detailed analysis of impacts is not included in the EIR as it is for other environmental topics that do have potential for environmental impacts.

A brief justification for the exclusion of these topics from further analysis, including the basis for the no impact conclusion, is given for each of the topics listed below is presented in the following subsections:

- Agricultural and Forestry Resources
- Mineral Resources
- Wildfire

3.18.1 Agricultural and Forestry Resources

Based on Appendix G of the CEQA Guidelines, the Project is considered to have a significant impact on agricultural and forestry resources if it would:

- Convert Prime Farmland, Unique Farmland, or Farmland of State-wide 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;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in PRC Section 12220(g)), timberland (as defined by PRC Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g));
- Result in the loss of forest land or conversion of forest land to non-forest uses; or
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.

The project site is currently developed with urban uses and is designated as “Urban and Built-Up Land” by the California Department of Conservation Farmland Mapping and Monitoring Program (California Department of Conservation 2016). The project site is not located on lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, nor is it in on lands zoned as forestland, timberland, or a Timberland Production Zone and does not contain 10 percent native tree cover that would be classified as forest land under PRC Section 12220(g). Therefore, the Project would not conflict with existing agricultural zoning or a Williamson Act contract, convert or facilitate the conversion of prime farmland to non-agricultural uses, or result in the loss of forest lands. There would be **no impact** to agricultural and forestry resources under Project or cumulative conditions.

3.18.2 Mineral Resources

Based on Appendix G of the CEQA Guidelines, the Project is considered to have a significant impact on mineral resources if it would:

- 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; or
- Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

The City of Palo Alto does not contain any mineral deposits of regional significance (City of Palo Alto 2017a). The project site is not located in an area known as containing regionally or locally significant mineral resources. Therefore, the Project would not result in the loss of mineral resources of statewide, regional or local importance. There would be **no impact** related to mineral resources under Project or cumulative conditions.

3.18.3 Wildfire

Based on Appendix G of the CEQA Guidelines, the Project would have a significant impact related to wildfire if it is located within or near a State Responsibility Area or Very High Fire Hazard Severity Zone and would:

- Substantially impair an adopted emergency response plan or emergency evacuation plan;
- 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;
- 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; or
- 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.

As discussed for Impact HAZ-6 in Section 3.9, "Hazards and Hazardous Materials," the project site is not within a State Responsibility Area or within a Very High Fire Hazard Severity Zone and is more than 1.5 miles from the nearest such area or zone (CAL FIRE 2021). Therefore, the significance thresholds pertaining to wildfire hazards are not applicable to the Project. There would be **no impact** related to wildfire under Project or cumulative conditions.

3.19 Mandatory Findings of Significance

3.19.1 Project Impacts and Mitigation

This section evaluates the following mandatory findings of significance outlined in CEQA Guidelines Appendix G:

- **Impact MFS-1:** Would the Project have a substantial adverse effect on wildlife or plant species or eliminate important examples of the major periods of California history or prehistory?
- **Impact MFS-2:** Would the Project have cumulative impacts that are individually limited but cumulatively considerable?
- **Impact MFS-3:** Would the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Impact MFS-1: Substantial Adverse Effects to Biological or Cultural Resources

The impacts would be **potentially significant.** With implementation of Mitigation Measures MM-BIO-4 and MM-CUL-2 the impacts would be reduced to **less than significant with mitigation**.

Standards of Significance

Based on Appendix G of the CEQA Guidelines, a project may have a significant impact if it would have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory.

Impact Analysis

Based upon background research and the analysis in this EIR, the Project would not have the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of a rare or endangered plant or animal. As discussed above in Section 3.3, “Biological Resources,” construction of the Project could disturb common birds that are nesting on or near the project site (see Impact BIO-4). Implementation of Mitigation Measure MM-BIO-4 would reduce this potentially significant impact to a less-than-significant level by conducting demolition, construction, and tree trimming/removal outside the nesting season or conducting preconstruction nesting bird survey for demolition, construction and tree trimming/removal during the nesting season and establishing active nest buffers until the nest is no longer active. All other biological resources impacts would be less than significant.

As discussed in Section 3.4, “Cultural Resources,” the Project would not result in a substantial adverse change in the significance of a historical resource (see Impact CUL-1) and would not cause significant impacts from the potential disturbance of human remains (see Impact CUL-3). However, the Project could have a potentially significant impact from disturbance of previously unrecorded subsurface prehistoric and historic-era archeological resources (see Impact CUL-2) or tribal cultural resources (see Impact TCR-1). Because MM-CUL-2 would require worker awareness training and a tribal cultural resources monitor to be present during disturbance of previously-undisturbed areas; evaluation of any potential find, if encountered, to determine if it meets the definition of a historical, archaeological, or tribal cultural resource or not; and recommendations from a qualified archaeologist (in consultation with tribal representatives, if appropriate) regarding the treatment and disposition of such a find, impacts to unrecorded subsurface prehistoric and historic-era archaeological resources would be reduced to a less-than-significant level.

With implementation of MM-BIO-4 and MM-CUL-2, the impact would be reduced to **less than significant with mitigation.**

Impact MFS-2: Individually Limited but Cumulatively Considerable Impacts

The cumulative impact would be **no impact** or **less than significant** for most resource topics, except for air quality, cultural, greenhouse gases, hazards, public services and recreation, traffic, and tribal cultural resources, for which the Project which would have a **less than cumulatively considerable contribution with mitigation**; and for noise and vibration, for which the Project would have a **significant and unavoidable** cumulative impact**.**

Standard of Significance

Based on Appendix G of the CEQA Guidelines, the Project may have a significant impact if it would have impacts that are individually limited, but cumulatively considerable.

Impact Analysis

Analysis of cumulative impacts is provided for each environmental topic within each of the "Cumulative Impacts and Mitigation" subsections within Section 3 of this EIR. As discussed within subsection 3.2.4 through subsection 3.17.4, the Project in combination with other past, present, and probable future projects would result in less-than-significant cumulative impacts, except for the following:

- The overall cumulative impacts for C-GHG-1, C-POP-1, C-PSR-2, and C-TRA-1 would be **potentially significant**, but the Project's contribution to these cumulative impacts would be **less than cumulatively considerable**. No mitigation measures are required.
- The overall cumulative impacts for C-AIR-1, C-CUL-2, C-HAZ-3, C-NOI-1, and C-TCR-1 would be **potentially significant**, but the Project's contribution to the cumulative impact would be **reduced to less than cumulatively considerable** with implementation of Project-level mitigation measures MM-AIR-2, MM-CUL-2, and MM-HAZ-3A through MM-HAZ-3E. No additional mitigation measures, beyond those required to reduce the Project-level impacts, are required for these cumulative impacts.
- The overall cumulative impact for C-TRA-3 would be **potentially significant**, but the Project's contribution to the cumulative impact would be **reduced to less than cumulatively considerable** with implementation of an additional cumulative-level mitigation measure, MM-C-TRA-3.
- The overall cumulative impact for C-NOI-1 and C-NOI-2 would be significant. Implementation of Project-level mitigation measures MM-NOI-1 and MM-NOI-2 would reduce these impacts, but not a less-than-significant level. These cumulative impacts would therefore be **significant and unavoidable**.

Impact MFS-3: Direct or Indirect Adverse Effects on Human Beings

The impact would be **no impact, less than significant,** or **less than significant with mitigation** for all resource topics, except for construction noise, for which the impact would be **significant and unavoidable**.

Standard of Significance

Based on Appendix G of the CEQA Guidelines, the Project may have a significant impact if it would have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly.

Impact Analysis

Based upon background research and the analysis herein, the Project would not cause substantial adverse effects on human beings with respect to any of the environmental topics except for construction noise and vibration, as any potentially significant impacts for other environmental topics would be reduced to a less than significant level with mitigation.

As discussed in Section 3.10.3 (Impact NOI-1), the Project would exceed the County's established thresholds for construction noise, even with the implementation of feasible mitigation measures (MM-NOI-1). Therefore, the Project would result in a **significant and unavoidable impact** for construction noise.

Similarly, as discussed in Section 3.10.3 (Impact NOI-2), the Project would generate construction-related vibration levels that would exceed established thresholds for both human annoyance and building damage. With implementation of feasible mitigation measures (MM-NOI-2), the thresholds for building damage would not be exceeded, but the threshold for human annoyance would still be exceeded. Therefore, the Project would result in a **significant and unavoidable impact** for construction vibration.

4 Alternatives

4.1Introduction

CEQA requires that an EIR describe and evaluate a reasonable range of alternatives to the proposed project, or to the location of the proposed project, and evaluate the comparative environmental effects of the alternatives (CEQA Guidelines Section 15126.6(a), (d)). The "range of alternatives" is governed by the "rule of reason," which requires the EIR to describe and consider only those alternatives necessary to permit informed public participation, and an informed and reasoned choice by the decision-making body (CEQA Guidelines Section 15126.6(a), (f)).

The range of alternatives must include alternatives that could feasibly attain most of the basic objectives of the project and could avoid or substantially lessen any of the significant effects of the project (CEQA Guidelines Section 15126.6(a)-(c)). CEQA generally defines "feasible" to mean an alternative that is capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, technological, and legal factors (CEQA Guidelines Section 15364). In addition, the following may be taken into consideration when assessing the feasibility of alternatives: site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or regulatory limitations; jurisdictional boundaries; and the ability of the proponent to attain site control (CEQA Guidelines Section 15126.6(f)(1)). If the lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR (CEQA Guidelines Section 15126.6(f)(2)(B)).

The description or evaluation of alternatives does not need to be exhaustive, and an EIR need not consider alternatives for which the effects cannot be reasonably determined and for which implementation is remote or speculative. An EIR need not describe or evaluate the environmental effects of alternatives in the same level of detail as the proposed project, but must include enough information to allow meaningful evaluation, analysis, and comparison with the proposed project (CEQA Guidelines Section 15126.6(d)).

A "no project" alternative must also be evaluated. This analysis is required to include a discussion of the continuation of the existing conditions, as well as what could be reasonably expected to occur in the foreseeable future if the Project were not approved, based on current plans and consistent with available infrastructure and community services (CEQA Guidelines Section 15126.6I(2)).

CEQA also requires that an environmentally superior alternative be selected from among the alternatives. The environmentally superior alternative is the alternative with the fewest or least severe adverse environmental impacts. If the "no project" alternative is the environmentally superior alternative, the EIR must also identify an environmentally superior alternative from among the other alternatives (CEQA Guidelines Section 15126.6(e)(2)).

4.1.1 Project Objectives

As presented in Section 2.2, the objectives of the Project are reiterated below. The objectives of the Project are to:

1. Provide at least 60 rental housing units for teachers and classified staff in targeted school districts within Santa Clara County and a sufficient number of units to meet the Facebook Grant criteria, delivered at an accelerated pace.
2. Provide housing that is affordable to a range of incomes from low-income to incomes at or slightly above the area median income[54].
3. Provide housing that is high-quality and compatible with the surrounding neighborhood, while still maintaining development and operational cost efficiencies.
4. Provide housing that maximizes the number of units on the site.
5. Provide housing that is close to public transit.
6. Incorporate innovative technologies and sustainability measures.
7. Provide desirable public and residential amenity spaces.
8. Provide easily accessible bicycle parking and to encourage the use of alternative forms of transportation to nearby employment and transit.

4.1.2 Summary of Significant Effects of the Project

Alternatives to the Project must substantially lessen or avoid one or more of the Project's significant environmental impacts. The following significant and unavoidable impacts were identified for the Project, as discussed in more detail in Section 3.12:

- Impact NOI-1: Project construction would result in generation of a substantial temporary increase in ambient noise levels (project-level and cumulative).
- Impact NOI-2: Project construction could result in generation of substantial temporary vibration levels (project-level and cumulative).

The Project would also have the following potentially significant impacts which would be reduced to less than significant with implementation of recommended mitigation measures, as discussed in more detail in Section 3:

- Impact AIR-2: Project construction could result in fugitive dust emissions.
- Impact BIO-4: Project construction could disturb nesting birds.
- Impact CUL-1: Project construction could result in vibration damage to a potentially historic resource.
- Impact CUL-2: Project construction could disturb previously unidentified cultural resources.

[54] The area median income is the midpoint of a region's income distribution, meaning that half of households in a region earn more than the median and half earn less than the median. For households and families, the median income is based on the distribution of the total number of households and families including those with no income. The median income for individuals is based on individuals 15 years old and over with income.

- Impact GEO-3: Project construction could result in destabilization of the adjacent building foundations.
- Impact GEO-6: Project construction could disturb unique paleontological resources.
- Impact HAZ-3: Project construction could result in human health and environmental hazards if contaminated groundwater is improperly contained, treated, and discharged. Project operations could expose future residents and site users to vapor intrusion risks.
- Impact HYD-1: Project construction could result in violation of water quality standards if contaminated groundwater is improperly contained, treated, and discharged.
- Impact HYD-5: Project construction could conflict with the provisions of the San Francisco Bay Basin Plan if contaminated groundwater is improperly contained, treated, and discharged.
- Impact TRA-3: Project operation could increase the potential for bicycle/vehicle or pedestrian/vehicle accidents.
- Impact TCR-1: Project construction could disturb previously unidentified tribal cultural resources.

4.2 Alternatives Considered but Rejected from Further Analysis

Section 15126.6(c) of the CEQA Guidelines requires an EIR to identify and briefly discuss any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process. Reasons for eliminating an alternative from detailed consideration include, but are not limited to:

- Failure to meet most of the basic project objectives;
- Infeasibility; or
- Inability to avoid significant environmental impacts.

Section 15126(f)(1) of the CEQA Guidelines states that "Among the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries…and whether the proponent can reasonably acquire control or otherwise have access to the alternative site. No one of these factors establishes a fixed limit on the scope of reasonable alternatives."

The following potential alternatives to the Project were initially considered but were determined to be infeasible and, as such, were eliminated from further analysis:

- **Project Location Alternative:** EIRs often consider alternative locations for a Project which might avoid the significant environmental impacts [per CEQA Guidelines 15126.6(f)(2)(A)]. Due to constraints related to Project financing, the County reached out to all school districts and cities within the area to be served by the Project, as well as Facebook and VTA, to identify potential alternative sites that might be suitable for the Project that would be available for long-term lease or purchase at little to no cost. [55] The majority of agencies contacted[56] had no available or suitable land; however, the following properties were identified as potentially suitable, but were ultimately dismissed from further consideration for the reasons described below.

- 1798 Bay Road, East Palo Alto (APN: 063-231-250) – this approximately 1.35-acre property is owned by the City of East Palo Alto. The property is zoned by the City as "Corridor" and designated as "Bay Road Central" within the Ravenswood/4 Corners Transit-Oriented Design Specific Plan (City of East Palo Alto 2013). Land within this designation is intended for multi-story, mixed-use development with first floor retail/storefront and a maximum allowable density of 50 dwelling units per acre. The property is currently being used as the City's Recreational Vehicle Safe Parking Program via a Temporary Use Permit (TUP) in conjunction with a non-profit organization, Project We Help Other People Excel (WeHOPE) (Horst, pers. comm. 2021a). The TUP expires in April 2022 but has an option to extend for 2 more years. After the TUP expires, the City of East Palo Alto Police Department has plans to use the site for approximately one year (Horst, pers. comm. 2021b). Therefore, this property would not be available until at least April 2023 (assuming no extension of TUP) or possibly until April 2025 (if TUP is extended for 2 years). One of the Project objectives is to provide housing that is "delivered at an accelerated pace," and the County is seeking to begin construction in mid-2022 and be operational by 2024. For all of the reasons described above, this property is not considered a feasible alternative site for the Project.
- 2120 Euclid Avenue, East Palo Alto (APN: 063-292-380) – this approximately 4-acre property is owned by the Ravenswood City School District. The property is zoned by the City of East Palo Alto as "MUH" and designated as "Mixed Use High" within the East Palo Alto General Plan (City of East Palo Alto 2017). This designation allows mixed-use developments up to 8 stories in height with a maximum allowable density of 86 dwelling units per acre; however, at least 35 percent of ground floor area must be for retail use. The property is currently used as the School District's administrative offices, but the Board of Trustees recently passed a resolution declaring its intent to lease the site (Ravenswood City School District 2021). The School District indicated that the initial term of the lease should be for ten years, and that the School District would retain the right to not renew the lease following the initial term in case the land is needed for School District use in the future (Eger, pers. comm. 2021b). Because the long-term availability of the property cannot be secured beyond ten years, this property is not a feasible alternative site for the Project.
- 320 Sheridan Drive, Menlo Park (APN: 055-303-110) – this approximately 2.5-acre property is owned by the Ravenswood City School District and is the site of the former Flood Elementary School. The property is zoned by the City of Menlo Park as "Single Family Urban Residential (R1U)" and designated as "Low Density Residential" within the

[55] Based on current offers and deals in the Palo Alto area, the cost of acquiring land for the Project at fair market value would be approximately $22 million. This is based on $505 per square foot or $200,000 per unit.

[56] Aguilar, pers. comm. 2021; Birnie, pers. comm. 2021; Burmeister, pers. comm. 2021; Cadiz, pers. comm. 2021; Chow, pers. comm. 2021; Coffman, pers. comm. 2021; Fuentes, pers. comm. 2021; Golem, pers. comm. 2021; Grady, pers. comm. 2021; LaMonica, pers. comm. 2021; Maher, pers. comm. 2021; Marquez, pers. comm. 2021; Natarajan, pers. comm. 2021; Padovan, pers. comm. 2021; Rodericks, pers. comm. 2021; Rudolph, pers. comm. 2021.

City's General Plan (City of Menlo Park 2016). This designation provides for single family detached homes, secondary dwelling units, public and quasi-public uses, and similar and compatible uses, with a maximum allowable density of 8.9 dwelling units per acre. The property had been studied by the school district previously and was found not suitable for housing due to the low density of the surrounding area and zoning restrictions (Eger, pers. comm. 2021a). Although the County is not subject to zoning and land use provisions of other local government agencies, this would not be an appropriate location for the Project for several reasons. Vehicular access to the property is limited—either requiring travel through an established low density residential community (Hedge Road) or via an informal roadway/parking lot within the adjacent Flood Park—which may require an agreement with the City and/or improvements to the local road network to support the additional traffic associated with the Project. The property is also not as well-served by public transit as the project site. Ravenswood City School District has indicated that they would be seeking fair market value for the property (Eger, pers. comm. 2021b), which would substantially increase project costs and likely make the Project economically infeasible. Furthermore, although not a CEQA issue, the site is immediately adjacent to the US-101 Bayshore Freeway, which may require the Project to use non-standard construction materials (e.g., sound-rated windows and walls) in order to achieve acceptable noise levels within habitable rooms of the building, which would also increase Project costs. For all of the reasons described above, this property is not considered a feasible alternative site for the Project.

– 4000 Middlefield Road, Palo Alto (APN: 147-08-052) – This approximately 8-acre property is owned by the City of Palo Alto, and is part of a larger 35-acre property on which the City operates the Cubberley Community Center, providing a variety of community services such as daycare/early childhood education, after-school programs, art and dance studios, and senior services. The remaining approximately 27 acres of the Cubberley campus is owned by the PAUSD and leased to the City[57]. The City of Palo Alto and PAUSD have prepared a conceptual Master Plan for future redevelopment of the Cubberley campus (Concordia 2019). Environmental review of the Master Plan under CEQA is currently being undertaken, which assumes a phased build-out over 5 to 7 years, with consideration of up to 100 housing units on City of Palo Alto property within the fourth (last) phase of development. However, no funding has been identified for Master Plan implementation, so the actual timeframe for buildout is uncertain and could be substantially longer than the 5 to 7 years assumed in the environmental review (Raybould, pers. comm. 2021b). Therefore, it is unlikely that this site would allow the County to meet its objective of housing that is "delivered at an accelerated pace". In any case, the County's overall goal is to increase housing stock in the County and, therefore, it would not want to displace potential housing developments by other agencies such as the City of Palo Alto. For the reasons described above, this property is not considered a feasible alternative site for the Project.

[57] The City used to lease the entire 27-acre property from PAUSD, but as of June 2020 only leases certain portions of the PAUSD property actively used for Community Center purposes (PaloAltoOnline 2020).

4.3 Alternatives Retained for Further Analysis

The following alternatives are evaluated in this EIR:

- No Project Alternative
- Alternative 1 – Traditional Construction Methods
- Alternative 2 – Reduced-Scale Development

Detailed descriptions and analysis of each of these alternatives are provided in Sections 4.3.1 through 4.3.3 below.

4.3.1 No Project Alternative

CEQA Guidelines Section 15126.6(e) requires that an EIR analyze a “No Project” alternative. The purpose of describing and analyzing a no project alternative is to allow decision makers to compare the impacts of approving the project with the impacts of not approving the project. The No Project Alternative reflects the conditions that would reasonably be expected to occur in the foreseeable future if the project were not approved (CEQA Guidelines Section 15126.6(e)).

Description of Alternative

Under the No Project Alternative, the existing single-story office building would not be demolished, and no construction or site improvements would occur at the site. The existing building would continue to be used by the County of Santa Clara Office of the Public Defender and various community groups.

Ability of Alternative to Meet Project Objectives

The No Project Alternative would not meet Project Objectives identified in Section 2.2. This alternative would not result in provision of any new housing units and, therefore, would not meet Objectives 1 through 5. The No Project Alternative also would not incorporate any innovative technologies and sustainability measures, provide desirable public and residential amenity spaces, or encourage the use of alternative forms of transportation and, therefore, would not meet Objectives 6 through 8.

Analysis of Environmental Impacts of Alternative

As discussed for the Project in Section 3.18, “Environmental Topics for which No Impacts were Identified,” there are no agricultural, forestry, or mineral resources in close proximity to the project site, and the area is not within a wildfire hazard zone. As such, the No Project Alternative would have no impacts on agriculture and forestry resources, mineral resources, or wildfire hazards.

The No Project Alternative would not include any construction or demolition activities, ground disturbance, tree removal, or heavy equipment operation at the project site and would not generate any construction-related traffic movements. Therefore, there would be no construction-related impacts to air quality, biological resources, cultural resources, greenhouse gas emissions, geology and soils, hazards and hazardous materials, hydrology and water quality, noise and vibration, transportation, or tribal cultural resources under the No Project Alternative. In particular, the No Project Alternative would avoid the significant and unavoidable construction noise and vibration impacts identified for the Project, and would also avoid the Project’s potentially-significant construction-related impacts related to fugitive dust emissions, nesting birds, historic resources, archaeological resources, unstable soils, paleontological resources, contaminated groundwater, violation of water quality standards, conflicts with applicable water quality control plans, and tribal cultural resources.

The No Project Alternative would not include any new development on the project site and would not introduce new residential units or commercial operations that would result in changes to site population or employment opportunities. With no new development and no new residents or employees at the project site, the No Project Alternative would have no direct operational-related impacts to aesthetics; air quality; biological resources; greenhouse gas emissions; geology and soils; hazards and hazardous materials; hydrology and water quality; public services; recreation; transportation and traffic; or utilities and services as compared to the current environmental baseline. In particular, the No Project Alternative would avoid the Project's potentially significant operational impacts related to vapor intrusion and traffic safety.

However, because the No Project Alternative would not redevelop the project site with educator workforce housing, the beneficial impacts of the Project related to the jobs/housing balance and reduction in commute length would not occur. Furthermore, continued demand for housing in the region may result in development in other locations that are not within a Transit Priority Area. As such, the No Project Alternative could potentially have indirect impacts on air quality, greenhouse gas emissions, population and housing, and transportation and traffic.

4.3.2 Alternative 1 – Traditional Construction Methods

Description of Alternative

Alternative 1 would be identical to the proposed project described in Section 2, Project Description, except that it would utilize traditional construction methods rather than modular construction methods.

All operational components, including the number of residential units and associated amenities, flex space and public amenities, size and layout of the proposed building, landscaping, access, and utilities, would be as described in Sections 2.2.1 through 2.2.6 above.

This description of Alternative 1 therefore focuses on construction details.

Construction Phasing, Equipment and Personnel

Construction is anticipated to begin in mid-2022 and the on-site construction period is expected to last approximately 17 to 20 months in total, compared to 15 to 18 months for the Project. The additional two months of construction for Alternative 1 is attributed to the five additional weeks required for each of the last two phases (wood framing/exterior cladding and interior finishes/landscaping); the estimated duration for the first three phases would be identical to the proposed Project. As with the Project, the project schedule for Alternative 1 is dependent on market conditions, regulatory approvals, and other factors and, therefore, is subject to change.

The following estimates for construction phasing, equipment, and personnel needs have been established for Alternative 1, as shown in Table 4.3-1.

Table 4.3-1 Estimated Construction Phasing, Equipment and Personnel – Alternative 1

Construction Phase	Estimated Duration[1]	Equipment Type	Average Number of Workers
1. Site Clearing, Grading, and Excavation	6 weeks	1 truck excavator 1 skid steer loader 1 truck tractor 1 backhoe loader 1 hollow stem auger vibratory rollers vibratory plate compactors jackhammers jumping jack compactors	15
2. Underground Utilities	4 weeks	1 backhoe loader 1 mini-excavator vibratory plate compactor	15
3. Ground Floor Concrete Work	20 weeks	1 reach forklift 1 mobile crane (intermittent) 1-2 boom lifts 1 backhoe loader 1 skid steer vibratory plate compactor	30
4. Wood Framing and Exterior Cladding	16 weeks	1 reach forklift 1 boom lift 1 mobile crane (intermittent)	50
5. Interior Finishes and Landscaping	38 weeks	1 reach forklift 1-2 boom lifts 1 mobile crane (intermittent)	75

Source: Compiled by AECOM 2021 based on information provided by Developer.
Note: 1. It is assumed that up to two weeks overlap could occur between each phase.

As described for the Project, construction activities for Alternative 1 would be limited to between 8:00 a.m. and 6:00 p.m. Monday through Friday and between 9:00 a.m. and 6:00 p.m. on Saturdays, in accordance with the City of Palo Alto Municipal Code, Chapter 9.10, which is the more restrictive of the City and County noise ordinances. No construction would occur on Sundays or public holidays.

The first three phases of construction (site clearing, grading, and excavation; underground utilities; and ground floor concrete work) would be identical to that described for the Project in Section 2.4, above. However, during the fourth phase of construction, the above-grade levels would be built using traditional “stick built” methods, including wood framing and exterior cladding, rather than the modular construction described for Phase 4 of the proposed Project. Finally, during Phase 5 of Alternative 1, the interior of the building would be completed, and exterior landscaping would be installed, which would be similar to the fifth phase of the proposed Project construction but of slightly longer duration.

The maximum depth of excavation (approximately 17 or 27 feet bgs, depending on the selected foundation design) and the volume of demolition debris and soil export would be identical to that described for the Project (3,000 cubic yards and 10,000 cubic yards, respectively). However, Alternative 1 would not require any truck trips for modular unit transportation.

Construction Staging, Haul Routes and Traffic Control

Similar to the Project, no offsite construction staging areas are anticipated for Alternative 1, except for the street frontages immediately adjacent to the site. Workers would be expected to park in public parking lots within a quarter mile of the site.

Haul routes will vary depending on material/destination, but it is anticipated that the majority of truck traffic would be via US-101/Oregon Expressway.

Similar to the Project, one way traffic controls and temporary closure of on-street parking would be required on Grant Avenue between Park Boulevard and Birch Avenue throughout the majority of the construction period, and occasional lane closures on Birch Avenue (northbound side of median only) and Park Boulevard may also be required. Grant Avenue would likely need to be closed periodically during the construction period to allow for crane mobilization and/or concrete pours; however, the 4- to 8-week full closure of Grant Avenue required for the Project would not be needed for Alternative 1 because traditional construction would require less frequent use of cranes compared to modular construction. The size of the crane required for Alternative 1 would also be smaller than for the Project.

As described for the Project, before construction begins, the construction contractor would prepare and implement a traffic control plan in consultation with the City of Palo Alto. The traffic control plan would be prepared in accordance with the City’s latest Traffic Control Plan Requirements and Public Works Standard Specifications and would include the same information as described for the Project in Section 2.4.2.

Ability of Alternative to Meet Project Objectives

Alternative 1 would fully or partially meet all of the Project Objectives, as discussed in turn below:

1) Provide at least 60 rental housing units for teachers and classified staff in targeted school districts within Santa Clara County and a sufficient number of units to meet the Facebook Grant criteria, delivered at an accelerated pace.

Alternative 1 would meet this objective, but to a lesser degree than the Project. Alternative 1 would be identical to the Project in terms of the number of units provided and allocation of units to staff from targeted school districts within Santa Clara County and to meet grant criteria. However, due to the longer construction period that would be required for traditional building methods, Alternative 1 would be delivered at a slightly slower pace than the Project.

2) Provide housing that is affordable to a range of incomes from low-income to incomes at or slightly above the area median income.

Alternative 1 would fully meet this objective, as the Alternative would be identical to the Project in terms of the allocation of units based on income.

3) Provide housing that is high-quality and compatible with the surrounding neighborhood, while still maintaining development and operational cost efficiencies.

Alternative 1 would meet this objective, but to a lesser degree than the Project, because the use of traditional construction methods would be slightly less cost-efficient than the Project's proposed use of modular construction methods. The quality of this alternative, and its compatibility with the surrounding neighborhood would be the same as the Project.

4) Provide housing that maximizes the number of units on the site.

Alternative 1 would fully meet this objective, as the Alternative would be identical to the Project in terms of the number of units provided.

5) Provide housing that is close to public transit.

Alternative 1 would fully meet this objective, as the Alternative would be identical to the Project in terms of the number of units provided close to public transit.

6) Incorporate innovative technologies and sustainability measures.

Alternative 1 would partially meet this objective. The proposed building would include the same sustainable features as the Project (e.g., energy-efficient construction, all-electric infrastructure, photo-voltaic solar electricity, electric vehicle-ready parking spaces, easily accessible bicycle parking) but would not incorporate innovative technologies such as modular construction.

7) Provide desirable public and residential amenity spaces.

Alternative 1 would fully meet this objective, as the Alternative would be identical to the Project in terms of the design and area of public and residential amenity spaces.

8) Provide easily accessible bicycle parking and to encourage the use of alternative forms of transportation to nearby employment and transit.

Alternative 1 would fully meet this objective, as the Alternative would be identical to the Project in terms of the number and type of bicycle facilities provided and encouragement to use alternative forms of transportation.

Analysis of Environmental Impacts of Alternative 1

All operational components of Alternative 1, including the number of residential units and associated amenities, flex space and public amenities, size and layout of the proposed building, landscaping, access, and utilities, would be identical to the Project; therefore, the operational impacts of Alternative 1 would also be identical to those described for the Project in Section 3. In particular, Alternative 1 would have the same potentially significant operational impacts as the Project, in relation to:

- vapor intrusion from the underlying California-Olive-Emerson regional groundwater plume, as discussed in Section 3.9.3 (Impact HAZ-3); and
- traffic safety impacts due to the increased potential for pedestrian/vehicle and bicycle/pedestrian conflicts associated with additional operational traffic crossing the existing bike lane on Park Boulevard and existing sidewalks on Park Boulevard and Birch Street, as discussed in Section 3.16.3 (Impact TRA-3).

As described for the Project, these potentially significant operational impacts would be reduced to less than significant with mitigation through implementation of mitigation measures MM-HAZ-3E, MM-TRA-3A, and MM-TRA-3B. All other operational impacts of Alternative 1 would be less than significant or no impact for the same reasons described for the Project.

The analysis of Alternative 1 impacts below therefore focuses on construction-related impacts only.

Aesthetics

Impact AES-1: No Impact

As described for the Project in Section 3.2.3, there are no scenic views, such as views of hillsides to the west or the baylands to the northeast, that would be obstructed by construction of Alternative 1 on the project site. Therefore, similar to the Project, there would be no substantial adverse effect on a scenic vista from Alternative 1 and **no impact** would occur. This is the same level of significance as the Project.

Impact AES-2: No Impact

As described for the Project in Section 3.2.3, there are no state scenic highways in the project area and there are no views of the project site from Oregon Expressway, which is designated as a local scenic route by the City of Palo Alto. Therefore, similar to the Project, Alternative 1 would not affect scenic resources within a state or local scenic route and **no impact** would occur. This is the same level of significance as the Project.

Impact AES-3: Less than Significant

As described for the Project in Section 3.11.3, the County is sponsoring the development and the development would primarily serve a public purpose. Thus, under state law, Alternative 1 is exempt from the City's land use regulations. County General Plan policies and regulations governing scenic quality apply only to unincorporated areas of the County and, therefore, are not applicable to Alternative 1, which is within the incorporated city limits of Palo Alto. Therefore, Alternative 1 would not conflict with any zoning or other regulations governing scenic quality.

With respect to the scoping comment that requested the development be designed to "suit" existing development in the neighborhood, a discussion of which is provided for informational purposes only, Alternative 1 would be identical to the Project, and would be consistent with the City's development standards and design criteria, except for building height. For the same reasons discussed for the Project in Section 3.11.3, Alternative 1 would have a **less than significant impact** on scenic quality.

Impact AES-4: Less than Significant
Similar to the Project, construction activities for Alternative 1 would comply with the City's construction hours and no nighttime lighting would occur. Any nighttime lighting required for site security would be directed downward and/or shielded to reduce spillover onto neighboring properties and public rights-of-way. Therefore, similar to the Project, impacts from light and glare would be **less than significant**. This is the same level of significance as the Project.

Air Quality

Impact AIR-1: Less than Significant
Construction of Alternative 1 would be similar to that described for the Project, except that traditional construction methods would be utilized rather than modular construction methods. Construction of Alternative 1 would include implementation of the same fugitive dust control measures, health and safety regulations and hazardous materials removal and disposal protocols, and solid waste recycling and diversion targets as described for the Project in Section 3.3.3. Therefore, for the same reasons described for the Project, construction of Alternative 1 would not conflict with the 2017 Clean Air Plan (BAAQMD 2017c) and the impact would be **less than significant.** This is the same level of significance as the Project.

Impact AIR-2: Less than Significant with Mitigation
Construction of Alternative 1 using traditional methods would be generally similar to construction of the Project using modular methods, with key differences pertaining to air emissions including:

- Alternative 1 would require a slightly longer total construction duration (17 to 20 months, compared to 15 to 18 months for the Project), due to the last two phases (wood framing/exterior cladding and interior finishes/landscaping) taking longer than the corresponding phases of the Project (the duration of the first three construction phases would be identical for the Project and Alternative 1).
- Alternative 1 would require a smaller size crane and/or fewer days of crane equipment usage and other miscellaneous equipment (e.g., truck excavator, rollers, plate compactors, jumping jack compactors) than for the Project. Wood framing and exterior cladding activities typically involve the use of smaller equipment such as hand tools that are electric-powered, as wood frames are light in weight and do not typically require cranes or other heavy machinery for the erection process (The Constructor 2021).
- Alternative 1 would not require any truck trips for delivery of modular units but would require more truck trips for delivery of building materials than the Project. Alternative 1 would include the same number of truck trips for hauling soil export and demolition debris.
- Alternative 1 would require additional construction workers during the last two phases of construction, compared to the Project.

Construction-related emissions under Alternative 1 are summarized in Table 4.3-2 below.

Table 4.3-2 Average Daily and Annual Criteria Pollutant Construction Emissions for Alternative 1 and the Proposed Project

Description	Alt 1 ROG	Alt 1 NO_X	Alt 1 PM_{10} (Exhaust)	Alt 1 $PM_{2.5}$ (Exhaust)	Project ROG	Project NO_X	Project PM_{10} (Exhaust)	Project $PM_{2.5}$ (Exhaust)
Total Emissions (tons)	0.90	2.00	0.08	0.07	0.90	2.26	0.09	0.08
Average Daily Emissions (lb/day)[1]	**3.91**	**8.75**	**0.33**	**0.31**	**4.54**	**11.35**	**0.45**	**0.41**
Thresholds of Significance	54	54	82	54	54	54	82	54
Exceeds Threshold?	No	No	No	No	No	No	No	No

Source: Estimated by AECOM in 2021. See Appendix B for detailed modelling assumptions, outputs, and results.

Notes:

[1] *Average daily emission estimates are based on approximately 458 construction workdays (17 months of construction, 6 days of construction per week).*

Acronyms: Alt 1 = Alternative 1; lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter.

As shown in Table 4.3-1, construction activities under Alternative 1 would result in slightly lower total emissions from the project site than the Project due to the lower overall equipment usage. Construction activities under Alternative 1 would also result in lower average daily construction-related emissions due to the longer construction duration and would still be substantially below the average daily thresholds of significance. Similar to the Project, construction of Alternative 1 would require implementation of the BAAQMD Basic Construction Measures to minimize fugitive dust emissions during construction as described in Mitigation Measure MM-AIR-2 in Section 3.3.3. Fugitive dust emissions are considered to be significant unless the project implements the BAAQMD's BMPs for fugitive dust control during construction. Construction-related impacts from Alternative 1 would therefore be **potentially significant**.

With implementation of Mitigation Measure MM-AIR-2, Alternative 1 would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment of applicable federal or state ambient air quality standard. Implementation of MM-AIR-2 would therefore reduce Alternative 1 construction impacts from fugitive dust emissions to **less than significant with mitigation.** This is the same level of significance as the Project.

Impact AIR-3: Less than Significant

As discussed previously, construction of Alternative 1 using traditional construction methods would require a slightly longer construction duration and more construction workers than the Project but would generally use smaller equipment or would use large equipment for shorter periods of time than the Project. Therefore, it is anticipated that the surrounding sensitive receptors would be exposed to lower levels of criteria air pollutant emissions and toxic air contaminant emissions under Alternative 1 than described for the Project in Section 3.3.3. Therefore, construction activities under Alternative 1 would not expose sensitive receptors to substantial pollutant concentrations. Thus, the construction-related impact would be **less than significant.** This is the same level of significance as the Project.

Impact AIR-4: Less than Significant

Construction activities under Alternative 1 would generate similar typical construction-related odors to those described for the Project in Section 3.3.3. The use of traditional construction methods is not anticipated to generate substantially more or less odors than the modular construction methods proposed by the Project. Therefore, for the same reasons described for the Project, impacts from other emissions (such as those leading to odors) from construction of Alternative 1 would be **less than significant.** This is the same level of significance as the Project.

Biological Resources

Impact BIO-1: No Impact
As discussed in Section 3.4.3, there is no potential for special-status plant species to occur in the landscaped areas of the project site, and there is no suitable habitat for special-status species. Therefore, for the same reasons described for the Project, the construction and operation of Alternative 1 would have **no impact** on candidate, sensitive, or special status species**.** This is the same level of significance as the Project.

Impact BIO-2: No Impact
As discussed in Section 3.4.3, there are no riparian habitat or other sensitive natural communities on or near the project site. Therefore, for the same reasons described for the Project, Alternative 1 would not result in impacts to riparian habitat or other sensitive natural communities, and there would be **no impact.** This is the same level of significance as the Project.

Impact BIO-3: No Impact
As discussed in Section 3.4.3, there are no state or federally protected wetlands at the project site and the nearest wetland resources are separated from the site by developed land and the Oregon Expressway. Therefore, for the same reasons described for the Project, Alternative 1 would have **no impact** on state or federally protected wetlands. This is the same level of significance as the Project.

Impact BIO-4: Less than Significant with Mitigation
As described in Section 3.4.3, there are no native resident or migratory wildlife corridors or native wildlife nursery sites in the vicinity of the project site, but common nesting birds inhabit native and non-native trees at and around the project site. Alternative 1 would remove the same trees as the Project; therefore, damage or destruction of nests or killing or injury to nesting birds could occur during construction, as described for the Project. Although the duration of construction for Alternative 1 would be shorter, the noise and vibration from construction of Alternative 1 would still be substantial enough that adult birds may abandon their nests. Therefore, for the same reasons as described for the Project, Alternative 1 would have a **potentially significant** impact on nesting birds, similar to the Project.

Mitigation Measure MM-BIO-4, as described for the Project in Section 3.4.3, would also apply to Alternative 1 and require either avoiding the nesting bird season, or conducting nesting bird surveys prior to construction and establishing a work-exclusion buffer zone around any active nests. For the same reasons described for the Project, with the implementation of MM-BIO-4, the potential impacts of Alternative 1 on nesting birds would be reduced to **less than significant with mitigation.** This is the same level of significance as the Project.

Impact BIO-5: Less than Significant
Construction of Alternative 1 would require the same trees to be removed as the Project and would be subject to the County Tree Ordinance for trees on the project site, and the City Tree

Ordinance for street trees. Operation of Alternative 1 would be identical to the Project. Therefore, for the same reasons described for the Project, Alternative 1 would not result in conflict with local policies or ordinances protecting biological resources, and the impact would be **less than significant.** This is the same level of significance as the Project.

Impact BIO-6: No Impact

As described in Section 3.4.3, the project site is not within an approved Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, for the same reasons as described for the Project, Alternative 1 would not result in conflict with such a plan and there would be **no impact.** This is the same level of significance as the Project.

Cultural Resources

Impact CUL-1: Less than Significant with Mitigation

Alternative 1 would be identical to the Project, except that it would be constructed using traditional “stick built” construction methods, rather than the proposed “modular” construction proposed by the Project. The different method of construction would not change the potential for construction-related impacts on historical resources. For the same reasons described for the Project, impacts from Alternative 1 on historical resources would therefore be the same as for the Project in Section 3.5.3, such impacts could be **potentially significant**.

Mitigation measure MM-NOI-1, described in Section 3.12.3, would also apply to Alternative 1 and would require that measures be taken to avoid construction activities that would result in vibration levels at adjacent buildings that exceed the threshold for building damage. Therefore, for the reasons described in Section 3.5.3, implementation of mitigation measure MM-CUL would reduce the impact to historic resources to **less than significant with mitigation.** This is the same level of significance as the Project.

Impact CUL-2: Less than Significant with Mitigation

Alternative 1 would include the same horizontal and vertical footprint as the Project, only the construction methods would differ. Therefore, the impacts from construction of Alternative 1 on as-yet to be identified archaeological resources would be very similar, if not identical, to the Project. For the reasons described for the Project in Section 3.5.3, such impacts could be **potentially significant.**

Mitigation measure MM-CUL-1, described in Section 3.5.3, would address this potentially significant impact by requiring stoppage of work while a qualified archaeologist evaluates the find to determine if it meets the definition of a historical or archaeological resource, and complying with the archaeologist’s recommendations regarding the disposition of such finds. Therefore, with implementation of MM-CUL-1, impacts to subsurface cultural resources from Alternative 1 would be reduced to **less than significant with mitigation**. This is the same level of significance as the Project.

Impact CUL-3: Less than Significant

Alternative 1 would include the same horizontal and vertical footprint as the Project, only the construction methods would differ. Therefore, the possibility of encountering human remains during construction of Alternative 1 would be very similar, if not identical, to the Project. If human remains were uncovered during demolition or excavation activities associated with Alternative 1, the procedures in County Ordinance Code Sections B6-18 through B6-20 would be followed, which would reduce potential impacts to **less than significant**. This is the same level of significance as the Project.

Energy

Impact ENE-1: Less than Significant

The majority of construction activities under Alternative 1 using traditional construction methods would be similar, if not identical, to the modular construction methods proposed by the Project, with key differences as described for air quality, above.

Table 4.3-3 shows the estimated total and annual energy consumption as a result of the fuel used during construction activities under Alternative 1.

Table 4.3-3 Alternative 1 - Construction-Related Energy Consumption

Source	Alternative 1 Total Energy Requirement (gallons)	Alternative 1 Annual Energy Requirement[a] (gallons)	Alternative 1 Energy Consumption (MMBtu)	Project Energy Consumption[b] (MMBtu)
Diesel	36,965	1,232	170	193
Gasoline	18,415	614	77	56
Total Construction Energy Requirement	-	-	**247**	**249**

Source: compiled by AECOM in 2021.
Notes: MMBtu = million British thermal units; - indicates blank cell.
[a] *Since construction-related energy demand would cease upon completion of construction, similar to the methodology for GHG emissions, energy demand associated with construction of the Project was amortized over the Project lifetime. The assumed amortization period is 30 years, based on the typically assumed project lifetime used by other air districts (e.g., South Coast Air Quality Management District [2008]).*
[b] *Refer to Table 3.6-2 in Section 3.6, "Energy," for more detailed estimate of Project energy consumption.*

As shown in Table 4.3-2, construction activities under Alternative 1 are anticipated to require less diesel-related fuel due to the reduction in haul trips and reduction in equipment usage than shown for the Project in Table 3.6-2. However, construction of Alternative 1 would require more gasoline-related fuel due to the additional worker trips. Overall, the total construction energy requirement for Alternative 1 (247 MMBtu) would be similar to the Project (249 MMBtu)and would not include unusual characteristics that would necessitate the use of construction equipment that is less energy-efficient than the equipment used at comparable construction sites.

Alternative 1 would also require implementation of MM-AIR-2, the CARB Airborne Toxic Control Measure for Diesel-Fueled Commercial Motor Vehicle Idling, and construction and demolition waste diversion requirements, as described for the Project. Therefore, construction of Alternative 1 would also not result in the wasteful, inefficient, or unnecessary consumption of energy resources and this impact would be **less than significant.** This is the same level of significance as the Project.

Impact ENE-2: Less than Significant

As previously discussed, Alternative 1 would be identical to the Project, except that it would be constructed using traditional "stick" construction methods, rather than the "modular" construction proposed by the Project. Regardless of the method of construction, the proposed development would still be consistent with state and local plans for renewable energy or energy efficiency.

Therefore, for the same reasons as discussed for the Project in Section 3.6.3, Alternative 1 would not conflict with any applicable plans and the impact would be **less than significant.** This is the same level of significance as the Project.

Geology and Soils

Impact GEO-1: Less than Significant
Regardless of the method of construction, the geological and soil conditions at the project site would not change. Therefore, for the same reasons described for the Project in Section 3.7.3, Alternative 1 would not cause or exacerbate potential substantial adverse effects associated with fault rupture or landslide hazards.

The foundation design for Alternative 1 would be identical to the Project, and both methods of construction are equally subject to the requirements of the CBC addressing seismic design, such as the ability of the structure to withstand shear and lateral forces. Therefore, for the same reasons described for the Project in Section 3.7.3, Alternative 1 would not cause or exacerbate potential substantial adverse effects associated strong seismic ground shaking and liquefaction. The impact would be **less than significant**. This is the same level of significance as the Project.

Impact GEO-2: Less than Significant
The traditional construction method employed under Alternative 1 would result in the same potential for erosion and sedimentation as described in Section 3.7.3 for the Project. In particular, the first phase of construction (site clearing, grading, and excavation) for the Project and Alternative 1 would be identical. Therefore, for the same reasons described for the Project, the impact of Alternative 1 on soil erosion or loss of topsoil would be **less than significant.** This is the same level of significance as the Project.

Impact GEO-3: Less than Significant with Mitigation
Although Alternative 1 would utilize traditional construction methods rather than the modular methods proposed by the Project, the foundation design for the building would be the same for both, and operational activities would be identical. Therefore, construction of Alternative 1 would result in the same potential for destabilization of adjacent building foundations as described for the Project in Section 3.7.3. For the same reasons described for the Project, the impact from construction of Alternative 1 in unstable soils and the potential for destabilization of the neighboring building foundations would be **potentially significant**, but would be reduced to **less than significant with mitigation** with the implementation of Mitigation Measure MM-GEO-3, which requires preparation of a subsequent geotechnical report addressing this issue and implementation of a program to monitor whether destabilization occurs (and appropriate remedies identified, if it does). This is the same level of significance as the Project.

Impact GEO-4: Less than Significant
Although Alternative 1 would utilize traditional construction methods rather than the modular methods proposed by the Project, the foundation designs would be the same for both. Therefore, the traditional construction method employed under Alternative 1 would result in the same potential for construction in expansive soils as described for the Project in Section 3.7.3. For the same reasons described for the Project, the impact from Alternative 1 related to expansive soil would be **less than significant**. This is the same level of significance as the Project.

Impact GEO-5: No Impact
Similar to the Project, Alternative 1 would not include the use of septic systems or other alternative means of wastewater disposal. Therefore, for the reasons described for the Project in Section 3.7.3, Alternative 1 would have **no impact** related to soil suitability for septic tanks or alternative wastewater disposal systems. This is the same level of significance as the Project.

Impact GEO-6: Less than Significant with Mitigation
Although Alternative 1 would utilize traditional construction methods rather than the modular methods proposed by the Project, the foundation designs and depth of disturbance would be the same for both. Therefore, Alternative 1 would result in the same potential for disturbance of unique paleontological resources as described for the Project in Section 3.7.3 and could result in accidental damage to or destruction of unique paleontological resources. For the same reasons described for the Project, the impact of Alternative 1 on unique paleontological resources is considered **potentially significant**, but would be reduced to **less than significant with mitigation** through the implementation of Mitigation Measure MM-GEO-6, requiring paleontological awareness training for construction workers, monitoring by an experienced field paleontologist during construction, and protocols to be followed if resources are encountered. This is the same level of significance as the Project.

Greenhouse Gas Emissions

Impact GHG-1: Less than Cumulatively Considerable
The majority of construction activities under Alternative 1 using traditional construction methods would be similar, if not identical, to the modular construction methods proposed by the Project, with key differences as described for air quality, above.

Construction of Alternative 1 would generate approximately 548 MT CO_2e, compared to approximately 555 MT CO_2e that would be generated by construction of the Project. Operation of Alternative 1, including operational GHG emissions and total service population, would be identical to the Project. Therefore, the total annual GHG emissions from Alternative 1 would be 0.2 MT CO_2e lower (when amortizing the construction-related emissions over the lifetime of the project) than those presented for the Project in Table 3.8-4. Because the net GHG emissions and net GHG emissions per service population for Alternative 1 would not exceed the BAAQMD efficiency threshold established under AB 32 of 4.6 MT CO_2e per service population, nor the local service population efficiency 2030 target of 2.88 MT CO_2e, Alternative 1-related GHG emissions during the construction and operational phase would be **less than cumulatively considerable**. This is the same level of significance as the Project.

Impact GHG-2: Less than Cumulatively Considerable
Alternative 1 would be identical to the Project, except that it would be constructed using traditional “stick built” construction methods, rather than the “modular” construction proposed by the Project. Regardless of the method of construction, the project would still be consistent with applicable plans, policies, and regulations adopted for the purpose of reducing GHG emissions. Therefore, for the same reasons as discussed for the Project in Section 3.8.3, Alternative 1 would not conflict with any applicable plans, policies, or regulations and the impact would be **less than significant.** This is the same level of significance as the Project.

Hazards and Hazardous Materials

Impact HAZ-1: Less than Significant

Although Alternative 1 would utilize traditional construction methods rather than the modular methods proposed by the Project, construction would still require the use of heavy equipment and vehicles containing fuel, oil, and grease, as well as use and transport of these materials, and would also involve the demolition of the existing building on site that may contain ACMs. Construction of Alternative 1 would be subject to the same established, comprehensive framework independent of the CEQA process that is intended to reduce the risks associated with the use, transport and disposal of hazardous materials. Therefore, for the same reasons described for the Project in Section 3.9.3, impacts related to the routine use, transport, disposal, or accidental release of hazardous materials under Alternative 1 would be **less than significant.** This is the same level of significance as the Project.

Impact HAZ-2: No Impact

As discussed for the Project in Section 3.9.3, there are no K–12 schools within one-quarter mile of the project site. Thus, Alternative 1 would not result in hazardous emissions within a quarter mile of a school. There would be **no impact**. This is the same level of significance as the Project.

Impact HAZ-3: Less than Significant with Mitigation

Although Alternative 1 would utilize traditional construction methods rather than the modular methods proposed by the Project, the foundation designs and depth of excavation would be the same for both. Therefore, excavation activities associated with construction of Alternative 1 could encounter contaminated groundwater, which could result in the same human health and environmental hazards due to the presence of VOCs in groundwater at the site, as described for the Project in Section 3.9.3. For the same reasons described for the Project, the construction-related impacts of Alternative 1 would be **potentially significant**, but would be reduced to **less than significant with mitigation** through the implementation of mitigation measures MM-HAZ-3A through MM-HAZ-3D, requiring the Developer to obtain regulatory oversight, to prepare a Site Assessment and Conceptual Site Model and Site Management Plan for review and approval by the Selected Regulatory Agency, to obtain and comply with all permits for discharge of contaminated groundwater, to incorporate hazardous materials-related provisions into the Project's construction specifications, and to prepare and implement a site-specific health and safety plan consistent with the approved Site Management Plan. This is the same level of significance as the Project.

As previously discussed, operation of Alternative 1 would also have the same **potentially significant** impact due to vapor intrusion as the Project, which would be reduced to **less than significant with mitigation** through the implementation of mitigation measure MM-HAZ-3E, regarding installation of a Vapor Intrusion Mitigation System and periodic indoor air quality testing if required by the Selected Regulatory Agency as described in Section 3.9.3.

Impact HAZ-4: No Impact

As discussed for the Project in Section 3.9.3, the project site is not within 2 miles of an airport and is not within an airport land use plan. Therefore, Alternative 1 would have **no impact** relating to airport-related safety or noise hazards. This is the same level of significance as the Project.

Impact HAZ-5: Less than Significant
Alternative 1 would result in fewer roadway lane closures, for a shorter period of time, because smaller cranes would be used for a shorter duration to perform the traditional wood framing/cladding than would be required for the modular unit placement for the Project. However, one-way traffic controls and temporary closure of on-street parking would still be required on the non-public road portion of Grant Avenue between Park Boulevard and Birch Avenue throughout the majority of the construction period, and Grant Avenue would still likely need to be closed periodically during the construction period to allow for crane mobilization and/or concrete pours. Occasional lane closures on Birch Avenue (northbound side of median only) and Park Boulevard may also be required.

Before the start of Alternative 1 construction activities, the County and/or its construction contractor would prepare and implement a traffic control plan, in consultation with the City of Palo Alto, which would include the same components as those described for the Project. Therefore, for the same reasons as described for the Project in Section 3.9.3, with implementation of the traffic control plan construction of Alternative 1 would not substantially impede access for emergency vehicles and personnel and would not impede emergency evacuation routes or emergency plans created by local or regional agencies. Thus, Alternative 1 would have a **less than significant impact.** This is the same level of significance as the Project.

Impact HAZ-6: No Impact
As discussed in Section 3.9.3, the project site is not within or near a CAL FIRE State Responsibility Area or within or near a very high fire severity zone (CAL FIRE 2021). Therefore, for the same reasons described for the Project, Alternative 1 would not expose people or structures to hazards from wildland fires, and there would be **no impact.** This is the same level of significance as the Project.

Hydrology and Water Quality

Impact HYD-1: Less than Significant with Mitigation
Although Alternative 1 would utilize traditional construction methods rather than the modular methods proposed by the Project, the foundation designs and depth of excavation would be the same for both. Alternative 1 would be subject to the same requirements of the NPDES Construction General Permit as described for the Project in Section 3.10.3 and would be required to implement BMPs to reduce erosion at the construction site and reduce the likelihood of accidental spills from entering stormwater or local waterbodies. As described for the Project, excavation activities associated with construction of Alternative 1 could also encounter contaminated groundwater, which could result in the same **potentially significant** impacts from violation of water quality standards as described for the Project. For the same reasons described for the Project, the construction-related impacts from Alternative 1 would be reduced to **less than significant with mitigation** with the implementation of Mitigation Measure MM-HAZ-3B, which requires the Developer to obtain a permit from the RWQCB if dewatering of contaminated groundwater is necessary and to implement appropriate groundwater storage methods prior to discharge. This is the same level of significance as the Project.

Impact HYD-2: Less than Significant
Although Alternative 1 would utilize traditional construction methods rather than the modular methods proposed by the Project, the foundation designs and depth of excavation would be the same for both. Therefore, excavation activities associated with construction of Alternative 1 would have the same potential for dewatering as described for the Project. Similarly, the total area of pervious surfaces at the site under Alternative 1 would be identical to the Project. Therefore, for the same reasons described for the Project in Section 3.10.3, Alternative 1 would have a **less than significant** impact on groundwater supplies or interference with groundwater recharge. This is the same level of significance as the Project.

Impact HYD-3: Less than Significant
Although Alternative 1 would utilize traditional construction methods rather than the modular methods proposed by the Project, the proposed demolition, excavation, trenching, and grading activities during construction would be the same for both. Therefore, construction of Alternative 1 would alter existing on-site drainage patterns in the same way as described for the Project in Section 3.10.3, and the Construction General Permit would require the same SWPPP and BMPs designed to reduce erosion and siltation. Similarly, the total area of pervious surfaces at the site under Alternative 1 would be identical to the Project. Therefore, for the same reasons described for the Project, Alternative 1 would have a **less than significant** impact from the alteration of drainage patterns or increased impervious surface area. This is the same level of significance as the Project.

Impact HYD-4: Less than Significant
As discussed for the Project in Section 3.10.3, the project site is not subject to tsunami or seiche hazards and the risk of substantial flooding at the site would be extremely low. Although Alternative 1 would utilize traditional construction methods rather than the modular methods proposed by the Project, the types and amounts of pollutants present at the site would be similar during construction and would be identical during operation. Therefore, for the same reasons described for the Project, Alternative 1 would have a **less-than-significant** impact on the risk of pollutant release due to inundation of the site. This is the same level of significance as the Project.

Impact HYD-5: Less than Significant with Mitigation
Although Alternative 1 would utilize traditional construction methods rather than the modular methods proposed by the Project, the foundation designs and depth of excavation would be the same for both. Therefore, dewatering activities associated with construction of Alternative 1 could encounter contaminated groundwater, which could result in the same **potentially significant** impacts from conflicts with the San Francisco Bay Basin Plan as described for the Project in Section 3.10.3. For the same reasons described for the Project, impacts from Alternative 1 would be reduced to **less than significant with mitigation** with the implementation of Mitigation Measure MM-HAZ-3B, which requires the Developer to obtain a permit from the RWQCB if dewatering of contaminated groundwater is necessary and to implement appropriate groundwater storage methods prior to discharge. This is the same level of significance as the Project.

Land Use and Planning

Impact LUP-1: No Impact

Construction activities under Alternative 1 would require similar periodic lane closures on Birch Avenue and Park Boulevard as the Project. Although short-term closures of the non-public portion of Grant Avenue would also be required under Alternative 1, the length of such closures would be shorter than those required for the Project, due to traditional construction methods requiring fewer large truck deliveries and smaller crane operations for shorter periods of time than required for modular construction. Similar to the Project, the Developer and/or its construction contractor would prepare and implement a traffic control plan, in consultation with the City of Palo Alto. No extended lane closures are anticipated that would have a lasting effect on connectivity between existing multifamily residential neighborhoods along Grant Avenue, Birch Avenue, Park Boulevard, or to the California Avenue commercial area or Caltrain station. Therefore, similar to the proposed Project, construction of Alternative 1 would not physically divide an established community, and **no impact** would occur. This is the same level of significance as the Project.

Impact LUP-2: No Impact

As discussed for the Project, although the project site is within the limits of the City of Palo Alto, the City's land use regulations are not applicable to County-initiated projects on County-owned land. However, the City has commented that construction of a multi-family housing project and associated common space appears to be consistent with the City's land use designation for the project site. The County of Santa Clara's General Plan policies generally apply only to the unincorporated areas of the County and are therefore not applicable to the project site. However, the County would comply with all applicable County ordinances with respect to County-owned property as discussed in each resource topic of this EIR. Therefore, implementation of Alternative 1 would not conflict with an applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect, and **no impact** would occur. This is the same level of significance as the Project.

Noise

Impact NOI-1: Significant and Unavoidable

As discussed previously, Alternative 1 would require fewer construction-related truck trips than the Project, because this Alternative would not require modular unit deliveries during Phase 4. Truck-trips associated with soil export and demolition debris during Phase 1 (the most intensive phase for truck traffic) would be identical to the Project. Alternative 1 would also require additional construction workers during the last two phases of construction (an average of up to 75 workers per day for Alternative 1, compared to 65 workers per day for the Project). Due to the larger number of workers, Alternative 1 would generate more peak-hour traffic than the Project with up to 75 peak hour trips during the fifth phase of construction. As discussed in Section 3.12.3, existing traffic volumes on local roadways are more than 150 vehicles per hour, therefore Alternative 1 would not result in a doubling of existing traffic volumes. Because traffic volumes would need to double in order to result in a 3 dBA change in noise levels, which would be an incremental change that can barely be perceived, construction-related traffic from Alternative 1 would not result in a perceptible increase in traffic noise.

Phases 1, 2, 3, and 5 of Alternative 1 construction would use identical equipment to the equivalent phases of the Project and, therefore, would generate the same levels of noise during those phases as described in Section 3.12.3 (see Table 3.12-10), although the duration of construction for Phase 5 would be longer under Alternative 1. Phase 4 of Alternative 1 construction would also be of a slightly longer duration but would use a smaller crane for fewer days than for the Project, therefore noise levels during this phase would be slightly lesser than the equivalent phase of the Project.

Because the loudest phase of construction (Phase 1) would be identical to that of the Project, Alternative 1 would generate up to 80 dBA at the nearest residential boundary on average during Phase 1, but up to 89 dBA at the nearest sensitive receptors during periods when loud equipment such as a drill rig or large excavator is operating in close proximity to the boundary. This anticipated level of construction noise would exceed applicable County standards and would be **potentially significant**. For the same reasons described for the Project, implementation of Mitigation Measure MM-NOI-1 (requiring construction noise reduction measures to be implemented), would reduce construction noise levels at nearby sensitive receptors but might not reduce noise to a level that would be less than significant. Therefore, the impact of construction noise from Alternative 1 would be **significant and unavoidable,** which is the same level of significance as the Project.

Impact NOI-2: Significant and Unavoidable

As discussed previously, Alternative 1 would use the same heavy construction equipment as the Project, except that a smaller crane would likely be used. Therefore, the potential for construction-related vibration would be the same as described for the Project in Section 3.12.3 (see Table 3.12-13), with vibration levels of up to 1.160 in/sec PPV or 109 dBA at the adjacent apartment building and Courthouse Plaza office building, which would exceed the applicable thresholds for building damage and human annoyance at the Courthouse Plaza and adjacent apartment building; and vibration levels of up to 0.050 in/sec PPV or 82 VdB at the Palo Alto Courthouse, which would exceed the threshold for human annoyance. Similar to the Project, the vibration impact from construction of Alternative 1 would be **potentially significant**. For the same reasons described for the Project, implementation of Mitigation Measure MM-NOI-2 would reduce the impacts to below the applicable threshold for potential building damage, but not to below the applicable thresholds for human annoyance. Therefore, the impact would be **significant and unavoidable**. This is the same level of significance as the Project.

Impact NOI-3: No Impact

As discussed for the Project in Section 3.12.1, the project site is not within the vicinity of a private airstrip or an airport land use plan and is not within 2 miles of a public airport or public use airport. Therefore, Alternative 1 would have **no impact** with respect to airport-related noise. This is the same level of significance as the Project.

Population and Housing

Impact POP-1: Less than Significant

Alternative 1 would require an estimated average of 75 daily construction employees during the most labor-intensive phase of construction, compared to 65 daily workers for the Project, and the overall duration of construction would be approximately 2 months longer. Similar to the Project, the source of the construction labor force is unknown at this time, but workers would likely come from the local labor pool and would not relocate to Palo Alto from other areas. Therefore, for the same reasons described for the Project in Section 3.13.3, construction of Alternative 1 would not induce substantial unplanned growth and there would be **no impact.** This is the same level of significance as the Project.

As previously discussed, operation of Alternative 1 would be identical to operation of the Project. Therefore, Alternative 1 would have a **less than significant** operational impact on growth inducement, as described in Section 3.13.3.

Impact POP-2: No Impact
As discussed for the Project, there are no existing residential units on the project site. Alternative 1 would be identical to the Project, except that the construction method would vary, and would include demolition of the existing office building on the project site. For the same reasons described for the Project in Section 3.13.3, Alternative 1 would not displace substantial numbers of people or housing and would have **no impact**. This is the same level of significance as the Project.

Public Services and Recreation

Impact PSR-1: Less than Significant
Similar to Project construction, Alternative 1 construction could result in a small, temporary increase in the demand for fire suppression, emergency medical, and police services due to the temporary presence of construction personnel in the area. Alternative 1 staffing levels for construction would vary with on-site activities but are not expected to exceed on average 75 construction workers at any one time and would last approximately 19 months. As described for the Project, federal and state worker safety regulations would be adhered to in order to minimize the likelihood of workplace injuries and accidents requiring emergency medical attention. Typical fire and safety precautions would be taken, such as prohibiting on-site fires; reporting any fires, even if they have been extinguished; discarding any smoking materials in approved containers; maintaining access to emergency vehicles; maintaining access to fire hydrants, emergency water tanks, and emergency turnouts; and following regulations and best practices for handling and storage of hazardous materials. Therefore, for the same reasons as described for the Project in Section 3.14.3, Alternative 1 would not necessitate construction of new fire protection facilities or affect emergency response times and the impact would be **less than significant.** This is the same level of significance as the Project.

Impact PSR-2: Less than Significant
Construction of Alternative 1 would require slightly more workers than the Project (an average of 75 workers during the most labor-intensive construction phase), and the construction period would be slightly longer (19 months). However, similar to the Project, construction workers are anticipated to come from the local labor pool and would not be expected to relocate to the City from other areas. Therefore, for the same reasons described for the Project in Section 3.14.3, there would be no increased use of existing parks or recreational facilities during construction of Alternative 1 that might cause or accelerate substantial physical deterioration of these facilities, and there would be **no impact**. This is the same level of significance as the Project.

As previously discussed, operation of Alternative 1 would be identical to operation of the Project. Therefore, Alternative 1 would have a **less than significant** operational impact on recreational resources, as described in Section 3.14.3.

Impact PSR-3: Less than Significant
Alternative 1 would include the same provision of private and public open space as described for the Project in Section 3.14.3. Impacts resulting from construction of these features, in combination with the other Project features, are addressed throughout this EIR. Although construction of Alternative 1 would have potentially significant impacts on air quality, biological resources, cultural resources, geology, hazardous materials, hydrology, noise, and tribal cultural resources, such potentially significant impacts would arise from construction of the Alternative as a whole, and not specifically due to construction of recreational features at the project site. Therefore, for the same reasons described for the Project, Alternative 1 would have a **less than significant** impact. This is the same level of significance as the Project.

Transportation

Impact TRA-1: Less than Significant
As described previously, Alternative 1 would generate slightly more construction worker traffic during the last two phases of construction but would generate slightly less truck traffic because this Alternative would not require modular unit deliveries during Phase 4. As a result, substantially fewer oversize vehicles would access the project site under Alternative 1. Road and lane closures would be of lesser extent and duration under Alternative 1 than described for the Project. Similar to the Project, Alternative 1 would include development and implementation of a construction traffic management plan, in accordance with City requirements, which would limit the impact of these temporary disruptions to roadway, transit, pedestrian, and bicycle circulation in the vicinity of the project site. For the same reasons described for the Project in Section 3.16.3, construction of Alternative 1 would not conflict with any adopted goals or policies relating to the circulation system and the impact would be **less than significant**. This is the same level of significance as the Project.

Impact TRA-2: Less than Significant
As discussed previously, construction-related travel is not included in VMT analysis because it is temporary. Operation of Alternative 1 would be identical to the Project and would meet the City's VMT screening criteria, therefore requiring no further analysis. For the same reasons described for the Project in Section 3.16.3, Alternative 1 would not cause a substantial increase in VMT and the impact would be **less than significant**. This is the same level of significance as the Project.

Impact TRA-3: Less than Significant with Mitigation
As described above, Alternative 1 would generate slightly more construction worker traffic but slightly less truck traffic than the Project; road and lane closures would be of lesser extent and duration; and substantially fewer oversize vehicles would need to access the project site. Similar to the Project, Alternative 1 would not involve any permanent geometric design features and any temporary lane and road closures would be designed and implemented according to the City's temporary traffic control standards. Alternative 1 would also include development and implementation of a construction traffic management plan, in accordance with City requirements and appropriate permits for right-of-way encroachment and for use of oversized vehicle on City

streets, if needed. For the same reasons described for the Project in Section 3.16.3, construction of Alternative 1 would not substantially increase traffic hazards and the impact would be **less than significant**. This is the same level of significance as the Project.

As previously discussed, operation of Alternative 1 would also have the same **potentially significant** impact due to increased potential for bicycle/vehicle or pedestrian/vehicle conflicts as the Project, which would be reduced to **less than significant with mitigation** through the implementation of mitigation measures MM-TRA-3A and MM-TRA-3B, requiring installation of pedestrian/bicycle warning systems and maintenance of sight distance from garage exits.

Impact TRA-4: Less than Significant

As described above, construction of Alternative 1 would require fewer and shorter duration road and lane closures and substantially fewer oversize vehicles would need to access the project site. Similar to the Project, Alternative 1 would include development and implementation of a construction traffic management plan, in accordance with City requirements, which would require maintenance of emergency access to all properties in the project area throughout construction, and advance notification to emergency providers so that alternative routes can be planned ahead of time. For the same reasons described for the Project in Section 3.16.3, construction of Alternative 1 would not result in loss of, or substantial impedance to, adequate emergency access and the impact would be **less than significant**. This is the same level of significance as the Project.

Tribal Cultural Resources

Impact TCR-1: Less than Significant with Mitigation

Alternative 1 would require the same horizontal and vertical footprint as the Project, only the construction methods would differ. Such ground disturbance has the potential for impacts to as-yet unidentified tribal cultural and/or archaeological resources that may also be potentially eligible as tribal cultural resources. Therefore, for the same reasons described for the Project in Section 3.17.3, there is the potential for impacts to unidentified archaeological resources that may also be potentially eligible as tribal cultural resources. The impact would be **potentially significant** but would be reduced to **less than significant with mitigation** through the implementation of Mitigation Measure MM-CUL-2, requiring a tribal cultural resources monitor during ground-disturbing activities and protocols to be followed if potential tribal cultural resources are encountered. This is the same level of significance as the Project.

Utilities and Services Systems

Impact UTI-1: Less Than Significant

Similar to the Project, Alternative 1 construction would not generate substantial demand for water supplies or substantial volumes of wastewater. Construction would also not require connecting to, or the construction of, new or expanded water, wastewater treatment, storm drainage, electric, natural gas, or telecommunications facilities. There would be **no impact.** This is the same level of significance as the Project.

As previously discussed, operation of Alternative 1 would be identical to operation of the Project. Therefore, Alternative 1 would have a **less than significant** operational impact from new or expanded utility services, as described in Section 3.17.3.

Impact UTI-2: Less than Significant
Similar to the Project, Alternative 1 construction would not generate significant demand for new water supplies. During demolition, minimal water would be needed for activities such as soil compaction and dust control. This water would be obtained from the City's existing water supply and the additional water use would be short-term and negligible compared to available water supply. This impact would be **less than significant.** This is the same level of significance as the Project.

Impact UTI-3: Less than Significant
Similar to the Project, Alternative 1 construction would not generate significant volumes of wastewater that would exceed the capacity of the wastewater treatment provider or exceed applicable treatment requirements. During construction, portable restrooms would be provided for construction workers. Wastewater from portable restrooms would be disposed of at an appropriately licensed local facility with adequate capacity to accommodate project needs. There would be **no impact.** This is the same level of significance as the Project.

As previously discussed, operation of Alternative 1 would be identical to operation of the Project. Therefore, Alternative 1 would have a **less than significant** operational impact to wastewater systems, as described in Section 3.17.3.

Impact UTI-4: Less than Significant
The site clearing, grading, and excavation phase of Alternative 1 (including demolition of the existing office building) would be identical to that described for the Project and would generate the same volume of demolition debris. Although the traditional method of construction proposed for Alternative 1 may generate slightly more construction waste during the wood framing/exterior cladding phase than the Project, the total volume of construction waste would not exceed the available capacity of the Kirby Canyon Landfill. Furthermore, Alternative 1 would be subject to the same provisions of the 2019 CALGreen Code (Title 24, Part 11 of the California Code of Regulations) as described for the Project in Section 3.17.3. For the same reasons as described for the Project, Alternative 1 would not generate solid waste that would exceed the capacity of any receiving landfill or State or local standards and the impact would be **less than significant.** This is the same level of significance as the Project.

Impact UTI-5: Less than Significant
Similar to the Project, construction of Alternative 1 would comply with all statutes and regulations related to solid waste, including the 2019 California Green Building Standards Code (Title 24 CCR Part 11), the City's Construction & Demolition Debris Diversion Program, and submittal of a Waste Management Plan. For the same reasons as described for the Project, Alternative 1 would not conflict with or interfere with the State or City's ability to implement its adopted solid waste management programs and policies and the impact would be **less than significant.** This is the same level of significance as the Project.

Agriculture and Forestry Resources, Mineral Resources, and Wildfire
As described in Section 3.18, "Environmental Topics for which No Impacts were Identified," there are no agricultural, forestry, or mineral resources in close proximity to the Project site, and the area is not within a wildfire hazard zone. As such, Alternative 1 would have **no impact** on agriculture and forestry resources, mineral resources, or wildfire hazards, which is the same level of significance as the Project.

4.3.3 Alternative 2 – Reduced-Scale Alternative

Description of Alternative

Alternative 2 would demolish the existing 6,800-square-feet (SF) office building and would construct a new three-story building, totaling approximately 75,000 SF, on the approximately 1.4-acre site. The building would be developed with approximately 63 residential units (compared to the Project's 110 units) and associated amenities, resulting in a residential density of 45 dwelling units per acre (compared to approximately 79 units per acre for the Project). Conceptual site layouts for Alternative 2 are provided in Figures 4.3-1 and 4.3-2.

Building Design and Site Layout

The design and layout of the proposed building under Alternative 2 would be generally similar to that proposed by the Project, except that it would have one less level, resulting in a total building height of approximately 35 feet (compared to 50 feet for the Project) and the northeastern portion of the building would have an increased setback from the rear boundary (with the adjacent apartment building), resulting in three of the wings of the building on levels 2 and 3 being shorter than for the Project (see Figure 4.3-2). Setbacks from Grant Avenue, Park Boulevard, and Birch Street would be similar to that described for the Project in Section 2.3.1.

Residential Units and Resident Amenities

The approximately 63 residential units would include a mix of studio, 1-bedroom, and 2-bedroom units, as shown in Table 4.3-4. Approximately 31 of these units would serve teachers and other full-time staff from the participating school districts. The other 32 units would be set aside for school employees in certain public and nonprofit schools in southern San Mateo County. If there are unfilled vacancies, the units may be occupied by public safety employees or other employees of nonprofit, public interest organizations agreed to by the County and Facebook, similar to the Project. The allocation criteria for units relating to income levels would be the same (on a percentage basis) as the Project.

Table 4.3-4 Number of Residential Units by Unit Type and Floor Level – Alternative 2

Unit Type	Level 1	Level 2	Level 3	Total
Studio	0	8	8	**16**
1-Bedroom	4	15	15	**34**
2-Bedroom	1	6	6	**13**
Total	**5**	**29**	**29**	**63**

Source: Prepared by AECOM based on information provided by Mercy Housing and Abode Communities, 2021.

Note: Number of units is based on conceptual design plans and may be subject to change during the detailed design process.

The same residential amenities (community room, laundry, storage areas, bike storage room, management services, etc.) as described for the Project in Section 2.3.2 would be provided. The three landscaped courtyards on Level 2 would be similar to those described for the Project with approximately 10,300 SF of usable open space (see Figure 4.3-2).

Flex Space and Public Amenities

Alternative 2 would include approximately 1,000 SF of "flex space" at the northeast corner of the building, which could be utilized as a café or other retail or commercial use (see Figure 4.3-1).

This is slightly smaller than the flex space proposed for the Project (1,100 SF). The alternative would include the same public outdoor plazas as described for the Project in Section 2.3.3.

Landscaping, Utilities, and Other Site Improvements

Alternative 2 would include the same proposed tree removal and retention as described for the Project in Section 2.3.4. The three landscaped courtyards on Level 2 would be similar to or slightly larger than that described for the Project with approximately 10,300 SF of usable open space (see Figure 4.3-2).

Access and Circulation

Alternative 1 would include a total of 64 parking spaces, 25 of which would be within an exterior, at-grade surface parking area within the 30-foot setback, and the rest within an at-grade parking garage on the ground floor of the building (see Figure 4.3-1). All parking spaces would be at-grade and no parking stacker system would be used for this alternative.

Vehicular access to the garage would be from Birch Avenue and Park Boulevard, and the exterior surface parking would be accessed from the parking garage. Four of the parking spaces would be ADA spaces and at least eight would be electric vehicle-ready. A secure bicycle parking room on the ground floor of the building would accommodate up to 90 bicycles.

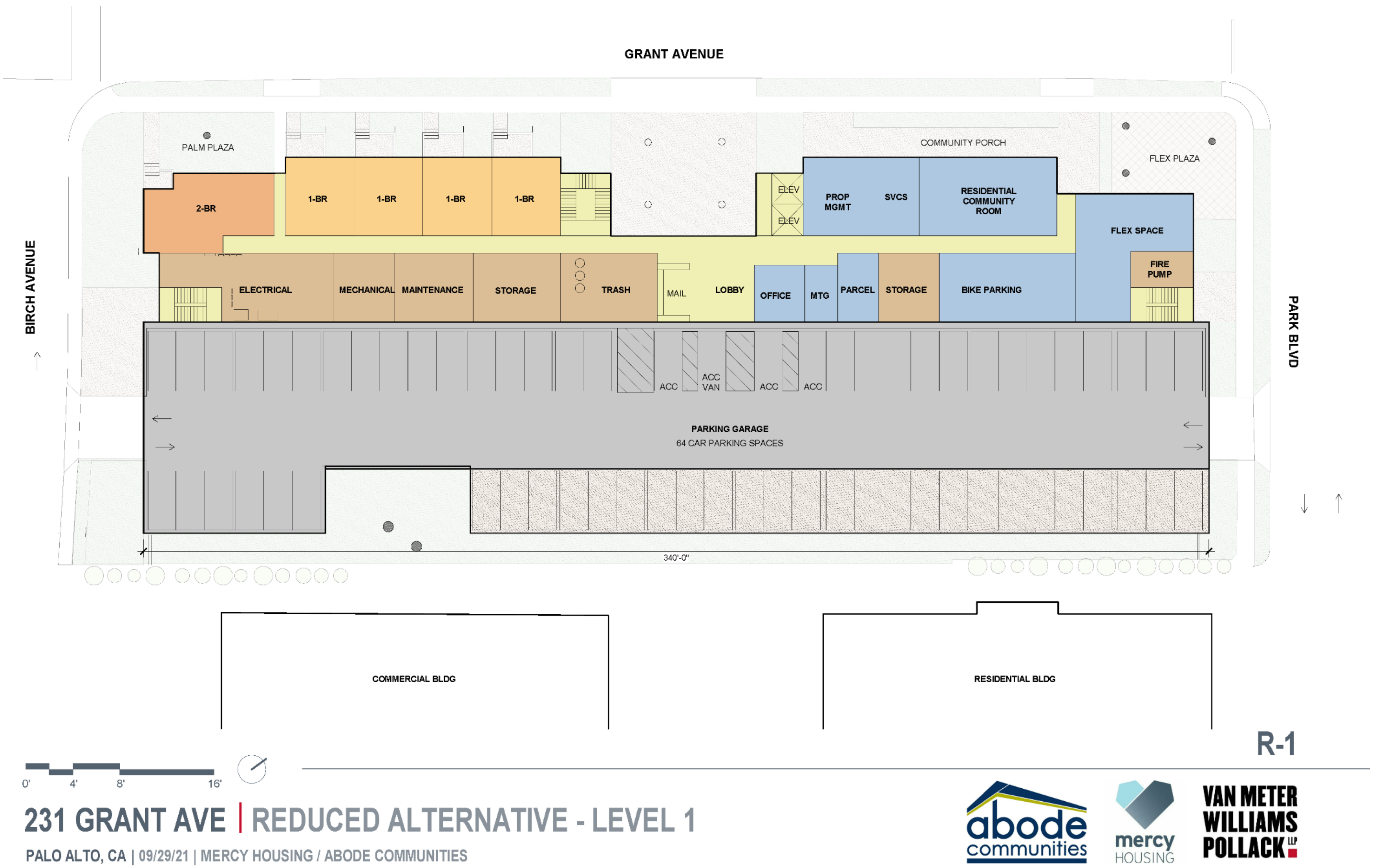

Figure 4.3-1 Conceptual Ground Floor Site Plan – Alternative 2

Source: Mercy Housing and Abode Communities, 2021a.

Figure 4.3-2 Conceptual Upper Floor Site Plan – Alternative 2

Source: Mercy Housing and Abode Communities, 2021a.

Alternative 2 Construction

Construction of Alternative 2 is anticipated to begin in mid-2022 and the on-site construction period is expected to last approximately 14 months in total, compared to 15 to 18 months for the Project. The shorter construction timeframe for Alternative 2 is attributed to the shorter duration of Phase 4 (Modular Placement/Setting, Wood Framing, and Structural Connections) due to the lesser number of modular units that would be required for this alternative (55 modular units compared to 105 for the Project). As with the Project, the project schedule for Alternative 2 is dependent on market conditions, regulatory approvals, and other factors and, therefore, is subject to change.

The following estimates for construction phasing, equipment, and personnel needs have been established for Alternative 2, as shown in Table 4.3-5.

Table 4.3-5 Estimated Construction Phasing, Equipment and Personnel – Alternative 2

Construction Phase	Estimated Duration[1]	Equipment Type	Average Number of Workers
1. Site Clearing, Grading, and Excavation	6 weeks	2 truck excavators 1 skid steer loader 1 truck tractor 1 backhoe loader 1 hollow stem auger vibratory rollers vibratory plate compactors jackhammers jumping jack compactors	15
2. Underground Utilities	4 weeks	1 backhoe loader 1 mini-excavator vibratory plate compactors	15
3. Ground Floor Concrete Work	20 weeks	2 reach forklifts 1 mobile crane (intermittent) 1-2 boom lifts 1 backhoe loader 1 skid steer vibratory plate compactors	30
4. Modular Placement/Setting, Wood Framing, and Structural Connections	7 weeks	2 reach forklifts 1 boom lift 1 large crawler crane	30
5. Interior Finishes/Landscaping	33 weeks	1 reach forklift 1-2 boom lifts 1 mobile crane (intermittent)	65

Source: Prepared by AECOM based on information provided by Mercy Housing and Abode Communities, 2021.
Notes: 1. It is assumed that up to two weeks of overlap could occur between each phase.

The construction process would be similar to that described for the Project in Section 2.4.1. Preliminary estimates of site grading volumes and associated truck trips for fill import/export are shown in Table 4.3-6. The maximum depth of excavation for Alternative 2 is estimated to be approximately 6 feet, as the deeper foundation support required for the Project would not be required for this alternative due to the increased setback from the adjacent underground parking garage.

Table 4.3-6 Estimated Material Import/Export Volumes – Alternative 2

Material Type	Volume	Estimated Truck Loads	Estimated Truck Trips
Demolition Debris	3,000 cubic yards	300	600
Soil Export	8,000 cubic yards	800	1600
Modular Units	55 units	55	110
Total	**11,000 cubic yards and 55 modular units**	**1,155**	**2,310**

Source: Prepared by AECOM in 2021.

Notes: Soil and debris volumes and number of modular truck trips provided by Developer. Calculation of truck loads for soil and debris based on dump truck volume of 10 cubic yards.

Construction Staging, Haul Routes, and Traffic Control

Similar to the Project, no offsite construction staging areas are anticipated for Alternative 2, except for the street frontages immediately adjacent to the site. Workers would be expected to park in public parking lots within a quarter mile of the site.

Haul routes would vary depending on material/destination, but it is anticipated that the majority of truck traffic for general construction would be via US-101/Oregon Expressway and that modular haul routes would be as shown for the Project in Figure 2.5-1.

Similar to the Project, one-way traffic controls and temporary closure of on-street parking would be required on the non-public portion of Grant Avenue between Park Boulevard and Birch Avenue throughout the majority of the construction period, and this portion of Grant Avenue would likely need to be closed periodically during the construction period to allow for crane mobilization and/or concrete pours, including a full closure for approximately 2 to 3 weeks during crane setting of modular units. Lane closures on Birch Avenue (northbound side of median only) and Park Boulevard may also be required occasionally, including one to two days each for crane setting of the far southwest and far southeast modular units, respectively.

As described for the Project, before construction of Alternative 2 begins, the construction contractor would prepare and implement a traffic control plan in consultation with the City of Palo Alto. The traffic control plan would be prepared in accordance with the City's latest Traffic Control Plan Requirements and Public Works Standard Specifications and would include the same information as described for the Project in Section 2.4.2.

Ability of Alternative to Meet Project Objectives

Alternative 2 would partially or fully meet some of the Project Objectives, but would not meet all of them, as discussed in turn below:

1) Provide at least 60 rental housing units for teachers and classified staff in targeted school districts within Santa Clara County and a sufficient number of units to meet the Facebook grant criteria, delivered at an accelerated pace.

Alternative 2 would not meet this objective. Although the Alternative would provide 63 new residential units, only 31 would be available for teachers and classified staff in targeted school districts within Santa Clara County. This is due to the need to set aside 32 of the units for school employees in certain public and nonprofit schools in southern San Mateo County in order to meet the criteria of the Facebook grant (which is necessary to obtain sufficient funding for the development).

2) Provide housing that is affordable to a range of incomes from low-income to incomes at or slightly above the area median income.

Alternative 2 would meet this objective, as the allocation of units based on income would be the same (on a percentage basis) as the Project.

3) Provide housing that is high-quality and compatible with the surrounding neighborhood, while still maintaining development and operational cost efficiencies.

Alternative 2 would partially meet this objective. The development would be high-quality and compatible with the surrounding neighborhood. However, because the reduced number of residential units would result in an increased per-unit development cost and reduced operational income, the cost-efficiency would be reduced.

4) Provide housing that maximizes the number of units on the site.

Alternative 2 would not meet this objective, as only 63 residential units would be provided under this Alternative (a residential density of 45 units per acre), compared to 110 units (79 units per acre) for the Project.

5) Provide housing that is close to public transit.

Alternative 2 would meet this objective, for the same reasons as the Project.

6) Incorporate innovative technologies and sustainability measures.

Alternative 2 would meet this objective. The proposed building under Alternative 2 would include the same sustainable features as the Project (e.g., energy-efficient construction, photo-voltaic solar electricity, electric vehicle-ready parking spaces, easily accessible bicycle parking) and would incorporate the same innovative “modular construction” technology.

7) Provide desirable public and residential amenity spaces.

Alternative 2 would meet this objective, as the Alternative would provide similar public and residential amenity spaces compared to the Project.

8) Provide easily accessible bicycle parking and encourage the use of alternative forms of transportation to nearby employment and transit.

Alternative 2 would meet this objective, as the Alternative would include the same type of bicycle facilities described for the Project, and encouragement to use alternative forms of transportation would also be the same as the Project. The ratio of bike spaces to residential units under Alternative 2 (approximately 1.4 bike spaces per unit) would be higher than for the Project (1.2 bike spaces per unit).

Analysis of Environmental Impacts of Alternative 2

Aesthetics

Impact AES-1: No Impact

As described for the Project in Section 3.2.3, there are no scenic views, such as views of hillsides to the west or the baylands to the northeast, that would be obstructed by construction of Alternative 2 on the project site. Therefore, similar to the Project, there would be no substantial adverse effect on a scenic vista from Alternative 2 and **no impact** would occur. This is the same level of significance as the Project.

Impact AES-2: No Impact

As described for the Project in Section 3.2.3, there are no state scenic highways in the project area and there are no views of the project site from Oregon Expressway, which is designated as a local scenic route by the City of Palo Alto. Therefore, similar to the Project, Alternative 2 would not affect scenic resources within a state or local scenic route and **no impact** would occur. This is the same level of significance as the Project.

Impact AES-3: No Impact

As described for the Project in Section 3.11.3, the County is sponsoring the developer and the development would primarily serve a public purpose. Thus, under state law, Alternative 2 is exempt from the City's land use regulations. County General Plan policies and regulations governing scenic quality apply only to unincorporated areas of the County and, therefore, are not applicable to Alternative 2, which is within the incorporated city limits of Palo Alto. Therefore, Alternative 2 would not conflict with any zoning or other regulations governing scenic quality.

With respect to the scoping comment that requested the development be designed to "suit" existing development in the neighborhood, a discussion of which is provided for informational purposes only, Alternative 2 would be consistent with the City's development standards and design criteria. In particular, Alternative 2 would be consistent with the standards for setbacks, usable common and private open space, landscaping and visual screening, and building size and bulk provided in Chapters 18.23 and 18.34 in Section 18 of the City municipal code. Unlike the Project, the height of Alternative 2 would be consistent with the maximum height of 40 feet for the California Avenue Pedestrian and Transit Oriented Development Combining District (Section 18.34.04). Therefore, Alternative 2 would have **no impact** on scenic quality, which is a lower level of significance than the Project's less than significant impact.

Impact AES-4: Less than Significant

Construction

Similar to the Project, construction activities for Alternative 2 would comply with the City's construction hours and no nighttime lighting would occur. Any nighttime lighting required for site security would be directed downward and/or shielded to reduce spillover onto neighboring properties and public rights-of-way. Therefore, construction of Alternative 2 would have a **less than significant** impact on light and glare. This is the same level of significance as the Project.

Operation

The light and glare created by development under Alternative 2 would be similar to the Project, except that the proposed new building and associated light sources would be one less floor in height. New sources of light and glare associated with Alternative 2 would be consistent with the levels of lighting and glare currently emitted by existing buildings near the project site and street lighting. Similar to the Project, exterior light sources would be designed so as not to create significant light and glare on adjacent properties through the use of concealed sources and/or downcast light fixtures. Therefore, for the same reasons described for the Project in Section 3.2.3, impact of Alternative 2 operation relating to light and glare would be **less than significant**. This is the same level of significance as the Project.

Air Quality

Impact AIR-1: Less than Significant

Construction

Construction of Alternative 2 would be similar to that described for the Project, except that the overall construction period would be shorter (14 months) due to fewer modular units having to be installed during Phase 4 (modular setting/placement, wood framing, and structural connections). Construction of Alternative 2 would include implementation of the same fugitive dust control measures, health and safety regulations and hazardous materials removal and disposal protocols, and solid waste recycling and diversion targets as described for the Project in Section 3.3.3. Therefore, for the same reasons described for the Project, construction of Alternative 2 would not conflict with the 2017 Clean Air Plan (BAAQMD 2017c) and the construction impact would be **less than significant.** This is the same level of significance as the Project.

Operation

Operation of Alternative 2 would also support the goals of the BAAQMD 2017 Clean Air Plan and include applicable control measures from the Clean Air Plan, as described for the Project in Section 3.3.3. The operational impact would be **less than significant**, which is the same level of significance as the Project.

Impact AIR-2: Less than Significant with Mitigation

Construction

Construction of Alternative 2 would be generally similar to construction of the Project, with key differences pertaining to air emissions including:

- Alternative 2 would require a shorter total construction duration (approximately 14 months, compared to 15 to 18 months for the Project), due to fewer modular units having to be installed during Phase 4. The duration of the other construction phases would be identical for the Project and Alternative 2.
- Alternative 2 would require the same number of trucks for hauling demolition debris, but approximately 20 percent fewer trucks for soil export because the deep foundation at the eastern corner of the building would not be required. Alternative 2 would require approximately half of the number of trucks for modular delivery as the Project, due to the reduced number of units.
- Alternative 2 would generally use the same type and number of construction equipment but would require fewer days of crane equipment usage than for the Project, due to the smaller number of modular units. A drill rig would not be required for this alternative.
- Alternative 2 would require the same number of construction workers as the Project.

Construction-related emissions under Alternative 2 are summarized in Table 4.3-7 below.

Table 4.3-7 Average Daily and Annual Criteria Pollutant Construction Emissions for Alternative 2 and the Proposed Project

Description	Alt 2 ROG	Alt 2 NO_X	Alt 2 PM_{10} (Exhaust)	Alt 2 $PM_{2.5}$ (Exhaust)	Project ROG	Project NO_X	Project PM_{10} (Exhaust)	Project $PM_{2.5}$ (Exhaust)
Total Emissions (tons)	0.68	1.77	0.07	0.07	0.90	2.26	0.09	0.08
Average Daily Emissions (lb/day)[1]	**3.63**	**9.49**	**0.39**	**0.36**	**4.54**	**11.35**	**0.45**	**0.41**
Thresholds of Significance	54	54	82	54	54	54	82	54
Exceeds Threshold?	No	No	No	No	No	No	No	No

Source: Estimated by AECOM in 2021. See Appendix B for detailed modelling assumptions, outputs, and results.

Notes:

[1] Average daily emission estimates are based on approximately 374 construction workdays (14 months of construction, 6 days of construction per week).

Acronyms: Alt 2 = Alternative 2; lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter.

As shown in Table 4.3-7, construction activities under Alternative 2 would result in slightly lower total emissions from the project site than the Project due to the shorter construction duration and fewer truck trips associated with soil export and modular deliveries. The average daily construction-related emissions for Alternative 2 would also be slightly lower than as average daily emissions associated with construction of the Project, due to the lower overall equipment usage and would be substantially below the average daily thresholds of significance. Similar to the Project, construction of Alternative 2 would require implementation of the BAAQMD Basic Construction Measures to minimize fugitive dust emissions during construction as described in Mitigation Measure MM-AIR-2 in Section 3.3.3. Fugitive dust emissions are considered to be significant unless the project implements the BAAQMD's BMPs for fugitive dust control during construction. Construction-related impacts from Alternative 2 would therefore be **potentially significant**.

With implementation of Mitigation Measure MM-AIR-2, Alternative 2 would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment of applicable federal or state ambient air quality standard. Implementation of MM-AIR-2 would therefore reduce Alternative 2 construction impacts from fugitive dust emissions to **less than significant with mitigation.** This is the same level of significance as the Project.

Operation

Operation of Alternative 2 would generate fewer operational emissions than the Project, due to the reduced number of residents and associated reduction in vehicular traffic (approximately 655 daily vehicle trips compared to the Project's 925 daily trips).   As shown in Tables 4.3-8 and 4.3-9, the total and net increase in operational emissions generated by Alternative 2 be less than for the Project and would not exceed the BAAQMD daily or annual thresholds.

Because operational emissions from Alternative 2 would not exceed the BAAQMD daily or annual thresholds, the alternative would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state AAQS. Therefore, operational activities associated with Alternative 2 would be **less than significant**. This is the same level of significance as the Project.

Table 4.3-8 Annual Operational Criteria Air Pollutant Emissions – Alternative 2

Description	Alt 2 ROG	Alt 2 NO_X	Alt 2 PM_{10}	Alt 2 $PM_{2.5}$	Project ROG	Project NO_X	Project PM_{10}	Project $PM_{2.5}$
Annual Emissions (tons/year)	0.60	0.28	0.51	0.14	0.84	0.41	0.73	0.20
Existing Annual Emissions (tons/year)	0.04	0.02	0.02	<0.01	0.04	0.02	0.02	<0.01
Net Annual Emissions (tons/year)[1]	0.56	0.26	0.49	0.13	**0.79**	**0.39**	**0.71**	**0.20**
Thresholds of Significance (tons/year)	10	10	15	10	10	10	15	10
Exceeds Threshold?	No	No	No	No	No	No	No	No

Source: Estimated by AECOM in 2021. See Appendix B for detailed modelling assumptions, outputs, and results.
Notes:
[1]Net annual emissions calculated by subtracting the existing annual emissions from the uses that would be demolished from the Project (or Alternative) operational emissions.
Acronyms: ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter.

Table 4.3-9 Average Daily Operational Criteria Air Pollutant Emissions – Alternative 2

Description	Alt 2 ROG	Alt 2 NO_X	Alt 2 PM_{10}	Alt 2 $PM_{2.5}$	Project ROG	Project NO_X	Project PM_{10}	Project $PM_{2.5}$
Total Average Daily Emissions (lb/day)[1]	3.27	1.55	2.77	0.76	4.58	2.23	3.98	1.10
Existing Average Daily Emissions (lb/day)	0.22	0.10	0.08	0.03	0.22	0.10	0.08	0.03
Net Average Daily Emissions (lb/day) [2]	3.05	1.45	2.68	0.74	**4.36**	**2.13**	**3.89**	**1.07**
Thresholds of Significance	54	54	82	54	54	54	82	54
Exceeds Threshold?	No	No	No	No	No	No	No	No

Source: Estimated by AECOM in 2021. See Appendix B for detailed modelling assumptions, outputs, and results.
Notes:
[1] Average daily emission estimates are based on the annual operational emissions divided by 365 days.
[2] Net emissions calculated by subtracting operational emissions from the existing uses that would be demolished from the Project (or Alternative) operational emissions.
Acronyms: lb/day = pounds per day; ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than 10 microns in diameter; $PM^{2.5}$ = particulate matter less than 2.5 microns in diameter.

Impact AIR-3: Less than Significant

Construction

As discussed previously, construction of Alternative 2 would have the same number of daily construction workers as the Project and would generally use the same types of equipment (except would not include use of a drill rig), but for a shorter overall construction period. Therefore, it is anticipated that the surrounding sensitive receptors would be exposed to lower total levels of criteria air pollutant emissions and toxic air contaminant emissions under Alternative 2 than described for the Project in Section 3.3.3, although average daily emissions are anticipated to be similar to the Project. Therefore, construction activities under Alternative 2 would not expose sensitive receptors to substantial pollutant concentrations. Thus, the construction-related impact would be **less than significant.** This is the same level of significance as the Project.

Operation

Similar to the Project, operation of Alternative 2 would involve residential and retail land uses that would not be a substantial source of toxic air contaminants and/or $PM_{2.5}$ emissions.

Additionally, any increase in vehicle trips by visitors to the project site would primarily be light-duty vehicles, which are not substantial sources of toxic air contaminant emissions (e.g., diesel PM) that are primarily associated with diesel-fueled vehicles. As such, implementation of Alternative 2 would not expose sensitive receptors to substantial pollutant concentrations. This operational impact would be **less than significant**, which is the same level of significance as the Project.

Impact AIR-4: Less than Significant

Construction

Construction activities under Alternative 2 would generate similar typical construction-related odors to those described for the Project in Section 3.3.3, but for a shorter duration due to the shorter construction period required for this alternative. Therefore, for the same reasons described for the Project, impacts from other emissions (such as those leading to odors) from construction of Alternative 2 would be **less than significant.** This is the same level of significance as the Project.

Operation

Operation of Alternative 2 would include the same types of residential, retail, and commercial land uses as the Project, which are not typical odor-generating facilities and would be similar to the uses surrounding the project site. Therefore, for the same reasons described for the Project in Section 3.3.3, operation of Alternative 2 would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. This operational impact would be **less than significant**, which is the same level of significance as the Project.

Biological Resources

Impact BIO-1: No Impact

As discussed in Section 3.4.3, there is no potential for special-status plant species to occur in the landscaped areas of the project site, and there is no suitable habitat for special-status species. Therefore, for the same reasons described for the Project, the construction and operation of Alternative 2 would have **no impact** on candidate, sensitive, or special status species**.** This is the same level of significance as the Project.

Impact BIO-2: No Impact

As discussed in Section 3.4.3, there are no riparian habitat or other sensitive natural communities on or near the project site. Therefore, for the same reasons described for the Project, Alternative 2 would not result in impacts to riparian habitat or other sensitive natural communities, and there would be **no impact.** This is the same level of significance as the Project.

Impact BIO-3: No Impact

As discussed in Section 3.4.3, there are no state or federally protected wetlands at the project site and the nearest wetland resources are separated from the site by developed land and the Oregon Expressway. Therefore, for the same reasons described for the Project, Alternative 2 would have **no impact** on state or federally protected wetlands. This is the same level of significance as the Project.

Impact BIO-4: Less than Significant with Mitigation

Construction

As described in Section 3.4.3, there are no native resident or migratory wildlife corridors or native wildlife nursery sites in the vicinity of the project site, but common nesting birds inhabit native and non-native trees at and around the project site. Alternative 2 would remove the same trees as the Project; therefore, damage or destruction of nests or killing or injury to nesting birds could occur during construction, as described for the Project. Although the duration of construction for Alternative 2 would be shorter, the noise and vibration from construction of Alternative 2 would still be substantial enough that adult birds may abandon their nests. Therefore, for the same reasons as described for the Project, construction of Alternative 2 would have a **potentially significant** impact on nesting birds, similar to the Project.

Mitigation Measure MM-BIO-4, as described for the Project in Section 3.4.3, would also apply to Alternative 2 and require either avoiding the nesting bird season, or conducting nesting bird surveys prior to construction and establishing a work-exclusion buffer zone around any active nests. For the same reasons described for the Project, with the implementation of MM-BIO-4, the potential impacts of Alternative 2 construction on nesting birds would be reduced to **less than significant with mitigation.** This is the same level of significance as the Project.

Operation

Operation of Alternative 2 would result in the same minor reduction in nesting habitat as described for the Project in Section 3.4.3, and would result in a smaller increase in human activity compared to existing conditions than the Project would, due to the lower number of residential units and associated reduction in residential population and traffic movements. Therefore, for the same reasons described in for the Project, operation of Alternative 2 would have a **less than significant** impact on nesting birds, which is the same level of significance as the Project.

Impact BIO-5: Less than Significant

Alternative 2 would require the same trees to be removed as the Project and would be subject to the County Tree Ordinance for trees on the project site, and the City Tree Ordinance for street trees. Operation of Alternative 2 would be identical to the Project. Therefore, for the same reasons described for the Project, Alternative 2 would not result in conflict with local policies or ordinances protecting biological resources, and the impact would be **less than significant.** This is the same level of significance as the Project.

Impact BIO-6: No Impact

As described in Section 3.4.3, the project site is not within an approved Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, for the same reasons as described for the Project, Alternative 2 would not result in conflict with such a plan and there would be **no impact.** This is the same level of significance as the Project.

Cultural Resources

Impact CUL-1: Less than Significant with Mitigation

Construction

Construction activities for Alternative 2 (including site grading and excavation) would occur within the same general horizontal footprint as the Project, but the depth of excavation, particularly in the eastern corner of the property would be substantially reduced. As described in Section 3.5.3, there are no built historic resources on the project site; however, there are two nearby buildings that were identified as potential historical resources due to their age. As described for the Project in Section 3.12.3, Noise and Vibration, operation of heavy equipment on the project site in close proximity to the Courthouse Plaza office building could result in vibration levels that exceed the threshold for building damage at this building. For the same reasons described for the Project, impacts from Alternative 2 on potential historical resources would therefore be the same as for the Project in Section 3.5.3, such impacts could be **potentially significant**.

Mitigation measure MM-NOI-2, described in Section 3.12.3, would also apply to Alternative 2 and would require that measures be taken to avoid construction activities that would result in vibration levels at adjacent buildings that would exceed the threshold for potential building damage. Although mitigated vibration levels could still exceed the thresholds for potential human annoyance, MM-NOI-2 would reduce vibration levels to below the threshold for potential building damage, therefore construction would not result in a substantial adverse change in the significance of an historical resource. Therefore, for the reasons described in Section 3.5.3, implementation of mitigation measure MM-NOI-2 would reduce this potential impact to **less than significant with mitigation.** This is the same level of significance as the Project.

Operation

The new building under Alternative 2 would have similar or larger setbacks as the Project, and would be one less floor in height, and therefore would not dominate or overshadow the adjacent Courthouse Plaza office building or Palo Alto Courthouse. Therefore, for the same reasons described for the Project in Section 3.12.3, Alternative 2 would not materially impact the setting of these adjacent buildings, and the operational impact would be **less than significant**. This is the same level of significance as the Project.

Impact CUL-2: Less than Significant with Mitigation

Alternative 2 would include a similar horizontal disturbance footprint as the Project, and a substantially smaller vertical footprint. Therefore, the impacts from construction or operation of Alternative 2 on as-yet to be identified archaeological resources would be similar to, or slightly less than, the Project. For the reasons described for the Project in Section 3.5.3, due to the potential for ground disturbing activities to encounter previously unknown buried archaeological resources, the impact would be **potentially significant.**

Mitigation measure MM-CUL-1, described in Section 3.5.3, would address this potentially significant impact by requiring training for construction workers and use of a tribal cultural resources monitor during construction activities that disturb previously undisturbed areas of the site. If a potential resource is encountered, MM-CUL-1 requires the stoppage of work in that area while a qualified archaeologist evaluates the find to determine if it meets the definition of a historical or archaeological resource, and compliance with the archaeologist's recommendations regarding the disposition of such finds. If potential tribal cultural resources are found, the archaeologist must consult with a Tamien Nation representative. Therefore, with implementation of MM-CUL-1, impacts to subsurface cultural resources from Alternative 2 would be reduced to **less than significant with mitigation**. This is the same level of significance as the Project.

Impact CUL-3: Less than Significant

As noted previously, Alternative 2 would include a similar horizontal ground disturbance footprint as the Project, and a smaller vertical footprint. Therefore, the possibility of encountering human remains during construction or operation of Alternative 2 would be similar to, or less than, that described for the Project in Section 3.5.3. If human remains were uncovered during demolition or excavation activities associated with Alternative 2, the procedures in County Ordinance Code Sections B6-18 through B6-20 would be followed, which would reduce potential impacts to **less than significant**. This is the same level of significance as the Project.

Energy

Impact ENE-1: Less than Significant

Construction

The majority of construction activities under Alternative 2 would be similar to those of the Project, with key differences as described for air quality, above. Table 4.3-10 shows the estimated total and annual energy consumption as a result of the fuel used during construction activities under Alternative 2.

Table 4.3-10 Alternative 2 - Construction-Related Energy Consumption

Source	Alternative 2 Total Energy Requirement (gallons)	Alternative 2 Annual Energy Requirement[a] (gallons)	Alternative 2 Energy Consumption (MMBtu)	Project Energy Consumption[b] (MMBtu)
Diesel	32,525	1,084	150	193
Gasoline	13,045	435	54	56
Total Construction Energy Requirement	-	-	**204**	**249**

Source: compiled by AECOM in 2021.
Notes: MMBtu = million British thermal units; - indicates blank cell.

[a] *Since construction-related energy demand would cease upon completion of construction, similar to the methodology for GHG emissions, energy demand associated with construction of the Alternative was amortized over the Alternative lifetime. The assumed amortization period is 30 years, based on the typically assumed project lifetime used by other air districts (e.g., South Coast Air Quality Management District [2008]).*

[b] *Refer to Table 3.6-2 in Section 3.6, "Energy," for more detailed estimate of Project energy consumption.*

As shown in Table 4.3-10, construction activities under Alternative 2 are anticipated to require slightly less diesel-related fuel than the Project due to the reduction in the number of construction haul trips and the shorter duration of crane usage. Construction of Alternative 2 would also require less gasoline-related fuel due to the shorter construction period. Overall, the total construction energy requirement for Alternative 2 (204 MMBtu) would be slightly lower than for the Project (249 MMBtu), and would not include unusual characteristics that would necessitate the use of construction equipment that is less energy-efficient than the equipment used at comparable construction sites.

Alternative 2 would also require implementation of MM-AIR-2, the CARB Airborne Toxic Control Measure for Diesel-Fueled Commercial Motor Vehicle Idling, and construction and demolition waste diversion requirements, as described for the Project. Therefore, construction of

Alternative 2 would also not result in the wasteful, inefficient, or unnecessary consumption of energy resources and this impact would be **less than significant.** This is the same level of significance as the Project.

Operation

Implementation of Alternative 2 would result in the development of new land uses that result in an increase in electricity and natural gas consumption compared to existing conditions, as well as additional vehicle miles traveled that would result in the consumption of fossil fuels. However, the scale of new development under Alternative 2 would be smaller than for the Project and, therefore, the level of electricity/natural gas consumption and total vehicle miles traveled would also be less.

The amortized construction-related, total, and net energy requirements associated with Alternative 2 are shown in Table 4.3-11. Operation of Alternative 2 would result in an annual net increase of approximately 6,662 Million British thermal units (MMBtu), when compared to existing conditions, which is approximately 3,701 MMBtu less than for the Project.

Alternative 2 would be required to comply with the same energy efficiency standards as described for the Project in Section 3.6.3, and would be more energy efficient than the existing, older building currently on the site. Therefore, for the same reasons described for the Project, Alternative 2 would not result in inefficient, wasteful, or unnecessary consumption of energy, and this impact would be **less than significant.** This is the same level of significance as the Project.

Table 4.3-11 Estimated Energy Demand – Alternative 2

Energy Consuming Activity	Alt 2 Energy Requirement	Unit	Alt 2 Annual Energy Consumption (MMBtu)	Project Annual Energy Consumption (MMBtu)
Construction Diesel Consumption (amortized)	1,084	gal/year	150	193
Construction Gasoline Consumption (amortized)	435	gal/year	54	56
Construction Fuel Subtotal (amortized)	**-**	**-**	**204**	***249***
Building Electricity Consumption	549,732	kWh/year	1,876	3,212
Building Operations Energy Subtotal	**-**	**-**	**1,876**	***3,212***
Transportation Electricity Consumption	1,355	kWh/year	5	7
Transportation Diesel Consumption	411	gal/year	57	81
Transportation Gasoline Consumption	42,341	gal/year	5,293	7,586
Transportation (Residents, Visitor & Employee Trips) Subtotal	**-**	**-**	**5,354**	**7,674**
Total Project Energy Requirement	-	-	**7,434**	**11,135**
Existing Land Uses Energy Requirement	-	-	772	772
Net Project Total	**-**	**-**	**6,662**	**10,363**

Notes: "-" indicates blank cell; MMBtu= Million British thermal units; kWh = kilowatt-hours; kBtu = thousand British thermal unit; gal = gallons; Alt 2 = Alternative 2

Sources: Modeled by AECOM in 2021.

Impact ENE-2: Less than Significant

Implementation of Alternative 2 would result in the development of new land uses that result in an increase in electricity consumption compared to existing conditions, as well as additional vehicle miles traveled that would result in the consumption of fossil fuels. However, the scale of new development under Alternative 2 would be smaller than for the Project and, therefore, the level of electricity consumption and total vehicle miles traveled would also be less.

As described for the Project, design and construction of Alternative 2 would comply with the most recently adopted California Building Energy Efficiency Standards Code and CalGreen, and project objectives incorporate the goals included in the County's Sustainability Master Plan. Therefore, for the same reasons as discussed for the Project in Section 3.6.3, Alternative 2 would not conflict with any applicable plans and the impact would be **less than significant.** This is the same level of significance as the Project.

Geology and Soils

Impact GEO-1: Less than Significant

Geological and soil conditions at the project site are described in Section 3.7.1. Although Alternative 2 would be of a smaller scale than the Project in terms of building height and foundation depth, the geological conditions at the project site, including the likelihood of seismic events or landslide hazards, would not change. Therefore, for the same reasons described for the Project in Section 3.7.3, Alternative 2 would not cause or exacerbate potential substantial adverse effects associated with fault rupture or landslide hazards.

Similar to the Project, Alternative 2 would be designed in accordance with the recommendations of the site-specific geotechnical report and would be subject to the requirements of the CBC addressing seismic design, such as the ability of the structure to withstand shear and lateral forces. Therefore, for the same reasons described for the Project in Section 3.7.3, Alternative 2 would not cause or exacerbate potential substantial adverse effects associated strong seismic ground shaking and liquefaction. The impact would be **less than significant**. This is the same level of significance as the Project.

Impact GEO-2: Less than Significant

Alternative 2 would result in the same potential for erosion and sedimentation as described in Section 3.7.3 for the Project. In particular, the horizontal area of ground disturbance for the Project and Alternative 2 would be the same. As described for the Project, the Developer would be required to prepare and implement a SWPPP and associated BMPs to control construction-related stormwater runoff and reduce erosion. Therefore, for the same reasons described for the Project, the impact of Alternative 2 on soil erosion or loss of topsoil would be **less than significant.** This is the same level of significance as the Project.

Impact GEO-3: Less than Significant with Mitigation

Alternative 2 would be set back at least 30 feet from the boundary with the adjacent residential property to the east and, therefore, the foundations for the proposed building would not be within the zone of influence for the adjacent apartment building's underground parking lot. Therefore, the potentially significant project impact relating to destabilization of adjacent building foundations (as described for the Project in Section 3.7.3) would be avoided.

However, the poorly-compacted fill material present at the project site could still result in differential settlement or lateral deformation of excavation walls (if there is not enough space to adequately slope-cut the excavations), as described for the Project. The impact from construction of Alternative 2 in unstable soils would be **potentially significant**, but would be reduced to **less than significant with mitigation** with the implementation of Mitigation Measure MM-GEO-3, which requires preparation of a subsequent geotechnical report to provide more detailed recommendations for foundation design to address geotechnical conditions. This is the same level of significance as the Project.

Impact GEO-4: Less than Significant

As discussed for the Project in Section 3.7.3, near-surface soils throughout the project site contain highly expansive clay. The geotechnical report prepared for the Project contained recommendations to address the effects of these expansive soils, consistent with CBC requirements and County building standards. Because such recommendations would be followed for the Project or any alternative, the impact from Alternative 2 related to expansive soil would be **less than significant**. This is the same level of significance as the Project.

Impact GEO-5: No Impact

Similar to the Project, Alternative 2 would not include the use of septic systems or other alternative means of wastewater disposal. Therefore, for the reasons described for the Project in Section 3.7.3, Alternative 2 would have **no impact** related to soil suitability for septic tanks or alternative wastewater disposal systems. This is the same level of significance as the Project.

Impact GEO-6: Less than Significant

As discussed in Section 3.7.3, shallow deposits at the site (artificial fill and Holocene alluvium) are not anticipated to include any unique paleontological resources. At an unknown depth below the project site, the alluvial material likely transitions from Holocene to Pleistocene age, and this older Pleistocene formation is considered to be a paleontologically sensitive rock formation.

Alternative 2 would have a substantially shallower vertical disturbance footprint than the Project, with a maximum depth of disturbance of approximately 6 feet below ground surface, compared to 17 to 27 feet bgs for the Project. Therefore, construction of Alternative 2 is unlikely to encounter the older Pleistocene formation and there would have limited potential for accidental damage to or destruction of unique paleontological resources. The impact of Alternative 2 on unique paleontological resources is therefore considered **less than significant**. This is a lower level of significance than the Project.

Greenhouse Gas Emissions

Impact GHG-1: Less than Cumulatively Considerable

Construction

The majority of construction activities under Alternative 2 would be similar, if not identical, to those proposed by the Project, with the key differences (such as shorter construction duration) as described for air quality, above. Construction of Alternative 2 would generate approximately 453 MT CO_2e, compared to approximately 555 MT CO_2e that would be generated by construction of the Project. As described for the Project in Section 3.8.3, construction-related emissions are amortized over the life of the Project (assumed to be 30 years) and added to the operational emissions (shown in Table 4.3-12 below).

Operation

Operation of Alternative 2 would have fewer residential units and associated vehicular movements, so there would be lower total annual GHG emissions. However, the building footprint under Alternative 2 would be less GHG efficient on a per service population basis because it would also house fewer permanent residents. The net GHG emissions and net

GHG emissions per service population per year for Alternative 2 are shown in Table 4.3-12 and would be approximately 457 MT CO_2e and 2.87 MT CO_2e, respectively. Because these net emissions would not exceed the BAAQMD efficiency thresholds established under AB 32 of 4.6 MT CO_2e per service population, nor the local service population efficiency 2030 target of 2.88 MT CO_2e, Alternative 2-related GHG emissions during the construction and operational phase would be **less than cumulatively considerable**. This is the same level of significance as the Project.

Table 4.3-12 Project Annual GHG Emissions – Alternative 2

Description	Alternative 2 GHG Emissions (MT CO_2e)	Project GHG Emissions (MT CO_2e
Total Construction GHG Emissions	*453*	*555*
Amortized Construction [1]	15	18
Area	1	6
Energy[2]	0	0
Mobile	443	634
Waste	20	32
Water	5	10
Total GHG Emissions per year	**484**	***701***
Existing GHG Emissions per year	27	27
Total Net New GHG Emissions per year	**457**	**674**
Net GHG Emissions Per Service Population (MT CO_2e/SP) [3]	**2.87**	**2.44**
BAAQMD Total Emissions Threshold (MT CO_2e per year)	1,100	1,100
BAAQMD 2020 Efficiency Threshold (MT CO_2e/SP)	4.6	4.6
2030 Efficiency Threshold (MT CO_2e/SP)	2.88	2.88
Exceeds Thresholds?	No	No

Notes: Estimated by AECOM in 2021. Additional details provided in Appendix B. Totals may not add due to rounding.

Acronyms: BAAQMD = Bay Area Air Quality Management District; GHG = greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalent; SP = service population;

1 *Amortized construction-related emissions calculated by dividing the Project's total construction GHG emissions by the operational lifetime of the Project (assumed to be 30 years).*

2 *The building under the Project and Alternative 2 is anticipated to be all-electric (no natural gas combustion) and the City of Palo Alto's electricity is 100 percent carbon neutral.*

2 *Net emissions per service population calculated by dividing the Project's net new emissions by the number of employees and residents assumed for the Project land uses. The analysis assumed the Project would have approximately 273 new residents and 3 new employees. The analysis under Alternative 2 assumed approximately 156 new residents and 3 new employees.*

Impact GHG-2: Less than Cumulatively Considerable

As discussed previously, Alternative 2 would be similar to the Project, except that it would include fewer residential units, and would still be consistent with applicable plans, policies, and regulations adopted for the purpose of reducing GHG emissions. Therefore, for the same reasons as discussed for the Project in Section 3.8.3, Alternative 2 would not conflict with any applicable plans, policies, or regulations and the impact would be **less than cumulatively considerable.** This is the same level of significance as the Project.

Hazards and Hazardous Materials

Impact HAZ-1: Less than Significant

Construction

Although the construction period would be shorter for Alternative 2 than for the Project, it would still require the use of heavy equipment and vehicles containing fuel, oil, and grease, as well as use and transport of these materials, and would also involve the demolition of the existing building on site that may contain ACMs. Construction of Alternative 2 would be subject to the same established, comprehensive framework independent of the CEQA process that is intended to reduce the risks associated with the use, transport and disposal of hazardous materials. Therefore, for the same reasons described for the Project in Section 3.9.3, impacts related to the routine use, transport, disposal, or accidental release of hazardous materials under Alternative 2 would be **less than significant.** This is the same level of significance as the Project.

Operation

Similar to the Project, Alternative 2 would involve the operational use and storage of small amounts of hazardous substances such as paints, solvents, and cleaners associated with maintenance, cleaning, and landscaping services at the site, as well as household use of small quantities of commercially available products. None of these substances would be acutely hazardous. Building tenants and maintenance staff would be required to use, store, and dispose of these materials properly in accordance with label directions. Therefore, the use, transport and disposal of such substances is not anticipated to pose a substantial hazard to the public or the environment and this impact would be **less than significant.** This is the same level of significance as the Project.

Impact HAZ-2: No Impact

As discussed for the Project in Section 3.9.3, there are no K–12 schools within one-quarter mile of the project site. Thus, Alternative 2 would not result in hazardous emissions within a quarter mile of a school. There would be **no impact**. This is the same level of significance as the Project.

Impact HAZ-3: Less than Significant with Mitigation

Construction

Alternative 2 would have a shallower foundation than the Project, as it would not require the deeper foundation underpinning in proximity to the underground parking garage on the adjacent property, due to the increased setback from this boundary. The maximum depth of excavation anticipated for Alternative 2 would be approximately 6 feet bgs. As discussed in Section 3.9.3, the historic groundwater level in the vicinity of the project site is approximately 15 feet bgs and is known to be contaminated with VOCs due to the presence of a regional groundwater plume associated with nearby superfund sites.

Because Alternative 2 would not include excavation at depths that would encounter groundwater, there would be no potential for adverse human health or environmental hazards due to potential contact with VOC-contaminated groundwater during construction. However, vapors from the contaminated groundwater plume beneath the site could still migrate upward through soil pores and create a potential inhalation hazard for construction workers. This construction phase impact would be **potentially significant** but implementation of mitigation measure MM-HAZ-3D, requiring a site-specific health and safety plan to address such issues, would reduce the impact to **less than significant with mitigation**. This is the same level of impact as the Project.

Operation

Similarly, vapors from the contaminated groundwater plume beneath the site could also migrate upward through the foundations of the proposed building to create a potential vapor intrusion hazard for future residents, or the building could alter localized vapor migration patterns, as described for the Project in Section 3.9.3. This operational phase impact would be **potentially significant** but implementation of mitigation measure MM-HAZ-3A, MM-HAZ-3C, and MM-HAZ-3E, requiring a further investigation and development of a Site Management Plan under the oversight of a regulatory agency, incorporation of appropriate measures from the Site Management Plan into contractor specifications, and installation of a Vapor Intrusion Management System if required by the regulatory agency, would reduce the impact to **less than significant with mitigation**. This is the same level of impact as the Project.

Impact HAZ-4: No Impact

As discussed for the Project in Section 3.9.3, the project site is not within 2 miles of an airport and is not within an airport land use plan. Therefore, Alternative 2 would have **no impact** relating to airport-related safety or noise hazards. This is the same level of significance as the Project.

Impact HAZ-5: Less than Significant

Construction

Alternative 2 would result in fewer roadway lane closures, for a shorter period of time, because fewer modular units would need to be placed, compared to the Project. However, one-way traffic controls and temporary closure of on-street parking would still be required on the non-public road portion of Grant Avenue between Park Boulevard and Birch Avenue throughout the majority of the construction period, and the non-public portion of Grant Avenue would still likely need to be closed for approximately 2 to 3 weeks for modular placement and periodically during the construction period to allow for crane mobilization and/or concrete pours. Occasional lane closures on Birch Avenue (northbound side of median only) and Park Boulevard may also be required.

Before the start of Alternative 2 construction activities, the County and/or its construction contractor would prepare and implement a traffic control plan, in consultation with the City of Palo Alto, which would include the same components as those described for the Project. Therefore, for the same reasons as described for the Project in Section 3.9.3, with implementation of the traffic control plan construction of Alternative 2 would not substantially impede access for emergency vehicles and personnel and would not impede emergency evacuation routes or emergency plans created by local or regional agencies. Thus, the construction impact of Alternative 2 would be **less than significant.** This is the same level of significance as the Project.

Operation

As for the Project, Alternative 2 would be designed according to fire code requirements for appropriate emergency ingress and egress and there would not be any permanent roadway lane closures. Therefore, operation of Alternative 2 would not impede emergency evacuation routes or emergency plans created by local or regional agencies. Thus, operation of Alternative 2 would have **no impact**. This is the same level of significance as the Project.

Impact HAZ-6: No Impact

As discussed in Section 3.9.3, the project site is not within or near a CAL FIRE State Responsibility Area or within or near a very high fire severity zone (CAL FIRE 2021). Therefore, for the same reasons described for the Project, Alternative 2 would not expose people or structures to hazards from wildland fires, and there would be **no impact.** This is the same level of significance as the Project.

Hydrology and Water Quality

Impact HYD-1: Less than Significant

Construction

Construction of Alternative 2 would be subject to the same requirements of the NPDES Construction General Permit as described for the Project in Section 3.10.3 and would be required to implement BMPs to reduce erosion at the construction site and reduce the likelihood of accidental spills from entering stormwater or local waterbodies. Because the depth of excavation for Alternative 2 would not extend below the depth of historic groundwater, groundwater is not anticipated to be encountered during construction. Therefore, Alternative 2 would avoid the potentially significant impacts associated with handling and disposal of contaminated groundwater that could occur for the Project. Therefore, the construction-related impacts from Alternative 2 would be **less than significant** and no mitigation measures are required. This is a lower level of significance than the Project.

Operation

As discussed for the Project in Section 3.10.3, once construction is complete, the project site would continue to drain to the existing drainage system that discharges to Matadero Creek and the County would continue to implement the requirements of the MS4 Permit issued by the San Francisco Bay RWQCB. Therefore, for the same reasons described for the Project, operation of Alternative 2 would result in **less-than-significant** impacts on surface water and groundwater quality and would not violate water quality standards. This is the same level of significance as the Project.

Impact HYD-2: Less than Significant

Construction

Similar to the Project, Alternative 2 would not require the use of groundwater for construction as any construction water needs (e.g., for dust control) would be supplied by trucks. As discussed previously, Alternative 2 would not require excavation below the groundwater table and, therefore, would not require any dewatering of groundwater during construction. Therefore, construction of Alternative 2 would have **no impact** on groundwater supply. This is a lower level of significance than the Project.

Operation

As for the Project, operation of Alternative 2 would not require use of groundwater for water supply to the building. The total area of pervious surfaces at the site under Alternative 2 would be almost identical to the Project, which would result in an approximately 3 percent increase in impervious surfaces at the site compared to existing conditions and therefore would not substantially decrease the potential for groundwater recharge in the area. Therefore, for the same reasons described for the Project in Section 3.10.3, the operational impact of Alternative 2 on groundwater supplies or interference with groundwater recharge would be **less than significant**. This is the same level of significance as the Project.

Impact HYD-3: Less than Significant

Construction

Similar to the Project, earthworks and grading associated with construction of Alternative 2 would alter on-site drainage patterns but would not alter any streams or rivers, or result in substantial redirection of stormwater or flood flows to adjacent properties. In addition, the Construction General Permit would require the same SWPPP and BMPs designed to reduce erosion and siltation as described for the Project. Therefore, for the same reasons discussed for the Project in Section 3.10.3, construction-related impacts from Alternative 2 on drainage patterns would be **less than significant**, which is the same level of significance as the Project.

Operation

The total area of pervious surfaces at the site under Alternative 2 would be similar to the Project and would not result in a substantial increase in stormwater runoff compared to existing conditions, increased erosion or siltation, or impedance or redirection of flood flows. As described for the Project, Alternative 2 would include a detention and pre-treatment system designed in accordance with County Drainage Manual requirements, and the County would continue to implement requirements of the MS4 Permit requiring pollutant reduction and prohibition of non-stormwater discharges. Therefore, for the same reasons described for the Project, operation of Alternative 2 would have a **less than significant** impact from the alteration of drainage patterns or increased impervious surface area. This is the same level of significance as the Project.

Impact HYD-4: Less than Significant

Construction

As discussed for the Project in Section 3.10.3, the project site is not subject to tsunami or seiche hazards and the risk of substantial flooding at the site would be extremely low. Although Alternative 2 would have a shorter duration of construction than the Project, the types and amounts of pollutants present at the site would be similar. Therefore, for the same reasons described for the Project, construction of Alternative 2 would have a **less-than-significant** impact on the risk of pollutant release due to inundation of the site**.** This is the same level of significance as the Project.

Operation

Similar to the Project, operation of Alternative 2 would only involve the storage of minor amounts of hazardous materials such as fertilizers and pesticides to maintain the on-site landscaping, along with household cleaning materials used by on-site residents. Because the risk of substantial flooding at the project site is extremely low as described for the Project in Section 3.10.3, operation of Alternative 2 would have a **less-than-significant** impact on the risk of pollutant release due to inundation of the site. This is the same level of significance as the Project.

Impact HYD-5: Less than Significant

For the reasons discussed previously in Impact HYD-1 and Impact HYD-2, the construction and operation of Alternative 2 would not obstruct implementation of the Santa Clara Valley Water District's Alternative Groundwater Sustainability Plan or the San Francisco Bay Basin Plan. Unlike the Project, Alternative 2 would not require dewatering of groundwater, and therefore would avoid the potentially significant impact of the Project relating to conflicts with the Basin Plan. The impacts from Alternative 2 would be **less than significant** and no mitigation measures would be required. This is a lower level of significance than the Project.

Land Use and Planning

Impact LUP-1: No Impact

Construction

Construction activities under Alternative 2 would require similar periodic lane closures on Birch Avenue and Park Boulevard and short-term closures of the non-public portion of Grant Avenue, although the length of such closures would be shorter than those required for the Project, due to the shorter construction duration and smaller number of modular units to be set. Similar to the Project, the Developer and/or its construction contractor would prepare and implement a traffic control plan, in consultation with the City of Palo Alto. No extended lane closures are anticipated that would have a lasting effect on connectivity between existing multifamily residential neighborhoods along Grant Avenue, Birch Avenue, Park Boulevard, or to the California Avenue commercial area or Caltrain station. Therefore, similar to the proposed Project, construction of Alternative 2 would not physically divide an established community, and **no impact** would occur. This is the same level of significance as the Project.

Operation

Similar to the Project, Alternative 2 would develop the project site with residential units, flex space that could be utilized as a café or other retail or commercial use, and public open space consisting of outdoor plazas, albeit at a reduced scale of density. No permanent road closures or changes to the existing roading network are proposed as part of the Project. The proposed land uses are compatible with the existing development in the surrounding area and would not introduce a use or physical feature that would create a barrier, divide, or separate adjacent uses. Therefore, **no impact** associated with physical division of an established community would occur due to operation of Alternative 2. This is the same level of significance as the Project.

Impact LUP-2: No Impact

As discussed for the Project, although the project site is within the limits of the City of Palo Alto, the City's land use regulations are not applicable to County-initiated projects on County-owned land. However, the City has commented that construction of a multi-family housing project and associated common space appears to be consistent with the City's land use designation for the project site. The County of Santa Clara's General Plan policies generally apply only to the unincorporated areas of the County and are therefore not applicable to the project site. However, the County would comply with all applicable County ordinances with respect to County-owned property as discussed in each resource topic of this EIR. Therefore, implementation of Alternative 2 would not conflict with an applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect, and **no impact** would occur. This is the same level of significance as the Project.

Noise

Impact NOI-1: Significant and Unavoidable Impact

Construction

Similar to the Project, construction of Alternative 2 would generally comply with the construction hour requirements of both the County and City noise ordinances, but early starts or late finishes may be required on occasion to accommodate major concrete pours, crane mobilization, or other logistical needs.

As discussed previously, Alternative 2 would require fewer construction-related truck trips than the Project, because there would be less soil export during Phase 1 and fewer deliveries of modular units during Phase 4. Therefore, peak-hour traffic during Alternative 2 would be similar to, or less than that described for the Project in Section 3.12.3, with a maximum of up to 65 peak hour trips during the most traffic-intensive phase of construction (Phase 5). As discussed in Section 3.12.3, existing traffic volumes on local roadways are more than 150 vehicles per hour, therefore construction traffic from Alternative 2 would not result in a doubling of existing traffic volumes. Because traffic volumes would need to double in order to result in a 3 dBA change in noise levels, which would be an incremental change that can barely be perceived, construction-related traffic from Alternative 2 would not result in a perceptible increase in traffic noise.

Construction of Alternative 2 construction would use the same types of equipment as the equivalent phases of the Project, except that a drill rig would not be used for this alternative. Therefore, construction of Alternative 2 would generate similar or slightly lower levels of noise during each phase of construction as described in Section 3.12.3 (see Table 3.12-6), with a combined equivalent noise level of between 71 to 80 dBA at the nearest residential boundary, which would exceed the County's thresholds for long-term (stationary source) construction noise at a multifamily residential boundary (65 dBA) by up to 15 dBA, and the County's threshold for long-term (stationary source) construction noise at a commercial boundary (70 dBA) by up to 10 dBA.

Alternative 2 would not require drilling or excavation of deep foundations in close proximity to the adjacent residential apartment building, therefore would not generate the same "worst case" construction noise described for the Project in Section 3.12.3 (Table 3.12-7). For Alternative 2, the "worst case" scenario for construction noise would be use of an excavator to demolish the existing office building, which could cause exterior noise levels of up to 83 dBA at the closest balcony (approximately 25 feet from the existing office building).

Although Alternative 2 would reduce the duration of construction noise impacts and would avoid some of the "worst case" noise-generating activities associated with Project construction, overall construction noise would still exceed the applicable County standards and, therefore, would be **potentially significant**.

As discussed for the Project, implementation of MM-NOI-1A would require the construction contractor to adhere to the City's allowable construction hours wherever feasible, so that construction noise predominantly occurs during daytime hours and therefore would not disturb people during normal sleeping hours. For the limited occasions when earlier starts morning starts or late evening work are required for logistical reasons, the contractor would need to obtain an exception permit from the City and potentially a variance from the County depending on the extended hours of operation, and provide advance notice to nearby sensitive receivers. MM-NOI-1B would require that a disturbance coordinator be appointed to investigate noise complaints and implement additional measures, where feasible, to address them. MM-NOI-1C would require the contractor to take measures to minimize unnecessary or particularly annoying noise sources during construction. MM-NOI-1D would reduce the transmission of noise beyond the project site by providing a physical barrier between the sources of construction noise and nearby receptors.

For the Project, the specified height of the barriers required by MM-NOI-1D were based on the maximum height that was considered likely to be feasible at the site given the limited space between the proposed building and adjacent structures and other factors. For Alternative 2, because of the increased setback between the proposed building and the adjacent residential apartment building, it may be feasible to construct a higher temporary sound barrier along this boundary than that specified in MM-NOI-1D, which would increase the area shielded by the barriers. In addition, because less heavy equipment work would be required in proximity to the boundary, the temporary noise barriers would likely be able to remain in place for a greater proportion of the construction period. Therefore, implementation of MM-NOI-1D is likely to be more effective at reducing construction noise from Alternative 2 for nearby receptors than it would be for the Project. However, because it is possible that construction activities from Alternative 2 would still cause a substantial temporary increase in ambient noise levels above applicable significance standards, even with implementation of MM-NOI-1A through MM-NOI-1D, the construction noise impact would be **significant and unavoidable,** which is the same level of significance as the Project.

Operation

As discussed in Section 3.12.3, operational noise sources associated with the Project would not cause a substantial increase in noise levels that would exceed applicable City or County thresholds, and would not result in an increase above existing ambient noise levels of more than 5 dBA. Operational noise sources for Alternative 2, including operational traffic, delivery and trash/recycling trucks, outdoor courtyards, and mechanical equipment would be the same as, or less than, that described for the Project. In particular, operational traffic associated with Alternative 2 would be substantially less than for the Project due to the reduction in the number of residential units, and the residential courtyards would be farther from the property boundary under Alternative 2, resulting in additional noise attenuation due to the increased distance between source and receptors. Therefore, for the same reasons discussed in Section 3.12.3, operational noise sources from Alternative 2 would not exceed the County's residential noise standards or cause an increase in existing ambient noise levels of more than 5 dBA on adjacent properties. The operational noise impact would be **less than significant**, which is the same level of significance as the Project.

Impact NOI-2: Significant and Unavoidable Impact

Construction

As discussed previously, Alternative 2 would use the same equipment as the Project (except it would not include use of a drill rig); therefore, the potential levels of construction-related vibration would be similar to those described for the Project in Section 3.12.3 (see Table 3.12-2). However, due to the increased setback of the proposed building from the rear site boundary under this alternative, less heavy equipment use would be required in proximity to the adjacent apartment building, therefore the duration of periods when vibration levels would operate at the stated distance between the source and receptor would be reduced compared to the Project.

Similar to the Project, use of large vibratory equipment such as vibratory rollers could result in vibration levels of up to 1.160 in/sec PPV or 109 dBA at the adjacent apartment building and Courthouse Plaza office building if operated up to the property boundary, which would exceed the applicable threshold of potential building damage to the Courthouse Plaza building and adjacent apartment building. Operation of other heavy equipment, such as large excavators and trucks in proximity to the property boundary, could also exceed the threshold for human annoyance at these two buildings, and operation of vibratory rollers could exceed the threshold of human annoyance at the Palo Alto Courthouse. These impacts would be **potentially significant**.

For the same reasons described for the Project, implementation of Mitigation Measure MM-NOI-2 would reduce the impacts and would avoid the potential for building damage, but could still result in vibration levels at nearby buildings that would exceed the threshold for human annoyance. Therefore, the vibration impact from construction of Alternative 2 would be **significant and unavoidable**. This is the same level of significance as the Project.

Operation

Operation of Alternative 2 would not introduce any new vibration-generating sources or activities in the project area. Therefore, operation of Alternative 2 would have **no impact** related to vibration. This is the same level of significance as the Project.

Impact NOI-3: No Impact

As discussed for the Project in Section 3.12.1, the project site is not within the vicinity of a private airstrip or an airport land use plan and is not within 2 miles of a public airport or public use airport. Therefore, Alternative 2 would have **no impact** with respect to airport-related noise. This is the same level of significance as the Project.

Population and Housing

Impact POP-1: Less than Significant

Construction

Alternative 2 would require the same number of construction employees as the Project, and the overall duration of construction would be approximately one to three months shorter. Similar to the Project, the source of the construction labor force is unknown at this time, but workers would likely come from the local labor pool and would not relocate to Palo Alto from other areas. Therefore, for the same reasons described for the Project in Section 3.13.3, construction of Alternative 2 would not induce substantial unplanned growth and the impact would be **no impact.** This is the same level of significance as the Project.

Operation

Alternative 2 would include 63 new residential units, compared to the 110 units proposed by the Project. Assuming an average of 2.48 residents per unit[58], there would be an increase of 156 permanent residents at the site under Alternative 2.[59] The housing units are anticipated to be developed by 2024 and would represent approximately 1.7 percent of the housing growth expected in Palo Alto by 2040. For the same reasons described for the Project in Section 3.13.1, the new housing units provided by Alternative 2 would cause a minimal increase in the City's population, would be consistent with the overall planned growth in the City and region, and would contribute to the City's RHNA goals. Similar to the Project, Alternative 2 would supply housing to employed local teachers, full-time school district employees, and other public safety employees who are already employed within the local area, allowing them to live within closer proximity to their existing workplaces. Therefore, the Project is not expected to significantly increase the number of jobseekers such that the jobs-housing balance would be adversely affected.

Under Alternative 2, the amount of "flex space" would be smaller than for the Project, and therefore would generate the same or fewer employees and would not increase the demand

[58] Average Household Size per CDOF City/County Population and Housing Estimates (CDOF 2020).

[59] This is considered a conservative estimate of population generation, as the 2.48 residents per housing unit is a citywide average for all housing types, whereas Alternative 2, like the Project, would create multifamily residential units with a high proportion of studio and 1-bedroom units, which would likely have a lesser number of residents per unit than the citywide average.

for new housing. Similar to the Project, Alternative 2 would be located in an already-urbanized area and would not include any oversized infrastructure or extension of roadways or other services that might indirectly induce growth in the area.

For these reasons, operation of Alternative 2 would not induce substantial unplanned growth in the City of Palo Alto, and the impact would be **less than significant**. This is the same level of significance as the Project.

Impact POP-2: No Impact

As discussed for the Project, there are no existing residential units on the project site, therefore Alternative 2 would not displace substantial numbers of people or housing and would have **no impact**. This is the same level of significance as the Project.

Public Services and Recreation

Impact PSR-1: Less than Significant

Construction

Similar to Project construction, Alternative 2 construction could result in a small, temporary increase in the demand for fire suppression, emergency medical, and police services due to the temporary presence of construction personnel in the area. Alternative 2 staffing levels for construction would vary with on-site activities but are not expected to exceed on average 65 construction workers at any one time and would last approximately 14 months. As described for the Project, federal and state worker safety regulations would be adhered to in order to minimize the likelihood of workplace injuries and accidents requiring emergency medical attention. Typical fire and safety precautions would be taken, such as prohibiting on-site fires; reporting any fires, even if they have been extinguished; discarding any smoking materials in approved containers; maintaining access to emergency vehicles; maintaining access to fire hydrants, emergency water tanks, and emergency turnouts; and following regulations and best practices for handling and storage of hazardous materials. Therefore, for the same reasons as described for the Project in Section 3.14.3, Alternative 2 would not necessitate construction of new fire protection facilities or affect emergency response times and the impact would be **less than significant.** This is the same level of significance as the Project.

Operation

As described previously, Alternative 2 would create fewer housing units at the project site than the Project, and the resulting increase in resident population would also be smaller. Therefore, Alternative 2 would generate less demand for public services such as fire protection, police protection, schools, parks and other public services than the Project. Therefore, for the same reasons described for the Project in Section 3.14.3, operation of Alternative 2 would have a **less than significant** impact on public services. This is the same level of significance as the Project.

Impact PSR-2: Less than Significant

Construction

Construction of Alternative 2 would require the same number of workers as the Project (an average of 65 workers during the most labor-intensive construction phase), and the construction period would be slightly shorter (14 months). However, similar to the Project, construction workers are anticipated to come from the local labor pool and would not be expected to relocate to the City from other areas. Therefore, for the same reasons described for the Project in Section 3.14.3, there would be no increased use of existing parks or recreational facilities during construction of Alternative 2 that might cause or accelerate substantial physical deterioration of these facilities, and there would be **no impact**. This is the same level of significance as the Project.

Operation

As described previously, Alternative 2 would create fewer housing units at the project site than the Project, and the resulting increase in resident population would also be smaller. Therefore, Alternative 2 would generate less demand for existing parks or recreational facilities than the Project. Therefore, for the same reasons described for the Project in Section 3.14.3, operation of Alternative 2 would have a **less than significant** impact on public services. This is the same level of significance as the Project.

Impact PSR-3: Less than Significant

Construction

Alternative 2 would include construction of the same public open space as the Project (public plazas), and slightly less private open space (outdoor courtyards for use by residents). Impacts resulting from construction of these features, in combination with the other features of Alternative 2, are addressed throughout this alternatives analysis (Section 4.3.3). Although construction of Alternative 2 would have potentially significant impacts on air quality, biological resources, cultural resources, geology, hazardous materials, noise, and tribal cultural resources, such potentially significant impacts would arise from construction of the Alternative as a whole, and not specifically due to construction of recreational features at the project site. Therefore, for the same reasons described for the Project, Alternative 2 would have a **less than significant** impact from construction of recreational facilities. This is the same level of significance as the Project.

Operation

As discussed above for Population and Housing impacts, Alternative 2 would result in a smaller increase in residential population at the project site and is not anticipated to induce substantial unplanned growth in the Palo Alto. Additionally, the increased recreational demand by new residents would be dispersed among the nearby parks, existing open space areas, and proposed open space areas, thereby minimizing substantial impacts on a single recreation or open space area. As such, operation of Alternative 2 would not result in a substantial increase in demand for parks and recreational facilities that would require expansion of existing recreational facilities or construction of new facilities. Therefore, this impact would be **less than significant.** This is the same level of significance as the Project.

Transportation

Impact TRA-1: Less than Significant

Construction

Alternative 2 would generate the same number of daily construction worker vehicle trips as the Project but would generate slightly less truck traffic due to the fewer number of modular units and slightly less soil export volume. As a result, fewer oversize vehicles would access the project site under Alternative 2 than for the Project. In addition, the construction period would be shorter, and road and lane closures would be of lesser extent and duration under Alternative 2 than described for the Project. Similar to the Project, Alternative 2 would include development and implementation of a construction traffic management plan, in accordance with City requirements, which would limit the impact of these temporary disruptions to roadway, transit, pedestrian, and bicycle circulation in the vicinity of the project site. For the same reasons described for the Project in Section 3.15.3, construction of Alternative 2 would not conflict with any adopted goals or policies relating to the circulation system and the impact would be **less than significant**. This is the same level of significance as the Project.

Operation

Similar to the Project, Alternative 2 would not include any permanent changes to roadways in the project area and would support goals relating to travel demand management and reducing single-occupant vehicle trips by providing housing within a transit priority area. Alternative 2 would not implement or install any transit impeding facilities. The smaller number of residents at the project site under Alternative 2 would generate less new transit riders than the Project and would generate less operational traffic, therefore Alternative 2 would be expected to cause fewer delays for transit movements at nearby intersections than described for the Project in Section 3.16.3. Similarly, Alternative 2 would generate fewer pedestrians and bicyclists than the Project and would not interfere with any existing or planned bicycle or pedestrian facilities. For the same reasons described for the Project, Alternative 2 would not conflict with any applicable programs, plans, ordinances, or policies addressing the circulation system and the impact would be **less than significant**. This is the same level of significance as the Project.

Impact TRA-2: Less than Significant

As discussed for the Project, construction-related travel is not included in VMT analysis because it is temporary. Operation of Alternative 2 would involve the same land uses as the Project, but at a reduced scale. The Alternative would meet the City's VMT screening criteria, therefore requiring no further analysis. For the same reasons described for the Project in Section 3.15.3, Alternative 2 would not cause a substantial increase in VMT and the impact would be **less than significant**. This is the same level of significance as the Project.

Impact TRA-3: Less than Significant with Mitigation

Construction

As described above, Alternative 2 would generate the same construction worker traffic but slightly less truck traffic than the Project; road and lane closures would be of lesser extent and duration; and fewer oversize vehicles would need to access the project site. Similar to the Project, Alternative 2 would not involve any permanent geometric design features and any temporary lane and road closures would be designed and implemented according to the City's temporary traffic control standards. Alternative 2 would also include development and implementation of a construction traffic management plan, in accordance with City requirements and appropriate permits for right-of-way encroachment and for use of oversized vehicle on City streets, if needed. For the same reasons described for the Project in Section 3.15.3, construction of Alternative 2 would not substantially increase traffic hazards and the impact would be **less than significant**. This is the same level of significance as the Project.

Operation

Alternative 2 would have the same site access configuration as the Project, but the lower number of residential units would result in less traffic utilizing the two driveways. Although the number of vehicles using the two driveways would be reduced, operation of Alternative 2 would still have **potentially significant** impact due to increased potential for bicycle/vehicle or pedestrian/vehicle conflicts at the Park Boulevard and Birch Street driveways, which would be reduced to **less than significant with mitigation** through the implementation of mitigation measures MM-TRA-3A and MM-TRA-3B, requiring installation of pedestrian/bicycle warning systems and maintenance of sight distance from garage exits. This is the same level of significance as the Project.

Impact TRA-4: Less than Significant

Construction

As described above, construction of Alternative 2 would require fewer and shorter duration road and lane closures and fewer oversize vehicles would need to access the project site. Similar to the Project, Alternative 2 would include development and implementation of a construction traffic management plan, in accordance with City requirements, which would require maintenance of emergency access to all properties in the project area throughout construction, and advance notification to emergency providers so that alternative routes can be planned ahead of time. For the same reasons described for the Project in Section 3.15.3, construction of Alternative 2 would not result in loss of, or substantial impedance to, adequate emergency access and the impact would be **less than significant**. This is the same level of significance as the Project.

Operation

Alternative 2 would have the same site access configuration as the Project and would be required to conform with the same design requirements and traffic and safety regulations. Therefore, for the same reasons described for the Project in Section 3.15.3, operation of Alternative 2 would not result in inadequate emergency access and the impact would be **less than significant**. This is the same level of significance as the Project.

Tribal Cultural Resources

Impact TCR-1: Less than Significant with Mitigation

Construction

Alternative 2 would disturb the same horizontal footprint as the Project, but the maximum depth of disturbance would be reduced. Similar to the Project, such ground disturbance has the potential for impacts to as-yet unidentified tribal cultural resources, for the same reasons described for the Project in Section 3.16.3. The impact would be **potentially significant** but would be reduced to **less than significant with mitigation** through the implementation of Mitigation Measure MM-CUL-2, requiring a tribal monitor during ground-disturbing activities and protocols to be followed if potential tribal cultural resources are encountered. This is the same level of significance as the Project.

Operation

Operation of Alternative 2 would not involve any further ground disturbance and, therefore, would not have a substantial adverse effect on potential buried tribal cultural resources. There would be **no impact**. This is the same level of significance as the Project.

Utilities and Services Systems

Impact UTI-1: Less Than Significant

Construction

Similar to the Project, Alternative 2 construction would not generate substantial demand for water supplies or substantial volumes of wastewater. Construction would also not require connecting to, or the construction of, new or expanded water, wastewater treatment, storm drainage, electric, natural gas, or telecommunications facilities. There would be **no impact.** This is the same level of significance as the Project.

Operation

As discussed for Impacts UTI-2 and UTI-3 below, operation of Alternative 2 would generate less demand for water supplies and would generate less wastewater than the Project, due to the reduced number of residential units. Therefore, for the same reasons described for the Project in Section 3.17.3, Alternative 2 would have a **less than significant** operational impact from new or expanded utility services. This is the same level of significance as the Project.

Impact UTI-2: Less than Significant

Construction

Similar to the Project, construction of Alternative 2 would not generate significant demand for new water supplies. Minimal water would be needed for activities such as soil compaction and dust control. This water would be obtained from the City's existing water supply and the additional water use would be short-term and negligible compared to available water supply. This impact would be **less than significant.** This is the same level of significance as the Project.

Operation

Alternative 2 would utilize similar volumes of water for landscaping and commercial/café purposes, but less volume for residential uses, due to the smaller number of residential units. Assuming that water use is approximately 120 percent of wastewater generation (7,720 gallons per day), Alternative 2 would demand approximately 9,260 gallons per day of water, or approximately 10 AFY (see Table 4.3-13 under Impact UTI-3 below for estimated wastewater generation calculations). For the same reasons described for the Project in Section 3.17-3, operation of Alternative 2 would have a **less than significant** impact on water supply. This is the same level of significance as the Project.

Impact UTI-3: Less than Significant

Construction

Similar to the Project, Alternative 2 construction would not generate significant volumes of wastewater that would exceed the capacity of the wastewater treatment provider or exceed applicable treatment requirements. During construction, portable restrooms would be provided for construction workers. Wastewater from portable restrooms would be disposed of at an appropriately licensed local facility with adequate capacity to accommodate project needs. There would be **no impact.** This is the same level of significance as the Project.

Operation

Alternative 2 would generate similar or slightly less volume of wastewater from the "flex space" and substantially less volume from residential uses than the Project, due to the smaller number of residential units. Estimated wastewater generation for the Project is given in Table 4.3-13 below. For the same reasons described for the Project in Section 3.17-3, Alternative 2 would not exceed wastewater treatment requirements, require the construction or expansion of wastewater facilities, or result in a substantial physical deterioration of public wastewater facilities. Therefore, Alternative 2 would have a **less than significant** operational impact to wastewater systems. This is the same level of significance as the Project.

Table 4.3-13 Estimated Wastewater Generation – Alternative 2

Source	Generation Factor[1]	Estimated Alternative 2 Wastewater Use	Estimated Project Wastewater Use
Studio Residential Units	*80 gpd per unit*	1,280 gpd	1,920 gpd
One-Bedroom Residential Units	*120 gpd per unit*	4,080 gpd	7,320 gpd
Two-Bedroom Residential Units	*160 gpd per unit*	2,080 gpd	4,000 gpd
Flex Space (café)	*280 gpd per 1,000 SF*	280 gpd	308 gpd
Total Wastewater Generation	*NA*	**7,720 gpd**	**13,548 gpd**

Source: Calculated using generation factors from City of Los Angeles 2006.

Notes: 1. Palo Alto's Utilities UWMP does not list wastewater generation factors, therefore City of Los Angeles factors were used to calculate wastewater generation. This approach is consistent with recent CEQA analysis within the City (City of Palo Alto 2018b).

Acronyms: gpd = gallons per day; SF = square feet; NA = not applicable

Impact UTI-4: Less than Significant

Construction

Alternative 2 would generate the same volume of demolition debris as the Project and would generate the same or slightly less construction waste during other phases of construction. Alternative 2 would be subject to the same provisions of the 2019 CALGreen Code (Title 24, Part 11 of the California Code of Regulations) as described for the Project in Section 3.17.3. For the same reasons as described for the Project, Alternative 2 would not generate solid waste that would exceed the capacity of any receiving landfill or State or local standards and the impact would be **less than significant.** This is the same level of significance as the Project.

Operation

Operation of Alternative 2 would generate similar or slightly less solid waste from the "flex space" commercial uses and substantially less volume from residential uses than the Project, due to the smaller number of residential units. Estimated solid waste generation for the Project is given in Table 4.3-14 below. For the same reasons described for the Project in Section 3.17-3, Alternative 2 would not exceed wastewater treatment requirements, require the construction or expansion of wastewater facilities, or result in a substantial physical deterioration of public wastewater facilities. Therefore, Alternative 2 would have a **less than significant** operational impact to wastewater systems. This is the same level of significance as the Project.

Table 4.3-14 Estimated Solid Waste Generation – Alternative 2

Source	Generation Factor	Estimated Solid Waste Generation – Alternative 2	Estimated Solid Waste Generation – Project
Residents	*3.7 lbs/day per resident*	578 lbs/day	1,010 lbs/day
Flex Space Employees	*12.1 lbs/day per employee*	36.3 lbs/day	36.3 lbs/day
Total Solid Waste Generation	*NA*	**614.3 lbs/day**	**1,046.3 lbs/day**

Source: Calculated using generation factors from CalRecycle 2019 (residential) and Cascadia Consulting Group 2006 (restaurant). Solid waste generation rates for café use were not available, therefore the generation rate for restaurant use was applied to the "flex space". Generation rates for retail stores (4.7 pounds per day per employee) and other non-restaurant commercial uses are lower than for restaurant use (12.1 pounds per day), therefore use of the restaurant generation rate is considered a conservative approach.

Acronyms: lbs/day = pounds per day; NA = not applicable

Impact UTI-5: Less than Significant

Similar to the Project, construction and operation of Alternative 2 would comply with all statutes and regulations related to solid waste, including the 2019 California Green Building Standards Code (Title 24 CCR Part 11), the City's Construction & Demolition Debris Diversion Program, and submittal of a Waste Management Plan. For the same reasons as described for the Project, Alternative 2 would not conflict with or interfere with the State or City's ability to implement its adopted solid waste management programs and policies and the impact would be **less than significant.** This is the same level of significance as the Project.

Agriculture and Forestry Resources, Mineral Resources, and Wildfire

As described in Section 3.18, "Environmental Topics for which No Impacts were Identified," there are no agricultural, forestry, or mineral resources in close proximity to the Project site, and the area is not within a wildfire hazard zone. As such, Alternative 2 would have **no impact** on agriculture and forestry resources, mineral resources, or wildfire hazards, which is the same level of significance as the Project.

4.4 Environmentally Superior Alternative

CEQA requires that, among the alternatives, an "environmentally superior" alternative be selected and that the reasons for such selection be disclosed. In general, the environmentally superior alternative is the alternative that would generate the fewest or least severe adverse impacts. Table 4.4-1 below provides a comparison of the Project to the alternatives with respect to the potential to avoid or substantially reduce environmental impacts.

For the purposes of this EIR, the No Project Alternative is environmentally superior because it would have no environmental impacts and would avoid the significant and unavoidable impact from construction noise. When the No Project Alternative is environmentally superior, another alternative must be identified [CEQA Guidelines Section 15126.6(e)(2)].

In this case, the next environmentally superior alternative would be Alternative 2. Although Alternative 2 would still result in a substantial temporary increase in ambient noise levels during construction that would be significant and unavoidable, the degree and duration of the temporary noise increases would be less than would occur during construction of the Project. Alternative 2 would also avoid the potentially significant hydrology impacts of the Project and would also have a lower level of significance for some aesthetics and geology impacts, as shown in Table 4.4-1 and discussed in Section 4.3.3. In addition, the magnitude of impact would be slightly lesser for some air quality, energy, geology and soils, GHG emissions, hazards and hazardous materials, and public services and recreation, although the reduction in these impacts would not be substantial enough to reduce the level of significance. As discussed in Section 4.3.3, Alternative 2 would not achieve all of the Project Objectives and may not be economically feasible.

As shown in Table 4.4-1 and discussed in Section 4.3.2, Alternative 1 would have the same level of significance as the Project for all environmental topics. Although the magnitude of impacts would be slightly lesser for air quality, greenhouse gas emissions, and transportation, the slight differences between the Project and Alternative 1 would not be substantial enough to change the level of significance in any environmental topic. Alternative 1 would at least partially meet all of the Project Objectives.

Table 4.4-1 Comparison of Environmental Impacts of the Alternatives to the Project

Environmental Impact	Project	No Project Alternative	Alternative 1: Traditional Construction	Alternative 2: Reduced Scale
Impact AES-1	NI	NI	NI	NI
Impact AES-2	NI	NI	NI	NI
Impact AES-3	LTS	**NI**	LTS	**NI**
Impact AES-4	LTS	**NI**	LTS	LTS
Impact AIR-1	LTS	**NI***	LTS	LTS
Impact AIR-2	LTSM	**NI***	LTSM	LTSM-
Impact AIR-3	LTS	**NI**	LTS-	LTS-
Impact AIR-4	LTS	**NI**	LTS	LTS
Impact BIO-1	NI	NI	NI	NI
Impact BIO-2	NI	NI	NI	NI
Impact BIO-3	NI	NI	NI	NI
Impact BIO-4	LTSM	**NI**	LTSM	LTSM-
Impact BIO-5	LTS	**NI**	LTS	LTS
Impact BIO-6	NI	NI	NI	NI
Impact CUL-1	LTSM	**NI**	LTSM	LTSM
Impact CUL-2	LTSM	**NI**	LTSM	LTSM-
Impact CUL-3	LTS	**NI**	LTS	LTS-
Impact ENE-1	LTS	**NI**	LTS-	LTS-
Impact ENE-2	LTS	**NI**	LTS	LTS
Impact GEO-1	LTS	**NI**	LTS	LTS
Impact GEO-2	LTS	**NI**	LTS	LTS
Impact GEO-3	LTSM	**NI**	LTSM	LTSM-
Impact GEO-4	LTS	**NI**	LTS	LTS
Impact GEO-5	NI	NI	NI	NI
Impact GEO-6	LTSM	**NI**	LTSM	**LTS**
Impact GHG-1	LTCC	**NI***	LTCC-	LTCC-
Impact GHG-2	LTCC	**NI***	LTCC	LTCC
Impact HAZ-1	LTS	**NI**	LTS	LTS
Impact HAZ-2	NI	NI	NI	NI
Impact HAZ-3	LTSM	**NI**	LTSM	LTSM-
Impact HAZ-4	NI	NI	NI	NI
Impact HAZ-5	LTS	**NI**	LTS-	LTS-
Impact HAZ-6	NI	NI	NI	NI
Impact HYD-1	LTSM	**NI**	LTSM	**LTS**
Impact HYD-2	LTS	**NI**	LTS	LTS-
Impact HYD-3	LTS	**NI**	LTS	LTS
Impact HYD-4	LTS	**NI**	LTS	LTS

Environmental Impact	Project	No Project Alternative	Alternative 1: Traditional Construction	Alternative 2: Reduced Scale
Impact HYD-5	LTSM	**NI**	LTSM	**LTS**
Impact LUP-1	NI	NI	NI	NI
Impact LUP-2	NI	NI	NI	NI
Impact NOI-1	S&U	**NI**	S&U	S&U-
Impact NOI-2	S&U	**NI**	S&U	S&U
Impact NOI-3	NI	NI	NI	NI
Impact POP-1	LTS	**NI***	LTS	LTS
Impact POP-2	NI	NI	NI	NI
Impact PSR-1	LTS	**NI**	LTS	LTS-
Impact PSR-2	LTS	**NI**	LTS	LTS-
Impact PSR-3	LTS	**NI**	LTS	LTS-
Impact TRA-1	LTS	**NI***	LTS-	LTS-
Impact TRA-2	LTS	**NI***	LTS	LTS
Impact TRA-3	LTSM	**NI**	LTSM	LTSM
Impact TRA-4	LTS	**NI**	LTS-	LTS-
Impact TCR-1	LTSM	**NI**	LTSM	LTSM
Impact UTI-1	LTS	**NI**	LTS	LTS-
Impact UTI-2	LTS	**NI**	LTS	LTS-
Impact UTI-3	LTS	**NI**	LTS	LTS-
Impact UTI-4	LTS	**NI**	LTS	LTS-
Impact UTI-5	LTS	**NI**	LTS	LTS
Agriculture and Forestry Impacts	NI	NI	NI	NI
Mineral Resource Impacts	NI	NI	NI	NI
Wildfire Impacts	NI	NI	NI	NI
Number of impacts with higher significance level than Project	N/A	0	0	0
Number of impacts with lower significance level than Project	N/A	57	0	4
Number of impacts with same significance level as Project	N/A	4	61	57

Source: compiled by AECOM in 2021. For each alternative, the significance determination shown in the table for a particular impact is the most severe of the construction or operational-phase impact.

Acronyms: N/A = Not Applicable; NI = No Impact; LTCC = Less than Cumulatively Considerable; LTS = Less than Significant Impact; LTSM = Less than Significant with Mitigation; S&U = Significant and Unavoidable.

***Bold** indicates that impact is different level of significance than the Project.*

- indicates that duration or intensity of the impact would be less than for the Project, even if level of significance is the same.

** indicates potential for indirect impacts and/or lack of beneficial impacts.*

5 Other CEQA Considerations

5.1 Significant Environmental Effects That Cannot be Avoided if the Project is Implemented

Section 21100(b)(2)(A) of the CEQA requires that a draft EIR identify significant environmental effects that cannot be avoided if a project is implemented.

Most impacts identified related to the Project would be either less than significant or could be mitigated to a less than significant level. However, the Project would also result in some significant impacts that cannot feasibly be avoided or mitigated to less than significant levels. Based on the environmental analyses within this Draft EIR, the County has determined that implementation of the Project would result in the following significant and unavoidable impacts:

- Impact NOI-1: Project construction would result in generation of a substantial temporary increase in ambient noise levels (project-level and cumulative).
- Impact NOI-2: Project construction would result in generation of substantial temporary vibration levels (project-level).

Due to these significant unavoidable environmental effects, if the County Board of Supervisors decides to approve the Project, it would need to adopt a Statement of Overriding Considerations, which would include findings that the benefits of the Project outweigh the impacts.

5.2 Significant Irreversible Environmental Changes

CEQA (PRC Section 21100(b)(2)) provides that an EIR shall include a detailed statement setting forth "[i]n a separate section…[a]ny significant effects on the environment that would be irreversible if the project is implemented." CEQA Guidelines Section 15126.2(c) provides the following guidance for analyzing the significant irreversible environmental changes of a project:

> *Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irretrievable damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.*

If the Project is implemented, it would demolish the existing office building on the project site, which would be an irreversible change. However, the existing office building is not an historic resource, and demolition of older non-historic buildings to make way for new development is common within existing urban areas and would be consistent with the City's Comprehensive Plan, which is the community's blueprint and vision for future development of the City. Implementation of the Project would not provide access to a previously inaccessible area, and the proposed infill redevelopment of an underutilized site within a transit priority area would indirectly result in a reduction in the use of nonrenewable resources compared to new greenfield development.

Implementation of the Project would also involve the use of nonrenewable resources, primarily through use of petroleum-based fuels for Project construction and operation, that would deplete supplies of nonrenewable resources. However, as discussed in Section 3.6, “Energy,” the Project would comply with applicable regulations and requirements regarding energy efficiency and would not result in inefficient, wasteful, and unnecessary consumption of energy. The Project would be more energy efficient than the existing uses on the project site.

Other nonrenewable and slowly-renewable resources consumed as a result of Project development would include, but not necessarily be limited to, lumber and other forest products, sand and gravel, asphalt, petrochemical construction materials, and water. The use of these nonrenewable resources would account for only a small portion of the region’s resources and would not affect the availability of these resources for other needs in the region.

The Project would not result in irreversible damage from environmental accidents, such as an accidental spill or explosion of a hazardous material. During construction, equipment would be using various fuels and materials classified as hazardous. In the State of California, the storage and use of hazardous substances are strictly regulated and enforced by local, regional, and state agencies to prevent impacts related to environmental accidents. The nature of construction—that for an infill mixed-use development using a modular construction technique—would not involve unusual amounts or types of hazardous materials that could result in irreversible damage from an accidental release. Similarly, long-term occupation of the project site would not involve hazardous materials beyond standard, common-place household, commercial cleaning, and maintenance products and landscaping chemicals, which would not result in significant environmental accidents with their use in accordance with manufacturer instructions. The types and amounts of hazardous materials used at the project site under the Project would not pose any greater risk of upset or accident than the existing uses at the site or at other similar development elsewhere in the region.

5.3 Growth Inducement

Section 15126.2(d) of the State CEQA Guidelines requires that an EIR discuss the ways in which a proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. An EIR must also discuss the characteristics of the project that could encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively.

Direct growth inducement would arise if a project involved construction of new housing that has not been accounted for in the City’s planning efforts and growth forecasts. Indirect growth inducement would arise, for instance, if a project would remove obstacles to population growth (e.g., a major expansion of a wastewater treatment plant).

Growth-inducement itself is not an environmental effect, but it may foreseeably lead to environmental effects. These environmental effects may include increased demand on other community and public services and infrastructure, increased traffic and noise, degradation of air or water quality, degradation or loss of plant or animal habitats, or conversion of agricultural and open space land to urban uses.

5.3.1 Growth-Inducing Impacts of the Project

As discussed in Section 3.13, “Population and Housing,” the Project would not induce substantial unplanned population growth in the area. The Project would introduce 110 new residential units resulting in an associated increase in population of approximately 273 new residents at the project site. This growth would be within an infill priority development area that is planned for development of more housing, employment opportunities and community amenities (MTC 2020). The direct growth associated with the Project would be consistent with the overall planned growth in the City and region and would also be consistent with various housing and land use policies in the City’s Comprehensive Plan (see Appendix A) and the City’s RHNA goals. Furthermore, the Project would provide new housing opportunities for school district employees already working within the local area, thereby improving the jobs/housing balance.

Temporary housing or other services would not be required to accommodate Project construction workers, as the duration of construction and number of construction workers required would be typical of other mixed-use developments in the area and workers are anticipated to come from the local labor pool.

The number of employment opportunities associated with Project operation (e.g., apartment manager and flex space staff) would be less than the existing number of employees at the existing office building; therefore, the Project would not introduce substantial new permanent employment opportunities or stimulation of economic activity.

The Project is located in an already-urbanized area and would not include any oversized infrastructure or extension of roadways or other services that might indirectly induce growth in the area. The Project would not establish any policies or precedents that would directly or indirectly encourage unplanned growth.

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7 List of Preparers

7.1 County of Santa Clara (Lead Agency)

Emily Chen .... Senior Planner
Kathy Bradley .... Project Manager
David Barry .... Chief of Facilities Planning Services
Lizanne Reynolds .... Deputy County Counsel
Karen Willis .... Deputy County Counsel
Consuelo Hernandez .... Office of Supportive Housing Director
Melissa Sifuentes .... Public Communication Specialist

7.2 AECOM (CEQA Consultant)

Rod Jeung .... Project Director
Emma Rawnsley .... Project Manager
Emily Biro .... Environmental Planner
Allison Brock .... Environmental Planner
Jenifer King .... Environmental Planner
Roshni Saxena .... Environmental Planner
Paul Burge .... Acoustic Engineer
Annamarie Leon Guerrero .... Archaeologist
Jennifer Redmond .... Archaeologist
Jay Rehor .... Archaeologist
Trina Meiser .... Architectural Historian
Chandra Miller .... Architectural Historian
Heather Miller .... Architectural Historian
Monica Wilson .... Architectural Historian
Keith Wright .... Biologist
Issa Mahmodi .... Environmental Analyst
Paola Peña .... Environmental Analyst
Wendy Copeland .... Environmental Analyst
Nichole Seow .... Transportation Planner
Deborah Jew .... Document Production
Robin Lium .... GIS Analyst
Anne Campbell .... Graphics

aecom.com

Appendix A – Notice of Preparation and Comments Received

Contains:

- Notice of Preparation, December 2, 2020
- Scoping Period comment letters received from:
  - Gail Price, December 19, 2020
  - City of Palo Alto, January 6, 2021
  - City of Palo Alto, January 11, 2021

County of Santa Clara

Facilities and Fleet Department

County Center at Charcot
2310 North First Street, Suite 200
San Jose, California 95131-1011
(408) 993-4600

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR 231 GRANT EDUCATOR WORKFORCE HOUSING

Project Owner/Proponent: County of Santa Clara - Facilities and Fleets Department (FAF)
Project Title: 231 Grant Educator Workforce Housing
Assessor's Parcel Number: 132-31-074

As the Lead Agency, the County of Santa Clara (County) will prepare an Environmental Impact Report (EIR) for the proposed project referenced above. The County welcomes your input regarding the scope and content of the environmental information to be included in the EIR. A brief description of the proposed project, its location, and a summary of the potential environmental effects is provided on the following pages.

The project proposes demolition of the existing single-story building on the site and construction of a four-story building that would contain approximately 110 residential units and related amenities and approximately 1,200 square feet of "flex space" which could be utilized as a café or other retail/commercial use. Approval of the project will require actions by the County of Santa Clara, including approval by the County Board of Supervisors.

A Public Scoping/Community Meeting to solicit comments on the Notice of Preparation will be held on:

Wednesday, December 16, 2020 from 6:30 p.m. to 7:30 p.m.

The meeting will be held virtually. The meeting link and instructions for joining the virtual meeting are available on the project website at https://www.sccgov.org/231grant.

In accordance with the California Environmental Quality Act (CEQA), comments on this Notice of Preparation are due within 30 days of its receipt. However, an earlier response, if possible, would be appreciated. Please send your response to:

County of Santa Clara Facilities and Fleets Department
Attention: Emily Chen
2310 North First Street, Suite 200
San Jose CA 95131
E-mail: Emily.F.Chen@faf.sccgov.org; Phone: (408) 993-4635

Prepared by:
Emily Chen, Senior Planner — Emily Chen — 12/2/2020
Signature ***Date***

Approved by:
David Barry, Chief of Facilities Planning Services — David Barry — 12/2/2020
Signature ***Date***

231 GRANT EDUCATOR WORKFORCE HOUSING

Project Location

The project site is at 231 Grant Avenue in the City of Palo Alto (Figure 1). The project site is approximately 1.4 acres bounded by Park Boulevard, Grant Avenue, and Birch Street. The project site contains an approximately 6,800-square-foot office building completed in 1956 and an associated parking area. The site is owned by the County and the existing office building currently houses the Santa Clara County Office of the Public Defender (Figure 2).

An outdoor café and multifamily residential housing are adjacent to northeast boundary of the Project site at the corner of Sheridan Avenue and Park Boulevard and a multistory office building is adjacent to southeast boundary of the project site at the corner of Sheridan Avenue and Birch Street. The Santa Clara County Superior Court building is west of the project site, across Grant Avenue. Areas to the east and west of Grant Avenue and south of Birch Street in the vicinity of the project site are predominantly multifamily residential housing. Office buildings and multifamily residential housing are north of the project site along Park Boulevard.

The project site is on County-owned property but within the incorporated area of the City of Palo Alto.

Project Description

The 231 Grant Educator Workforce Housing (the proposed project) is currently sponsored by the County of Santa Clara, Facebook, the City of Palo Alto, and participating school districts in Santa Clara County.

The proposed project would demolish the existing 6,800-square-foot office building at the project site and would construct a new four-story building, totaling approximately 112,000 square feet, on the site. The building would be developed with 110 residential units. These units would be intended to serve teachers and other full-time staff from participating school districts in Santa Clara County and from certain geographic districts in southern San Mateo County.[1] Approximately 2,000 square feet of community space, including a lounge, activity room and laundry, would be provided for residents' use, as well as management offices and approximately 1,200 square feet of "flex space" which could be utilized as a café or other retail or commercial use.

An at-grade parking structure with double car stackers would provide 112 parking spaces and a secure bicycle parking room would be provided with capacity for 134 bicycles. Approximately 5,600 square feet of open public space would be provided within three outdoor plaza areas, each centered around an existing mature tree (palm, camphor, and redwood, respectively) that would be retained as part of the project.

The project is anticipated to utilize modular construction methods; however, the use of traditional construction methods will also be analyzed as an alternative to the proposed project.

Potential Environmental Effects of the Project

The EIR will identify the significant environmental effects anticipated to result from implementation of the proposed project. As allowed by CEQA Guidelines §15063(a), an Initial Study has not been prepared for the proposed project because an EIR will clearly be required. Due to the location of the project site in an urban area that is not within or close to any farmlands or forestry resources, known mineral deposits, or wildfire hazard areas, these environmental topics will not be addressed in detail in the EIR.

[1] In the event units are not filled by school employees, then units may be offered to public safety employees or nonprofit employees.

The EIR will evaluate all other environmental issues contemplated for consideration under CEQA and the CEQA Guidelines, including:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise and Vibration
- Recreational Resources
- Population and Housing
- Public Services
- Transportation
- Utilities and Service Systems
- Tribal Cultural Resources

It is anticipated that the primary focus of analysis will be on the specific environmental topics outlined below. Mitigation measures will be identified to reduce or avoid significant impacts, as appropriate.

Aesthetics

The project site currently contains a single-story office building and associated surface parking and landscaping. The proposed project calls for the County to demolish this building, and to develop a four story building on the site. The EIR will describe the existing visual setting of the project area and changes that are anticipated to occur as a result of the proposed project. The EIR will also discuss potential light and glare issues from the development and evaluate the project's consistency with applicable zoning and design guidelines and other regulations governing scenic quality and aesthetics.

Air Quality

The EIR will address the regional air quality conditions in the Bay Area and discuss the proposed project's impacts to local and regional air quality according to the 2017 Bay Area Air Quality Management District guidelines and thresholds, focusing on temporary construction-related impacts such as construction vehicle exhaust and dust, as well as operational impacts from traffic generated by project residents, employees and visitors, and other operational emissions sources.

Biological Resources

The EIR will describe existing biological resources in the project vicinity and address any biological resource effects associated with the project, including impacts to habitats and special-status species, including nesting birds. The EIR will also address the loss of trees within the project site and the project's consistency with tree preservation ordinances of both the City of Palo Alto and the County.

Cultural and Tribal Cultural Resources

The existing office building on the project site was constructed in 1956. An historical resource evaluation has been completed for the site (AECOM 2020), which found that the existing building is not eligible for the National Register of Historic Places, California Register of Historical Places, County Heritage Resource Inventory, or the City of Palo Alto Historic Inventory. Direct impacts to built historic resources are therefore not anticipated for the project, although the EIR will identify any built historic resources in the vicinity of the project site that could potentially be indirectly impacted by the project. The EIR will also discuss the potential for prehistoric and Native American tribal cultural resources to be located in the project area.

Energy

The EIR will examine the potential for the project to result in excessive or inefficient use of energy and will discuss any energy conservation measures included as part of the project.

Geology & Soils

The project site is located within a seismically active region. The EIR will describe existing geological and soil conditions at the site, and discuss possible impacts associated with seismic hazards and soil instability, as well as potential impacts to paleontological resources.

Greenhouse Gas Emissions

The EIR will describe the regulatory context surrounding the issue of global climate change and will evaluate the project's greenhouse gas emissions and contribution to global climate change, in conformance with the methodology of the Bay Area Air Quality Management District and any other applicable criteria.

Hazards & Hazardous Materials

According to Regional Water Quality Control Board GeoTracker records, a regional plume of chlorinated solvents, known as the California-Olive-Emerson plume, exists in groundwater in the project vicinity. The EIR will describe existing hazardous materials conditions on and adjacent to the project site and identify any potential contamination or other hazardous materials that could affect construction workers and/or nearby receptors, such as residences, schools, daycare facilities, and open space/recreational areas. The EIR will also describe any hazardous materials or emissions associated with project construction or operation, and their potential impacts.

Hydrology & Water Quality

The EIR will describe the existing hydrologic and drainage conditions at the project site, as well as changes in site drainage and hydrological conditions that may result from the proposed project. The EIR will address the possible impacts of the project on stormwater, surface water, and groundwater quality.

Land Use and Planning

The project site is located in an urban area within the City of Palo Alto. The EIR will describe the existing land uses and zoning designations on and adjacent to the project site. Cumulative land use impacts that would occur as a result of the proposed project would be analyzed, including impacts due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

Noise and Vibration

The EIR will describe existing noise conditions in the project area and evaluate the potential for noise and vibration generated by the project to exceed applicable noise standards and adversely affect sensitive receptors in the area. Noise and vibration impacts from both construction-related sources and operational sources (including project-generated traffic) will be analyzed.

Population and Housing

The project would construct up to 110 residential units. The EIR will assess whether the project would induce cumulative unplanned population growth in the area or displace substantial numbers of existing people or housing.

Public Services and Recreational Resources

The EIR will discuss the availability of public facilities and service systems (including police and fire services, parks, schools, and libraries) and recreational resources in the project area, and the potential for the project to require the construction of new or expanded facilities or result in adverse physical impacts to existing facilities.

Transportation

The EIR will describe the existing transportation network and analyze the impacts of the project, including whether the project would conflict with applicable transportation planning policies, result in a substantial increase in vehicle miles travelled, create a traffic safety hazard, or impact emergency access. Temporary construction-related traffic impacts will also be analyzed.

Utilities and Service Systems

The EIR will describe the existing utilities serving the project area, including potable water supply, sanitary sewer, storm drainage, and solid waste management services. The EIR will evaluate the proposed project's effects on these utilities.

Alternatives

The EIR will identify and evaluate a reasonable range of alternatives to the project that would feasibly attain most of the project's basic objectives, but would avoid or substantially lessen any of the project's significant effects. It is anticipated that one of the alternatives to be analyzed would include the use of traditional construction methods rather than modular construction as proposed by the project. As required by CEQA, the EIR will analyze a "No Project" alternative. Other alternatives that seek to reduce the significant environmental impacts of the project will be identified. Alternatives discussed will be chosen based on their ability to reduce or avoid identified significant impacts of the project while achieving most of the identified objectives of the project (see CEQA Guidelines Section 15126.6).

The EIR will identify the degree to which each alternative might avoid or substantially lessen one or more of the project's significant environmental impacts, whether the alternative could result in other or increased impacts, and the degree to which the alternative would feasibly accomplish most of the project's basic objectives. In accordance with CEQA, the EIR will identify an environmentally superior alternative, based on the number and degree of associated environmental impacts.

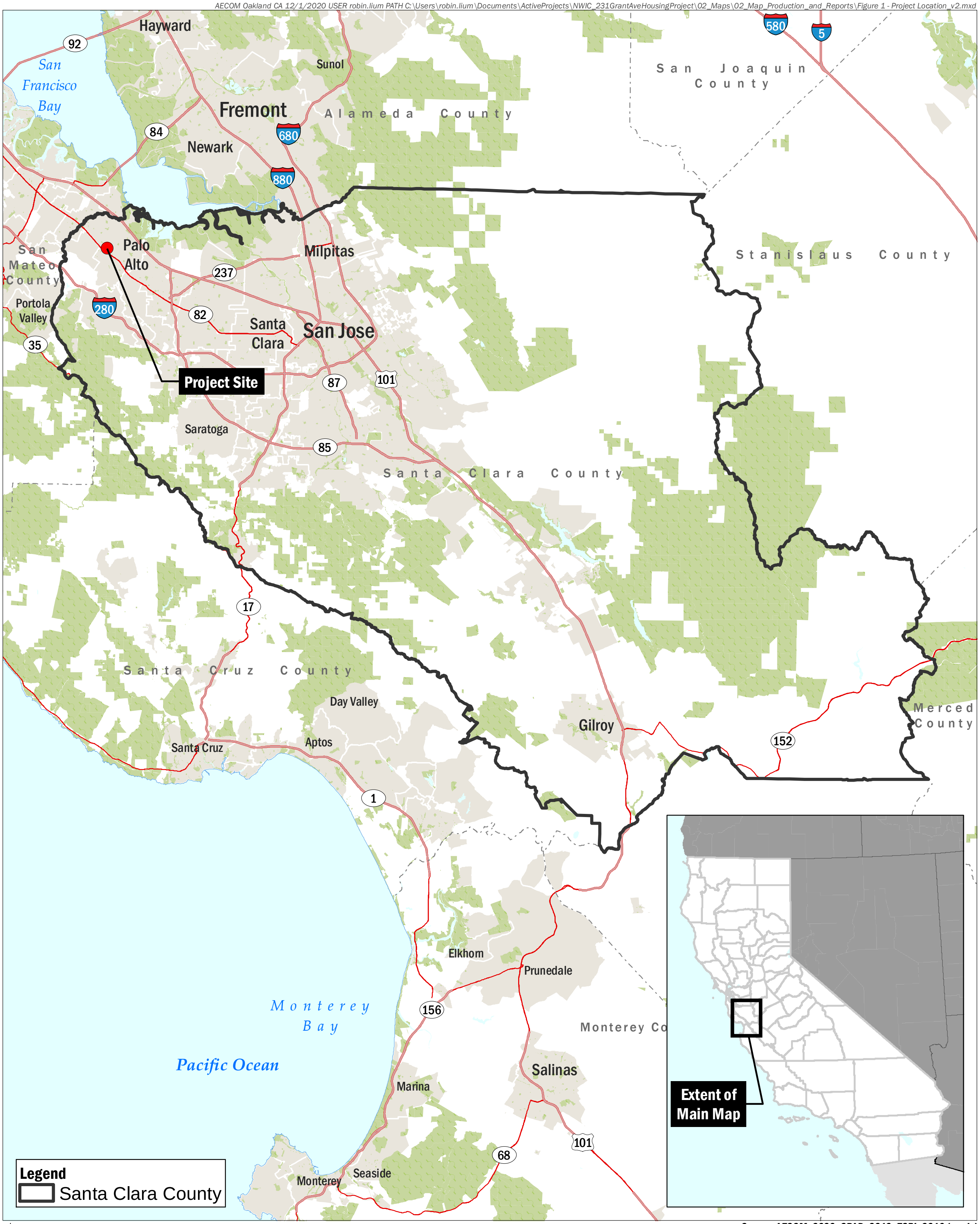
Cumulative Impacts

The EIR will include a discussion of significant cumulative impacts of the project when considered with other past, present, and reasonably foreseeable future projects in the area. This section will cover all relevant subject areas discussed in the EIR (e.g., air quality, noise, traffic), will specify which of the areas are anticipated to experience significant cumulative impacts, and will determine whether the proposed project's incremental contributions are cumulatively considerable. Mitigation measures will be identified to reduce or avoid any cumulatively considerable contribution from the project to significant cumulative impacts.

Other CEQA Sections

The EIR will also include other sections required by CEQA, including growth inducing impacts, significant and irreversible environmental changes, significant unavoidable impacts, references, EIR preparers, and appendices.

AECOM Oakland CA 12/1/2020 USER robin.lium PATH C:\Users\robin.lium\Documents\ActiveProjects\NWIC_231GrantAveHousingProject\02_Maps\02_Map_Production_and_Reports\Figure 1 - Project Location_v2.mxd



Source: AECOM, 2020; CPAD, 2019; ESRI, 2016 (roads)

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Miles

AECOM

Santa Clara County

231 Grant Educator Workforce Housing

FIGURE 1

Project Location

C:\Users\robin.lium\Documents\ActiveProjects\NWIC_231GrantAveHousingProject\02_Maps\02_Map_Production_and_Reports\Figure 2 - Proposed Project Site.mxd

Source: AECOM, 2020; ESRI, 2020; CPAD, 2019; ESRI, 2016 (roads)

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Feet

AECOM

Santa Clara County

231 Grant Educator Workforce Housing

FIGURE 2

Proposed Project Site

donotreply@isd.sccgov.org

Subject: FW: 231 Grant: Public Comment from the Project Website

From: donotreply@isd.sccgov.org <donotreply@isd.sccgov.org>
Sent: Saturday, December 19, 2020 8:40 AM
To: Sifuentes, Melissa <melissa.sifuentes@faf.sccgov.org>
Subject: Request to receive updates about the County of Santa Clara's, 231 Grant Educator Workforce Housing project

First Name : Gail

Last Name : Price

Title:

Company or Organization Represented:

Phone Number: [redacted]

Street Address : [redacted]

City : [redacted]

State: [redacted]

Zip Code : 94306

Email: [redacted]

Comments: This is a critical and needed housing complex for educator workforce employees. It will serve as a model for other communities and demonstrate how partnerships can create much needed housing. Gail Price Former PAUSD School Board Trustee

PLANNING & DEVELOPMENT SERVICES

CITY OF PALO ALTO
250 Hamilton Avenue, 5th Floor
Palo Alto, CA 94301
(650) 329-2441

January 6, 2021

Emily Chen, Project Manager
City of East Palo Alto, Planning Division
2310 North First Street, Suite 200
San Jose, CA 95131
Email: Emily.F.Chen@faf.sccgov.org

RE: Notice of Preparation of Environmental Impact Report, 231 Grant Educator Workforce Housing

Thank you for including the City of Palo Alto in the environmental review process for the above-referenced project.

Project Understanding
The Project, 231 Grant Educator Workforce Housing, is located on Assessor's Parcel Number (APN) 132-31-074, a 1.4 acre County-owned parcel within the City of Palo Alto bounded by Park Boulevard, Grant Avenue, and Birch Street. The project proposes demolition of an existing 6,800 square foot (sf) office building and associated parking lot and reconstruction of the site with a new four-story building totaling approximately 112,000 sf. The new building would include 110 multi-family residential rental units, approximately 2,000 sf of community living space, and approximately 1,200 sf of "flex space:" which could be utilized as a café or other retail or commercial use. The City understands that 112 vehicle parking spaces and 134 bicycle parking spaces would be provided. Approximately 5,600 sf of open public space would be provided within three outdoor plaza areas, each plaza designed around an existing mature tree that would be retained.

The zoning designation on the site is Public Facilities (PF) and the Comprehensive Plan land use designation of the site is Major Institution, Special Facilities (MISP). However, the City understands that the County intends to use preemptive authority for governmental immunity on this project. The City understands that, therefore, the City's zoning code and associated permit requirements would not apply to the proposed project. The County will serve as the lead agency and the County's applicable regulations would apply in-lieu of the City's requirements.

The City of Palo Alto provides the following comments in response to the Notice of Preparation.

Project Description
The project description should clearly demonstrate how the project qualifies for an exemption from local regulation under California Government Code Section 54701 with respect to the proposed uses of the site. The different uses of the project and the future tenants must meet the requirements in the government code in order to qualify for this exemption from local zoning requirements and local permitting requirements.

Thresholds
Because the project is located squarely within the City of Palo Alto and because the City of Palo Alto will serve as a responsible agency for this project, the EIR should utilize the City's thresholds of significance in-lieu of or in addition to the County's thresholds of significance when evaluating CEQA impacts. To the extent that these thresholds differ from the County's thresholds, the County should utilize the more conservative threshold. In particular, the City notes that its Council adopted thresholds of significance for Vehicle Miles Traveled that may differ from the County's thresholds.

Transportation

Although the CEQA analysis will not include a level of service analysis at nearby intersections in accordance with SB 743, the City of Palo may require a separate local traffic analysis be prepared so that the local impacts of the proposed development can be understood in accordance with the City of Palo Alto's Local Transportation Impact Analysis Policy and the City's Comprehensive Plan. The City requests that a proposed analysis scope discuss the anticipated trip generated by the proposed development, the anticipated distribution pattern of those trips, and estimated number of peak hour project trips at the nearby intersections where anticipated project trips may trigger the City's thresholds for additional Level of Service (LOS) analysis. This scoping and analysis is necessary for understanding traffic circulation around the site. The City of Palo Alto's intersection standards should be utilized. The City's LOS policy, which includes thresholds and standards, is provided here:
https://www.cityofpaloalto.org/civicax/filebank/blobdload.aspx?t=65453.84&BlobID=77026

Bicycle and Vehicle Circulation

Park Boulevard is a major bike route; therefore, the City would not recommend the addition of any new curb cuts along this frontage or a design that directs increased vehicle ingress/egress to this frontage. The City encourages reducing existing curb cuts where feasible.

Traffic Calming

In the past, the City has received concerns from the residents in this neighborhood regarding the volume and speed of traffic in this area. The environmental analysis must determine whether the project may contribute to such issues, and consider if implementing traffic calming measures as part of the project would be appropriate within the immediate vicinity of the project.

Coordination

The City anticipates that construction of the City's Public Service Building could coincide with construction of this building. The traffic analysis must consider the cumulative impacts of these projects, particularly during construction, so that the impacts on traffic and access to adjacent residences and businesses can be understood. Access to adjacent properties must be maintained throughout construction. Coordination between the County and City of Palo Alto must occur to minimize potential impacts associated with street closures, vehicle deliveries, and other construction activities.

Permits

The County must obtain a permit from the City of Palo Alto for any material haul/wide truck loads as well as encroachment permit(s) for any temporary or permanent encroachment within the City's right-of-way.

The City understands that the County will be evaluating modular construction as an alternative to traditional construction methods. This would reduce the timeframe of construction; however, the City anticipates that it would increase the number of wide loads and total trucks traveling to and from the site during certain periods of construction. Additional information on the number of truck trips, the number of wide loads, etc. must be provided as part of the environmental analysis. The City will require that the County submit a Traffic Control Plan (TCP) for the City's review and approval prior to construction; this should be identified in the environmental analysis. The City would review the TCP to analyze and approve the routes, timing, and to determine if additional temporary traffic control measures are necessary.

Groundwater

The City understands that the project site is located within the California-Olive-Emerson Plume, which is known to contain groundwater contaminated with volatile organic compounds (VOCs). The EIR must analyze the impacts of construction activities on the release of VOCs and must identify the proper disposal of contaminated water, if encountered during construction. Although not required in accordance with

CEQA, the City anticipates that the County will work with the Regional Water Quality Control Board, Department of Toxic Substances Control, and/or the County Department of Environmental Health to identify appropriate measures for the safety of future residents/users.

Should you have any questions regarding this letter and the City's comment, please contact Claire Raybould at (650) 329-2116 or Claire.Raybould@cityofpaloalto.org or Jonathan Lait at Jonathan.Lait@cityofpaloalto.org.

Sincerely,

DocuSigned by:
Claire Raybould
2721A1A8AE4C4AA...

Claire Raybould, AICP
Senior Planner, Planning & Development Services

PLANNING & DEVELOPMENT SERVICES

CITY OF PALO ALTO
250 Hamilton Avenue, 5th Floor
Palo Alto, CA 94301
(650) 329-2441

January 11, 2021

Emily Chen, Project Manager
City of East Palo Alto, Planning Division
2310 North First Street, Suite 200
San Jose, CA 95131
Email: Emily.F.Chen@faf.sccgov.org

RE: City of Palo Alto Comprehensive Plan Conformity Analysis, 231 Grant Educator Workforce Housing Project

On December 2, 2020 the County of Santa Clara submitted a letter to the City of Palo Alto noticing the proposed lease and project construction at 231 Grant Avenue pursuant to Government Code Section 25351. The letter also constituted a request for a General Plan conformity determination pursuant to Government Code Section 65402(b)[1].

Project Understanding
The Project, 231 Grant Educator Workforce Housing, is located on Assessor's Parcel Number (APN) 132-31-074, a 1.4 acre County-owned parcel within the City of Palo Alto bounded by Park Boulevard, Grant Avenue, and Birch Street. The project proposes demolition of an existing 6,800 square foot (sf) office building and associated parking lot and reconstruction of the site with a new four-story building totaling approximately 112,000 sf. The new building would include 110 multi-family residential rental units, approximately 2,000 sf of community living space, and approximately 1,200 sf of "flex space:" which could be utilized as a café or other retail or commercial use. The City understands that 112 vehicle parking spaces and 134 bicycle parking spaces would be provided. Approximately 5,600 sf of open public space would be provided within three outdoor plaza areas, each plaza designed around an existing mature tree that would be retained. The City understands that the County intends to use preemptive authority for governmental immunity on this project.

The City is unable to provide a complete analysis of the project's conformity with the City's Comprehensive Plan at this time because sufficient plan details are not yet available for the City to review. Instead we are providing the following comments based on the information currently available:

<u>Land Use Designation</u>
The Comprehensive Plan land use designation for this property is "Major Institution, Special Facilities (MISP)". The MISP land use designation in the City's Land Use Element states that "Consistent with the

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[1] Government Code Section 65402(b) states: "(b) A county shall not acquire real property for any of the purposes specified in paragraph (a), nor dispose of any real property, nor construct or authorize a public building or structure, in another county or within the corporate limits of a city, if such city or other county has adopted a general plan or part thereof and such general plan or part thereof is applicable thereto,…until the location, purpose and extent of such acquisition, disposition, or such public building or structure have been submitted to and reported upon by the planning agency having jurisdiction, as to conformity with said adopted general plan or part thereof. Failure of the planning agency to report within forty (40) days after the matter has been submitted to it shall be conclusively deemed a finding that the proposed acquisition, disposition, or public building or structure is in conformity with said adopted general plan or part thereof…"

Comprehensive Plan's encouragement of housing near transit centers, higher density multi-family housing may be allowed in specific locations." Therefore construction of a multi-family housing project in this location and other common space associated with the multi-family residential use appears to be consistent with the City's land use designation at this site.

Housing

The project goals and general program description appear to be consistent with overarching goals outlined in the City's Housing Element and Land Use Element, which encourage housing production. In particular, the City notes that the project appears to be consistent with the following goals and policies because it would increase housing production in a transit rich location, creates more affordable housing options for teachers and public employees, and it utilizes new strategies to help increase housing density and diversity within the City:

- Program L2.4.7: Explore mechanisms for increasing multi-family housing density near multimodal transit centers.
- Policy L-2.5: Support the creation of affordable housing units for middle to lower income level earners, such as City and school district employees, as feasible.
- Policy H2.1: Identify and implement strategies to increase housing density and diversity, including mixed-use development and a range of unit styles, near community services. Emphasize and encourage the development of affordable and mixed income housing to support the City's fair share of the regional housing needs and to ensure that the City's population remains economically diverse.
- Program H2.1.2: Allow increased residential densities and mixed use development only where adequate urban services and amenities, including roadway capacity, are available.

The City requests confirmation from the County that, although located on County land, the proposed units, which are located squarely within the City's boundaries, would contribute toward the City's Regional Housing Needs Allocation. This would further Policy H2.1, as noted above, and works toward implementation of housing units in accordance with the City's RHNA allocation in Section 2.6 of the City's Housing Element.

The City reserves the right to provide further analysis of the project's conformity with the City's Comprehensive Plan once project plans become available.

Should you have any questions regarding this letter, please contact Claire Raybould at (650) 329-2116 or Claire.Raybould@cityofpaloalto.org or Jonathan Lait at Jonathan.Lait@cityofpaloalto.org.

Sincerely,

DocuSigned by:
Claire Raybould
2721A1A8AE4C4AA...

Claire Raybould, AICP
Senior Planner, Planning & Development Services

Appendix B – Air Quality and Greenhouse Gas Emissions Supporting Documentation

231 Grant Educator Workforce Housing - Air Quality and Greenhouse Gas Emissions Summary

Annual Construction Emissions											
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
Year	tons/year										MT/year
2022	0.1385	1.5155	1.4285	3.72E-03	0.0845	0.0593	0.1437	0.0221	0.0548	0.0769	348
2023	0.7651	0.7431	0.9424	2.27E-03	0.1119	0.0299	0.1417	0.0298	0.0275	0.0573	207
Total Emissions (tons)	0.90	2.26	2.37	0.01	0.20	0.09	0.29	0.05	0.08	0.13	555

Notes: ROG = reactive organic gases; NOx = nitrogen oxides; CO = carbon monoxide; SO2 = sulfur dioxide; PM10 = particulate matter equal or less than 10 micrometers in diameter; PM2.5 = particulate matter equal or less than 2.5 micrometers in diameter

Average Daily Construction Emissions										
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Emissions (tons)	0.90	2.26	2.37	0.01	0.20	0.09	0.29	0.05	0.08	0.13
Average Daily Emissions (pounds/day)[1]	4.54	11.35	11.91	0.03	0.99	0.45	1.43	0.26	0.41	0.67
Threshold[2]	54	54				82			54	
Exceed Threshold?	No	No				No			No	

Notes:

[1]Average daily emission estimates are based on approximately 398 construction workdays (15 months of construction, 6 days of construction per week).

[2] Thresholds from Table 2-1 of the BAAQMD CEQA Air Quality Guidelines (BAAQMD 2017)

ROG = reactive organic gases; NOx = nitrogen oxides; CO = carbon monoxide; SO2 = sulfur dioxide; PM10 = particulate matter equal or less than 10 micrometers in diameter; PM2.5 = particulate matter equal or less than 2.5 micrometers in diameter

Annual Operational Emissions											
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
Year	tons/year										MT/year
Proposed Project	0.84	0.41	4.20	0.01	0.72	0.01	0.73	0.19	0.01	0.20	682
Existing	0.04	0.02	0.09	0.00	0.01	0.00	0.02	0.00	0.00	0.00	27
Net Emissions (tons)	0.79	0.39	4.11	0.01	0.70	0.01	0.71	0.19	0.01	0.20	656
Threshold	10.00	10.00					15.00			10.00	
Exceed Threshold?	No	No					No			No	

Notes: ROG = reactive organic gases; NOx = nitrogen oxides; CO = carbon monoxide; SO2 = sulfur dioxide; PM10 = particulate matter equal or less than 10 micrometers in diameter; PM2.5 = particulate matter equal or less than 2.5 micrometers in diameter

Average Daily Operational Emissions										
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Emissions (tons)	0.84	0.41	4.20	0.01	0.72	0.01	0.73	0.19	0.01	0.20
Average Daily Emissions (pounds/day)[1]	4.58	2.23	23.03	0.04	3.92	0.05	3.98	1.05	0.05	1.10
Existing Average Daily Emissions	0.22	0.10	0.51	0.00	0.08	0.00	0.08	0.02	0.00	0.03
Net Average Daily Emissions	4.36	2.13	22.52	0.04	3.84	0.05	3.89	1.03	0.05	1.07
Threshold	54	54					82			54
Exceed Threshold?	No	No					No			No

Start Date	6/1/2022
End Date	9/7/2023
Total Days of Construction	398
lb/ton	2000

Operational Greenhouse Gas Emissions	
Year	MT CO2e
Proposed Project	682
Existing	27
Net GHG Emissions	656
Amortized Construction GHG Emissions	18
Total GHG Emissions	674
Service Population (Pop + Emp)	276
Emissions Per SP (MT CO_2e/SP)	2.44
Threshold (MT CO_2e/SP)	2.88

Existing Average Daily Operational Emissions										
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Area	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.01	0.01	0.09	0.00	0.01	0.00	0.02	0.00	0.00	0.00
Total Emissions (tons)	0.04	0.02	0.09	0.00	0.01	0.00	0.02	0.00	0.00	0.00
Average Daily Emissions (pounds/day)[1]	0.22	0.10	0.51	0.00	0.08	0.00	0.08	0.02	0.00	0.03

Alternative 1 Emissions Summary

Annual Construction Emissions											
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
Year	tons/year										MT/year
2022	0.1065	1.1691	1.1199	3.13E-03	0.087	0.0421	0.1291	0.0227	0.0389	0.0616	294
2023	0.7893	0.8336	1.176	2.79E-03	0.1592	0.0338	0.193	0.0423	0.0311	0.0734	253
Total Emissions (tons)	0.90	2.00	2.30	0.01	0.25	0.08	0.32	0.07	0.07	0.14	548

Notes: ROG = reactive organic gases; NOx = nitrogen oxides; CO = carbon monoxide; SO2 = sulfur dioxide; PM10 = particulate matter equal or less than 10 micrometers in diameter; PM2.5 = particulate matter equal or less than 2.5 micrometers in diameter

Average Daily Construction Emissions										
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Emissions (tons)	0.90	2.00	2.30	0.01	0.25	0.08	0.32	0.07	0.07	0.14
Average Daily Emissions (pounds/day)[1]	3.91	8.75	10.03	0.03	1.08	0.33	1.41	0.28	0.31	0.59
Threshold[2]	54	54				82			54	
Exceed Threshold?	No	No				No			No	

Notes:

[1]Average daily emission estimates are based on approximately 458 construction workdays (17 months of construction, 6 days of construction per week).

[2] Thresholds from Table 2-1 of the BAAQMD CEQA Air Quality Guidelines (BAAQMD 2017)

ROG = reactive organic gases; NOx = nitrogen oxides; CO = carbon monoxide; SO2 = sulfur dioxide; PM10 = particulate matter equal or less than 10 micrometers in diameter; PM2.5 = particulate matter equal or less than 2.5 micrometers in diameter

Start Date	6/1/2022
End Date	11/16/2023
Total Days of Construction	458
lb/ton	2000

Unit Conversions	
tons	pounds
1	2000

Alternative 2 Emissions Summary

Annual Construction Emissions											
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
Year	tons/year										MT/year
2022	0.1535	1.383	1.3601	3.41E-03	0.0828	0.0555	0.1383	0.0216	0.0513	0.0729	316
2023	0.5254	0.3907	0.6335	1.50E-03	0.0992	0.0167	0.1159	0.0264	0.0154	0.0418	137
Total Emissions (tons)	0.68	1.77	1.99	0.00	0.18	0.07	0.25	0.05	0.07	0.11	453

Notes: ROG = reactive organic gases; NOx = nitrogen oxides; CO = carbon monoxide; SO2 = sulfur dioxide; PM10 = particulate matter equal or less than 10 micrometers in diameter; PM2.5 = particulate matter equal or less than 2.5 micrometers in diameter

Average Daily Construction Emissions										
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Emissions (tons)	0.68	1.77	1.99	0.00	0.18	0.07	0.25	0.05	0.07	0.11
Average Daily Emissions (pounds/day)[1]	3.63	9.49	10.66	0.03	0.97	0.39	1.36	0.26	0.36	0.61
Threshold[2]	54	54				82			54	
Exceed Threshold?	No	No				No			No	

Notes:

[1]Average daily emission estimates are based on approximately 374 construction workdays (14 months of construction, 6 days of construction per week).

[2] Thresholds from Table 2-1 of the BAAQMD CEQA Air Quality Guidelines (BAAQMD 2017)

ROG = reactive organic gases; NOx = nitrogen oxides; CO = carbon monoxide; SO2 = sulfur dioxide; PM10 = particulate matter equal or less than 10 micrometers in diameter; PM2.5 = particulate matter equal or less than 2.5 micrometers in diameter

Annual Operational Emissions											
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	CO2e
Year	tons/year										MT/year
Proposed Project	0.60	0.28	2.86	0.00	0.50	0.01	0.51	0.13	0.01	0.14	469
Existing	0.04	0.02	0.09	0.00	0.01	0.00	0.02	0.00	0.00	0.00	27
Net Emissions (tons)	0.56	0.26	2.77	0.00	0.48	0.01	0.49	0.13	0.01	0.13	442
Threshold	10.00	10.00					15.00			10.00	
Exceed Threshold?	No	No					No			No	

Notes: ROG = reactive organic gases; NOx = nitrogen oxides; CO = carbon monoxide; SO2 = sulfur dioxide; PM10 = particulate matter equal or less than 10 micrometers in diameter; PM2.5 = particulate matter equal or less than 2.5 micrometers in diameter

Average Daily Operational Emissions										
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Total Emissions (tons)	0.60	0.28	2.86	0.00	0.50	0.01	0.51	0.13	0.01	0.14
Average Daily Emissions (pounds/day)[1]	3.27	1.55	15.67	0.03	2.74	0.03	2.77	0.73	0.03	0.76
Existing Average Daily Emissions	0.22	0.10	0.51	0.00	0.08	0.00	0.08	0.02	0.00	0.03
Net Average Daily Emissions	3.05	1.45	15.16	0.02	2.66	0.03	2.68	0.71	0.03	0.74
Threshold	54	54					82			54
Exceed Threshold?	No	No					No			No

Start Date	6/1/2022
End Date	8/10/2023
Total Days of Construction	374
lb/ton	2000

Operational Greenhouse Gas Emissions	
Year	MT CO2e
Proposed Project	469
Existing	27
Net GHG Emissions	442
Amortized Construction GHG Emissions	15
Total GHG Emissions	457
Service Population (Pop + Emp)	159
Emissions Per SP (MT CO_2e/SP)	2.87
Threshold (MT CO_2e/SP)	2.88

Existing Average Daily Operational Emissions										
	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Area	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.01	0.01	0.09	0.00	0.01	0.00	0.02	0.00	0.00	0.00
Total Emissions (tons)	0.04	0.02	0.09	0.00	0.01	0.00	0.02	0.00	0.00	0.00
Average Daily Emissions (pounds/day)[1]	0.22	0.10	0.51	0.00	0.08	0.00	0.08	0.02	0.00	0.03

231 Grant Educator Workforce Housing - Energy Consumption Summary

Project: Energy Consumption Summary			
Phase	Energy Requirement	Unit	Annual Energy Consumption (MMBtu)
Construction[1] (amortized over project lifetime)			
Diesel	1,395	Gallons/yr	193
Gasoline	451	Gallons/yr	56
		Subtotal	*249*
Building Operations[2]			
Electrical	941,420	KWh/yr	3,212
		Subtotal	*3,212*
Operational Transportation[3]			
Electricity	1,941	KWh/yr	7
Diesel	588	Gallons/yr	81
Gasoline	60,686	Gallons/yr	7,586
		Subtotal	*7,674*
		Total	*11,135*

Notes:
Totals do not add due to rounding.
Source: Modeled by AECOM in 2021

Notes:
1. Construction estimates are based on conversion for CO_2 emissions estimates from CalEEMod to fuel consumption for diesel and gasoline-powered vehicles using U.S. Energy Information Administration 2016 factors.
2. Building operation energy consumption is based on estimated electricity demand from CalEEMod. The analysis conservatively does not include the renewable energy generated via the rooftop solar panels.
3. Operational transportation fuel consumption reflects CalEEMod VMT estimate, which incorporates trip generation data provided by AECOM TIA for the Project and the fleet mix for Santa Clara County.

Existing Land Uses: Energy Consumption Summary			
Phase	Energy Requirement	Unit	Annual Energy Consumption (MMBtu)
Construction *(Not applicable)*			
Diesel	-	Gallons/yr	-
Gasoline	-	Gallons/yr	-
		Subtotal	-
Building Operations[1]			
Electrical	139,876	KWh/yr	477
Natural Gas	135,728	kBTU/yr	136
		Subtotal	*613*
Operational Transportation[2]			
Electricity	40	KWh/yr	0.1
Diesel	12	Gallons/yr	2
Gasoline	1,258	Gallons/yr	157
		Subtotal	*159*
		Total	*772*

Notes:
Totals do not add due to rounding.
Source: Modeled by AECOM in 2021

Notes:
1. Building operation energy consumption is based on estimated electricity and natural gas demand from CalEEMod using historical default energy rates for projects built to 2005 energy standards. This is conservative as the project was built prior to 2005.
2. Operational transportation fuel consumption reflects CalEEMod VMT estimate, which incorporates trip generation data provided by AECOM TIA for the Project and the fleet mix for Santa Clara County.

Conversion Factors		
Category	Amount	Units
Diesel (heat content)	5.8	MMBtu/barrel
Motor Gasoline	5.25	MMBtu/barrel
Btu per kWh	3,412	Btu/kWh
Gallons per Barrel	42	gallons/barrel

https://www.theclimateregistry.org/wp-content/uploads/2020/04/The-Climate-Registry-2020-Default-Emission-Factor-Document.pdf

231 Grant Educator Workforce Housing - Project Construction-Related Energy Consumption

231 Grant Educator Workforce Housing: Fuel Consumption, Total and Amortized over 30 Years				
Source	MT CO_2 [a]	Fuel Type	Factor ($MT\ CO_2$/gallon) [b]	Gallons
Offroad Equipment	299	Diesel	0.01016	29,395
Hauling	104	Diesel	0.01016	10,220
Vendor	23	Diesel	0.01016	2,223
Worker	120	Gas	0.00889	13,530
Total Gallons			Diesel	41,838
			Gasoline	13,530
Amortized Demands (over 30 years)			Diesel	1,395
			Gasoline	451
Notes:				

Sources:
[a] Modeled by AECOM in 2021;
[b] U.S. Energy Information Administration 2016 (https://www.eia.gov/environment/emissions/co2_vol_mass.php)

Amortization period (yrs): 30

Factor	MT/gallon
Diesel	1.02E-02
Gasoline	8.89E-03

Construction Activities by Phase	Year	Source	MT CO2
Demo/Site Clearing	2022	Offroad	13.7005
		Hauling	18.882
		Vendor	0
		Worker	1.2229
Grading and Excavation	2022	Offroad	51.31
		Hauling	62.9399
		Vendor	0
		Worker	2.3518
Underground Utilities	2022	Offroad	9.4771
		Hauling	0
		Vendor	0
		Worker	2.3518
Ground Floor Concrete Work	2022	Offroad	94.1954
		Hauling	0
		Vendor	22.5873
		Worker	22.7649
Modular Placement Framing and Connections	2022	Offroad	17.9999
		Hauling	13.0799
		Vendor	0
		Worker	7.3375
Modular Placement Framing and Connections	2023	Offroad	12.9229
		Hauling	8.932
		Vendor	0
		Worker	5.1354
Architectural Coatings	2023	Offroad	93.1615
		Hauling	0
		Vendor	0
		Worker	79.0791
Paving	2023	Offroad	5.8862
		Hauling	0
		Vendor	0
		Worker	0

Project Operational Transportation Energy Consumption

Source: EMFAC2021 (v1.0.1) Emissions Inventory
Region Type: County
Region: Santa Clara
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	% VMT	Fuel Consumption	Fuel Consumption / Mile	EVMT	Energy Consumption	Energy Consumption / Mile
Santa Clara	2023	HHDT	Aggregate	Aggregate	Gasoline	3.454009	114.3093	0.00%	0.031050824	0.272	0	0	
Santa Clara	2023	HHDT	Aggregate	Aggregate	Diesel	8235.059	991289	2.14%	171.6488481	0.173	0	0	
Santa Clara	2023	HHDT	Aggregate	Aggregate	Electricity	6.70171	411.5054	0.00%	0	0.000	411.5053623	754.9232545	1.835
Santa Clara	2023	HHDT	Aggregate	Aggregate	Natural Gas	753.7366	53295.97	0.12%	10.5173842	0.197	0	0	
Santa Clara	2023	LDA	Aggregate	Aggregate	Gasoline	601938.3	22370251	48.37%	758.1523908	0.034	0	0	
Santa Clara	2023	LDA	Aggregate	Aggregate	Diesel	1871.125	56220.8	0.12%	1.29892798	0.023	0	0	
Santa Clara	2023	LDA	Aggregate	Aggregate	Electricity	53751.15	2268185	4.90%	0	0.000	2268185.318	875706.7364	0.386
Santa Clara	2023	LDA	Aggregate	Aggregate	Plug-in Hybrid	15805.32	700610.9	1.51%	12.06393978	0.017	343961.2598	103886.5521	0.302
Santa Clara	2023	LDT1	Aggregate	Aggregate	Gasoline	53782.25	1744480	3.77%	70.12001518	0.040	0	0	
Santa Clara	2023	LDT1	Aggregate	Aggregate	Diesel	26.04714	391.8698	0.00%	0.016037369	0.041	0	0	
Santa Clara	2023	LDT1	Aggregate	Aggregate	Electricity	194.8941	7068.184	0.02%	0	0.000	7068.184366	2728.902534	0.386
Santa Clara	2023	LDT1	Aggregate	Aggregate	Plug-in Hybrid	43.27677	2048.369	0.00%	0.03210507	0.016	1104.211319	333.5047292	0.302
Santa Clara	2023	LDT2	Aggregate	Aggregate	Gasoline	280180.4	10140967	21.93%	427.6416304	0.042	0	0	
Santa Clara	2023	LDT2	Aggregate	Aggregate	Diesel	978.4967	36936.87	0.08%	1.148123535	0.031	0	0	
Santa Clara	2023	LDT2	Aggregate	Aggregate	Electricity	1105.879	38931.7	0.08%	0	0.000	38931.70292	15030.85053	0.386
Santa Clara	2023	LDT2	Aggregate	Aggregate	Plug-in Hybrid	1696.55	77270.66	0.17%	1.268124945	0.016	40127.97918	12119.84572	0.302
Santa Clara	2023	LHDT1	Aggregate	Aggregate	Gasoline	19180.96	711085.5	1.54%	74.66781372	0.105	0	0	
Santa Clara	2023	LHDT1	Aggregate	Aggregate	Diesel	9807.465	384084.8	0.83%	24.16048678	0.063	0	0	
Santa Clara	2023	LHDT2	Aggregate	Aggregate	Gasoline	2494.382	90793.04	0.20%	10.67729528	0.118	0	0	
Santa Clara	2023	LHDT2	Aggregate	Aggregate	Diesel	4479.532	176769.2	0.38%	13.40074061	0.076	0	0	
Santa Clara	2023	MCY	Aggregate	Aggregate	Gasoline	27894.5	164894.5	0.36%	3.930936692	0.024	0	0	
Santa Clara	2023	MDV	Aggregate	Aggregate	Gasoline	153799.1	5358084	11.59%	274.4637038	0.051	0	0	
Santa Clara	2023	MDV	Aggregate	Aggregate	Diesel	2374.918	86834.44	0.19%	3.53404257	0.041	0	0	
Santa Clara	2023	MDV	Aggregate	Aggregate	Electricity	1130.115	40073.7	0.09%	0	0.000	40073.70084	15471.75599	0.386
Santa Clara	2023	MDV	Aggregate	Aggregate	Plug-in Hybrid	986.0895	41899.14	0.09%	0.720324533	0.017	21111.78799	6376.389206	0.302
Santa Clara	2023	MH	Aggregate	Aggregate	Gasoline	2522.745	22546.87	0.05%	5.106865714	0.226	0	0	
Santa Clara	2023	MH	Aggregate	Aggregate	Diesel	959.1578	9344.849	0.02%	0.995112486	0.106	0	0	
Santa Clara	2023	MHDT	Aggregate	Aggregate	Gasoline	1418.703	70785.86	0.15%	14.99216178	0.212	0	0	
Santa Clara	2023	MHDT	Aggregate	Aggregate	Diesel	10273.55	431550.4	0.93%	51.22495678	0.119	0	0	
Santa Clara	2023	MHDT	Aggregate	Aggregate	Electricity	4.749835	101.8022	0.00%	0	0.000	101.802183	108.6850176	1.068
Santa Clara	2023	MHDT	Aggregate	Aggregate	Natural Gas	83.841	4047.874	0.01%	0.566845061	0.140	0	0	
Santa Clara	2023	OBUS	Aggregate	Aggregate	Gasoline	458.8974	20830.08	0.05%	4.374109066	0.210	0	0	
Santa Clara	2023	OBUS	Aggregate	Aggregate	Diesel	870.4209	61645.66	0.13%	7.918344692	0.128	0	0	
Santa Clara	2023	OBUS	Aggregate	Aggregate	Natural Gas	6.1456	409.5466	0.00%	0.054019102	0.132	0	0	
Santa Clara	2023	SBUS	Aggregate	Aggregate	Gasoline	166.9867	8309.308	0.02%	0.842317687	0.101	0	0	
Santa Clara	2023	SBUS	Aggregate	Aggregate	Diesel	667.1185	15392.68	0.03%	1.88782318	0.123	0	0	
Santa Clara	2023	SBUS	Aggregate	Aggregate	Electricity	0.302373	3.510494	0.00%	0	0.000	3.510494287	3.69814983	1.053
Santa Clara	2023	SBUS	Aggregate	Aggregate	Natural Gas	23.50762	595.8705	0.00%	0.108660666	0.182	0	0	
Santa Clara	2023	UBUS	Aggregate	Aggregate	Gasoline	45.94709	4798.244	0.01%	0.51741281	0.108	0	0	
Santa Clara	2023	UBUS	Aggregate	Aggregate	Diesel	436.6681	48829.71	0.11%	5.293673869	0.108	0	0	
Santa Clara	2023	UBUS	Aggregate	Aggregate	Electricity	5.046757	199.0027	0.00%	0	0.000	199.0027319	346.910342	1.743
Santa Clara	2023	UBUS	Aggregate	Aggregate	Natural Gas	42.26114	4829.673	0.01%	0.799417876	0.166	0	0	
								100.00%					

Total Annual VMT: 1,937,342

% VMT by Fuel:	
Diesel	5%
Gasoline	88%
Natural Gas	0%
Electricity	5%
Plug-in Hybrid	2%
	100.00%

Weighted Average Fuel Consumption:		Unit
Diesel	0.006109063	gal/mi
Gasoline	0.035580906	gal/mi
Natural Gas	0.000260477	gal/mi
Electricity	0.019680158	kWh/mi
Plug-in Hybrid	0.000304548	gal/mi

Fuel/Energy Use by Type		Unit
Diesel	588.42	gal/year
Gasoline	60,675.99	gal/year
Natural Gas	0.69	gal/year
Electricity	1,941.49	kWh/year
Plug-in Hybrid	10.48	gal/year

*Note that natural gas consumption is negligible an not accounted for in summary tab. Plug-in Hybrid is summed with Gasoline in Summary Tab.
Total Annual VMT is based on CalEEMod VMT estimate.

Note that grey highlighted columns indicated calculations using EMFAC data, not data output from EMFAC.

231 Grant Educator Workforce Housing - Alternative 1: Energy Consumption Summary

Alt 1: Energy Consumption Summary			
Phase	Energy Requirement	Unit	Annual Energy Consumption (MMBtu)
Construction[1] (amortized over project lifetime)			
Diesel	1,232	Gallons/yr	170
Gasoline	614	Gallons/yr	77
		Subtotal	*247*
Building Operations[2]			
Electrical	941,420	KWh/yr	3,212
		Subtotal	*3,212*
Operational Transportation[3]			
Electricity	1,941	KWh/yr	7
Diesel	588	Gallons/yr	81
Gasoline	60,686	Gallons/yr	7,586
		Subtotal	*7,674*
		Total	*11,133*

Notes:
Totals do not add due to rounding.
Source: Modeled by AECOM in 2021

Notes:
1. Construction estimates are based on conversion for CO_2 emissions estimates from CalEEMod to fuel consumption for diesel and gasoline-powered vehicles using U.S. Energy Information Administration 2016 factors.
2. Building operation energy consumption is based on estimated electricity demand from CalEEMod. The analysis conservatively does not include the renewable energy generated via the rooftop solar panels.
3. Operational transportation fuel consumption reflects CalEEMod VMT estimate, which incorporates trip generation data provided by AECOM TIA for the Project and the fleet mix for Santa Clara County.

Conversion Factors		
Category	Amount	Units
Diesel (heat content)	5.8	MMBtu/barrel
Motor Gasoline	5.25	MMBtu/barrel
Btu per kWh	3,412	Btu/kWh
Gallons per Barrel	42	gallons/barrel

https://www.theclimateregistry.org/wp-content/uploads/2020/04/The-Climate-Registry-2020-Default-Emission-Factor-Document.pdf

231 Grant Educator Workforce Housing - Alternative 1: Construction-Related Energy Consumption

231 Grant Educator Workforce Housing Alternative 1: Fuel Consumption, Total and Amortized over 30 Years				
Source	MT CO_2 [a]	Fuel Type	Factor (MT CO_2/gallon) [b]	Gallons
Offroad Equipment	271	Diesel	0.01016	26,688
Hauling	82	Diesel	0.01016	8,053
Vendor	23	Diesel	0.01016	2,223
Worker	164	Gas	0.00889	18,415
		Total Gallons	Diesel	36,965
			Gasoline	18,415
		Amortized Demands (over 30 years)	Diesel	1,232
			Gasoline	614
Notes:				

Sources:
[a] Modeled by AECOM in 2021;
[b] U.S. Energy Information Administration 2016 (https://www.eia.gov/environment/emissions/co2_vol_mass.php)

Amortization period (yrs): 30

Factor	MT/gallon
Diesel	1.02E-02
Gasoline	8.89E-03

Construction Activities by Phase	Year	Source	MT CO2
Demo/Site Clearing	2022	Offroad	13.7005
		Hauling	18.882
		Vendor	0
		Worker	1.2229
Grading and Excavation	2022	Offroad	25.1341
		Hauling	62.9399
		Vendor	0
		Worker	2.3518
Underground Utilities	2022	Offroad	9.0861
		Hauling	0
		Vendor	0
		Worker	2.3518
Ground Floor Concrete Work	2022	Offroad	84.1783
		Hauling	0
		Vendor	22.5873
		Worker	22.7649
Traditional Construction Method	2022	Offroad	10.4383
		Hauling	0
		Vendor	0
		Worker	12.2291
Traditional Construction Method	2023	Offroad	15.5235
		Hauling	0
		Vendor	0
		Worker	17.7294
Architectural Coatings	2023	Offroad	107.2059
		Hauling	0
		Vendor	0
		Worker	105.0007
Paving	2023	Offroad	5.8862
		Hauling	0
		Vendor	0
		Worker	0

231 Grant Educator Workforce Housing - Alternative 2: Energy Consumption Summary

Alternative 2: Energy Consumption Summary			
Phase	Energy Requirement	Unit	Annual Energy Consumption (MMBtu)
Construction[1] (amortized over project lifetime)			
Diesel	1,084	Gallons/yr	150
Gasoline	435	Gallons/yr	54
		Subtotal	*204*
Building Operations[2]			
Electrical	549,732	KWh/yr	1,876
		Subtotal	*1,876*
Operational Transportation[3]			
Electricity	1,355	KWh/yr	5
Diesel	411	Gallons/yr	57
Gasoline	42,341	Gallons/yr	5,293
		Subtotal	*5,354*
		Total	*7,434*

Notes:

Totals do not add due to rounding.

Source: Modeled by AECOM in 2021

Notes:

1. Construction estimates are based on conversion for CO_2 emissions estimates from CalEEMod to fuel consumption for diesel and gasoline-powered vehicles using U.S. Energy Information Administration 2016 factors.
2. Building operation energy consumption is based on estimated electricity demand from CalEEMod. The analysis conservatively does not include the renewable energy generated via the rooftop solar panels.
3. Operational transportation fuel consumption reflects CalEEMod VMT estimate, which incorporates trip generation data provided by AECOM TIA for the Project and the fleet mix for Santa Clara County.

Existing Land Uses: Energy Consumption Summary			
Phase	Energy Requirement	Unit	Annual Energy Consumption (MMBtu)
Construction *(Not applicable)*			
Diesel	-	Gallons/yr	-
Gasoline	-	Gallons/yr	-
		Subtotal	-
Building Operations[1]			
Electrical	139,876	KWh/yr	477
Natural Gas	135,728	kBTU/yr	136
		Subtotal	*613*
Operational Transportation[2]			
Electricity	40	KWh/yr	0.1
Diesel	12	Gallons/yr	2
Gasoline	1,258	Gallons/yr	157
		Subtotal	*159*
		Total	*772*

Notes:

Totals do not add due to rounding.

Source: Modeled by AECOM in 2021

Notes:

1. Building operation energy consumption is based on estimated electricity and natural gas demand from CalEEMod using historical default energy rates for projects built to 2005 energy standards. This is conservative as the project was built prior to 2005.
2. Operational transportation fuel consumption reflects CalEEMod VMT estimate, which incorporates trip generation data provided by AECOM TIA for the Project and the fleet mix for Santa Clara County.

Conversion Factors		
Category	Amount	Units
Diesel (heat content)	5.8	MMBtu/barrel
Motor Gasoline	5.25	MMBtu/barrel
Btu per kWh	3,412	Btu/kWh
Gallons per Barrel	42	gallons/barrel

https://www.theclimateregistry.org/wp-content/uploads/2020/04/The-Climate-Registry-2020-Default-Emission-Factor-Document.pdf

231 Grant Educator Workforce Housing - Alternative 2: Construction-Related Energy Consumption

231 Grant Educator Workforce Housing Alternative 2: Fuel Consumption, Total and Amortized over 30 Years				
Source	MT CO_2 [a]	Fuel Type	Factor (MT CO_2/gallon) [b]	Gallons
Offroad Equipment	237	Diesel	0.01016	23,349
Hauling	81	Diesel	0.01016	7,968
Vendor	12	Diesel	0.01016	1,209
Worker	116	Gas	0.00889	13,045
		Total Gallons	Diesel	32,525
			Gasoline	13,045
		Amortized Demands (over 30 years)	Diesel	1,084
			Gasoline	435
Notes:				
Sources: [a] Modeled by AECOM in 2021; [b] U.S. Energy Information Administration 2016 (https://www.eia.gov/environment/emissions/co2_vol_mass.php)				

Amortization period (yrs): 30

Factor	MT/gallon
Diesel	1.02E-02
Gasoline	8.89E-03

Construction Activities by Phase	Year	Source	MT CO2
Demo/Site Clearing	2022	Offroad	13.7005
		Hauling	18.882
		Vendor	0
		Worker	1.2229
Grading and Excavation	2022	Offroad	40.4706
		Hauling	50.3519
		Vendor	0
		Worker	2.3518
Underground Utilities	2022	Offroad	9.8681
		Hauling	0
		Vendor	0
		Worker	2.3518
Ground Floor Concrete Work	2022	Offroad	94.1954
		Hauling	0
		Vendor	12.2791
		Worker	22.7649
Modular Placement Framing and Connect	2022	Offroad	17.9999
		Hauling	10.6754
		Vendor	0
		Worker	7.3375
Modular Placement Framing and Connect	2023	Offroad	1.8461
		Hauling	1.0414
		Vendor	0
		Worker	0.7336
Architectural Coatings	2022	Offroad	2.4088
		Hauling	0
		Vendor	0
		Worker	3.6687
Architectural Coatings	2023	Offroad	50.8529
		Hauling	0
		Vendor	0
		Worker	75.5027
Paving	2023	Offroad	5.8862
		Hauling	0
		Vendor	0
		Worker	0

Alternative 2 Operational Transportation Energy Consumption

Source: EMFAC2021 (v1.0.1) Emissions Inventory
Region Type: County
Region: Santa Clara
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	% VMT	Fuel Consumption	Fuel Consumption / Mile	EVMT	Energy Consumption	Energy Consumption / Mile
Santa Clara	2023	HHDT	Aggregate	Aggregate	Gasoline	3.454009	114.3093	0.00%	0.031050824	0.272	0	0	
Santa Clara	2023	HHDT	Aggregate	Aggregate	Diesel	8235.059	991289	2.14%	171.6488481	0.173	0	0	
Santa Clara	2023	HHDT	Aggregate	Aggregate	Electricity	6.70171	411.5054	0.00%	0	0.000	411.5053623	754.9232545	1.835
Santa Clara	2023	HHDT	Aggregate	Aggregate	Natural Gas	753.7366	53295.97	0.12%	10.5173842	0.197	0	0	
Santa Clara	2023	LDA	Aggregate	Aggregate	Gasoline	601938.3	22370251	48.37%	758.1523908	0.034	0	0	
Santa Clara	2023	LDA	Aggregate	Aggregate	Diesel	1871.125	56220.8	0.12%	1.29892798	0.023	0	0	
Santa Clara	2023	LDA	Aggregate	Aggregate	Electricity	53751.15	2268185	4.90%	0	0.000	2268185.318	875706.7364	0.386
Santa Clara	2023	LDA	Aggregate	Aggregate	Plug-in Hybrid	15805.32	700610.9	1.51%	12.06393978	0.017	343961.2598	103886.5521	0.302
Santa Clara	2023	LDT1	Aggregate	Aggregate	Gasoline	53782.25	1744480	3.77%	70.12001518	0.040	0	0	
Santa Clara	2023	LDT1	Aggregate	Aggregate	Diesel	26.04714	391.8698	0.00%	0.016037369	0.041	0	0	
Santa Clara	2023	LDT1	Aggregate	Aggregate	Electricity	194.8941	7068.184	0.02%	0	0.000	7068.184366	2728.902534	0.386
Santa Clara	2023	LDT1	Aggregate	Aggregate	Plug-in Hybrid	43.27677	2048.369	0.00%	0.03210507	0.016	1104.211319	333.5047292	0.302
Santa Clara	2023	LDT2	Aggregate	Aggregate	Gasoline	280180.4	10140967	21.93%	427.6416304	0.042	0	0	
Santa Clara	2023	LDT2	Aggregate	Aggregate	Diesel	978.4967	36936.87	0.08%	1.148123535	0.031	0	0	
Santa Clara	2023	LDT2	Aggregate	Aggregate	Electricity	1105.879	38931.7	0.08%	0	0.000	38931.70292	15030.85053	0.386
Santa Clara	2023	LDT2	Aggregate	Aggregate	Plug-in Hybrid	1696.55	77270.66	0.17%	1.268124945	0.016	40127.97918	12119.84572	0.302
Santa Clara	2023	LHDT1	Aggregate	Aggregate	Gasoline	19180.96	711085.5	1.54%	74.66781372	0.105	0	0	
Santa Clara	2023	LHDT1	Aggregate	Aggregate	Diesel	9807.465	384084.8	0.83%	24.16048678	0.063	0	0	
Santa Clara	2023	LHDT2	Aggregate	Aggregate	Gasoline	2494.382	90793.04	0.20%	10.67729528	0.118	0	0	
Santa Clara	2023	LHDT2	Aggregate	Aggregate	Diesel	4479.532	176769.2	0.38%	13.40074061	0.076	0	0	
Santa Clara	2023	MCY	Aggregate	Aggregate	Gasoline	27894.5	164894.5	0.36%	3.930936692	0.024	0	0	
Santa Clara	2023	MDV	Aggregate	Aggregate	Gasoline	153799.1	5358084	11.59%	274.4637038	0.051	0	0	
Santa Clara	2023	MDV	Aggregate	Aggregate	Diesel	2374.918	86834.44	0.19%	3.53404257	0.041	0	0	
Santa Clara	2023	MDV	Aggregate	Aggregate	Electricity	1130.115	40073.7	0.09%	0	0.000	40073.70084	15471.75599	0.386
Santa Clara	2023	MDV	Aggregate	Aggregate	Plug-in Hybrid	986.0895	41899.14	0.09%	0.720324533	0.017	21111.78799	6376.389206	0.302
Santa Clara	2023	MH	Aggregate	Aggregate	Gasoline	2522.745	22546.87	0.05%	5.106865714	0.226	0	0	
Santa Clara	2023	MH	Aggregate	Aggregate	Diesel	959.1578	9344.849	0.02%	0.995112486	0.106	0	0	
Santa Clara	2023	MHDT	Aggregate	Aggregate	Gasoline	1418.703	70785.86	0.15%	14.99216178	0.212	0	0	
Santa Clara	2023	MHDT	Aggregate	Aggregate	Diesel	10273.55	431550.4	0.93%	51.22495678	0.119	0	0	
Santa Clara	2023	MHDT	Aggregate	Aggregate	Electricity	4.749835	101.8022	0.00%	0	0.000	101.802183	108.6850176	1.068
Santa Clara	2023	MHDT	Aggregate	Aggregate	Natural Gas	83.841	4047.874	0.01%	0.566845061	0.140	0	0	
Santa Clara	2023	OBUS	Aggregate	Aggregate	Gasoline	458.8974	20830.08	0.05%	4.374109066	0.210	0	0	
Santa Clara	2023	OBUS	Aggregate	Aggregate	Diesel	870.4209	61645.66	0.13%	7.918344692	0.128	0	0	
Santa Clara	2023	OBUS	Aggregate	Aggregate	Natural Gas	6.1456	409.5466	0.00%	0.054019102	0.132	0	0	
Santa Clara	2023	SBUS	Aggregate	Aggregate	Gasoline	166.9867	8309.308	0.02%	0.842317687	0.101	0	0	
Santa Clara	2023	SBUS	Aggregate	Aggregate	Diesel	667.1185	15392.68	0.03%	1.88782318	0.123	0	0	
Santa Clara	2023	SBUS	Aggregate	Aggregate	Electricity	0.302373	3.510494	0.00%	0	0.000	3.510494287	3.69814983	1.053
Santa Clara	2023	SBUS	Aggregate	Aggregate	Natural Gas	23.50762	595.8705	0.00%	0.108660666	0.182	0	0	
Santa Clara	2023	UBUS	Aggregate	Aggregate	Gasoline	45.94709	4798.244	0.01%	0.51741281	0.108	0	0	
Santa Clara	2023	UBUS	Aggregate	Aggregate	Diesel	436.6681	48829.71	0.11%	5.293673869	0.108	0	0	
Santa Clara	2023	UBUS	Aggregate	Aggregate	Electricity	5.046757	199.0027	0.00%	0	0.000	199.0027319	346.910342	1.743
Santa Clara	2023	UBUS	Aggregate	Aggregate	Natural Gas	42.26114	4829.673	0.01%	0.799417876	0.166	0	0	
								100.00%					

Total Annual VMT: 1,351,692

% VMT by Fuel:	
Diesel	5%
Gasoline	88%
Natural Gas	0%
Electricity	5%
Plug-in Hybrid	2%
	100.00%

Weighted Average Fuel Consumption:		Unit
Diesel	0.006109063	gal/mi
Gasoline	0.035580906	gal/mi
Natural Gas	0.000260477	gal/mi
Electricity	0.019680158	kWh/mi
Plug-in Hybrid	0.000304548	gal/mi

Fuel/Energy Use by Type		Unit
Diesel	410.54	gal/year
Gasoline	42,333.91	gal/year
Natural Gas	0.48	gal/year
Electricity	1,354.59	kWh/year
Plug-in Hybrid	7.32	gal/year

*Note that natural gas consumption is negligible an not accounted for in summary tab. Plug-in Hybrid is summed with Gasoline in Summary Tab.
Total Annual VMT is based on CalEEMod VMT estimate.

Note that grey highlighted columns indicated calculations using EMFAC data, not data output from EMFAC.

Existing Operational Transportation Energy Consumption

Source: EMFAC2021 (v1.0.1) Emissions Inventory
Region Type: County
Region: Santa Clara
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	% VMT	Fuel Consumption	Fuel Consumption / Mile	EVMT	Energy Consumption	Energy Consumption/Mile
Santa Clara	2023	HHDT	Aggregate	Aggregate	Gasoline	3.454009	114.3093	0.00%	0.031050824	0.272	0	0	
Santa Clara	2023	HHDT	Aggregate	Aggregate	Diesel	8235.059	991289	2.14%	171.6488481	0.173	0	0	
Santa Clara	2023	HHDT	Aggregate	Aggregate	Electricity	6.70171	411.5054	0.00%	0	0.000	411.5053623	754.9232545	1.835
Santa Clara	2023	HHDT	Aggregate	Aggregate	Natural Gas	753.7366	53295.97	0.12%	10.5173842	0.197	0	0	
Santa Clara	2023	LDA	Aggregate	Aggregate	Gasoline	601938.3	22370251	48.37%	758.1523908	0.034	0	0	
Santa Clara	2023	LDA	Aggregate	Aggregate	Diesel	1871.125	56220.8	0.12%	1.29892798	0.023	0	0	
Santa Clara	2023	LDA	Aggregate	Aggregate	Electricity	53751.15	2268185	4.90%	0	0.000	2268185.318	875706.7364	0.386
Santa Clara	2023	LDA	Aggregate	Aggregate	Plug-in Hybrid	15805.32	700610.9	1.51%	12.06393978	0.017	343961.2598	103886.5521	0.302
Santa Clara	2023	LDT1	Aggregate	Aggregate	Gasoline	53782.25	1744480	3.77%	70.12001518	0.040	0	0	
Santa Clara	2023	LDT1	Aggregate	Aggregate	Diesel	26.04714	391.8698	0.00%	0.016037369	0.041	0	0	
Santa Clara	2023	LDT1	Aggregate	Aggregate	Electricity	194.8941	7068.184	0.02%	0	0.000	7068.184366	2728.902534	0.386
Santa Clara	2023	LDT1	Aggregate	Aggregate	Plug-in Hybrid	43.27677	2048.369	0.00%	0.03210507	0.016	1104.211319	333.5047292	0.302
Santa Clara	2023	LDT2	Aggregate	Aggregate	Gasoline	280180.4	10140967	21.93%	427.6416304	0.042	0	0	
Santa Clara	2023	LDT2	Aggregate	Aggregate	Diesel	978.4967	36936.87	0.08%	1.148123535	0.031	0	0	
Santa Clara	2023	LDT2	Aggregate	Aggregate	Electricity	1105.879	38931.7	0.08%	0	0.000	38931.70292	15030.85053	0.386
Santa Clara	2023	LDT2	Aggregate	Aggregate	Plug-in Hybrid	1696.55	77270.66	0.17%	1.268124945	0.016	40127.97918	12119.84572	0.302
Santa Clara	2023	LHDT1	Aggregate	Aggregate	Gasoline	19180.96	711085.5	1.54%	74.66781372	0.105	0	0	
Santa Clara	2023	LHDT1	Aggregate	Aggregate	Diesel	9807.465	384084.8	0.83%	24.16048678	0.063	0	0	
Santa Clara	2023	LHDT2	Aggregate	Aggregate	Gasoline	2494.382	90793.04	0.20%	10.67729528	0.118	0	0	
Santa Clara	2023	LHDT2	Aggregate	Aggregate	Diesel	4479.532	176769.2	0.38%	13.40074061	0.076	0	0	
Santa Clara	2023	MCY	Aggregate	Aggregate	Gasoline	27894.5	164894.5	0.36%	3.930936692	0.024	0	0	
Santa Clara	2023	MDV	Aggregate	Aggregate	Gasoline	153799.1	5358084	11.59%	274.4637038	0.051	0	0	
Santa Clara	2023	MDV	Aggregate	Aggregate	Diesel	2374.918	86834.44	0.19%	3.53404257	0.041	0	0	
Santa Clara	2023	MDV	Aggregate	Aggregate	Electricity	1130.115	40073.7	0.09%	0	0.000	40073.70084	15471.75599	0.386
Santa Clara	2023	MDV	Aggregate	Aggregate	Plug-in Hybrid	986.0895	41899.14	0.09%	0.720324533	0.017	21111.78799	6376.389206	0.302
Santa Clara	2023	MH	Aggregate	Aggregate	Gasoline	2522.745	22546.87	0.05%	5.106865714	0.226	0	0	
Santa Clara	2023	MH	Aggregate	Aggregate	Diesel	959.1578	9344.849	0.02%	0.995112486	0.106	0	0	
Santa Clara	2023	MHDT	Aggregate	Aggregate	Gasoline	1418.703	70785.86	0.15%	14.99216178	0.212	0	0	
Santa Clara	2023	MHDT	Aggregate	Aggregate	Diesel	10273.55	431550.4	0.93%	51.22495678	0.119	0	0	
Santa Clara	2023	MHDT	Aggregate	Aggregate	Electricity	4.749835	101.8022	0.00%	0	0.000	101.802183	108.6850176	1.068
Santa Clara	2023	MHDT	Aggregate	Aggregate	Natural Gas	83.841	4047.874	0.01%	0.566845061	0.140	0	0	
Santa Clara	2023	OBUS	Aggregate	Aggregate	Gasoline	458.8974	20830.08	0.05%	4.374109066	0.210	0	0	
Santa Clara	2023	OBUS	Aggregate	Aggregate	Diesel	870.4209	61645.66	0.13%	7.918344692	0.128	0	0	
Santa Clara	2023	OBUS	Aggregate	Aggregate	Natural Gas	6.1456	409.5466	0.00%	0.054019102	0.132	0	0	
Santa Clara	2023	SBUS	Aggregate	Aggregate	Gasoline	166.9867	8309.308	0.02%	0.842317687	0.101	0	0	
Santa Clara	2023	SBUS	Aggregate	Aggregate	Diesel	667.1185	15392.68	0.03%	1.88782318	0.123	0	0	
Santa Clara	2023	SBUS	Aggregate	Aggregate	Electricity	0.302373	3.510494	0.00%	0	0.000	3.510494287	3.69814983	1.053
Santa Clara	2023	SBUS	Aggregate	Aggregate	Natural Gas	23.50762	595.8705	0.00%	0.108660666	0.182	0	0	
Santa Clara	2023	UBUS	Aggregate	Aggregate	Gasoline	45.94709	4798.244	0.01%	0.51741281	0.108	0	0	
Santa Clara	2023	UBUS	Aggregate	Aggregate	Diesel	436.6681	48829.71	0.11%	5.293673869	0.108	0	0	
Santa Clara	2023	UBUS	Aggregate	Aggregate	Electricity	5.046757	199.0027	0.00%	0	0.000	199.0027319	346.910342	1.743
Santa Clara	2023	UBUS	Aggregate	Aggregate	Natural Gas	42.26114	4829.673	0.01%	0.799417876	0.166	0	0	
								100.00%					

Total Annual VMT: 40,148

% VMT by Fuel:	
Diesel	5%
Gasoline	88%
Natural Gas	0%
Electricity	5%
Plug-in Hybrid	2%
	100.00%

Weighted Average Fuel Consumption:		Unit
Diesel	0.006109063	gal/mi
Gasoline	0.035580906	gal/mi
Natural Gas	0.000260477	gal/mi
Electricity	0.019680158	kWh/mi
Plug-in Hybrid	0.000304548	gal/mi

Fuel/Energy Use by Type		Unit
Diesel	12.19	gal/year
Gasoline	1,257.40	gal/year
Natural Gas	0.01	gal/year
Electricity	40.23	kWh/year
Plug-in Hybrid	0.22	gal/year

*Note that natural gas consumption is negligible an not accounted for in summary tab. Plug-in Hybrid is summed with Gasoline in Summary Tab.
Total Annual VMT is based on CalEEMod VMT estimate.

Note that grey highlighted columns indicated calculations using EMFAC data, not data output from EMFAC.

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

231 Grant Educator Workforce Housing

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	112.00	Space	0.00	21,088.00	0
Other Non-Asphalt Surfaces	16.60	1000sqft	0.38	16,600.00	0
Fast Food Restaurant w/o Drive Thru	1.10	1000sqft	0.03	1,100.00	0
Apartments Mid Rise	110.00	Dwelling Unit	0.99	92,812.00	273

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
Utility Company	City of Palo Alto Utilities Department				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Land uses based on applicant provided information. Square footage for residential land use includes community spaces/leasing office/etc. Parking garage acreage included withing total acreage for the site of 1.4 acres. Fast food restaurant w/out drive thru to represent flex space.

Construction Phase - Based on project specific info and assumes a 2-week overlap between each phase.

Off-road Equipment - Default equipment for demolition.

Off-road Equipment - Project specific information.

Off-road Equipment - Project specific information.

Off-road Equipment - Project specific information.

Off-road Equipment - Project specific information.

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

Off-road Equipment - Project specific information.

Off-road Equipment - Default equipment for paving.

Grading - Approximately 10,000 CY of material export.

Demolition - Demolition of existing 6,800 sq. ft. building.

Trips and VMT - Based on estimated average daily workers per phase. Project specific haul truck trips during demolition and grading. Haul trucks during modular placement assumes modular delivery from Vallejo.

Vehicle Trips - Adjusted residential trip rates to account for 9% reduction consistent with TIA due to VTA's guidelines for TOD housing.

Woodstoves - Assumes no woodstoves or wood-burning fireplaces per Reg 6, Rule 3.

Energy Use - Includes project design feature of all electric building (no natural gas infrastructure).

Construction Off-road Equipment Mitigation - Assumes implementation of BAAQMD BMPs for fugitive dust mitigation.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	199.00
tblConstructionPhase	NumDays	200.00	121.00
tblConstructionPhase	NumDays	200.00	67.00
tblConstructionPhase	NumDays	20.00	13.00
tblConstructionPhase	NumDays	4.00	25.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	NT24E	3,054.10	4,058.24
tblEnergyUse	NT24E	22.30	69.24
tblEnergyUse	NT24NG	3,155.00	0.00
tblEnergyUse	NT24NG	147.47	0.00
tblEnergyUse	T24E	70.89	1,734.38
tblEnergyUse	T24E	4.52	23.55

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

tblEnergyUse	T24NG	5,226.68	0.00
tblEnergyUse	T24NG	59.80	0.00
tblFireplaces	NumberGas	16.50	35.20
tblFireplaces	NumberWood	18.70	0.00
tblGrading	AcresOfGrading	0.00	4.00
tblGrading	MaterialExported	0.00	10,000.00
tblLandUse	LandUseSquareFeet	44,800.00	21,088.00
tblLandUse	LandUseSquareFeet	110,000.00	92,812.00
tblLandUse	LotAcreage	1.01	0.00
tblLandUse	LotAcreage	2.89	0.99
tblLandUse	Population	315.00	273.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

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

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Ground Floor Concrete Work
tblOffRoadEquipment	PhaseName		Modular Placement Framing and Connect
tblOffRoadEquipment	PhaseName		Architectural Coating
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Architectural Coating
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Underground Utilities
tblOffRoadEquipment	PhaseName		Architectural Coating
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Underground Utilities
tblOffRoadEquipment	PhaseName		Ground Floor Concrete Work
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Ground Floor Concrete Work
tblOffRoadEquipment	PhaseName		Underground Utilities
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00

tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	70.00
tblTripsAndVMT	HaulingTripNumber	31.00	600.00
tblTripsAndVMT	HaulingTripNumber	1,250.00	2,000.00
tblTripsAndVMT	HaulingTripNumber	0.00	210.00
tblTripsAndVMT	VendorTripNumber	18.00	0.00
tblTripsAndVMT	WorkerTripNumber	13.00	30.00
tblTripsAndVMT	WorkerTripNumber	33.00	30.00
tblTripsAndVMT	WorkerTripNumber	8.00	30.00
tblTripsAndVMT	WorkerTripNumber	95.00	60.00
tblTripsAndVMT	WorkerTripNumber	95.00	60.00
tblTripsAndVMT	WorkerTripNumber	19.00	130.00
tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblVehicleTrips	ST_TR	4.91	4.47
tblVehicleTrips	SU_TR	4.09	3.72
tblVehicleTrips	WD_TR	5.44	4.95
tblWoodstoves	NumberCatalytic	2.20	0.00
tblWoodstoves	NumberNoncatalytic	2.20	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1385	1.5155	1.4285	3.7200e-003	0.0845	0.0593	0.1437	0.0221	0.0548	0.0769	0.0000	340.2006	340.2006	0.0636	0.0194	347.5752
2023	0.7651	0.7431	0.9424	2.2700e-003	0.1119	0.0299	0.1417	0.0298	0.0275	0.0573	0.0000	205.1171	205.1171	0.0389	3.7300e-003	207.2014
Maximum	**0.7651**	**1.5155**	**1.4285**	**3.7200e-003**	**0.1119**	**0.0593**	**0.1437**	**0.0298**	**0.0548**	**0.0769**	**0.0000**	**340.2006**	**340.2006**	**0.0636**	**0.0194**	**347.5752**

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					
2022	0.1385	1.5155	1.4285	3.7200e-003	0.0811	0.0593	0.1404	0.0216	0.0548	0.0764	0.0000	340.2004	340.2004	0.0636	0.0194	347.5750
2023	0.7651	0.7431	0.9424	2.2700e-003	0.1119	0.0299	0.1417	0.0298	0.0275	0.0573	0.0000	205.1170	205.1170	0.0389	3.7300e-003	207.2013
Maximum	**0.7651**	**1.5155**	**1.4285**	**3.7200e-003**	**0.1119**	**0.0593**	**0.1417**	**0.0298**	**0.0548**	**0.0764**	**0.0000**	**340.2004**	**340.2004**	**0.0636**	**0.0194**	**347.5750**

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	1.69	0.00	1.16	0.87	0.00	0.34	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	6-1-2022	8-31-2022	0.9580	0.9580
2	9-1-2022	11-30-2022	0.5478	0.5478
3	12-1-2022	2-28-2023	0.4940	0.4940
4	3-1-2023	5-31-2023	0.5375	0.5375
5	6-1-2023	8-31-2023	0.5485	0.5485
6	9-1-2023	9-30-2023	0.0615	0.0615
		Highest	0.9580	0.9580

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	0.4611	0.0132	0.8198	7.0000e-005		4.8300e-003	4.8300e-003		4.8300e-003	4.8300e-003	0.0000	5.7308	5.7308	1.3700e-003	8.0000e-005	5.7892
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.3749	0.3937	3.3830	6.7000e-003	0.7159	4.8900e-003	0.7208	0.1911	4.5500e-003	0.1957	0.0000	624.1717	624.1717	0.0434	0.0308	634.4188
Waste						0.0000	0.0000		0.0000	0.0000	12.8432	0.0000	12.8432	0.7590	0.0000	31.8186
Water						0.0000	0.0000		0.0000	0.0000	2.3797	0.0000	2.3797	0.2444	5.7700e-003	10.2098
Total	**0.8360**	**0.4069**	**4.2027**	**6.7700e-003**	**0.7159**	**9.7200e-003**	**0.7257**	**0.1911**	**9.3800e-003**	**0.2005**	**15.2229**	**629.9025**	**645.1254**	**1.0482**	**0.0366**	**682.2363**

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	0.4611	0.0132	0.8198	7.0000e-005		4.8300e-003	4.8300e-003		4.8300e-003	4.8300e-003	0.0000	5.7308	5.7308	1.3700e-003	8.0000e-005	5.7892
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.3749	0.3937	3.3830	6.7000e-003	0.7159	4.8900e-003	0.7208	0.1911	4.5500e-003	0.1957	0.0000	624.1717	624.1717	0.0434	0.0308	634.4188
Waste						0.0000	0.0000		0.0000	0.0000	12.8432	0.0000	12.8432	0.7590	0.0000	31.8186
Water						0.0000	0.0000		0.0000	0.0000	2.3797	0.0000	2.3797	0.2444	5.7700e-003	10.2098
Total	**0.8360**	**0.4069**	**4.2027**	**6.7700e-003**	**0.7159**	**9.7200e-003**	**0.7257**	**0.1911**	**9.3800e-003**	**0.2005**	**15.2229**	**629.9025**	**645.1254**	**1.0482**	**0.0366**	**682.2363**

	ROG	NOx	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/Site Clearing	Demolition	6/1/2022	6/15/2022	6	13	
2	Grading and Excavation	Grading	6/16/2022	7/14/2022	6	25	
3	Underground Utilities	Trenching	6/30/2022	7/28/2022	6	25	

4	Ground Floor Concrete Work	Building Construction	7/14/2022	12/1/2022	6	121	
5	Modular Placement Framing and Connect	Building Construction	11/17/2022	2/2/2023	6	67	
6	Architectural Coating	Architectural Coating	1/19/2023	9/7/2023	6	199	
7	Paving	Paving	8/28/2023	9/7/2023	6	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0.38

Residential Indoor: 187,944; Residential Outdoor: 62,648; Non-Residential Indoor: 1,650; Non-Residential Outdoor: 550; Striped Parking Area: 2,261 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition/Site Clearing	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition/Site Clearing	Rubber Tired Dozers	1	8.00	247	0.40
Demolition/Site Clearing	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading and Excavation	Bore/Drill Rigs	1	8.00	221	0.50
Grading and Excavation	Excavators	2	8.00	158	0.38
Grading and Excavation	Graders	0	0.00	187	0.41
Grading and Excavation	Other Construction Equipment	2	8.00	172	0.42
Grading and Excavation	Plate Compactors	3	8.00	8	0.43
Grading and Excavation	Rollers	2	8.00	80	0.38
Grading and Excavation	Rubber Tired Dozers	0	0.00	247	0.40
Grading and Excavation	Skid Steer Loaders	1	8.00	65	0.37
Grading and Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Underground Utilities	Excavators	1	8.00	158	0.38
Underground Utilities	Plate Compactors	1	8.00	8	0.43
Underground Utilities	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Ground Floor Concrete Work	Aerial Lifts	2	8.00	63	0.31

Ground Floor Concrete Work	Cranes	1	8.00	231	0.29
Ground Floor Concrete Work	Forklifts	2	8.00	89	0.20
Ground Floor Concrete Work	Generator Sets	0	0.00	84	0.74
Ground Floor Concrete Work	Plate Compactors	1	8.00	8	0.43
Ground Floor Concrete Work	Skid Steer Loaders	1	8.00	65	0.37
Ground Floor Concrete Work	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Ground Floor Concrete Work	Welders	0	0.00	46	0.45
Modular Placement Framing and Connect	Aerial Lifts	1	8.00	63	0.31
Modular Placement Framing and Connect	Cranes	1	8.00	231	0.29
Modular Placement Framing and Connect	Forklifts	2	8.00	89	0.20
Modular Placement Framing and Connect	Generator Sets	0	0.00	84	0.74
Modular Placement Framing and Connect	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Modular Placement Framing and Connect	Welders	0	0.00	46	0.45
Architectural Coating	Aerial Lifts	2	8.00	63	0.31
Architectural Coating	Air Compressors	0	0.00	78	0.48
Architectural Coating	Cranes	1	8.00	231	0.29
Architectural Coating	Forklifts	1	8.00	89	0.20
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition/Site Clearing	5	30.00	0.00	600.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

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

Grading and Excavation	13	30.00	0.00	2,000.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Underground Utilities	3	30.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Ground Floor Concrete Work	8	60.00	18.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Modular Placement Framing and Connect	4	60.00	0.00	210.00	10.80	7.30	70.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	4	130.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition/Site Clearing - 2022

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					3.3500e-003	0.0000	3.3500e-003	5.1000e-004	0.0000	5.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0110	0.1080	0.0907	1.6000e-004		5.4500e-003	5.4500e-003		5.0900e-003	5.0900e-003	0.0000	13.7005	13.7005	3.4900e-003	0.0000	13.7878
Total	**0.0110**	**0.1080**	**0.0907**	**1.6000e-004**	**3.3500e-003**	**5.4500e-003**	**8.8000e-003**	**5.1000e-004**	**5.0900e-003**	**5.6000e-003**	**0.0000**	**13.7005**	**13.7005**	**3.4900e-003**	**0.0000**	**13.7878**

3.2 Demolition/Site Clearing - 2022

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	1.4200e-003	0.0519	0.0109	1.9000e-004	5.0900e-003	4.7000e-004	5.5600e-003	1.4000e-003	4.5000e-004	1.8500e-003	0.0000	18.8820	18.8820	6.5000e-004	2.9900e-003	19.7899
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.8000e-004	4.7100e-003	1.0000e-005	1.5500e-003	1.0000e-005	1.5500e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.2229	1.2229	4.0000e-005	4.0000e-005	1.2344
Total	**1.9400e-003**	**0.0523**	**0.0156**	**2.0000e-004**	**6.6400e-003**	**4.8000e-004**	**7.1100e-003**	**1.8100e-003**	**4.6000e-004**	**2.2700e-003**	**0.0000**	**20.1049**	**20.1049**	**6.9000e-004**	**3.0300e-003**	**21.0243**

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					1.5100e-003	0.0000	1.5100e-003	2.3000e-004	0.0000	2.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0110	0.1080	0.0907	1.6000e-004		5.4500e-003	5.4500e-003		5.0900e-003	5.0900e-003	0.0000	13.7005	13.7005	3.4900e-003	0.0000	13.7878
Total	**0.0110**	**0.1080**	**0.0907**	**1.6000e-004**	**1.5100e-003**	**5.4500e-003**	**6.9600e-003**	**2.3000e-004**	**5.0900e-003**	**5.3200e-003**	**0.0000**	**13.7005**	**13.7005**	**3.4900e-003**	**0.0000**	**13.7878**

3.2 Demolition/Site Clearing - 2022

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	1.4200e-003	0.0519	0.0109	1.9000e-004	5.0900e-003	4.7000e-004	5.5600e-003	1.4000e-003	4.5000e-004	1.8500e-003	0.0000	18.8820	18.8820	6.5000e-004	2.9900e-003	19.7899
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.8000e-004	4.7100e-003	1.0000e-005	1.5500e-003	1.0000e-005	1.5500e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.2229	1.2229	4.0000e-005	4.0000e-005	1.2344
Total	**1.9400e-003**	**0.0523**	**0.0156**	**2.0000e-004**	**6.6400e-003**	**4.8000e-004**	**7.1100e-003**	**1.8100e-003**	**4.6000e-004**	**2.2700e-003**	**0.0000**	**20.1049**	**20.1049**	**6.9000e-004**	**3.0300e-003**	**21.0243**

3.3 Grading and Excavation - 2022

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					2.6900e-003	0.0000	2.6900e-003	3.1000e-004	0.0000	3.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0279	0.2742	0.3351	5.9000e-004		0.0136	0.0136		0.0125	0.0125	0.0000	51.3100	51.3100	0.0163	0.0000	51.7184
Total	**0.0279**	**0.2742**	**0.3351**	**5.9000e-004**	**2.6900e-003**	**0.0136**	**0.0163**	**3.1000e-004**	**0.0125**	**0.0128**	**0.0000**	**51.3100**	**51.3100**	**0.0163**	**0.0000**	**51.7184**

3.3 Grading and Excavation - 2022

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	4.7300e-003	0.1731	0.0364	6.4000e-004	0.0170	1.5600e-003	0.0185	4.6700e-003	1.4900e-003	6.1600e-003	0.0000	62.9399	62.9399	2.1600e-003	9.9700e-003	65.9665
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**5.7300e-003**	**0.1739**	**0.0454**	**6.7000e-004**	**0.0199**	**1.5800e-003**	**0.0215**	**5.4600e-003**	**1.5000e-003**	**6.9700e-003**	**0.0000**	**65.2917**	**65.2917**	**2.2300e-003**	**0.0100**	**68.3403**

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					1.2100e-003	0.0000	1.2100e-003	1.4000e-004	0.0000	1.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0279	0.2742	0.3351	5.9000e-004		0.0136	0.0136		0.0125	0.0125	0.0000	51.3100	51.3100	0.0163	0.0000	51.7184
Total	**0.0279**	**0.2742**	**0.3351**	**5.9000e-004**	**1.2100e-003**	**0.0136**	**0.0148**	**1.4000e-004**	**0.0125**	**0.0127**	**0.0000**	**51.3100**	**51.3100**	**0.0163**	**0.0000**	**51.7184**

3.3 Grading and Excavation - 2022

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	4.7300e-003	0.1731	0.0364	6.4000e-004	0.0170	1.5600e-003	0.0185	4.6700e-003	1.4900e-003	6.1600e-003	0.0000	62.9399	62.9399	2.1600e-003	9.9700e-003	65.9665
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**5.7300e-003**	**0.1739**	**0.0454**	**6.7000e-004**	**0.0199**	**1.5800e-003**	**0.0215**	**5.4600e-003**	**1.5000e-003**	**6.9700e-003**	**0.0000**	**65.2917**	**65.2917**	**2.2300e-003**	**0.0100**	**68.3403**

3.4 Underground Utilities - 2022

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	5.0900e-003	0.0463	0.0713	1.1000e-004		2.3200e-003	2.3200e-003		2.1500e-003	2.1500e-003	0.0000	9.4771	9.4771	2.9800e-003	0.0000	9.5515
Total	**5.0900e-003**	**0.0463**	**0.0713**	**1.1000e-004**		**2.3200e-003**	**2.3200e-003**		**2.1500e-003**	**2.1500e-003**	**0.0000**	**9.4771**	**9.4771**	**2.9800e-003**	**0.0000**	**9.5515**

3.4 Underground Utilities - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**1.0000e-003**	**7.4000e-004**	**9.0500e-003**	**3.0000e-005**	**2.9700e-003**	**2.0000e-005**	**2.9900e-003**	**7.9000e-004**	**1.0000e-005**	**8.1000e-004**	**0.0000**	**2.3518**	**2.3518**	**7.0000e-005**	**7.0000e-005**	**2.3738**

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	5.0900e-003	0.0463	0.0713	1.1000e-004		2.3200e-003	2.3200e-003		2.1500e-003	2.1500e-003	0.0000	9.4771	9.4771	2.9800e-003	0.0000	9.5515
Total	**5.0900e-003**	**0.0463**	**0.0713**	**1.1000e-004**		**2.3200e-003**	**2.3200e-003**		**2.1500e-003**	**2.1500e-003**	**0.0000**	**9.4771**	**9.4771**	**2.9800e-003**	**0.0000**	**9.5515**

3.4 Underground Utilities - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**1.0000e-003**	**7.4000e-004**	**9.0500e-003**	**3.0000e-005**	**2.9700e-003**	**2.0000e-005**	**2.9900e-003**	**7.9000e-004**	**1.0000e-005**	**8.1000e-004**	**0.0000**	**2.3518**	**2.3518**	**7.0000e-005**	**7.0000e-005**	**2.3738**

3.5 Ground Floor Concrete Work - 2022

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	0.0573	0.6214	0.6185	1.0800e-003		0.0284	0.0284		0.0261	0.0261	0.0000	94.1954	94.1954	0.0301	0.0000	94.9466
Total	**0.0573**	**0.6214**	**0.6185**	**1.0800e-003**		**0.0284**	**0.0284**		**0.0261**	**0.0261**	**0.0000**	**94.1954**	**94.1954**	**0.0301**	**0.0000**	**94.9466**

3.5 Ground Floor Concrete Work - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4100e-003	0.0614	0.0180	2.3000e-004	7.1700e-003	6.4000e-004	7.8100e-003	2.0700e-003	6.2000e-004	2.6900e-003	0.0000	22.5873	22.5873	5.1000e-004	3.3300e-003	23.5932
Worker	9.7200e-003	7.1300e-003	0.0876	2.5000e-004	0.0288	1.5000e-004	0.0289	7.6600e-003	1.4000e-004	7.8000e-003	0.0000	22.7649	22.7649	7.0000e-004	6.6000e-004	22.9785
Total	**0.0121**	**0.0685**	**0.1056**	**4.8000e-004**	**0.0360**	**7.9000e-004**	**0.0368**	**9.7300e-003**	**7.6000e-004**	**0.0105**	**0.0000**	**45.3522**	**45.3522**	**1.2100e-003**	**3.9900e-003**	**46.5717**

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	0.0573	0.6213	0.6185	1.0800e-003		0.0284	0.0284		0.0261	0.0261	0.0000	94.1952	94.1952	0.0301	0.0000	94.9465
Total	**0.0573**	**0.6213**	**0.6185**	**1.0800e-003**		**0.0284**	**0.0284**		**0.0261**	**0.0261**	**0.0000**	**94.1952**	**94.1952**	**0.0301**	**0.0000**	**94.9465**

3.5 Ground Floor Concrete Work - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4100e-003	0.0614	0.0180	2.3000e-004	7.1700e-003	6.4000e-004	7.8100e-003	2.0700e-003	6.2000e-004	2.6900e-003	0.0000	22.5873	22.5873	5.1000e-004	3.3300e-003	23.5932
Worker	9.7200e-003	7.1300e-003	0.0876	2.5000e-004	0.0288	1.5000e-004	0.0289	7.6600e-003	1.4000e-004	7.8000e-003	0.0000	22.7649	22.7649	7.0000e-004	6.6000e-004	22.9785
Total	**0.0121**	**0.0685**	**0.1056**	**4.8000e-004**	**0.0360**	**7.9000e-004**	**0.0368**	**9.7300e-003**	**7.6000e-004**	**0.0105**	**0.0000**	**45.3522**	**45.3522**	**1.2100e-003**	**3.9900e-003**	**46.5717**

3.6 Modular Placement Framing and Connect - 2022

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	0.0124	0.1337	0.1032	2.0000e-004		6.3200e-003	6.3200e-003		5.8100e-003	5.8100e-003	0.0000	17.9999	17.9999	5.8200e-003	0.0000	18.1454
Total	**0.0124**	**0.1337**	**0.1032**	**2.0000e-004**		**6.3200e-003**	**6.3200e-003**		**5.8100e-003**	**5.8100e-003**	**0.0000**	**17.9999**	**17.9999**	**5.8200e-003**	**0.0000**	**18.1454**

3.6 Modular Placement Framing and Connect - 2022

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	8.6000e-004	0.0342	5.7600e-003	1.3000e-004	3.6300e-003	3.3000e-004	3.9600e-003	1.0000e-003	3.2000e-004	1.3100e-003	0.0000	13.0799	13.0799	4.5000e-004	2.0700e-003	13.7090
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1300e-003	2.3000e-003	0.0282	8.0000e-005	9.2800e-003	5.0000e-005	9.3300e-003	2.4700e-003	4.0000e-005	2.5100e-003	0.0000	7.3375	7.3375	2.3000e-004	2.1000e-004	7.4063
Total	**3.9900e-003**	**0.0365**	**0.0340**	**2.1000e-004**	**0.0129**	**3.8000e-004**	**0.0133**	**3.4700e-003**	**3.6000e-004**	**3.8200e-003**	**0.0000**	**20.4173**	**20.4173**	**6.8000e-004**	**2.2800e-003**	**21.1153**

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	0.0124	0.1337	0.1032	2.0000e-004		6.3200e-003	6.3200e-003		5.8100e-003	5.8100e-003	0.0000	17.9999	17.9999	5.8200e-003	0.0000	18.1454
Total	**0.0124**	**0.1337**	**0.1032**	**2.0000e-004**		**6.3200e-003**	**6.3200e-003**		**5.8100e-003**	**5.8100e-003**	**0.0000**	**17.9999**	**17.9999**	**5.8200e-003**	**0.0000**	**18.1454**

3.6 Modular Placement Framing and Connect - 2022

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	8.6000e-004	0.0342	5.7600e-003	1.3000e-004	3.6300e-003	3.3000e-004	3.9600e-003	1.0000e-003	3.2000e-004	1.3100e-003	0.0000	13.0799	13.0799	4.5000e-004	2.0700e-003	13.7090
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1300e-003	2.3000e-003	0.0282	8.0000e-005	9.2800e-003	5.0000e-005	9.3300e-003	2.4700e-003	4.0000e-005	2.5100e-003	0.0000	7.3375	7.3375	2.3000e-004	2.1000e-004	7.4063
Total	**3.9900e-003**	**0.0365**	**0.0340**	**2.1000e-004**	**0.0129**	**3.8000e-004**	**0.0133**	**3.4700e-003**	**3.6000e-004**	**3.8200e-003**	**0.0000**	**20.4173**	**20.4173**	**6.8000e-004**	**2.2800e-003**	**21.1153**

3.6 Modular Placement Framing and Connect - 2023

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	8.2800e-003	0.0878	0.0730	1.5000e-004		4.0200e-003	4.0200e-003		3.7000e-003	3.7000e-003	0.0000	12.9229	12.9229	4.1800e-003	0.0000	13.0273
Total	**8.2800e-003**	**0.0878**	**0.0730**	**1.5000e-004**		**4.0200e-003**	**4.0200e-003**		**3.7000e-003**	**3.7000e-003**	**0.0000**	**12.9229**	**12.9229**	**4.1800e-003**	**0.0000**	**13.0273**

3.6 Modular Placement Framing and Connect - 2023

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	2.2000e-004	0.0189	3.3000e-003	9.0000e-005	2.6000e-003	1.7000e-004	2.7700e-003	7.2000e-004	1.6000e-004	8.8000e-004	0.0000	8.9320	8.9320	3.1000e-004	1.4200e-003	9.3617
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-003	1.4600e-003	0.0188	6.0000e-005	6.6600e-003	3.0000e-005	6.7000e-003	1.7700e-003	3.0000e-005	1.8000e-003	0.0000	5.1354	5.1354	1.5000e-004	1.4000e-004	5.1812
Total	**2.3200e-003**	**0.0204**	**0.0221**	**1.5000e-004**	**9.2600e-003**	**2.0000e-004**	**9.4700e-003**	**2.4900e-003**	**1.9000e-004**	**2.6800e-003**	**0.0000**	**14.0674**	**14.0674**	**4.6000e-004**	**1.5600e-003**	**14.5429**

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	8.2800e-003	0.0878	0.0730	1.5000e-004		4.0200e-003	4.0200e-003		3.7000e-003	3.7000e-003	0.0000	12.9228	12.9228	4.1800e-003	0.0000	13.0273
Total	**8.2800e-003**	**0.0878**	**0.0730**	**1.5000e-004**		**4.0200e-003**	**4.0200e-003**		**3.7000e-003**	**3.7000e-003**	**0.0000**	**12.9228**	**12.9228**	**4.1800e-003**	**0.0000**	**13.0273**

3.6 Modular Placement Framing and Connect - 2023

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	2.2000e-004	0.0189	3.3000e-003	9.0000e-005	2.6000e-003	1.7000e-004	2.7700e-003	7.2000e-004	1.6000e-004	8.8000e-004	0.0000	8.9320	8.9320	3.1000e-004	1.4200e-003	9.3617
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.1000e-003	1.4600e-003	0.0188	6.0000e-005	6.6600e-003	3.0000e-005	6.7000e-003	1.7700e-003	3.0000e-005	1.8000e-003	0.0000	5.1354	5.1354	1.5000e-004	1.4000e-004	5.1812
Total	**2.3200e-003**	**0.0204**	**0.0221**	**1.5000e-004**	**9.2600e-003**	**2.0000e-004**	**9.4700e-003**	**2.4900e-003**	**1.9000e-004**	**2.6800e-003**	**0.0000**	**14.0674**	**14.0674**	**4.6000e-004**	**1.5600e-003**	**14.5429**

3.7 Architectural Coating - 2023

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	0.6669					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0521	0.5813	0.5137	1.0600e-003		0.0236	0.0236		0.0217	0.0217	0.0000	93.1615	93.1615	0.0301	0.0000	93.9147
Total	**0.7190**	**0.5813**	**0.5137**	**1.0600e-003**		**0.0236**	**0.0236**		**0.0217**	**0.0217**	**0.0000**	**93.1615**	**93.1615**	**0.0301**	**0.0000**	**93.9147**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0323	0.0225	0.2895	8.5000e-004	0.1026	5.1000e-004	0.1031	0.0273	4.7000e-004	0.0278	0.0000	79.0791	79.0791	2.2500e-003	2.1700e-003	79.7836
Total	**0.0323**	**0.0225**	**0.2895**	**8.5000e-004**	**0.1026**	**5.1000e-004**	**0.1031**	**0.0273**	**4.7000e-004**	**0.0278**	**0.0000**	**79.0791**	**79.0791**	**2.2500e-003**	**2.1700e-003**	**79.7836**

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	0.6669					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0521	0.5813	0.5137	1.0600e-003		0.0236	0.0236		0.0217	0.0217	0.0000	93.1614	93.1614	0.0301	0.0000	93.9146
Total	**0.7190**	**0.5813**	**0.5137**	**1.0600e-003**		**0.0236**	**0.0236**		**0.0217**	**0.0217**	**0.0000**	**93.1614**	**93.1614**	**0.0301**	**0.0000**	**93.9146**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0323	0.0225	0.2895	8.5000e-004	0.1026	5.1000e-004	0.1031	0.0273	4.7000e-004	0.0278	0.0000	79.0791	79.0791	2.2500e-003	2.1700e-003	79.7836
Total	**0.0323**	**0.0225**	**0.2895**	**8.5000e-004**	**0.1026**	**5.1000e-004**	**0.1031**	**0.0273**	**4.7000e-004**	**0.0278**	**0.0000**	**79.0791**	**79.0791**	**2.2500e-003**	**2.1700e-003**	**79.7836**

3.8 Paving - 2023

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	3.2200e-003	0.0312	0.0440	7.0000e-005		1.5400e-003	1.5400e-003		1.4200e-003	1.4200e-003	0.0000	5.8862	5.8862	1.8700e-003	0.0000	5.9329
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.2200e-003**	**0.0312**	**0.0440**	**7.0000e-005**		**1.5400e-003**	**1.5400e-003**		**1.4200e-003**	**1.4200e-003**	**0.0000**	**5.8862**	**5.8862**	**1.8700e-003**	**0.0000**	**5.9329**

3.8 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	3.2200e-003	0.0312	0.0440	7.0000e-005		1.5400e-003	1.5400e-003		1.4200e-003	1.4200e-003	0.0000	5.8862	5.8862	1.8700e-003	0.0000	5.9329
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.2200e-003**	**0.0312**	**0.0440**	**7.0000e-005**		**1.5400e-003**	**1.5400e-003**		**1.4200e-003**	**1.4200e-003**	**0.0000**	**5.8862**	**5.8862**	**1.8700e-003**	**0.0000**	**5.9329**

3.8 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.3749	0.3937	3.3830	6.7000e-003	0.7159	4.8900e-003	0.7208	0.1911	4.5500e-003	0.1957	0.0000	624.1717	624.1717	0.0434	0.0308	634.4188
Unmitigated	0.3749	0.3937	3.3830	6.7000e-003	0.7159	4.8900e-003	0.7208	0.1911	4.5500e-003	0.1957	0.0000	624.1717	624.1717	0.0434	0.0308	634.4188

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	544.54	491.49	409.41	1,195,591	1,195,591
Enclosed Parking with Elevator	0.00	0.00	0.00		
Fast Food Restaurant w/o Drive Thru	380.85	765.60	550.00	741,750	741,750
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	925.40	1,257.09	959.41	1,937,342	1,937,342

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
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Fast Food Restaurant w/o Drive	9.50	7.30	7.30	1.50	79.50	19.00	51	37	12
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

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

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Enclosed Parking with Elevator	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Fast Food Restaurant w/o Drive Thru	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Other Non-Asphalt Surfaces	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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					
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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					
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	718747	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	114719	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	107954	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	718747	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	114719	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	107954	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive 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	0.4611	0.0132	0.8198	7.0000e-005		4.8300e-003	4.8300e-003		4.8300e-003	4.8300e-003	0.0000	5.7308	5.7308	1.3700e-003	8.0000e-005	5.7892
Unmitigated	0.4611	0.0132	0.8198	7.0000e-005		4.8300e-003	4.8300e-003		4.8300e-003	4.8300e-003	0.0000	5.7308	5.7308	1.3700e-003	8.0000e-005	5.7892

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	0.0667					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3692					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	4.4000e-004	3.7900e-003	1.6100e-003	2.0000e-005		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	4.3943	4.3943	8.0000e-005	8.0000e-005	4.4205
Landscaping	0.0247	9.4300e-003	0.8181	4.0000e-005		4.5300e-003	4.5300e-003		4.5300e-003	4.5300e-003	0.0000	1.3365	1.3365	1.2900e-003	0.0000	1.3687
Total	**0.4611**	**0.0132**	**0.8198**	**6.0000e-005**		**4.8400e-003**	**4.8400e-003**		**4.8400e-003**	**4.8400e-003**	**0.0000**	**5.7308**	**5.7308**	**1.3700e-003**	**8.0000e-005**	**5.7892**

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	0.0667					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3692					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	4.4000e-004	3.7900e-003	1.6100e-003	2.0000e-005		3.1000e-004	3.1000e-004		3.1000e-004	3.1000e-004	0.0000	4.3943	4.3943	8.0000e-005	8.0000e-005	4.4205
Landscaping	0.0247	9.4300e-003	0.8181	4.0000e-005		4.5300e-003	4.5300e-003		4.5300e-003	4.5300e-003	0.0000	1.3365	1.3365	1.2900e-003	0.0000	1.3687
Total	**0.4611**	**0.0132**	**0.8198**	**6.0000e-005**		**4.8400e-003**	**4.8400e-003**		**4.8400e-003**	**4.8400e-003**	**0.0000**	**5.7308**	**5.7308**	**1.3700e-003**	**8.0000e-005**	**5.7892**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	2.3797	0.2444	5.7700e-003	10.2098
Unmitigated	2.3797	0.2444	5.7700e-003	10.2098

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	7.16694 / 4.51829	2.2737	0.2335	5.5100e-003	9.7554
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0.333887 / 0.0213119	0.1059	0.0109	2.6000e-004	0.4545
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**2.3797**	**0.2444**	**5.7700e-003**	**10.2098**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	7.16694 / 4.51829	2.2737	0.2335	5.5100e-003	9.7554
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0.333887 / 0.0213119	0.1059	0.0109	2.6000e-004	0.4545
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**2.3797**	**0.2444**	**5.7700e-003**	**10.2098**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	12.8432	0.7590	0.0000	31.8186
Unmitigated	12.8432	0.7590	0.0000	31.8186

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	50.6	10.2713	0.6070	0.0000	25.4468
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	12.67	2.5719	0.1520	0.0000	6.3718
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**12.8432**	**0.7590**	**0.0000**	**31.8186**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	50.6	10.2713	0.6070	0.0000	25.4468
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	12.67	2.5719	0.1520	0.0000	6.3718
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**12.8432**	**0.7590**	**0.0000**	**31.8186**

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

231 Grant Educator Workforce Housing - Alt 1 Traditional Construction

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	112.00	Space	0.00	21,088.00	0
Other Non-Asphalt Surfaces	16.60	1000sqft	0.38	16,600.00	0
Fast Food Restaurant w/o Drive Thru	1.10	1000sqft	0.03	1,100.00	0
Apartments Mid Rise	110.00	Dwelling Unit	0.99	92,812.00	273

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
Utility Company	City of Palo Alto Utilities Department				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Land uses same as proposed project - CalEEMod run for construction under Alternative 1.

Construction Phase - Based on construction schedule for Alternative 1 and assumes a 2-week overlap between each phase.

Off-road Equipment - Project specific information.

Off-road Equipment - Project specific information.

Off-road Equipment - Project specific information.

Off-road Equipment - Project specific information. Reduced crane usage for traditional construction method.

Off-road Equipment -

Off-road Equipment - Project specific information. Reduced crane usage for Alternative 1 construction methods.

Off-road Equipment - Project specific information.

Trips and VMT - Based on estimated average daily workers for Alternative 1. No modular deliveries under Alt 1.

Grading - Assumes 10,000 CY of material export.

Vehicle Trips - Alternative 1 operations is the same as proposed project.

Woodstoves - Alternative 1 operations is the same as proposed project.

Area Coating - Alternative 1 operations is the same as proposed project.

Energy Use - Alternative 1 operations is the same as proposed project.

Water And Wastewater - Alternative 1 operations is the same as proposed project.

Solid Waste - Alternative 1 operations is the same as proposed project.

Off-road Equipment -

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_Nonresidential_Exterior	550	0
tblAreaCoating	Area_Nonresidential_Interior	1650	0
tblAreaCoating	Area_Parking	2261	0
tblAreaCoating	Area_Residential_Exterior	62648	0
tblAreaCoating	Area_Residential_Interior	187944	0
tblConstructionPhase	NumDays	10.00	229.00
tblConstructionPhase	NumDays	200.00	121.00
tblConstructionPhase	NumDays	200.00	97.00
tblConstructionPhase	NumDays	20.00	13.00
tblConstructionPhase	NumDays	4.00	25.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00

tblEnergyUse	LightingElect	741.44	0.00
tblEnergyUse	LightingElect	1.75	0.00
tblEnergyUse	LightingElect	5.35	0.00
tblEnergyUse	NT24E	3,054.10	0.00
tblEnergyUse	NT24E	0.19	0.00
tblEnergyUse	NT24E	22.30	0.00
tblEnergyUse	NT24NG	3,155.00	0.00
tblEnergyUse	NT24NG	147.47	0.00
tblEnergyUse	T24E	70.89	0.00
tblEnergyUse	T24E	3.50	0.00
tblEnergyUse	T24E	4.52	0.00
tblEnergyUse	T24NG	5,226.68	0.00
tblEnergyUse	T24NG	59.80	0.00
tblFireplaces	NumberGas	16.50	0.00
tblFireplaces	NumberWood	18.70	0.00
tblGrading	AcresOfGrading	0.00	4.00
tblGrading	MaterialExported	0.00	10,000.00
tblLandUse	LandUseSquareFeet	44,800.00	21,088.00
tblLandUse	LandUseSquareFeet	110,000.00	92,812.00
tblLandUse	LotAcreage	1.01	0.00
tblLandUse	LotAcreage	2.89	0.99
tblLandUse	Population	315.00	273.00
tblOffRoadEquipment	OffRoadEquipmentType		Bore/Drill Rigs
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Ground Floor Concrete Work
tblOffRoadEquipment	PhaseName		Traditional Construction Method
tblOffRoadEquipment	PhaseName		Architectural Coating
tblOffRoadEquipment	PhaseName		Architectural Coating
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Underground Utilities
tblOffRoadEquipment	PhaseName		Architectural Coating
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Ground Floor Concrete Work
tblOffRoadEquipment	PhaseName		Underground Utilities
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00

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

tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblSolidWaste	SolidWasteGenerationRate	50.60	0.00
tblSolidWaste	SolidWasteGenerationRate	12.67	0.00
tblTripsAndVMT	HaulingTripNumber	31.00	600.00
tblTripsAndVMT	HaulingTripNumber	1,250.00	2,000.00
tblTripsAndVMT	VendorTripNumber	18.00	0.00
tblTripsAndVMT	WorkerTripNumber	13.00	30.00
tblTripsAndVMT	WorkerTripNumber	13.00	30.00
tblTripsAndVMT	WorkerTripNumber	5.00	30.00
tblTripsAndVMT	WorkerTripNumber	95.00	60.00
tblTripsAndVMT	WorkerTripNumber	95.00	100.00
tblTripsAndVMT	WorkerTripNumber	19.00	150.00
tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblVehicleTrips	ST_TR	4.91	0.00
tblVehicleTrips	ST_TR	696.00	0.00
tblVehicleTrips	SU_TR	4.09	0.00
tblVehicleTrips	SU_TR	500.00	0.00
tblVehicleTrips	WD_TR	5.44	0.00
tblVehicleTrips	WD_TR	346.23	0.00
tblWater	IndoorWaterUseRate	7,166,942.82	0.00
tblWater	IndoorWaterUseRate	333,887.08	0.00

tblWater	OutdoorWaterUseRate	4,518,290.04	0.00
tblWater	OutdoorWaterUseRate	21,311.94	0.00
tblWoodstoves	NumberCatalytic	2.20	0.00
tblWoodstoves	NumberNoncatalytic	2.20	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1065	1.1691	1.1199	3.1300e-003	0.0870	0.0421	0.1291	0.0227	0.0389	0.0616	0.0000	287.8668	287.8668	0.0497	0.0175	294.3202
2023	0.7893	0.8336	1.1760	2.7900e-003	0.1592	0.0338	0.1930	0.0423	0.0311	0.0734	0.0000	251.3457	251.3457	0.0451	3.3800e-003	253.4780
Maximum	**0.7893**	**1.1691**	**1.1760**	**3.1300e-003**	**0.1592**	**0.0421**	**0.1930**	**0.0423**	**0.0389**	**0.0734**	**0.0000**	**287.8668**	**287.8668**	**0.0497**	**0.0175**	**294.3202**

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					
2022	0.1065	1.1408	1.1199	3.1300e-003	0.0837	0.0421	0.1257	0.0223	0.0389	0.0611	0.0000	287.8667	287.8667	0.0497	0.0175	294.3200
2023	0.7893	0.8336	1.1760	2.7900e-003	0.1592	0.0338	0.1930	0.0423	0.0311	0.0734	0.0000	251.3456	251.3456	0.0451	3.3800e-003	253.4778
Maximum	**0.7893**	**1.1408**	**1.1760**	**3.1300e-003**	**0.1592**	**0.0421**	**0.1930**	**0.0423**	**0.0389**	**0.0734**	**0.0000**	**287.8667**	**287.8667**	**0.0497**	**0.0175**	**294.3200**

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	1.41	0.00	0.00	1.35	0.00	1.03	0.69	0.00	0.33	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	6-1-2022	8-31-2022	0.7371	0.7089
2	9-1-2022	11-30-2022	0.4604	0.4604
3	12-1-2022	2-28-2023	0.2039	0.2039
4	3-1-2023	5-31-2023	0.5224	0.5224
5	6-1-2023	8-31-2023	0.5054	0.5054
6	9-1-2023	9-30-2023	0.1648	0.1648
		Highest	0.7371	0.7089

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	0.3939	9.4300e-003	0.8181	4.0000e-005		4.5300e-003	4.5300e-003		4.5300e-003	4.5300e-003	0.0000	1.3365	1.3365	1.2900e-003	0.0000	1.3687
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.3939**	**9.4300e-003**	**0.8181**	**4.0000e-005**	**0.0000**	**4.5300e-003**	**4.5300e-003**	**0.0000**	**4.5300e-003**	**4.5300e-003**	**0.0000**	**1.3365**	**1.3365**	**1.2900e-003**	**0.0000**	**1.3687**

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	0.3939	9.4300e-003	0.8181	4.0000e-005		4.5300e-003	4.5300e-003		4.5300e-003	4.5300e-003	0.0000	1.3365	1.3365	1.2900e-003	0.0000	1.3687
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.3939**	**9.4300e-003**	**0.8181**	**4.0000e-005**	**0.0000**	**4.5300e-003**	**4.5300e-003**	**0.0000**	**4.5300e-003**	**4.5300e-003**	**0.0000**	**1.3365**	**1.3365**	**1.2900e-003**	**0.0000**	**1.3687**

	ROG	**NOx**	**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/Site Clearing	Demolition	6/1/2022	6/15/2022	6	13	
2	Grading and Excavation	Grading	6/16/2022	7/14/2022	6	25	
3	Underground Utilities	Trenching	6/30/2022	7/28/2022	6	25	

4	Ground Floor Concrete Work	Building Construction	7/14/2022	12/1/2022	6	121	
5	Traditional Construction Method	Building Construction	11/17/2022	3/9/2023	6	97	
6	Architectural Coating	Architectural Coating	2/23/2023	11/16/2023	6	229	
7	Paving	Paving	11/5/2023	11/16/2023	6	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0.38

Residential Indoor: 187,944; Residential Outdoor: 62,648; Non-Residential Indoor: 1,650; Non-Residential Outdoor: 550; Striped Parking Area: 2,261 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition/Site Clearing	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition/Site Clearing	Rubber Tired Dozers	1	8.00	247	0.40
Demolition/Site Clearing	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading and Excavation	Excavators	1	8.00	158	0.38
Grading and Excavation	Graders	0	0.00	187	0.41
Grading and Excavation	Rubber Tired Dozers	0	0.00	247	0.40
Grading and Excavation	Skid Steer Loaders	1	8.00	65	0.37
Grading and Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Underground Utilities	Excavators	1	8.00	158	0.38
Underground Utilities	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Ground Floor Concrete Work	Aerial Lifts	2	8.00	63	0.31
Ground Floor Concrete Work	Cranes	1	8.00	231	0.29
Ground Floor Concrete Work	Forklifts	1	8.00	89	0.20
Ground Floor Concrete Work	Generator Sets	0	0.00	84	0.74
Ground Floor Concrete Work	Skid Steer Loaders	1	8.00	65	0.37
Ground Floor Concrete Work	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Ground Floor Concrete Work	Welders	0	0.00	46	0.45
Traditional Construction Method	Aerial Lifts	1	8.00	63	0.31
Traditional Construction Method	Cranes	1	4.00	231	0.29
Traditional Construction Method	Forklifts	1	8.00	89	0.20
Traditional Construction Method	Generator Sets	0	0.00	84	0.74
Traditional Construction Method	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Traditional Construction Method	Welders	0	0.00	46	0.45
Architectural Coating	Aerial Lifts	2	8.00	63	0.31
Architectural Coating	Air Compressors	0	0.00	78	0.48
Architectural Coating	Cranes	1	8.00	231	0.29
Architectural Coating	Forklifts	1	8.00	89	0.20
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading and Excavation	Bore/Drill Rigs	1	8.00	221	0.50

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition/Site Clearing	5	30.00	0.00	600.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading and Excavation	5	30.00	0.00	2,000.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Underground Utilities	2	30.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Ground Floor Concrete Work	7	60.00	18.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Traditional Construction Method	4	100.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	4	150.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition/Site Clearing - 2022

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					3.3500e-003	0.0000	3.3500e-003	5.1000e-004	0.0000	5.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0110	0.1080	0.0907	1.6000e-004		5.4500e-003	5.4500e-003		5.0900e-003	5.0900e-003	0.0000	13.7005	13.7005	3.4900e-003	0.0000	13.7878
Total	**0.0110**	**0.1080**	**0.0907**	**1.6000e-004**	**3.3500e-003**	**5.4500e-003**	**8.8000e-003**	**5.1000e-004**	**5.0900e-003**	**5.6000e-003**	**0.0000**	**13.7005**	**13.7005**	**3.4900e-003**	**0.0000**	**13.7878**

3.2 Demolition/Site Clearing - 2022

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	1.4200e-003	0.0519	0.0109	1.9000e-004	5.0900e-003	4.7000e-004	5.5600e-003	1.4000e-003	4.5000e-004	1.8500e-003	0.0000	18.8820	18.8820	6.5000e-004	2.9900e-003	19.7899
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.8000e-004	4.7100e-003	1.0000e-005	1.5500e-003	1.0000e-005	1.5500e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.2229	1.2229	4.0000e-005	4.0000e-005	1.2344
Total	**1.9400e-003**	**0.0523**	**0.0156**	**2.0000e-004**	**6.6400e-003**	**4.8000e-004**	**7.1100e-003**	**1.8100e-003**	**4.6000e-004**	**2.2700e-003**	**0.0000**	**20.1049**	**20.1049**	**6.9000e-004**	**3.0300e-003**	**21.0243**

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					1.5100e-003	0.0000	1.5100e-003	2.3000e-004	0.0000	2.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0110	0.1080	0.0907	1.6000e-004		5.4500e-003	5.4500e-003		5.0900e-003	5.0900e-003	0.0000	13.7005	13.7005	3.4900e-003	0.0000	13.7878
Total	**0.0110**	**0.1080**	**0.0907**	**1.6000e-004**	**1.5100e-003**	**5.4500e-003**	**6.9600e-003**	**2.3000e-004**	**5.0900e-003**	**5.3200e-003**	**0.0000**	**13.7005**	**13.7005**	**3.4900e-003**	**0.0000**	**13.7878**

3.2 Demolition/Site Clearing - 2022

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	1.4200e-003	0.0519	0.0109	1.9000e-004	5.0900e-003	4.7000e-004	5.5600e-003	1.4000e-003	4.5000e-004	1.8500e-003	0.0000	18.8820	18.8820	6.5000e-004	2.9900e-003	19.7899
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.8000e-004	4.7100e-003	1.0000e-005	1.5500e-003	1.0000e-005	1.5500e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.2229	1.2229	4.0000e-005	4.0000e-005	1.2344
Total	**1.9400e-003**	**0.0523**	**0.0156**	**2.0000e-004**	**6.6400e-003**	**4.8000e-004**	**7.1100e-003**	**1.8100e-003**	**4.6000e-004**	**2.2700e-003**	**0.0000**	**20.1049**	**20.1049**	**6.9000e-004**	**3.0300e-003**	**21.0243**

3.3 Grading and Excavation - 2022

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					2.6900e-003	0.0000	2.6900e-003	3.1000e-004	0.0000	3.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0103	0.1040	0.1395	2.9000e-004		4.6700e-003	4.6700e-003		4.2900e-003	4.2900e-003	0.0000	25.1341	25.1341	8.1300e-003	0.0000	25.3373
Total	**0.0103**	**0.1040**	**0.1395**	**2.9000e-004**	**2.6900e-003**	**4.6700e-003**	**7.3600e-003**	**3.1000e-004**	**4.2900e-003**	**4.6000e-003**	**0.0000**	**25.1341**	**25.1341**	**8.1300e-003**	**0.0000**	**25.3373**

3.3 Grading and Excavation - 2022

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	4.7300e-003	0.1731	0.0364	6.4000e-004	0.0170	1.5600e-003	0.0185	4.6700e-003	1.4900e-003	6.1600e-003	0.0000	62.9399	62.9399	2.1600e-003	9.9700e-003	65.9665
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**5.7300e-003**	**0.1739**	**0.0454**	**6.7000e-004**	**0.0199**	**1.5800e-003**	**0.0215**	**5.4600e-003**	**1.5000e-003**	**6.9700e-003**	**0.0000**	**65.2917**	**65.2917**	**2.2300e-003**	**0.0100**	**68.3403**

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					1.2100e-003	0.0000	1.2100e-003	1.4000e-004	0.0000	1.4000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0103	0.0757	0.1395	2.9000e-004		4.6700e-003	4.6700e-003		4.2900e-003	4.2900e-003	0.0000	25.1340	25.1340	8.1300e-003	0.0000	25.3373
Total	**0.0103**	**0.0757**	**0.1395**	**2.9000e-004**	**1.2100e-003**	**4.6700e-003**	**5.8800e-003**	**1.4000e-004**	**4.2900e-003**	**4.4300e-003**	**0.0000**	**25.1340**	**25.1340**	**8.1300e-003**	**0.0000**	**25.3373**

3.3 Grading and Excavation - 2022

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	4.7300e-003	0.1731	0.0364	6.4000e-004	0.0170	1.5600e-003	0.0185	4.6700e-003	1.4900e-003	6.1600e-003	0.0000	62.9399	62.9399	2.1600e-003	9.9700e-003	65.9665
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**5.7300e-003**	**0.1739**	**0.0454**	**6.7000e-004**	**0.0199**	**1.5800e-003**	**0.0215**	**5.4600e-003**	**1.5000e-003**	**6.9700e-003**	**0.0000**	**65.2917**	**65.2917**	**2.2300e-003**	**0.0100**	**68.3403**

3.4 Underground Utilities - 2022

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	4.5900e-003	0.0432	0.0687	1.0000e-004		2.2000e-003	2.2000e-003		2.0200e-003	2.0200e-003	0.0000	9.0861	9.0861	2.9400e-003	0.0000	9.1595
Total	**4.5900e-003**	**0.0432**	**0.0687**	**1.0000e-004**		**2.2000e-003**	**2.2000e-003**		**2.0200e-003**	**2.0200e-003**	**0.0000**	**9.0861**	**9.0861**	**2.9400e-003**	**0.0000**	**9.1595**

3.4 Underground Utilities - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**1.0000e-003**	**7.4000e-004**	**9.0500e-003**	**3.0000e-005**	**2.9700e-003**	**2.0000e-005**	**2.9900e-003**	**7.9000e-004**	**1.0000e-005**	**8.1000e-004**	**0.0000**	**2.3518**	**2.3518**	**7.0000e-005**	**7.0000e-005**	**2.3738**

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	4.5900e-003	0.0432	0.0687	1.0000e-004		2.2000e-003	2.2000e-003		2.0200e-003	2.0200e-003	0.0000	9.0861	9.0861	2.9400e-003	0.0000	9.1595
Total	**4.5900e-003**	**0.0432**	**0.0687**	**1.0000e-004**		**2.2000e-003**	**2.2000e-003**		**2.0200e-003**	**2.0200e-003**	**0.0000**	**9.0861**	**9.0861**	**2.9400e-003**	**0.0000**	**9.1595**

3.4 Underground Utilities - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**1.0000e-003**	**7.4000e-004**	**9.0500e-003**	**3.0000e-005**	**2.9700e-003**	**2.0000e-005**	**2.9900e-003**	**7.9000e-004**	**1.0000e-005**	**8.1000e-004**	**0.0000**	**2.3518**	**2.3518**	**7.0000e-005**	**7.0000e-005**	**2.3738**

3.5 Ground Floor Concrete Work - 2022

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	0.0480	0.5423	0.5360	9.6000e-004		0.0235	0.0235		0.0217	0.0217	0.0000	84.1783	84.1783	0.0272	0.0000	84.8590
Total	**0.0480**	**0.5423**	**0.5360**	**9.6000e-004**		**0.0235**	**0.0235**		**0.0217**	**0.0217**	**0.0000**	**84.1783**	**84.1783**	**0.0272**	**0.0000**	**84.8590**

3.5 Ground Floor Concrete Work - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4100e-003	0.0614	0.0180	2.3000e-004	7.1700e-003	6.4000e-004	7.8100e-003	2.0700e-003	6.2000e-004	2.6900e-003	0.0000	22.5873	22.5873	5.1000e-004	3.3300e-003	23.5932
Worker	9.7200e-003	7.1300e-003	0.0876	2.5000e-004	0.0288	1.5000e-004	0.0289	7.6600e-003	1.4000e-004	7.8000e-003	0.0000	22.7649	22.7649	7.0000e-004	6.6000e-004	22.9785
Total	**0.0121**	**0.0685**	**0.1056**	**4.8000e-004**	**0.0360**	**7.9000e-004**	**0.0368**	**9.7300e-003**	**7.6000e-004**	**0.0105**	**0.0000**	**45.3522**	**45.3522**	**1.2100e-003**	**3.9900e-003**	**46.5717**

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	0.0480	0.5423	0.5360	9.6000e-004		0.0235	0.0235		0.0217	0.0217	0.0000	84.1782	84.1782	0.0272	0.0000	84.8589
Total	**0.0480**	**0.5423**	**0.5360**	**9.6000e-004**		**0.0235**	**0.0235**		**0.0217**	**0.0217**	**0.0000**	**84.1782**	**84.1782**	**0.0272**	**0.0000**	**84.8589**

3.5 Ground Floor Concrete Work - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4100e-003	0.0614	0.0180	2.3000e-004	7.1700e-003	6.4000e-004	7.8100e-003	2.0700e-003	6.2000e-004	2.6900e-003	0.0000	22.5873	22.5873	5.1000e-004	3.3300e-003	23.5932
Worker	9.7200e-003	7.1300e-003	0.0876	2.5000e-004	0.0288	1.5000e-004	0.0289	7.6600e-003	1.4000e-004	7.8000e-003	0.0000	22.7649	22.7649	7.0000e-004	6.6000e-004	22.9785
Total	**0.0121**	**0.0685**	**0.1056**	**4.8000e-004**	**0.0360**	**7.9000e-004**	**0.0368**	**9.7300e-003**	**7.6000e-004**	**0.0105**	**0.0000**	**45.3522**	**45.3522**	**1.2100e-003**	**3.9900e-003**	**46.5717**

3.6 Traditional Construction Method - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.5600e-003	0.0723	0.0623	1.2000e-004		3.2600e-003	3.2600e-003		3.0000e-003	3.0000e-003	0.0000	10.4383	10.4383	3.3800e-003	0.0000	10.5227
Total	**6.5600e-003**	**0.0723**	**0.0623**	**1.2000e-004**		**3.2600e-003**	**3.2600e-003**		**3.0000e-003**	**3.0000e-003**	**0.0000**	**10.4383**	**10.4383**	**3.3800e-003**	**0.0000**	**10.5227**

3.6 Traditional Construction Method - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2200e-003	3.8300e-003	0.0471	1.3000e-004	0.0155	8.0000e-005	0.0156	4.1100e-003	7.0000e-005	4.1900e-003	0.0000	12.2291	12.2291	3.8000e-004	3.5000e-004	12.3438
Total	**5.2200e-003**	**3.8300e-003**	**0.0471**	**1.3000e-004**	**0.0155**	**8.0000e-005**	**0.0156**	**4.1100e-003**	**7.0000e-005**	**4.1900e-003**	**0.0000**	**12.2291**	**12.2291**	**3.8000e-004**	**3.5000e-004**	**12.3438**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.5600e-003	0.0723	0.0623	1.2000e-004		3.2600e-003	3.2600e-003		3.0000e-003	3.0000e-003	0.0000	10.4383	10.4383	3.3800e-003	0.0000	10.5227
Total	**6.5600e-003**	**0.0723**	**0.0623**	**1.2000e-004**		**3.2600e-003**	**3.2600e-003**		**3.0000e-003**	**3.0000e-003**	**0.0000**	**10.4383**	**10.4383**	**3.3800e-003**	**0.0000**	**10.5227**

3.6 Traditional Construction Method - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2200e-003	3.8300e-003	0.0471	1.3000e-004	0.0155	8.0000e-005	0.0156	4.1100e-003	7.0000e-005	4.1900e-003	0.0000	12.2291	12.2291	3.8000e-004	3.5000e-004	12.3438
Total	**5.2200e-003**	**3.8300e-003**	**0.0471**	**1.3000e-004**	**0.0155**	**8.0000e-005**	**0.0156**	**4.1100e-003**	**7.0000e-005**	**4.1900e-003**	**0.0000**	**12.2291**	**12.2291**	**3.8000e-004**	**3.5000e-004**	**12.3438**

3.6 Traditional Construction Method - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.0700e-003	0.0986	0.0915	1.8000e-004		4.3000e-003	4.3000e-003		3.9500e-003	3.9500e-003	0.0000	15.5235	15.5235	5.0200e-003	0.0000	15.6490
Total	**9.0700e-003**	**0.0986**	**0.0915**	**1.8000e-004**		**4.3000e-003**	**4.3000e-003**		**3.9500e-003**	**3.9500e-003**	**0.0000**	**15.5235**	**15.5235**	**5.0200e-003**	**0.0000**	**15.6490**

3.6 Traditional Construction Method - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2500e-003	5.0500e-003	0.0649	1.9000e-004	0.0230	1.1000e-004	0.0231	6.1200e-003	1.1000e-004	6.2200e-003	0.0000	17.7294	17.7294	5.1000e-004	4.9000e-004	17.8873
Total	**7.2500e-003**	**5.0500e-003**	**0.0649**	**1.9000e-004**	**0.0230**	**1.1000e-004**	**0.0231**	**6.1200e-003**	**1.1000e-004**	**6.2200e-003**	**0.0000**	**17.7294**	**17.7294**	**5.1000e-004**	**4.9000e-004**	**17.8873**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.0700e-003	0.0986	0.0915	1.8000e-004		4.3000e-003	4.3000e-003		3.9500e-003	3.9500e-003	0.0000	15.5235	15.5235	5.0200e-003	0.0000	15.6490
Total	**9.0700e-003**	**0.0986**	**0.0915**	**1.8000e-004**		**4.3000e-003**	**4.3000e-003**		**3.9500e-003**	**3.9500e-003**	**0.0000**	**15.5235**	**15.5235**	**5.0200e-003**	**0.0000**	**15.6490**

3.6 Traditional Construction Method - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2500e-003	5.0500e-003	0.0649	1.9000e-004	0.0230	1.1000e-004	0.0231	6.1200e-003	1.1000e-004	6.2200e-003	0.0000	17.7294	17.7294	5.1000e-004	4.9000e-004	17.8873
Total	**7.2500e-003**	**5.0500e-003**	**0.0649**	**1.9000e-004**	**0.0230**	**1.1000e-004**	**0.0231**	**6.1200e-003**	**1.1000e-004**	**6.2200e-003**	**0.0000**	**17.7294**	**17.7294**	**5.1000e-004**	**4.9000e-004**	**17.8873**

3.7 Architectural Coating - 2023

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	0.6669					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0599	0.6689	0.5912	1.2200e-003		0.0271	0.0271		0.0250	0.0250	0.0000	107.2059	107.2059	0.0347	0.0000	108.0727
Total	**0.7268**	**0.6689**	**0.5912**	**1.2200e-003**		**0.0271**	**0.0271**		**0.0250**	**0.0250**	**0.0000**	**107.2059**	**107.2059**	**0.0347**	**0.0000**	**108.0727**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0429	0.0299	0.3844	1.1300e-003	0.1362	6.8000e-004	0.1369	0.0362	6.2000e-004	0.0369	0.0000	105.0007	105.0007	2.9900e-003	2.8900e-003	105.9361
Total	**0.0429**	**0.0299**	**0.3844**	**1.1300e-003**	**0.1362**	**6.8000e-004**	**0.1369**	**0.0362**	**6.2000e-004**	**0.0369**	**0.0000**	**105.0007**	**105.0007**	**2.9900e-003**	**2.8900e-003**	**105.9361**

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	0.6669					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0599	0.6689	0.5912	1.2200e-003		0.0271	0.0271		0.0250	0.0250	0.0000	107.2058	107.2058	0.0347	0.0000	108.0726
Total	**0.7268**	**0.6689**	**0.5912**	**1.2200e-003**		**0.0271**	**0.0271**		**0.0250**	**0.0250**	**0.0000**	**107.2058**	**107.2058**	**0.0347**	**0.0000**	**108.0726**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0429	0.0299	0.3844	1.1300e-003	0.1362	6.8000e-004	0.1369	0.0362	6.2000e-004	0.0369	0.0000	105.0007	105.0007	2.9900e-003	2.8900e-003	105.9361
Total	**0.0429**	**0.0299**	**0.3844**	**1.1300e-003**	**0.1362**	**6.8000e-004**	**0.1369**	**0.0362**	**6.2000e-004**	**0.0369**	**0.0000**	**105.0007**	**105.0007**	**2.9900e-003**	**2.8900e-003**	**105.9361**

3.8 Paving - 2023

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	3.2200e-003	0.0312	0.0440	7.0000e-005		1.5400e-003	1.5400e-003		1.4200e-003	1.4200e-003	0.0000	5.8862	5.8862	1.8700e-003	0.0000	5.9329
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.2200e-003**	**0.0312**	**0.0440**	**7.0000e-005**		**1.5400e-003**	**1.5400e-003**		**1.4200e-003**	**1.4200e-003**	**0.0000**	**5.8862**	**5.8862**	**1.8700e-003**	**0.0000**	**5.9329**

3.8 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	3.2200e-003	0.0312	0.0440	7.0000e-005		1.5400e-003	1.5400e-003		1.4200e-003	1.4200e-003	0.0000	5.8862	5.8862	1.8700e-003	0.0000	5.9329
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.2200e-003**	**0.0312**	**0.0440**	**7.0000e-005**		**1.5400e-003**	**1.5400e-003**		**1.4200e-003**	**1.4200e-003**	**0.0000**	**5.8862**	**5.8862**	**1.8700e-003**	**0.0000**	**5.9329**

3.8 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	0.00	0.00	0.00		
Enclosed Parking with Elevator	0.00	0.00	0.00		
Fast Food Restaurant w/o Drive Thru	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

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
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Fast Food Restaurant w/o Drive	9.50	7.30	7.30	1.50	79.50	19.00	51	37	12
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

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

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Enclosed Parking with Elevator	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Fast Food Restaurant w/o Drive Thru	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Other Non-Asphalt Surfaces	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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					
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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					
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive 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	0.3939	9.4300e-003	0.8181	4.0000e-005		4.5300e-003	4.5300e-003		4.5300e-003	4.5300e-003	0.0000	1.3365	1.3365	1.2900e-003	0.0000	1.3687
Unmitigated	0.3939	9.4300e-003	0.8181	4.0000e-005		4.5300e-003	4.5300e-003		4.5300e-003	4.5300e-003	0.0000	1.3365	1.3365	1.2900e-003	0.0000	1.3687

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	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3692					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0247	9.4300e-003	0.8181	4.0000e-005		4.5300e-003	4.5300e-003		4.5300e-003	4.5300e-003	0.0000	1.3365	1.3365	1.2900e-003	0.0000	1.3687
Total	**0.3939**	**9.4300e-003**	**0.8181**	**4.0000e-005**		**4.5300e-003**	**4.5300e-003**		**4.5300e-003**	**4.5300e-003**	**0.0000**	**1.3365**	**1.3365**	**1.2900e-003**	**0.0000**	**1.3687**

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	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3692					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0247	9.4300e-003	0.8181	4.0000e-005		4.5300e-003	4.5300e-003		4.5300e-003	4.5300e-003	0.0000	1.3365	1.3365	1.2900e-003	0.0000	1.3687
Total	**0.3939**	**9.4300e-003**	**0.8181**	**4.0000e-005**		**4.5300e-003**	**4.5300e-003**		**4.5300e-003**	**4.5300e-003**	**0.0000**	**1.3365**	**1.3365**	**1.2900e-003**	**0.0000**	**1.3687**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	0 / 0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

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

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

231 Grant Educator Workforce Housing Alt 2

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	39.00	Space	0.00	7,343.00	0
Other Non-Asphalt Surfaces	16.60	1000sqft	0.38	16,600.00	0
Parking Lot	25.00	Space	0.22	10,000.00	0
Fast Food Restaurant w/o Drive Thru	1.00	1000sqft	0.02	1,000.00	0
Apartments Mid Rise	63.00	Dwelling Unit	1.00	66,657.00	156

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
Utility Company	City of Palo Alto Utilities Department				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Land uses based on applicant provided information. Square footage for residential land use includes community spaces/leasing office/etc. Parking garage acreage included withing total acreage for the site of 1.4 acres. Fast food restaurant w/out drive thru to represent flex space.

Construction Phase - Based on project specific info and assumes a 2-week overlap between each phase.

Off-road Equipment - Default equipment for demolition.

Off-road Equipment - Project specific information.

Off-road Equipment - Project specific information.

Off-road Equipment - Project specific information.

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

Off-road Equipment - Project specific information.

Off-road Equipment - Project specific information, with reduction in mobile crane usage due to fewer building stories/units.

Off-road Equipment - Default equipment for paving.

Grading - Approximately 8,000 CY of material export.

Demolition - Demolition of existing 6,800 sq. ft. building.

Trips and VMT - Based on estimated average daily workers per phase. Project specific haul truck trips during demolition and grading. Haul trucks during modular placement assumes modular delivery from Vallejo.

Vehicle Trips - Adjusted residential trip rates to account for 9% reduction consistent with TIA due to VTA's guidelines for TOD housing.

Woodstoves - Assumes no woodstoves or wood-burning or natural gas fireplaces per Reg 6, Rule 3.

Energy Use - Includes project design feature of all electric building (no natural gas infrastructure).

Water Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	199.00
tblConstructionPhase	NumDays	200.00	121.00
tblConstructionPhase	NumDays	200.00	43.00
tblConstructionPhase	NumDays	20.00	13.00
tblConstructionPhase	NumDays	4.00	25.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblEnergyUse	NT24E	3,054.10	4,058.24
tblEnergyUse	NT24E	22.30	69.24
tblEnergyUse	NT24NG	3,155.00	0.00
tblEnergyUse	NT24NG	147.47	0.00
tblEnergyUse	T24E	70.89	1,734.38

tblEnergyUse	T24E	4.52	23.55
tblEnergyUse	T24NG	5,226.68	0.00
tblEnergyUse	T24NG	59.80	0.00
tblFireplaces	NumberGas	9.45	0.00
tblFireplaces	NumberWood	10.71	0.00
tblGrading	AcresOfGrading	0.00	4.00
tblGrading	MaterialExported	0.00	8,000.00
tblLandUse	LandUseSquareFeet	15,600.00	7,343.00
tblLandUse	LandUseSquareFeet	63,000.00	66,657.00
tblLandUse	LotAcreage	0.35	0.00
tblLandUse	LotAcreage	1.66	1.00
tblLandUse	Population	180.00	156.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
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tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00

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

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Ground Floor Concrete Work
tblOffRoadEquipment	PhaseName		Modular Placement Framing and Connect
tblOffRoadEquipment	PhaseName		Architectural Coating
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Architectural Coating
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Underground Utilities
tblOffRoadEquipment	PhaseName		Architectural Coating
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Underground Utilities
tblOffRoadEquipment	PhaseName		Ground Floor Concrete Work
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Grading and Excavation
tblOffRoadEquipment	PhaseName		Ground Floor Concrete Work
tblOffRoadEquipment	PhaseName		Underground Utilities
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00

tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	70.00
tblTripsAndVMT	HaulingTripNumber	31.00	600.00
tblTripsAndVMT	HaulingTripNumber	1,000.00	1,600.00
tblTripsAndVMT	HaulingTripNumber	0.00	110.00
tblTripsAndVMT	VendorTripNumber	12.00	0.00
tblTripsAndVMT	VendorVehicleClass	HDT_Mix	MHDT
tblTripsAndVMT	WorkerTripNumber	13.00	30.00
tblTripsAndVMT	WorkerTripNumber	25.00	30.00
tblTripsAndVMT	WorkerTripNumber	10.00	30.00
tblTripsAndVMT	WorkerTripNumber	12.00	130.00
tblTripsAndVMT	WorkerTripNumber	13.00	0.00
tblVehicleTrips	ST_TR	4.91	4.40
tblVehicleTrips	SU_TR	4.09	3.70
tblVehicleTrips	WD_TR	5.44	4.90
tblVehicleTrips	WD_TR	346.23	346.00
tblWoodstoves	NumberCatalytic	1.26	0.00
tblWoodstoves	NumberNoncatalytic	1.26	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.1535	1.3830	1.3601	3.4100e-003	0.0828	0.0555	0.1383	0.0216	0.0513	0.0729	0.0000	310.5291	310.5291	0.0603	0.0154	316.6345
2023	0.5254	0.3907	0.6335	1.5000e-003	0.0992	0.0167	0.1159	0.0264	0.0154	0.0418	0.0000	135.8630	135.8630	0.0211	2.2600e-003	137.0650
Maximum	**0.5254**	**1.3830**	**1.3601**	**3.4100e-003**	**0.0992**	**0.0555**	**0.1383**	**0.0264**	**0.0513**	**0.0729**	**0.0000**	**310.5291**	**310.5291**	**0.0603**	**0.0154**	**316.6345**

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					
2022	0.1535	1.3830	1.3601	3.4100e-003	0.0795	0.0555	0.1350	0.0212	0.0513	0.0725	0.0000	310.5289	310.5289	0.0603	0.0154	316.6343
2023	0.5254	0.3907	0.6335	1.5000e-003	0.0992	0.0167	0.1159	0.0264	0.0154	0.0418	0.0000	135.8629	135.8629	0.0211	2.2600e-003	137.0649
Maximum	**0.5254**	**1.3830**	**1.3601**	**3.4100e-003**	**0.0992**	**0.0555**	**0.1350**	**0.0264**	**0.0513**	**0.0725**	**0.0000**	**310.5289**	**310.5289**	**0.0603**	**0.0154**	**316.6343**

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**1.79**	**0.00**	**1.28**	**0.94**	**0.00**	**0.39**	**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	**6-1-2022**	**8-31-2022**	0.8293	0.8293
2	**9-1-2022**	**11-30-2022**	0.5233	0.5233
3	**12-1-2022**	**2-28-2023**	0.4185	0.4185
4	**3-1-2023**	**5-31-2023**	0.3595	0.3595
5	**6-1-2023**	**8-31-2023**	0.3125	0.3125
		Highest	0.8293	0.8293

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	0.3288	5.4000e-003	0.4686	2.0000e-005		2.5900e-003	2.5900e-003		2.5900e-003	2.5900e-003	0.0000	0.7656	0.7656	7.4000e-004	0.0000	0.7840
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.2685	0.2781	2.3904	4.6800e-003	0.4995	3.4300e-003	0.5030	0.1333	3.1900e-003	0.1365	0.0000	436.1857	436.1857	0.0309	0.0218	443.4382
Waste						0.0000	0.0000		0.0000	0.0000	8.2211	0.0000	8.2211	0.4859	0.0000	20.3675
Water						0.0000	0.0000		0.0000	0.0000	1.3985	0.0000	1.3985	0.1436	3.3900e-003	6.0003
Total	**0.5973**	**0.2835**	**2.8591**	**4.7000e-003**	**0.4995**	**6.0200e-003**	**0.5055**	**0.1333**	**5.7800e-003**	**0.1391**	**9.6197**	**436.9512**	**446.5709**	**0.6611**	**0.0251**	**470.5901**

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	0.3288	5.4000e-003	0.4686	2.0000e-005		2.5900e-003	2.5900e-003		2.5900e-003	2.5900e-003	0.0000	0.7656	0.7656	7.4000e-004	0.0000	0.7840
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.2685	0.2781	2.3904	4.6800e-003	0.4995	3.4300e-003	0.5030	0.1333	3.1900e-003	0.1365	0.0000	436.1857	436.1857	0.0309	0.0218	443.4382
Waste						0.0000	0.0000		0.0000	0.0000	8.2211	0.0000	8.2211	0.4859	0.0000	20.3675
Water						0.0000	0.0000		0.0000	0.0000	1.1188	0.0000	1.1188	0.1149	2.7100e-003	4.8003
Total	**0.5973**	**0.2835**	**2.8591**	**4.7000e-003**	**0.4995**	**6.0200e-003**	**0.5055**	**0.1333**	**5.7800e-003**	**0.1391**	**9.3400**	**436.9512**	**446.2912**	**0.6324**	**0.0245**	**469.3900**

	ROG	NOx	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**	**2.91**	**0.00**	**0.06**	**4.35**	**2.70**	**0.26**

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/Site Clearing	Demolition	6/1/2022	6/15/2022	6	13	
2	Grading and Excavation	Grading	6/16/2022	7/14/2022	6	25	
3	Underground Utilities	Trenching	6/30/2022	7/28/2022	6	25	

4	Ground Floor Concrete Work	Building Construction	7/14/2022	12/1/2022		6	121	
5	Modular Placement Framing and Connect	Building Construction	11/17/2022	1/5/2023		6	43	
6	Architectural Coating	Architectural Coating	12/22/2022	8/10/2023		6	199	
7	Paving	Paving	7/30/2023	8/10/2023		6	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 4

Acres of Paving: 0.6

Residential Indoor: 134,980; Residential Outdoor: 44,993; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500; Striped Parking Area: 2,037 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition/Site Clearing	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition/Site Clearing	Rubber Tired Dozers	1	8.00	247	0.40
Demolition/Site Clearing	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading and Excavation	Bore/Drill Rigs	1	8.00	221	0.50
Grading and Excavation	Excavators	2	8.00	158	0.38
Grading and Excavation	Graders	0	0.00	187	0.41
Grading and Excavation	Other Construction Equipment	1	8.00	172	0.42
Grading and Excavation	Rollers	1	8.00	80	0.38
Grading and Excavation	Rubber Tired Dozers	0	0.00	247	0.40
Grading and Excavation	Skid Steer Loaders	1	8.00	65	0.37
Grading and Excavation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Underground Utilities	Excavators	1	8.00	158	0.38
Underground Utilities	Plate Compactors	2	8.00	8	0.43
Underground Utilities	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Ground Floor Concrete Work	Aerial Lifts	2	8.00	63	0.31
Ground Floor Concrete Work	Cranes	1	8.00	231	0.29

Ground Floor Concrete Work	Forklifts	2	8.00	89	0.20
Ground Floor Concrete Work	Generator Sets	0	0.00	84	0.74
Ground Floor Concrete Work	Plate Compactors	1	8.00	8	0.43
Ground Floor Concrete Work	Skid Steer Loaders	1	8.00	65	0.37
Ground Floor Concrete Work	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Ground Floor Concrete Work	Welders	0	0.00	46	0.45
Modular Placement Framing and Connect	Aerial Lifts	1	8.00	63	0.31
Modular Placement Framing and Connect	Cranes	1	8.00	231	0.29
Modular Placement Framing and Connect	Forklifts	2	8.00	89	0.20
Modular Placement Framing and Connect	Generator Sets	0	8.00	84	0.74
Modular Placement Framing and Connect	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Modular Placement Framing and Connect	Welders	0	8.00	46	0.45
Architectural Coating	Aerial Lifts	1	8.00	63	0.31
Architectural Coating	Air Compressors	0	0.00	78	0.48
Architectural Coating	Cranes	1	4.00	231	0.29
Architectural Coating	Forklifts	1	8.00	89	0.20
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Paving	Pavers	1	6.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition/Site Clearing	5	30.00	0.00	600.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading and Excavation	10	30.00	0.00	1,600.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

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

Underground Utilities	4	30.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Ground Floor Concrete Work	9	60.00	12.00	0.00	10.80	7.30	20.00	LD_Mix	MHDT	HHDT
Modular Placement Framing and Connect	4	60.00	0.00	110.00	10.80	7.30	70.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	4	130.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Demolition/Site Clearing - 2022

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					3.3500e-003	0.0000	3.3500e-003	5.1000e-004	0.0000	5.1000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0110	0.1080	0.0907	1.6000e-004		5.4500e-003	5.4500e-003		5.0900e-003	5.0900e-003	0.0000	13.7005	13.7005	3.4900e-003	0.0000	13.7878
Total	**0.0110**	**0.1080**	**0.0907**	**1.6000e-004**	**3.3500e-003**	**5.4500e-003**	**8.8000e-003**	**5.1000e-004**	**5.0900e-003**	**5.6000e-003**	**0.0000**	**13.7005**	**13.7005**	**3.4900e-003**	**0.0000**	**13.7878**

3.2 Demolition/Site Clearing - 2022

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	1.4200e-003	0.0519	0.0109	1.9000e-004	5.0900e-003	4.7000e-004	5.5600e-003	1.4000e-003	4.5000e-004	1.8500e-003	0.0000	18.8820	18.8820	6.5000e-004	2.9900e-003	19.7899
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.8000e-004	4.7100e-003	1.0000e-005	1.5500e-003	1.0000e-005	1.5500e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.2229	1.2229	4.0000e-005	4.0000e-005	1.2344
Total	**1.9400e-003**	**0.0523**	**0.0156**	**2.0000e-004**	**6.6400e-003**	**4.8000e-004**	**7.1100e-003**	**1.8100e-003**	**4.6000e-004**	**2.2700e-003**	**0.0000**	**20.1049**	**20.1049**	**6.9000e-004**	**3.0300e-003**	**21.0243**

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					1.5100e-003	0.0000	1.5100e-003	2.3000e-004	0.0000	2.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0110	0.1080	0.0907	1.6000e-004		5.4500e-003	5.4500e-003		5.0900e-003	5.0900e-003	0.0000	13.7005	13.7005	3.4900e-003	0.0000	13.7878
Total	**0.0110**	**0.1080**	**0.0907**	**1.6000e-004**	**1.5100e-003**	**5.4500e-003**	**6.9600e-003**	**2.3000e-004**	**5.0900e-003**	**5.3200e-003**	**0.0000**	**13.7005**	**13.7005**	**3.4900e-003**	**0.0000**	**13.7878**

3.2 Demolition/Site Clearing - 2022

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	1.4200e-003	0.0519	0.0109	1.9000e-004	5.0900e-003	4.7000e-004	5.5600e-003	1.4000e-003	4.5000e-004	1.8500e-003	0.0000	18.8820	18.8820	6.5000e-004	2.9900e-003	19.7899
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.8000e-004	4.7100e-003	1.0000e-005	1.5500e-003	1.0000e-005	1.5500e-003	4.1000e-004	1.0000e-005	4.2000e-004	0.0000	1.2229	1.2229	4.0000e-005	4.0000e-005	1.2344
Total	**1.9400e-003**	**0.0523**	**0.0156**	**2.0000e-004**	**6.6400e-003**	**4.8000e-004**	**7.1100e-003**	**1.8100e-003**	**4.6000e-004**	**2.2700e-003**	**0.0000**	**20.1049**	**20.1049**	**6.9000e-004**	**3.0300e-003**	**21.0243**

3.3 Grading and Excavation - 2022

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					2.5700e-003	0.0000	2.5700e-003	3.0000e-004	0.0000	3.0000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0196	0.1955	0.2537	4.6000e-004		9.4700e-003	9.4700e-003		8.7200e-003	8.7200e-003	0.0000	40.4706	40.4706	0.0131	0.0000	40.7978
Total	**0.0196**	**0.1955**	**0.2537**	**4.6000e-004**	**2.5700e-003**	**9.4700e-003**	**0.0120**	**3.0000e-004**	**8.7200e-003**	**9.0200e-003**	**0.0000**	**40.4706**	**40.4706**	**0.0131**	**0.0000**	**40.7978**

3.3 Grading and Excavation - 2022

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	3.7800e-003	0.1385	0.0291	5.1000e-004	0.0136	1.2500e-003	0.0148	3.7300e-003	1.1900e-003	4.9300e-003	0.0000	50.3519	50.3519	1.7300e-003	7.9800e-003	52.7732
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**4.7800e-003**	**0.1393**	**0.0382**	**5.4000e-004**	**0.0165**	**1.2700e-003**	**0.0178**	**4.5200e-003**	**1.2000e-003**	**5.7400e-003**	**0.0000**	**52.7037**	**52.7037**	**1.8000e-003**	**8.0500e-003**	**55.1470**

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					1.1600e-003	0.0000	1.1600e-003	1.3000e-004	0.0000	1.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0196	0.1955	0.2537	4.6000e-004		9.4700e-003	9.4700e-003		8.7200e-003	8.7200e-003	0.0000	40.4706	40.4706	0.0131	0.0000	40.7978
Total	**0.0196**	**0.1955**	**0.2537**	**4.6000e-004**	**1.1600e-003**	**9.4700e-003**	**0.0106**	**1.3000e-004**	**8.7200e-003**	**8.8500e-003**	**0.0000**	**40.4706**	**40.4706**	**0.0131**	**0.0000**	**40.7978**

3.3 Grading and Excavation - 2022

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	3.7800e-003	0.1385	0.0291	5.1000e-004	0.0136	1.2500e-003	0.0148	3.7300e-003	1.1900e-003	4.9300e-003	0.0000	50.3519	50.3519	1.7300e-003	7.9800e-003	52.7732
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**4.7800e-003**	**0.1393**	**0.0382**	**5.4000e-004**	**0.0165**	**1.2700e-003**	**0.0178**	**4.5200e-003**	**1.2000e-003**	**5.7400e-003**	**0.0000**	**52.7037**	**52.7037**	**1.8000e-003**	**8.0500e-003**	**55.1470**

3.4 Underground Utilities - 2022

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	5.5900e-003	0.0494	0.0739	1.2000e-004		2.4400e-003	2.4400e-003		2.2700e-003	2.2700e-003	0.0000	9.8681	9.8681	3.0200e-003	0.0000	9.9435
Total	**5.5900e-003**	**0.0494**	**0.0739**	**1.2000e-004**		**2.4400e-003**	**2.4400e-003**		**2.2700e-003**	**2.2700e-003**	**0.0000**	**9.8681**	**9.8681**	**3.0200e-003**	**0.0000**	**9.9435**

3.4 Underground Utilities - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**1.0000e-003**	**7.4000e-004**	**9.0500e-003**	**3.0000e-005**	**2.9700e-003**	**2.0000e-005**	**2.9900e-003**	**7.9000e-004**	**1.0000e-005**	**8.1000e-004**	**0.0000**	**2.3518**	**2.3518**	**7.0000e-005**	**7.0000e-005**	**2.3738**

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	5.5900e-003	0.0494	0.0739	1.2000e-004		2.4400e-003	2.4400e-003		2.2700e-003	2.2700e-003	0.0000	9.8680	9.8680	3.0200e-003	0.0000	9.9435
Total	**5.5900e-003**	**0.0494**	**0.0739**	**1.2000e-004**		**2.4400e-003**	**2.4400e-003**		**2.2700e-003**	**2.2700e-003**	**0.0000**	**9.8680**	**9.8680**	**3.0200e-003**	**0.0000**	**9.9435**

3.4 Underground Utilities - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-003	7.4000e-004	9.0500e-003	3.0000e-005	2.9700e-003	2.0000e-005	2.9900e-003	7.9000e-004	1.0000e-005	8.1000e-004	0.0000	2.3518	2.3518	7.0000e-005	7.0000e-005	2.3738
Total	**1.0000e-003**	**7.4000e-004**	**9.0500e-003**	**3.0000e-005**	**2.9700e-003**	**2.0000e-005**	**2.9900e-003**	**7.9000e-004**	**1.0000e-005**	**8.1000e-004**	**0.0000**	**2.3518**	**2.3518**	**7.0000e-005**	**7.0000e-005**	**2.3738**

3.5 Ground Floor Concrete Work - 2022

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	0.0573	0.6214	0.6185	1.0800e-003		0.0284	0.0284		0.0261	0.0261	0.0000	94.1954	94.1954	0.0301	0.0000	94.9466
Total	**0.0573**	**0.6214**	**0.6185**	**1.0800e-003**		**0.0284**	**0.0284**		**0.0261**	**0.0261**	**0.0000**	**94.1954**	**94.1954**	**0.0301**	**0.0000**	**94.9466**

3.5 Ground Floor Concrete Work - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5100e-003	0.0275	8.2000e-003	1.3000e-004	5.0500e-003	4.4000e-004	5.4900e-003	1.5200e-003	4.2000e-004	1.9400e-003	0.0000	12.2791	12.2791	8.0000e-005	1.6200e-003	12.7631
Worker	9.7200e-003	7.1300e-003	0.0876	2.5000e-004	0.0288	1.5000e-004	0.0289	7.6600e-003	1.4000e-004	7.8000e-003	0.0000	22.7649	22.7649	7.0000e-004	6.6000e-004	22.9785
Total	**0.0112**	**0.0347**	**0.0958**	**3.8000e-004**	**0.0338**	**5.9000e-004**	**0.0344**	**9.1800e-003**	**5.6000e-004**	**9.7400e-003**	**0.0000**	**35.0440**	**35.0440**	**7.8000e-004**	**2.2800e-003**	**35.7416**

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	0.0573	0.6213	0.6185	1.0800e-003		0.0284	0.0284		0.0261	0.0261	0.0000	94.1952	94.1952	0.0301	0.0000	94.9465
Total	**0.0573**	**0.6213**	**0.6185**	**1.0800e-003**		**0.0284**	**0.0284**		**0.0261**	**0.0261**	**0.0000**	**94.1952**	**94.1952**	**0.0301**	**0.0000**	**94.9465**

3.5 Ground Floor Concrete Work - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.5100e-003	0.0275	8.2000e-003	1.3000e-004	5.0500e-003	4.4000e-004	5.4900e-003	1.5200e-003	4.2000e-004	1.9400e-003	0.0000	12.2791	12.2791	8.0000e-005	1.6200e-003	12.7631
Worker	9.7200e-003	7.1300e-003	0.0876	2.5000e-004	0.0288	1.5000e-004	0.0289	7.6600e-003	1.4000e-004	7.8000e-003	0.0000	22.7649	22.7649	7.0000e-004	6.6000e-004	22.9785
Total	**0.0112**	**0.0347**	**0.0958**	**3.8000e-004**	**0.0338**	**5.9000e-004**	**0.0344**	**9.1800e-003**	**5.6000e-004**	**9.7400e-003**	**0.0000**	**35.0440**	**35.0440**	**7.8000e-004**	**2.2800e-003**	**35.7416**

3.6 Modular Placement Framing and Connect - 2022

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	0.0124	0.1337	0.1032	2.0000e-004		6.3200e-003	6.3200e-003		5.8100e-003	5.8100e-003	0.0000	17.9999	17.9999	5.8200e-003	0.0000	18.1454
Total	**0.0124**	**0.1337**	**0.1032**	**2.0000e-004**		**6.3200e-003**	**6.3200e-003**		**5.8100e-003**	**5.8100e-003**	**0.0000**	**17.9999**	**17.9999**	**5.8200e-003**	**0.0000**	**18.1454**

3.6 Modular Placement Framing and Connect - 2022

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	7.1000e-004	0.0279	4.7000e-003	1.1000e-004	2.9600e-003	2.7000e-004	3.2300e-003	8.1000e-004	2.6000e-004	1.0700e-003	0.0000	10.6754	10.6754	3.7000e-004	1.6900e-003	11.1889
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1300e-003	2.3000e-003	0.0282	8.0000e-005	9.2800e-003	5.0000e-005	9.3300e-003	2.4700e-003	4.0000e-005	2.5100e-003	0.0000	7.3375	7.3375	2.3000e-004	2.1000e-004	7.4063
Total	**3.8400e-003**	**0.0302**	**0.0329**	**1.9000e-004**	**0.0122**	**3.2000e-004**	**0.0126**	**3.2800e-003**	**3.0000e-004**	**3.5800e-003**	**0.0000**	**18.0128**	**18.0128**	**6.0000e-004**	**1.9000e-003**	**18.5952**

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	0.0124	0.1337	0.1032	2.0000e-004		6.3200e-003	6.3200e-003		5.8100e-003	5.8100e-003	0.0000	17.9999	17.9999	5.8200e-003	0.0000	18.1454
Total	**0.0124**	**0.1337**	**0.1032**	**2.0000e-004**		**6.3200e-003**	**6.3200e-003**		**5.8100e-003**	**5.8100e-003**	**0.0000**	**17.9999**	**17.9999**	**5.8200e-003**	**0.0000**	**18.1454**

3.6 Modular Placement Framing and Connect - 2022

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	7.1000e-004	0.0279	4.7000e-003	1.1000e-004	2.9600e-003	2.7000e-004	3.2300e-003	8.1000e-004	2.6000e-004	1.0700e-003	0.0000	10.6754	10.6754	3.7000e-004	1.6900e-003	11.1889
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1300e-003	2.3000e-003	0.0282	8.0000e-005	9.2800e-003	5.0000e-005	9.3300e-003	2.4700e-003	4.0000e-005	2.5100e-003	0.0000	7.3375	7.3375	2.3000e-004	2.1000e-004	7.4063
Total	**3.8400e-003**	**0.0302**	**0.0329**	**1.9000e-004**	**0.0122**	**3.2000e-004**	**0.0126**	**3.2800e-003**	**3.0000e-004**	**3.5800e-003**	**0.0000**	**18.0128**	**18.0128**	**6.0000e-004**	**1.9000e-003**	**18.5952**

3.6 Modular Placement Framing and Connect - 2023

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	1.1800e-003	0.0125	0.0104	2.0000e-005		5.7000e-004	5.7000e-004		5.3000e-004	5.3000e-004	0.0000	1.8461	1.8461	6.0000e-004	0.0000	1.8611
Total	**1.1800e-003**	**0.0125**	**0.0104**	**2.0000e-005**		**5.7000e-004**	**5.7000e-004**		**5.3000e-004**	**5.3000e-004**	**0.0000**	**1.8461**	**1.8461**	**6.0000e-004**	**0.0000**	**1.8611**

3.6 Modular Placement Framing and Connect - 2023

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	3.0000e-005	2.2100e-003	3.8000e-004	1.0000e-005	3.0000e-004	2.0000e-005	3.2000e-004	8.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.0414	1.0414	4.0000e-005	1.7000e-004	1.0915
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.1000e-004	2.6900e-003	1.0000e-005	9.5000e-004	0.0000	9.6000e-004	2.5000e-004	0.0000	2.6000e-004	0.0000	0.7336	0.7336	2.0000e-005	2.0000e-005	0.7402
Total	**3.3000e-004**	**2.4200e-003**	**3.0700e-003**	**2.0000e-005**	**1.2500e-003**	**2.0000e-005**	**1.2800e-003**	**3.3000e-004**	**2.0000e-005**	**3.6000e-004**	**0.0000**	**1.7751**	**1.7751**	**6.0000e-005**	**1.9000e-004**	**1.8317**

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	1.1800e-003	0.0125	0.0104	2.0000e-005		5.7000e-004	5.7000e-004		5.3000e-004	5.3000e-004	0.0000	1.8461	1.8461	6.0000e-004	0.0000	1.8611
Total	**1.1800e-003**	**0.0125**	**0.0104**	**2.0000e-005**		**5.7000e-004**	**5.7000e-004**		**5.3000e-004**	**5.3000e-004**	**0.0000**	**1.8461**	**1.8461**	**6.0000e-004**	**0.0000**	**1.8611**

3.6 Modular Placement Framing and Connect - 2023

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	3.0000e-005	2.2100e-003	3.8000e-004	1.0000e-005	3.0000e-004	2.0000e-005	3.2000e-004	8.0000e-005	2.0000e-005	1.0000e-004	0.0000	1.0414	1.0414	4.0000e-005	1.7000e-004	1.0915
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-004	2.1000e-004	2.6900e-003	1.0000e-005	9.5000e-004	0.0000	9.6000e-004	2.5000e-004	0.0000	2.6000e-004	0.0000	0.7336	0.7336	2.0000e-005	2.0000e-005	0.7402
Total	**3.3000e-004**	**2.4200e-003**	**3.0700e-003**	**2.0000e-005**	**1.2500e-003**	**2.0000e-005**	**1.2800e-003**	**3.3000e-004**	**2.0000e-005**	**3.6000e-004**	**0.0000**	**1.7751**	**1.7751**	**6.0000e-005**	**1.9000e-004**	**1.8317**

3.7 Architectural Coating - 2022

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	0.0218					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5100e-003	0.0167	0.0144	3.0000e-005		7.5000e-004	7.5000e-004		6.9000e-004	6.9000e-004	0.0000	2.4088	2.4088	7.8000e-004	0.0000	2.4283
Total	**0.0233**	**0.0167**	**0.0144**	**3.0000e-005**		**7.5000e-004**	**7.5000e-004**		**6.9000e-004**	**6.9000e-004**	**0.0000**	**2.4088**	**2.4088**	**7.8000e-004**	**0.0000**	**2.4283**

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5700e-003	1.1500e-003	0.0141	4.0000e-005	4.6400e-003	2.0000e-005	4.6600e-003	1.2300e-003	2.0000e-005	1.2600e-003	0.0000	3.6687	3.6687	1.1000e-004	1.1000e-004	3.7032
Total	**1.5700e-003**	**1.1500e-003**	**0.0141**	**4.0000e-005**	**4.6400e-003**	**2.0000e-005**	**4.6600e-003**	**1.2300e-003**	**2.0000e-005**	**1.2600e-003**	**0.0000**	**3.6687**	**3.6687**	**1.1000e-004**	**1.1000e-004**	**3.7032**

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	0.0218					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.5100e-003	0.0167	0.0144	3.0000e-005		7.5000e-004	7.5000e-004		6.9000e-004	6.9000e-004	0.0000	2.4088	2.4088	7.8000e-004	0.0000	2.4283
Total	**0.0233**	**0.0167**	**0.0144**	**3.0000e-005**		**7.5000e-004**	**7.5000e-004**		**6.9000e-004**	**6.9000e-004**	**0.0000**	**2.4088**	**2.4088**	**7.8000e-004**	**0.0000**	**2.4283**

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5700e-003	1.1500e-003	0.0141	4.0000e-005	4.6400e-003	2.0000e-005	4.6600e-003	1.2300e-003	2.0000e-005	1.2600e-003	0.0000	3.6687	3.6687	1.1000e-004	1.1000e-004	3.7032
Total	**1.5700e-003**	**1.1500e-003**	**0.0141**	**4.0000e-005**	**4.6400e-003**	**2.0000e-005**	**4.6600e-003**	**1.2300e-003**	**2.0000e-005**	**1.2600e-003**	**0.0000**	**3.6687**	**3.6687**	**1.1000e-004**	**1.1000e-004**	**3.7032**

3.7 Architectural Coating - 2023

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	0.4597					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0297	0.3231	0.2996	5.8000e-004		0.0141	0.0141		0.0130	0.0130	0.0000	50.8529	50.8529	0.0165	0.0000	51.2641
Total	**0.4895**	**0.3231**	**0.2996**	**5.8000e-004**		**0.0141**	**0.0141**		**0.0130**	**0.0130**	**0.0000**	**50.8529**	**50.8529**	**0.0165**	**0.0000**	**51.2641**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0309	0.0215	0.2764	8.1000e-004	0.0980	4.9000e-004	0.0984	0.0261	4.5000e-004	0.0265	0.0000	75.5027	75.5027	2.1500e-003	2.0800e-003	76.1753
Total	**0.0309**	**0.0215**	**0.2764**	**8.1000e-004**	**0.0980**	**4.9000e-004**	**0.0984**	**0.0261**	**4.5000e-004**	**0.0265**	**0.0000**	**75.5027**	**75.5027**	**2.1500e-003**	**2.0800e-003**	**76.1753**

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	0.4597					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0297	0.3231	0.2996	5.8000e-004		0.0141	0.0141		0.0130	0.0130	0.0000	50.8528	50.8528	0.0165	0.0000	51.2640
Total	**0.4895**	**0.3231**	**0.2996**	**5.8000e-004**		**0.0141**	**0.0141**		**0.0130**	**0.0130**	**0.0000**	**50.8528**	**50.8528**	**0.0165**	**0.0000**	**51.2640**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0309	0.0215	0.2764	8.1000e-004	0.0980	4.9000e-004	0.0984	0.0261	4.5000e-004	0.0265	0.0000	75.5027	75.5027	2.1500e-003	2.0800e-003	76.1753
Total	**0.0309**	**0.0215**	**0.2764**	**8.1000e-004**	**0.0980**	**4.9000e-004**	**0.0984**	**0.0261**	**4.5000e-004**	**0.0265**	**0.0000**	**75.5027**	**75.5027**	**2.1500e-003**	**2.0800e-003**	**76.1753**

3.8 Paving - 2023

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	3.2200e-003	0.0312	0.0440	7.0000e-005		1.5400e-003	1.5400e-003		1.4200e-003	1.4200e-003	0.0000	5.8862	5.8862	1.8700e-003	0.0000	5.9329
Paving	2.9000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.5100e-003**	**0.0312**	**0.0440**	**7.0000e-005**		**1.5400e-003**	**1.5400e-003**		**1.4200e-003**	**1.4200e-003**	**0.0000**	**5.8862**	**5.8862**	**1.8700e-003**	**0.0000**	**5.9329**

3.8 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	3.2200e-003	0.0312	0.0440	7.0000e-005		1.5400e-003	1.5400e-003		1.4200e-003	1.4200e-003	0.0000	5.8862	5.8862	1.8700e-003	0.0000	5.9329
Paving	2.9000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.5100e-003**	**0.0312**	**0.0440**	**7.0000e-005**		**1.5400e-003**	**1.5400e-003**		**1.4200e-003**	**1.4200e-003**	**0.0000**	**5.8862**	**5.8862**	**1.8700e-003**	**0.0000**	**5.9329**

3.8 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2685	0.2781	2.3904	4.6800e-003	0.4995	3.4300e-003	0.5030	0.1333	3.1900e-003	0.1365	0.0000	436.1857	436.1857	0.0309	0.0218	443.4382
Unmitigated	0.2685	0.2781	2.3904	4.6800e-003	0.4995	3.4300e-003	0.5030	0.1333	3.1900e-003	0.1365	0.0000	436.1857	436.1857	0.0309	0.0218	443.4382

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	308.70	277.20	233.10	677,639	677,639
Enclosed Parking with Elevator	0.00	0.00	0.00		
Fast Food Restaurant w/o Drive Thru	346.00	696.00	500.00	674,054	674,054
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	654.70	973.20	733.10	1,351,692	1,351,692

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
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Fast Food Restaurant w/o Drive	9.50	7.30	7.30	1.50	79.50	19.00	51	37	12
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

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

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Enclosed Parking with Elevator	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Fast Food Restaurant w/o Drive Thru	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Other Non-Asphalt Surfaces	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838
Parking Lot	0.571175	0.055403	0.188166	0.116095	0.020429	0.005041	0.007817	0.006362	0.000912	0.000389	0.024445	0.000927	0.002838

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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					
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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					
Apartments Mid Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	411646	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	39945.9	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	98140	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	3500	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	411646	0.0000	0.0000	0.0000	0.0000
Enclosed Parking with Elevator	39945.9	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	98140	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	3500	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive 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	0.3288	5.4000e-003	0.4686	2.0000e-005		2.5900e-003	2.5900e-003		2.5900e-003	2.5900e-003	0.0000	0.7656	0.7656	7.4000e-004	0.0000	0.7840
Unmitigated	0.3288	5.4000e-003	0.4686	2.0000e-005		2.5900e-003	2.5900e-003		2.5900e-003	2.5900e-003	0.0000	0.7656	0.7656	7.4000e-004	0.0000	0.7840

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	0.0482					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2664					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0142	5.4000e-003	0.4686	2.0000e-005		2.5900e-003	2.5900e-003		2.5900e-003	2.5900e-003	0.0000	0.7656	0.7656	7.4000e-004	0.0000	0.7840
Total	**0.3288**	**5.4000e-003**	**0.4686**	**2.0000e-005**		**2.5900e-003**	**2.5900e-003**		**2.5900e-003**	**2.5900e-003**	**0.0000**	**0.7656**	**0.7656**	**7.4000e-004**	**0.0000**	**0.7840**

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	0.0482					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2664					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0142	5.4000e-003	0.4686	2.0000e-005		2.5900e-003	2.5900e-003		2.5900e-003	2.5900e-003	0.0000	0.7656	0.7656	7.4000e-004	0.0000	0.7840
Total	**0.3288**	**5.4000e-003**	**0.4686**	**2.0000e-005**		**2.5900e-003**	**2.5900e-003**		**2.5900e-003**	**2.5900e-003**	**0.0000**	**0.7656**	**0.7656**	**7.4000e-004**	**0.0000**	**0.7840**

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	1.1188	0.1149	2.7100e-003	4.8003
Unmitigated	1.3985	0.1436	3.3900e-003	6.0003

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	4.1047 / 2.58775	1.3022	0.1338	3.1600e-003	5.5872
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0.303534 / 0.0193745	0.0963	9.8900e-003	2.3000e-004	0.4132
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**1.3985**	**0.1436**	**3.3900e-003**	**6.0003**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	3.28376 / 2.4299	1.0418	0.1070	2.5300e-003	4.4697
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	0.242827 / 0.0181926	0.0770	7.9100e-003	1.9000e-004	0.3305
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**1.1188**	**0.1149**	**2.7200e-003**	**4.8003**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	8.2211	0.4859	0.0000	20.3675
Unmitigated	8.2211	0.4859	0.0000	20.3675

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	28.98	5.8827	0.3477	0.0000	14.5741
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	11.52	2.3385	0.1382	0.0000	5.7934
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**8.2211**	**0.4859**	**0.0000**	**20.3675**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	28.98	5.8827	0.3477	0.0000	14.5741
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Fast Food Restaurant w/o Drive Thru	11.52	2.3385	0.1382	0.0000	5.7934
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**8.2211**	**0.4859**	**0.0000**	**20.3675**

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

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

231 Grant Educator Workforce Housing - Existing Land Use

Santa Clara County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Government Office Building	6.80	1000sqft	1.40	6,800.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2020
Utility Company	City of Palo Alto Utilities Department				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Operations only run to estimate existing emissions.

Land Use - Information based on existing office on the project site.

Construction Phase - Phases entered as placeholders; operations only run.

Off-road Equipment - Operations only run.

Off-road Equipment - Operations only run.

Grading -

Architectural Coating - Operations only run.

Vehicle Trips - Existing trips based on ITE code and land use in TIA Analysis of 3.28/employee.

Energy Use - Use of historical energy data (building was built in 1956)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	3,400.00	0.00

tblArchitecturalCoating	ConstArea_Nonresidential_Interior	10,200.00	0.00
tblConstructionPhase	NumDays	10.00	1.00
tblConstructionPhase	NumDays	2.00	1.00
tblLandUse	LotAcreage	0.16	1.40
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblOffRoadEquipment	UsageHours	7.00	0.00
tblOffRoadEquipment	UsageHours	8.00	0.00
tblVehicleTrips	WD_TR	22.59	4.82

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**

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

		Highest		

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	0.0301	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004
Energy	7.3000e-004	6.6500e-003	5.5900e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004	0.0000	7.2430	7.2430	1.4000e-004	1.3000e-004	7.2860
Mobile	0.0102	0.0120	0.0867	1.5000e-004	0.0148	1.7000e-004	0.0150	3.9600e-003	1.6000e-004	4.1200e-003	0.0000	14.1284	14.1284	1.1600e-003	7.9000e-004	14.3917
Waste						0.0000	0.0000		0.0000	0.0000	1.2829	0.0000	1.2829	0.0758	0.0000	3.1783
Water						0.0000	0.0000		0.0000	0.0000	0.4286	0.0000	0.4286	0.0440	1.0400e-003	1.8388
Total	**0.0411**	**0.0186**	**0.0924**	**1.9000e-004**	**0.0148**	**6.8000e-004**	**0.0155**	**3.9600e-003**	**6.7000e-004**	**4.6300e-003**	**1.7115**	**21.3715**	**23.0830**	**0.1211**	**1.9600e-003**	**26.6949**

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

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0301	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004
Energy	7.3000e-004	6.6500e-003	5.5900e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004	0.0000	7.2430	7.2430	1.4000e-004	1.3000e-004	7.2860
Mobile	0.0102	0.0120	0.0867	1.5000e-004	0.0148	1.7000e-004	0.0150	3.9600e-003	1.6000e-004	4.1200e-003	0.0000	14.1284	14.1284	1.1600e-003	7.9000e-004	14.3917
Waste						0.0000	0.0000		0.0000	0.0000	1.2829	0.0000	1.2829	0.0758	0.0000	3.1783
Water						0.0000	0.0000		0.0000	0.0000	0.4286	0.0000	0.4286	0.0440	1.0400e-003	1.8388
Total	**0.0411**	**0.0186**	**0.0924**	**1.9000e-004**	**0.0148**	**6.8000e-004**	**0.0155**	**3.9600e-003**	**6.7000e-004**	**4.6300e-003**	**1.7115**	**21.3715**	**23.0830**	**0.1211**	**1.9600e-003**	**26.6949**

	ROG	NOx	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	Site Preparation	Site Preparation	1/29/2019	1/29/2019	5	1	
2	Architectural Coating	Architectural Coating	11/27/2019	11/27/2019	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	0	0.00	187	0.41
Site Preparation	Rubber Tired Dozers	0	0.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Architectural Coating	Air Compressors	0	0.00	78	0.48

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
Site Preparation	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Site Preparation - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Architectural Coating - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

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	0.0102	0.0120	0.0867	1.5000e-004	0.0148	1.7000e-004	0.0150	3.9600e-003	1.6000e-004	4.1200e-003	0.0000	14.1284	14.1284	1.1600e-003	7.9000e-004	14.3917
Unmitigated	0.0102	0.0120	0.0867	1.5000e-004	0.0148	1.7000e-004	0.0150	3.9600e-003	1.6000e-004	4.1200e-003	0.0000	14.1284	14.1284	1.1600e-003	7.9000e-004	14.3917

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Government Office Building	32.78	0.00	0.00	40,148	40,148
Total	32.78	0.00	0.00	40,148	40,148

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
Government Office Building	9.50	7.30	7.30	33.00	62.00	5.00	50	34	16

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Government Office Building	0.566081	0.054633	0.191878	0.117238	0.020772	0.004815	0.008393	0.006391	0.000990	0.000417	0.024374	0.000959	0.003058

5.0 Energy Detail

Historical Energy Use: Y

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	7.3000e-004	6.6500e-003	5.5900e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004	0.0000	7.2430	7.2430	1.4000e-004	1.3000e-004	7.2860
NaturalGas Unmitigated	7.3000e-004	6.6500e-003	5.5900e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004	0.0000	7.2430	7.2430	1.4000e-004	1.3000e-004	7.2860

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					
Government Office Building	135728	7.3000e-004	6.6500e-003	5.5900e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004	0.0000	7.2430	7.2430	1.4000e-004	1.3000e-004	7.2860
Total		**7.3000e-004**	**6.6500e-003**	**5.5900e-003**	**4.0000e-005**		**5.1000e-004**	**5.1000e-004**		**5.1000e-004**	**5.1000e-004**	**0.0000**	**7.2430**	**7.2430**	**1.4000e-004**	**1.3000e-004**	**7.2860**

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					
Government Office Building	135728	7.3000e-004	6.6500e-003	5.5900e-003	4.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004	0.0000	7.2430	7.2430	1.4000e-004	1.3000e-004	7.2860
Total		**7.3000e-004**	**6.6500e-003**	**5.5900e-003**	**4.0000e-005**		**5.1000e-004**	**5.1000e-004**		**5.1000e-004**	**5.1000e-004**	**0.0000**	**7.2430**	**7.2430**	**1.4000e-004**	**1.3000e-004**	**7.2860**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Government Office Building	139876	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Government Office Building	139876	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

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

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0301	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004
Unmitigated	0.0301	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004

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	3.5500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0266					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004
Total	**0.0301**	**0.0000**	**6.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.0000**	**1.3000e-004**

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	3.5500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0266					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.3000e-004
Total	**0.0301**	**0.0000**	**6.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.0000**	**1.3000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.4286	0.0440	1.0400e-003	1.8388
Unmitigated	0.4286	0.0440	1.0400e-003	1.8388

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Government Office Building	1.35089 / 0.827962	0.4286	0.0440	1.0400e-003	1.8388
Total		**0.4286**	**0.0440**	**1.0400e-003**	**1.8388**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Government Office Building	1.35089 / 0.827962	0.4286	0.0440	1.0400e-003	1.8388
Total		**0.4286**	**0.0440**	**1.0400e-003**	**1.8388**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.2829	0.0758	0.0000	3.1783
Unmitigated	1.2829	0.0758	0.0000	3.1783

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Government Office Building	6.32	1.2829	0.0758	0.0000	3.1783
Total		**1.2829**	**0.0758**	**0.0000**	**3.1783**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Government Office Building	6.32	1.2829	0.0758	0.0000	3.1783
Total		**1.2829**	**0.0758**	**0.0000**	**3.1783**

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 C – Historical Resources Supporting Documentation

Contains:

- List of Archaeological Studies within 0.25-mile radius of the Project Site
- Letter Report – 231 Grant Avenue, Palo Alto Historic Resource Evaluation, October 14, 2020

LIST OF ARCHAEOLOGICAL STUDIES WITHIN 0.25-MILE RADIUS OF THE PROJECT SITE

Table C-1 Archaeological Studies within 0.25-mile Radius of the Project Site

Study Number	Report Title	Author(s)	Year of Study	Identified Resources within 0.25 Mile of Project Site?
S-003163	An Archaeological Reconnaissance of the Proposed Dumbarton Bridge Replacement Project	Treganza, Adan	1973	No
S-004883	Historic Property Survey Report, Oregon-Page Mill Expressway Intersection Improvements at El Camino Real, Palo Alto, California	Sullivan, Francis and Theodore A. Cicoletti	1977	No
S-011396	Technical Report of Cultural Resources Studies for the Proposed WTG-WEST, Inc., Los Angeles to San Francisco and Sacramento, California: Fiber Optic Cable Project	BioSystems Analysis, Inc.	1989	No
S-025174	Cultural Resources Report for San Bruno to Mountain View Internodal Level 3 Fiber Optics Project in San Mateo and Santa Clara Counties, California	Holson, John, Sutch, Cordelia, and Stephanie Pau	2002	No
S-026045	Cultural Resources Reconnaissance Survey and Inventory Report for the Metromedia Fiberoptic Cable Project, San Francisco Bay Area and Los Angeles Basin Networks	Carrico, Richard, Cooley, Theodore, and William Eckhardt	2000	No
S-029233	Nextel Communications Wireless Telecommunications Service Facility-Santa Clara County, Nextel Site No. (CA- 0871A)/Oregon Expressway	Billat, Lorna	2000	No
S-029657	Archaeological Inventory for the Caltrain Electrification Program Alternative in San Francisco, San Mateo, and Santa Clara Counties, California	Nelson, Wendy Jl, Norton, Tammara, Chiea, Larry, and Reinhard Pribish	2002	No
S-030233	Cultural Resources Analysis for Cingular Wireless Site BA-350 02, "California Avenue Caltrain Station", Palo Alto, California	Losee, Carolyn	2004	No
S-032250	Historic Property Survey Report, Mission Bells Project, State Route 82/Interstate 101, San Mateo and Santa Clara Counties, California	Lapin, Philippe	2003	No
S-039469	Historical Resources Compliance Report for the San Mateo County SMART Corridors Project, Segment III, Redwood City, Atherton, Menlo Park, East Palo Alto, and Palo Alto, San Mateo County & Santa Clara County, California; EA #4A9201; EFIS #0400001169, Caltrans District 4; SR 82 PM SM 0/4.8, SCL 24.1/26.4; SR 84 PM 24.6/28.7; US-101 PM 0.7/5.5; SR 109 PM 1.10/1.87; SR 114 PM 5.0/5.93	Kaptain, Neal	2012	Yes

Source: Compiled by AECOM in 2021.

300 California Street, Suite 600
San Francisco, CA 94104
aecom.com

To:
Emily Chen, County of Santa Clara, Facilities and Fleets Department

From:
Heather Miller, MA, Architectural Historian, AECOM
Chandra Miller, MA, Architectural Historian, AECOM

Project Name:
231 Grant Avenue Housing Project

Date:
October 14, 2020

Letter Report – 231 Grant Avenue, Palo Alto Historic Resource Evaluation

Introduction

AECOM Technical Services, Inc. (AECOM) has been retained by the County of Santa Clara to complete a historic resource evaluation on the 1956-constructed office building at 231 Grant Avenue in Palo Alto. This letter report describes the current condition of the building with recent photographs of existing conditions and evaluates the building for eligibility for listing in the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), and the Santa Clara County Landmark Designation Criteria.

Project Description

The 231 Grant Avenue Housing project is sponsored by the County of Santa Clara, County of Santa Clara Board of Supervisors, represented by Supervisor Simitian, Facebook, four Santa Clara County School Districts (Los Altos, Palo Alto, Mountain View Whisman, Mountain View Los Altos) and the Foothill-De Anza Community College District to serve teachers and classified staff from the participating school districts. The project site has an existing approximately 6,800 square foot (SF) office building constructed in 1956, that would be demolished as part of this project. The four-story proposed development would include approximately 110 residential units, office area, and community and retail spaces, laid out in two C-shape buildings to form three courtyards. A parking structure will provide both car and bicycle parking.

Archival Research and Survey Results

The background investigation for this historic resource evaluation includes research to develop a general historic context relative to the building's location and land use, to establish the property's physical history, and to place the 1956-constructed office building within the appropriate historical context.

AECOM examined standard sources of information that identify known and potential historical resources to determine whether any buildings, structures, objects, districts, or sites had been previously recorded or evaluated on the subject property. This included the California Historical Landmarks and Points of Interest publications and updates, National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), and the Office of Historic Preservation (OHP) Built Environment Resource Directory (BERD), California Historical Landmarks, California Points of Historical Interest, California

Historical Interest, the Santa Clara County Heritage Resource Inventory, and the Palo Alto Historic Inventory. AECOM also reviewed online sources of information including historic newspapers and architectural journals, historic Sanborn Fire Insurance maps, historic and modern aerial photography, United States Geographical Survey (USGS) maps, architect directories, and other relevant sources of information. AECOM also reviewed records on file at the Northwest Information Center (NWIC) of the California Historic Resource Inventory System to identify previously conducted cultural resources investigations and resources that may have been recorded on the subject property. These investigations did not identify any previously inventoried or evaluated NRHP, CRHR, or local register qualifying built environment resources. The office building at 231 Grant Avenue is not listed in the City of Palo Alto Historic Inventory, or the Santa Clara County Heritage Resource Inventory.

An intensive-level pedestrian survey was conducted under direction of AECOM Architectural Historian Heather Miller by AECOM Cultural Resources Specialist Annamarie Guerrero on September 23, 2020. Contextual and detailed photographs and notes were taken to observe and assess the current conditions of the 231 Grant Avenue building and was subsequently recorded and described on Department of Parks and Recreation (DPR) 523 series forms (see attached).

Historic Evaluation

Although the property is located within the city limits of Palo Alto, the building is owned by the County of Santa Clara, therefore it has been evaluated for eligibility against Santa Clara County Designation criteria instead of Palo Alto Historic Inventory Criteria for Designation. Regardless, the building at 231 Grant Avenue does not appear to meet the criteria for designation for listing in the Palo Alto Historic Inventory.

National Register of Historic Places

The National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR) use four similar criteria for eligibility. To be considered eligible for the NRHP, a resource must be significant at the local, state, or national level, under one or more of the following four criteria:

A. are associated with events that have made a significant contribution to the broad patterns of our history; or

B. are associated with the lives of persons significant to our past; or

C. embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master; or that possess high artistic values; or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. have yielded, or may be likely to yield, information important in prehistory or history.

California Register of Historical Resources Significance

The criteria for listing historical resources in the California Register are consistent with those developed for listing in the National Register but have been modified for state use in order to include a range of historical resources which better reflect the history of California. An historical resource must be significant at the local, state, or national level under one or more of the following four criteria:

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; or
4. has yielded, or may be likely to yield, information important in prehistory or history.

Santa Clara County Landmark Designation Criteria

Because the building at 231 Grant Avenue in Palo Alto is owned by the County, the building is being evaluated under the Santa Clara County Landmark Designation Criteria. For the county landmark criteria to apply, the building must be 50 years or older, must retain historic integrity, and meet one of the following criteria of significance:

1. Associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2. Associated with the lives of persons important to local, California or national history;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. Yielded or has the potential to yield information important to the pre-history or history of the local area, California, or the nation.

Evaluation Summary

The 1956-constructed office building at 231 Grant Avenue does not appear individually eligible for the NRHP or CRHR, or as a Santa Clara County Landmark. The building is not associated with significant historic events (NRHP Criterion A / CRHR Criterion 1 / Santa Clara County Landmark Designation Criterion 1) and it is not associated with any individuals who played a significant role in local, state, or national history (NRHP Criterion B / CRHR Criterion 2). Furthermore, the building does not embody distinctive characteristics of a type, period, or method of construction, nor does it appear to be a significant example of the work of a master architect (NRHP Criterion C / CRHR Criterion 3 / Santa Clara County Landmark Designation Criterion 3) and it is unlikely to yield information important to history (NRHP Criterion D / CRHR Criterion 4 / Santa Clara County Landmark Designation Criterion 4). The property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code (which mirror the criteria used in this assessment). The building at 231 Grant Avenue in Palo Alto does not appear to meet the criteria as a historical resource for the purposes of CEQA. Because the building is not historically significant, it does not have any character-defining features.

See attached DPR 523 forms prepared for 231 Grant Avenue, Palo Alto for full historical context and evaluation statements.

Attachment: DPR 523 Forms, 231 Grant Avenue, Palo Alto (12 pages)

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #_______________________
HRI #_______________________________

Trinomial___________________________
NRHP Status Code 6Z

Other Listings ____
Review Code Reviewer Date ____________

***Resource Name or #:** (Assigned by recorder) 231 Grant Avenue,Palo Alto

P1. Other Identifier: Santa Clara County Office of the Public Defender
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County:** Santa Clara
***b.USGS 7.5' Quad** Palo Alto, Calif. **Date** 1961 (photorevised 1973) **T** 3W; **R** 6S; **M.D.** B.M.
c. Address 231 Grant Avenue **City** Palo Alto **Zip** 94306
d. UTM: (Give more than one for large and/or linear resources) Zone_______ ;______________mE/____________mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
Assessor's Parcel Number (APN): 132-31-074

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
This 1.46-acre lot in the city of Palo Alto contains an approximately 6,800-square-foot office building completed in 1956. The Contemporary style single-story building is oriented northwest towards Grant Avenue on a rectangular shaped parcel with surface parking lots on the north and south ends (see Sketch Map and Photograph 1). Mature landscaping including Camphor, Redwood, Eucalyptus, and Magnolia trees and numerous shrubs are on the boundary and within the parcel boundary. The building rests on a concrete slab foundation with an irregular L-shaped plan that forms a rear courtyard area. A flat roof system with wide wood eaves tops the building with a slightly taller roof on the south section of the building. Rough stucco siding covers much of the exterior with a stack-course Roman brick wall section on the façade and stack-course concrete masonry units on the slightly taller roof on the south section of the building. The stepped façade contains the primary entrance into the building which consists of a non-original recessed single anodized-frame glass door flanked by sidelights (Photographs 1 and 2). North of the entrance is a stack-course Roman brick wall that wraps around to the façade. Much of the remainder of the façade is lined with two-part metal-frame windows separated by narrow wood pilasters and perpendicular louvered wood screens (Photographs 3 and 4).

The northeast side of the building has a two-part stepped façade with a central recessed glazed metal door (Photograph 4). Two utility equipment enclosures are sited on the west end of the northeast side. One is integrated into the building and the other is adjacent to the building on a separate concrete pad. Much of the northwest side of the building is lined with the same two-part metal frame windows, but two are infilled with the same stucco as the exterior (Photograph 5). [see Continuation Sheet]

***P3b. Resource Attributes:** (List attributes and codes) HP6 – Commercial Building
***P4. Resources Present:** ☒Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing

P5b. Description of Photo: (view, date, accession #) Photograph 1. Façade of 231 Grant Avenue, camera facing southeast, September 23, 2020

***P6. Date Constructed/Age and Source:** ☒Historic ☐Prehistoric ☐Both
1956 (Santa Clara Co./Luck 1999: 32)

***P7. Owner and Address:**
Santa Clara County Capital Programs/ Property Management/ Sustainability
2310 N. 1st Street
San Jose, CA 95131

***P8. Recorded by:** (Name, affiliation, address)
C. Miller and H. Miller, AECOM
2020 L Street, Suite 400
Sacramento, CA 95811

***P9. Date Recorded:** September 23, 2020

***P10. Survey Type:** Intensive

***P11. Report Citation**: AECOM. "Letter Report – 231 Grant Avenue, Palo Alto Historic Resource Evaluation." Prepared for County of Santa Clara, 2020.
***Attachments:** ☐NONE ☐Location Map ☒Continuation Sheet ☒Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐Other (List):

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code** 6Z

***Resource Name or #** (Assigned by recorder) 231 Grant Avenue, Palo Alto

B1. Historic Name: Annual Reviews, Inc.

B2. Common Name: Santa Clara County Office of the Public Defender

B3. Original Use: Publishing Company Office

B4. Present Use: County Department Offices

***B5. Architectural Style:** Contemporary

***B6. Construction History:** (Construction date, alterations, and date of alterations) 1956 (Santa Clara County/Luck 1999: 32); Primary entry configuration likely replaced circa 1990s.

***B7. Moved?** X **No** ____ **Yes** ____ **Unknown** **Date:** ____ **Original Location:** ____

***B8. Related Features:** n/a

B9a. Architect: unknown b. Builder: unknown

***B10. Significance: Theme** Post-war commercial/office development **Area** Palo Alto
Period of Significance 1956 **Property Type** Office Building **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Although the property is located within the city limits of Palo Alto, the building is owned by the County of Santa Clara, therefore it has been evaluated for eligibility against Santa Clara County Designation criteria instead of Palo Alto Historic Inventory Criteria for Designation. Regardless, the building at 231 Grant Avenue does not appear to meet the criteria for designation for listing in the Palo Alto Historic Inventory. The property at 231 Grant Avenue in Palo Alto does not meet National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR) criteria, or Santa Clara County Landmark Designation criteria, nor does it appear to be a historical resource for purposes of the California Environmental Quality Act (CEQA) or a historic property under Section 106 of the National Historic Preservation Act (NHPA). The property generally retains integrity to its original construction (1956) but does not meet any of the significance criteria necessary for eligibility for listing in the NRHP, CRHR, or as a county landmark. The property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code.

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:** SEE CONTINUATION SHEET

B13. Remarks:

***B14. Evaluator:** H. Miller, AECOM

***Date of Evaluation:** September 2020

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

P3a. Description (continued) & P5a. Photographs (continued):

Photograph 2: Detail of primary entry, camera facing east, September 23, 2020.

Photograph 3: Detail of windows and wood screens along façade, camera facing south, September 23, 2020.

Photograph 4: North end of façade and northeast side, camera facing south, September 23, 2020.

Photograph 5: Northeast (rear) side, camera facing southwest, September 23, 2020.

The northeast side of the north end of the building lacks wall openings (Photograph 6). The rear (northeast) side of the building reveals a courtyard area formed by the southeast side of the north building section and the northeast and southeast sides of the south building section (Photograph 7). The rear of the north building section has a metal glazed door with a fixed transom above and is lined with seven two-part metal frame windows. The northwest side of the courtyard also has a metal glazed door with a fixed transom above and seven two-part metal frame windows, plus one window opening has been infilled with stucco (Photograph 8). The northeast side of the south building section lacks wall openings and is constructed of stack-course concrete masonry units (Photographs 8 and 9).

Photograph 6: Northeast corner, camera facing southwest, September 23, 2020

Photograph 7: View of rear courtyard and north building section, camera facing north, September 23, 2020.

Photograph 8: View of rear courtyard, camera facing west, September 23, 2020.

Photograph 9: Northeast corner of south building section. Note the stack-course concrete masonry units, camera facing southwest, September 23, 2020.

The southeast side of the building contains a metal glazed door and a ribbon of five two-part metal frame windows, but the middle window has been infilled with stucco (Photographs 9 and 10). Stack-course concrete masonry units wrap around this side of the building and abut the door and the northernmost window.

The southwest and northwest sides of the south building section are also constructed of stack-course concrete masonry units (Photographs 10 and 11). The only wall openings on these two planes are a metal glazed door with transom above on the southwest side.

Photograph 10: Southwest and southeast sides of building, camera facing north, September 23, 2020.

Photograph 11: Façade and southeast sides of building, camera facing east, September 23, 2020.

***B10. Significance (continued):**

HISTORICAL CONTEXT

Mayfield and Palo Alto

This property is within the former community of Mayfield that was initially settled as "Mayfield Farm" in 1853 by Elisha O. Crosby near El Camino Real. A Mayfield post office was erected in 1855 and when the Southern Pacific Railroad built the line and depot through the area a decade later, the depot was also named Mayfield. In 1867, three years after the railroad line and depot were established, the town was officially platted. Sited between the railroad on the north and El Camino Real on the south, the small town was only four blocks long and five blocks wide (**Plate 1**) (Stanford University Libraries 2020; Gudde 1960: 196; *San Jose Mercury* 1901 Dec 22).

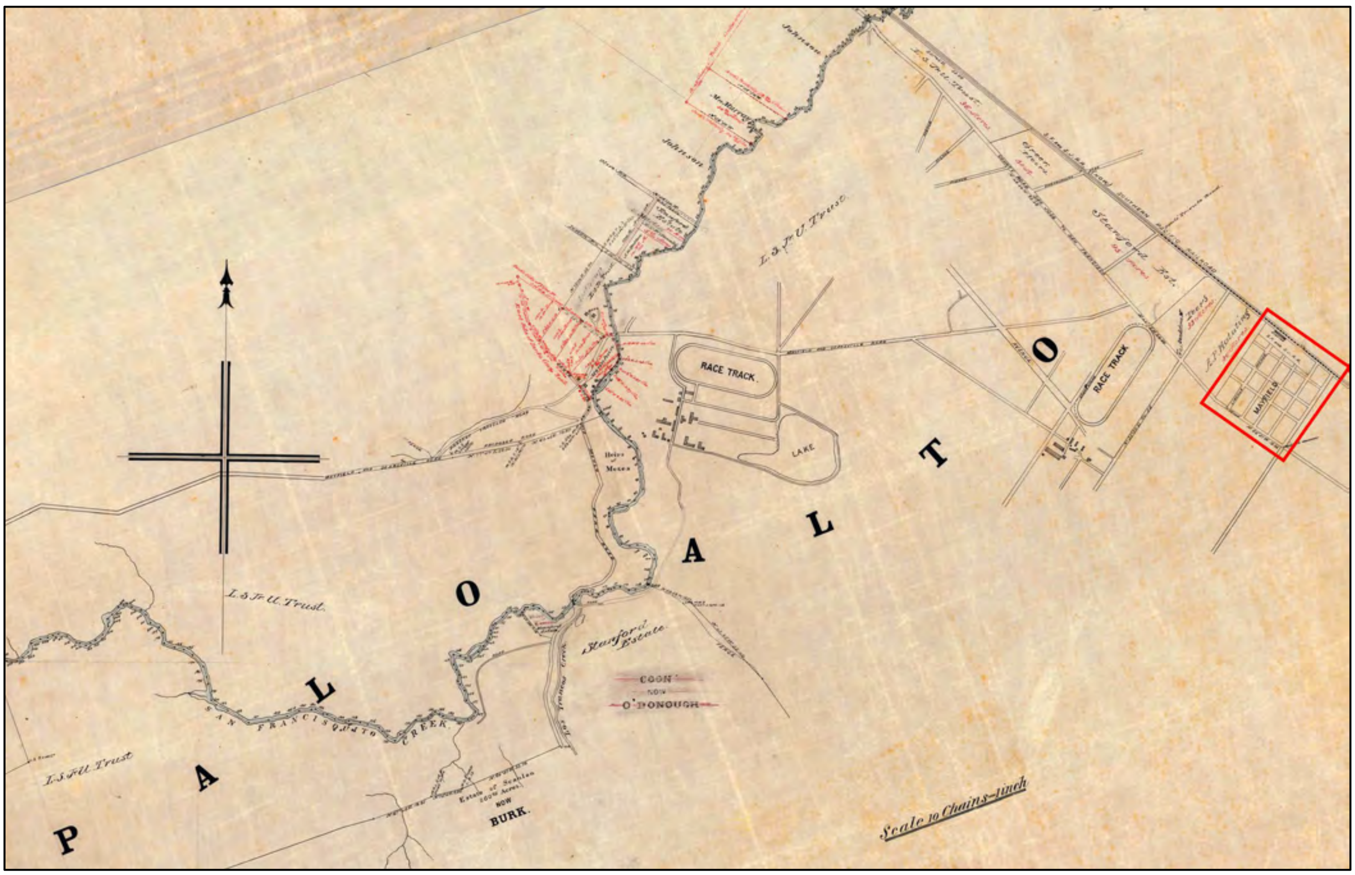

Plate 1: Circa 1880 map with Mayfield shown in red box sited between the Southern Pacific Railroad and El Camino Real. Note "Stanford Estate" near center (Source: Stanford University Libraries 2020).

Like many other sections of Santa Clara County, the early residents of Mayfield were involved in hay, grain, and livestock raising, but soon cultivated the land with orchards, vegetable fields, and wineries. By the turn of the century agricultural shipments out of Mayfield station ranged from 300,000 to 1,500,000 pounds per month (*San Jose Mercury* 1901 Dec 22).

A small commercial district grew on Lincoln Avenue (now S. California Avenue) just north of El Camino Real and the small town grew after the establishment of nearby Stanford University in 1891. By 1924, Mayfield's western boundary abutted the University grounds and spread south beyond El Camino Real with residential tract called College Terrace, expanded east six blocks, and expanded a few blocks north of the railroad tracks (**Plate 2**). In July 1925, the citizens of Mayfield voted to annex their town into the city Palo Alto (*San Jose Mercury* 1901 Dec 22; Sanborn 1924; City of Palo Alto 1952).

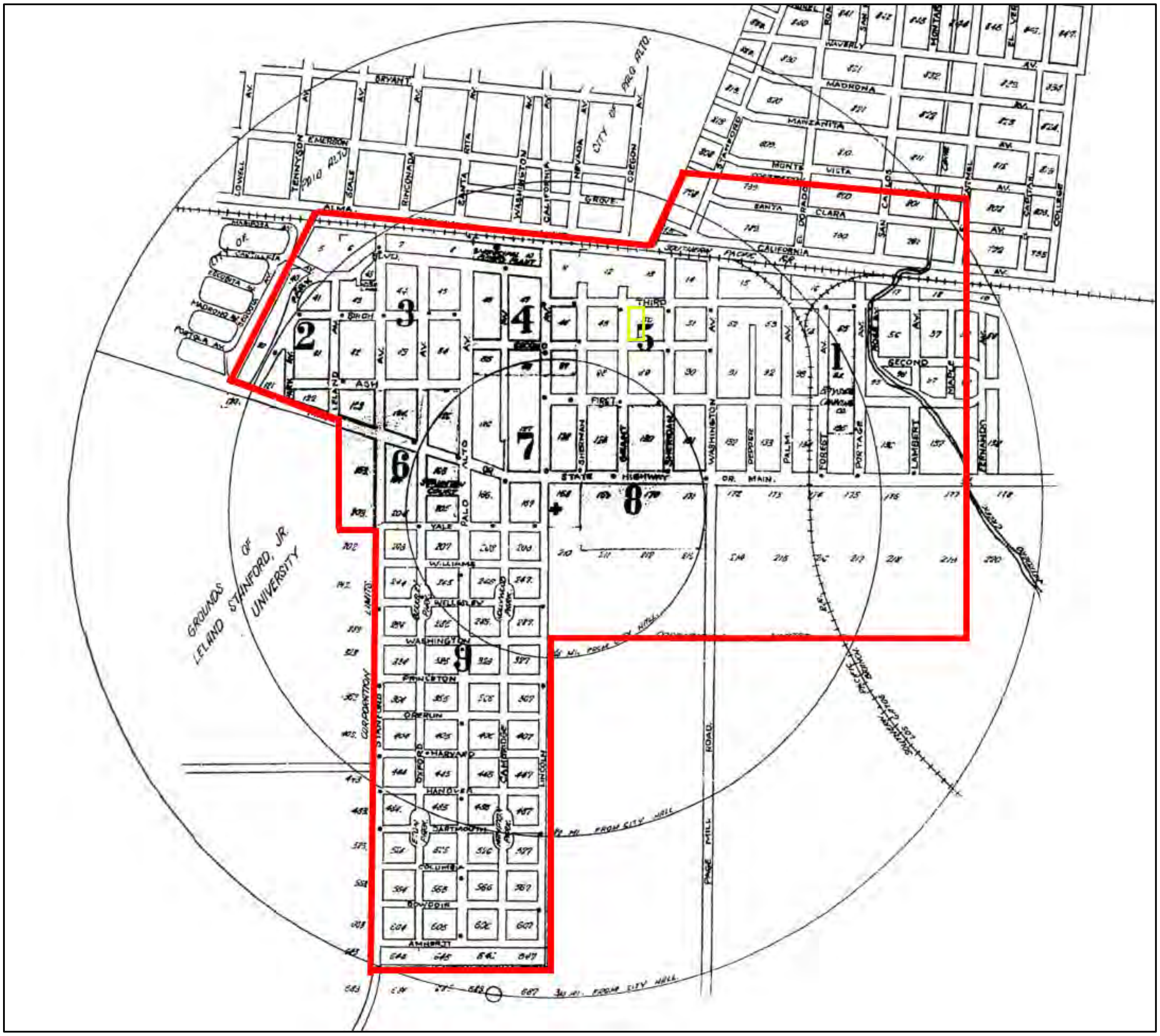

Plate 2: 1924 Sanborn map with expanded Mayfield town boundary shown by red border and subject property shown by yellow box. (Source: Sanborn 1924)

When this office building was completed in 1956, this block and the immediate vicinity were comprised of older residential building stock. Its construction served as a catalyst to transform this section of the city from single-family residence into offices and apartment buildings to serve the expanding influence of Stanford as a research and technology center (Plate 3). By 1960, ground was broken across the street for the Santa Clara County Office Building and the Oregon Expressway cut through the adjacent parcels to the east that connected the Bayshore Freeway to El Camino Real that required demolition of 90 residences (Sanborn 1945; HistoricAerials.com 1948, 1956, 1958, 1960; Heritage Services 2016 Nov 3: 8). Between 1960 and 1968 the majority of the remaining residences on the block with 231 Grant Avenue, and the adjacent residential parcel to the east, were razed to make way for parking lots and a four-story office building. By 1980, nearly all of the older residential and commercial buildings on the nine blocks bound by Park Avenue on the north, Sherman Avenue on the west, El Camino Real to the south, and the Oregon Expressway on the east were demolished and replaced with multi-story office buildings and large apartment complexes (HistoricAerials.com-1968, 1980).

Plate 3: 1956 oblique photograph showing subject property shown by yellow box in relationship to Stanford University campus and the newly developed Stanford Industrial Park (Source: Stanford University, Planning Office 1956)

Property History

This building was originally constructed in 1956 to house the offices of Annual Review, Inc. a non-profit publishing entity associated with Stanford University (Luck 1999: 32). Annual Reviews, Inc. began its partnership with Stanford University in 1931 and was granted free office space on the campus. The first Annual Review publication, *Annual Review of Biology*, was released the following year (Luck 1999: 28, 32). By the early 1950s, Annual Reviews, Inc. was responsible for the publication of books for eight scientific fields of study including microbiology, physiology, biochemistry, medicine, psychology, physical chemistry, plant physiology, and nuclear science (*Berkeley Daily Gazette* 1952 Mar 15).

A herculean building program was underway at Stanford in the mid-1950s including three new dorms to accommodate more than a thousand students. As the student population grew, Stanford needed any and all classrooms and offices spaces and asked the Annual Review to find a new location off campus (*Stanford Daily* 1955 Sep 27; Luck 1999: 32). Annual Review purchased two large empty lots on a residential block approximately 1.5-miles east from the main Stanford campus and a quarter-mile north from Stanford's 138-acre Industrial Park. Stanford set aside the initial 138-acres in 1951 just south of El Camino Real, as part of a long-range development plan to attract technology and research firms to the area. The first two companies to lease land and build in the Stanford Industrial Park was Varian Associates and Kodak in 1953, followed by two publishing companies with buildings designed by architect John S. Bolles in 1956 (none of the buildings are extant) (HistoricAerials.com 1948, 1956; *Stanford Daily* 1953 May 7; *Stanford Daily* 1955 Mar 28; *Architect and Engineer* 1955 Aug: 7)

Annual Review, Inc. moved into their new building at 231 Grant Avenue in 1956, but research did not reveal the architect or builder. In 1963 the four-story Santa Clara County Office Building was completed directly across the street from 231 Grant Avenue and housed County offices for the Clerk, Jury Commissioner, Juvenile Probation, Municipal Court Clerk, Civil Defense Substation of the Sheriff Department, Welfare Department, Health Department, and a Holding Facility for the jail (R.L. Polk 1962; 1963). In 1967, Santa Clara County declared eminent domain on the Annual Review, Inc.'s building at 231 Grant Avenue and the company relocated to 4139 El Camino Way in 1968. Once the building was vacant, the county transferred the Juvenile Probation Department, Civil Defense Substation of the Sheriff Department, Branch Office of the District Attorney, Adult Probation Department, and Weights & Measures from across the street into 231 Grant Avenue (Luck 1999: 32; R.L. Polk Co. 1967, 1968).

Between 1972 and 1974, only three county departments were housed in 231 Grant Avenue: the branch office for the District Attorney, Juvenile Probation Department, and the Adult Probation Department, and by 1976 the three departments moved out of the building to make way for the North Santa Clara County Mental Health Center (later changed to North County Community Mental Health Center) that took over the entire building (R.L. Polk 1972; 1974, 1976). By the 1990s, the North County Treatment & Recovery for drug and alcohol rehabilitation also moved into the building at 231 Grant Avenue (Santa Clara County 1999: 271).

In 2011, North County Community Mental Health Center vacated the building and was replaced with the Office of the Alternate Defender and the County of Santa Clara/North County Offices of the Office of the Public Defender (Google Maps Street View 2011 Mar, 2011 Dec). The departments shared the building for approximately five years and the current occupants, the Santa Clara County Office of the Public Defender and its Kurt E. Kumli Resource Center have been in the building since 2016 (Google Maps Street View 2014 Nov and 2016 Apr).

Contemporary Architecture

The office building at 231 Grant Avenue utilizes elements of the Contemporary style, popular between circa 1940 and 1980. The style is generally characterized by strong roof forms including flat, gabled, shed, or butterfly, typically with deep overhangs and/or exposed beams; large windows, and non-traditional exterior finishes. This architectural style emerged and proliferated through innovations in building materials that occurred in the late 1930s, including creation of exterior-grade plywood, laminated engineered wood with industrial glues, and large plate glass windows. These building materials allowed architects to create designs that blurred the line between indoor and outdoor spaces, utilizing large windows further highlighted through large spans of uninterrupted wall space. Exterior cladding materials could also include vertical wood siding, concrete block, pre-cast concrete panels, stucco, flagstone, and mullion-free glass; angular massing; sun shades, screens, or shadow block accents. Entrances into Contemporary style buildings are most often restrained or hidden from view with privacy screens. The Contemporary style was relatively inexpensive to build and was applied to single-family, multi-family, religious, commercial, school, and government buildings. More exaggerated roof forms like triangular, parabolic, or arched forms were used on commercial buildings rather than residential construction (McAlester 2013: 628-632).

EVALUATION

Under NRHP Criterion A / CRHR Criterion 1 / Santa Clara County Landmark Designation Criterion 1, the property at 231 Grant Avenue has no significant association with important historic events. While the building on this parcel, constructed in 1956, is associated with the transformation of the area from single-family residential to commercial and multi-family housing as part of the growth in response to the nearby Stanford Industrial Park; the building itself did not play a distinct or important role in this development in Palo Alto. It was one of many office buildings constructed in the area to meet increased demands for office, research, and warehouse space.

Under NRHP Criterion B / CRHR Criterion 2 / Santa Clara County Landmark Designation Criterion 2, the property at 231 Grant Avenue is not significant for any associations with the lives of persons important to history. Annual Reviews, Inc. commissioned construction of the building. The scientific journal and book publishing company was operated by a number of employees and no single individual is closely associated with the building. Nor have any individuals directly associated with the use of the building as a County-owned and operated facility have been found to have made a significant contribution to history at this property.

Under NRHP Criterion C / CRHR Criterion 3 / Santa Clara County Landmark Designation Criterion 3, this building is not significant because it is not an important example of a type, period, or method of construction, nor does it appear to represent the work of a master. The building's strong roof lines, ribbons of metal-framed windows, recessed entry, window screens, and the stylistic choice of a combination of exterior cladding materials generally reflects the aesthetic of the Contemporary style the period; however, it is a modest example of this style. The building does not appear to be a significant example of the work of a master architect. Architectural journals and local newspapers did not mention the construction of the building, so the architect and the builder could not be determined. Given that it is not an exemplary example of its style of architecture, it would not be a good candidate to best represent a master's work if it is later found that a master was responsible for its design or construction.

Under NRHP Criterion D / CRHR Criterion 4 / Santa Clara County Landmark Designation Criterion 4, this building is not significant as a source (or likely source) of important information regarding history. It does not appear to have any likelihood of yielding important information about historic construction materials or technologies.

While the property generally retains integrity of location, setting, design, materials, workmanship, feeling, and association to its date of construction (1956), with the exception of the primary entry configuration, it does not meet any of the significance criteria necessary for eligibility for listing in the NRHP, CRHR or as a Santa Clara County Landmark.

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Appendix D – Noise and Vibration Supporting Documentation

Project-Generated Construction Source Noise Prediction Model

60642412 - Santa Clara Grant Ave CEQA

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (Leq dBA)	
Threshold*	813	Daytime	60
	4,574	Nighttime	45
From Apartment	50	84	
From Office	50	84	

Assumptions:	Reference Emission Noise Levels (Lmax) at 50 feet1	Usage Factor1
Excavator	81	0.4
Front End Loader	79	0.4
Tractor	84	0.4
Front End Loader	79	0.4
Auger Drill Rig	84	0.2

Ground Type	Hard
Ground Factor	0.00

Predicted Noise Level 2	Leq dBA at 50 feet2
Excavator	77.0
Front End Loader	75.0
Tractor	80.0
Front End Loader	75.0
Auger Drill Rig	77.0

Combined Predicted Noise Level (Leq dBA at 50 feet)
84.2

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

Leq(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

60642412 - Santa Clara Grant Ave CEQA

AECOM

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)	
Threshold*	378	Daytime	60
	2,123	Nighttime	45
From Apartment	50	78	
From Office	50	78	

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Backhoe	78	0.4
Front End Loader	79	0.4

Ground Type Hard
Ground Factor 0.00

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Backhoe	74.0
Front End Loader	75.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)

77.6

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

60642412 - Santa Clara Grant Ave CEQA

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)	
Threshold*	474	Daytime	60
	2,665	Nighttime	45
From Apartment	50	80	
From Office	50	80	

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Man Lift	75	0.2
Crane	81	0.16
Man Lift	75	0.2
Backhoe	78	0.4
Front End Loader	79	0.4

Ground Type	Hard
Ground Factor	0.00

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Man Lift	68.0
Crane	73.0
Man Lift	68.0
Backhoe	74.0
Front End Loader	75.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
79.5

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

60642412 - Santa Clara Grant Ave CEQA

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)	
Threshold*	286	Daytime	60
	1,610	Nighttime	45
From Apartment	50	75	
From Office	50	75	

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Man Lift	75	0.2
Man Lift	75	0.2
Crane	81	0.16

Ground Type	Hard
Ground Factor	0.00

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Man Lift	68.0
Man Lift	68.0
Crane	73.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
75.2

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

60642412 - Santa Clara Grant Ave CEQA

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)	
Threshold*	286	Daytime	60
	1,610	Nighttime	45
From Apartment	50	75	
From Office	50	75	

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Man Lift	75	0.2
Man Lift	75	0.2
Crane	81	0.16

Ground Type	Hard
Ground Factor	0.00

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Man Lift	68.0
Man Lift	68.0
Crane	73.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
75.2

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

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D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

60642412 - Santa Clara Grant Ave CEQA

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (Leq dBA)	
Threshold*	813	Daytime	60
	4,574	Nighttime	45
From Apartment	50	84	
From Office	50	84	

Assumptions:	Reference Emission Noise Levels (Lmax) at 50 feet1	Usage Factor1
Excavator	81	0.4
Front End Loader	79	0.4
Tractor	84	0.4
Front End Loader	79	0.4
Auger Drill Rig	84	0.2

Ground Type	Hard
Ground Factor	0.00

Predicted Noise Level 2	Leq dBA at 50 feet2
Excavator	77.0
Front End Loader	75.0
Tractor	80.0
Front End Loader	75.0
Auger Drill Rig	77.0

Combined Predicted Noise Level (Leq dBA at 50 feet)
84.2

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

Leq(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

60642412 - Santa Clara Grant Ave CEQA

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)	
Threshold*	378	Daytime	60
	2,123	Nighttime	45
From Apartment	50	78	
From Office	50	78	

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Backhoe	78	0.4
Front End Loader	79	0.4

Ground Type	Hard
Ground Factor	0.00

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Backhoe	74.0
Front End Loader	75.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
77.6

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

60642412 - Santa Clara Grant Ave CEQA

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)	
Threshold*	474	Daytime	60
	2,665	Nighttime	45
From Apartment	50	80	
From Office	50	80	

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Man Lift	75	0.2
Crane	81	0.16
Man Lift	75	0.2
Backhoe	78	0.4
Front End Loader	79	0.4

Ground Type	Hard
Ground Factor	0.00

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Man Lift	68.0
Crane	73.0
Man Lift	68.0
Backhoe	74.0
Front End Loader	75.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
79.5

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

60642412 - Santa Clara Grant Ave CEQA

AECOM

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)	
Threshold*	286	Daytime	60
	1,610	Nighttime	45
From Apartment	50	75	
From Office	50	75	

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
Man Lift	75	0.2
Man Lift	75	0.2
Crane	81	0.16

Ground Type	Hard
Ground Factor	0.00

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Man Lift	68.0
Man Lift	68.0
Crane	73.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
75.2

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Project-Generated Construction Source Noise Prediction Model

60642412 - Santa Clara Grant Ave CEQA

Location	Distance to Nearest Receiver in feet	Combined Predicted Noise Level (L_{eq} dBA)	
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	1,610	Nighttime	45
From Apartment	50	75	
From Office	50	75	

Assumptions:	Reference Emission Noise Levels (L_{max}) at 50 feet[1]	Usage Factor[1]
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Man Lift	75	0.2
Crane	81	0.16

Ground Type	Hard
Ground Factor	0.00

Predicted Noise Level [2]	L_{eq} dBA at 50 feet[2]
Man Lift	68.0
Man Lift	68.0
Crane	73.0

Combined Predicted Noise Level (L_{eq} dBA at 50 feet)
75.2

Sources:

[1] Obtained from the FHWA Roadway Construction Noise Model, January 2006.

[2] Based on the following from the Federal Transit Noise and Vibration Impact Assessment, 2006.

L_{eq}(equip) = E.L.+10*log (U.F.) - 20*log (D/50) - 10*G*log (D/50)

Where: E.L. = Emission Level;

U.F.= Usage Factor;

G = Constant that accounts for topography and ground effects; and

D = Distance from source to receiver.

*Project specific threshold

Measurement Site	Address	Date		Start Time	Duration	Daytime		Nighttime		Ldn
		From	To			Leq	Lmax	L50	L90	
LT-01	Within the Project Site, Middle Area	2/3/2021	2/4/2021	15:00	24 Hour	57.7	87.5	52.2	70.3	55.4
ST-01	Northwestern corner of Project Site, along Grant Avenue	Wednesday, February 03, 2021		14:32	20:12	58.5	69.8	NA	NA	NA
ST-02	Southwestern corner of Project Site, along Grant Avenue	Wednesday, February 03, 2021		14:55	20:02	59.3	76.9	NA	NA	NA
ST-03	Southeastern corner of Project Site, along Birch Street	Wednesday, February 03, 2021		15:16	20:01	58.8	71.3	NA	NA	NA

C:\LARDAV 03FEB_14.bin Interv al Data

Site Locati	Meas Numbe	r	Date		Time	Duration	Leq	SEL	Lmax	Lmin	Peak	Uwpk
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0		0	3-Feb	21	14:10:28	2971.2	53.7	88.5	75.9	42.9	108.5	108
0		0	3-Feb	21	15:00:00	3600	56.1	91.7	74.3	44.4	89.1	97.7
0		0	3-Feb	21	16:00:00	3600	53.4	89	66.3	45.1	82.3	92.9
0		0	3-Feb	21	17:00:00	3600	56.1	91.7	80	44.8	93.9	99.9
0		0	3-Feb	21	18:00:00	3600	51.9	87.5	65.2	43.2	85.1	90.4
0		0	3-Feb	21	19:00:00	3600	51.8	87.3	68.6	42.4	81.5	92.9
0		0	3-Feb	21	20:00:00	3600	57	92.6	87.5	41.6	100.7	104.9
0		0	3-Feb	21	21:00:00	3600	48.9	84.5	63.5	39.2	79.7	0
0		0	3-Feb	21	22:00:00	3600	46.8	82.4	61.5	37.4	75.8	0
0		0	3-Feb	21	23:00:00	3600	45.6	81.2	67.1	36	76.8	0
0		0	4-Feb	21	0:00:00	3600	42.2	77.7	58.4	34.5	76.2	94.8
0		0	4-Feb	21	1:00:00	3600	41	76.6	58.9	34.2	75	0
0		0	4-Feb	21	2:00:00	3600	38.7	74.3	56.6	34	71.5	0
0		0	4-Feb	21	3:00:00	3600	40.6	76.2	61.7	35.6	81.1	0
0		0	4-Feb	21	4:00:00	3600	43.8	79.4	61.6	37.9	79.1	90.4
0		0	4-Feb	21	5:00:00	3600	47.2	82.8	67.7	40.2	83.1	92.9
0		0	4-Feb	21	6:00:00	3600	52.2	87.8	70.3	42.6	83.7	90.4
0		0	4-Feb	21	7:00:00	3600	57.2	92.8	79.4	46	96.3	99.9
0		0	4-Feb	21	8:00:00	3600	57.7	93.2	80.3	45	91.1	108.4
0		0	4-Feb	21	9:00:00	3600	54.2	89.8	75.6	42.5	88.3	93.9
0		0	4-Feb	21	10:00:00	3600	52.5	88	75.3	43	93.6	99.9
0		0	4-Feb	21	11:00:00	3600	54	89.6	74.4	42.9	85.9	94.8
0		0	4-Feb	21	12:00:00	3600	54.4	90	72.2	43.7	88.8	96.4
0		0	4-Feb	21	13:00:00	3600	54.5	90.1	72.6	44.1	95.4	102
0		0	4-Feb	21	14:00:00	3600	55.2	90.7	72.6	44.3	89.1	94.8
0		0	4-Feb	21	15:00:00	3464	54.6	90	75.1	45.2	89.3	99.9

L(2)	L(8)	L(25)	Wind Av L(50)	Wind g L(90)	Wind Min L(95)	RMS Peak Max * *	Uwpk Avg *	Min * *	Max *	Avg * *	Min *	Max Hz Hz
------	------	------	------	------	------	------------	-------	----------	------	------------	------	-----------
60.7	56.5	53.5	51	46.8	46.1	0	0	0	0	0	0	0
64.8	57.8	54.9	52.9	48.9	47.9	0	0	0	0	0	0	0
59.6	56.6	54	51.8	48.3	47.5	0	0	0	0	0	0	0
63.4	58.7	55.1	52.6	48.2	47.4	0	0	0	0	0	0	0
58.6	55.5	52.5	49.8	45.7	45.1	0	0	0	0	0	0	0
59.3	55.5	52.1	48.7	44.6	44.1	0	0	0	0	0	0	0
59.4	55	51.2	47.2	43.3	42.7	0	0	0	0	0	0	0
56.3	53.6	49.2	45.3	42.2	41.4	0	0	0	0	0	0	0
55.5	50.9	45.2	42.4	39.8	39.2	0	0	0	0	0	0	0
54.4	48.4	42.9	40.8	38.2	37.4	0	0	0	0	0	0	0
50.6	46.5	40.4	38.7	36.3	35.7	0	0	0	0	0	0	0
49.1	42.9	39.2	37.8	35.6	35.2	0	0	0	0	0	0	0
44	39.9	38.5	37.4	35.5	35.2	0	0	0	0	0	0	0
44.2	41.7	40.4	39.5	37.4	36.9	0	0	0	0	0	0	0
48.4	45.1	43.6	42.3	40	39.3	0	0	0	0	0	0	0
53.3	48.5	46.3	45	43	42.3	0	0	0	0	0	0	0
59.8	56.2	50.8	48.1	45.2	44.6	0	0	0	0	0	0	0
65.4	58.8	53.4	50.6	48.1	47.5	0	0	0	0	0	0	0
64.6	60.9	56.6	53.7	50.1	49.1	0	0	0	0	0	0	0
62.1	57.8	53.1	49.6	45.7	45.1	0	0	0	0	0	0	0
59.6	55.7	52.2	49.3	45.7	45.1	0	0	0	0	0	0	0
61.7	57.4	54	51	46.5	45.7	0	0	0	0	0	0	0
62.6	57.2	53.8	51	46.6	45.8	0	0	0	0	0	0	0
61.7	58	54.5	51.6	46.9	46.1	0	0	0	0	0	0	0
63.8	58	54.2	51.3	46.8	46.1	0	0	0	0	0	0	0
60.6	57.5	54.7	51.9	47.5	46.7	0	0	0	0	0	0	0

Avg @ Ma -------	Max Dir x Count Co -------------	Excd Count ------	Excd E loads	xcd	Over			
0	0	0	0	N	4	11	0	0
0	0	0	0	N	14	0	0	0
0	0	0	0	N	2	0	0	0
0	0	0	0	N	11	1	0	0
0	0	0	0	N	1	0	0	0
0	0	0	0	N	2	0	0	0
0	0	0	0	N	5	3	0	0
0	0	0	0	N	0	0	0	0
0	0	0	0	N	0	0	0	0
0	0	0	0	N	1	0	0	0
0	0	0	0	N	0	0	0	0
0	0	0	0	N	0	0	0	0
0	0	0	0	N	0	0	0	0
0	0	0	0	N	0	0	0	0
0	0	0	0	N	0	0	0	0
0	0	0	0	N	1	0	0	0
0	0	0	0	N	1	0	0	0
0	0	0	0	N	10	9	0	0
0	0	0	0	N	11	1	0	0
0	0	0	0	N	5	0	0	0
0	0	0	0	N	3	1	0	0
0	0	0	0	N	6	0	0	0
0	0	0	0	N	7	0	0	0
0	0	0	0	N	6	3	0	0
0	0	0	0	N	7	0	0	0
0	0	0	0	N	3	0	0	0

Long-Term 24 Hour Continuous Noise Monitoring
Model Input Sheet

AECOM

Project: 60642412 - Santa Clara Grant Ave CEQA

Date: **Wednesday, February 03, 2021** **to** **Thursday, February 04, 2021**

Site: LT-01

Hour	Leq	Lmax	L50	L90
15:00	56.1	74.3	52.9	48.9
16:00	53.4	66.3	51.8	48.3
17:00	56.1	80.0	52.6	48.2
18:00	51.9	65.2	49.8	45.7
19:00	51.8	68.6	48.7	44.6
20:00	57.0	87.5	47.2	43.3
21:00	48.9	63.5	45.3	42.2
22:00	46.8	61.5	42.4	39.8
23:00	45.6	67.1	40.8	38.2
0:00	42.2	58.4	38.7	36.3
1:00	41.0	58.9	37.8	35.6
2:00	38.7	56.6	37.4	35.5
3:00	40.6	61.7	39.5	37.4
4:00	43.8	61.6	42.3	40.0
5:00	47.2	67.7	45.0	43.0
6:00	52.2	70.3	48.1	45.2
7:00	57.2	79.4	50.6	48.1
8:00	57.7	80.3	53.7	50.1
9:00	54.2	75.6	49.6	45.7
10:00	52.5	75.3	49.3	45.7
11:00	54.0	74.4	51.0	46.5
12:00	54.4	72.2	51.0	46.6
13:00	54.5	72.6	51.6	46.9
14:00	55.2	72.6	51.3	46.8

Averages

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	54.9	73.9	50.4	46.5
Nighttime (10 p.m. - 7 a.m.)	46.2	62.6	41.3	39.0

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 10 p.m.)	57.7	87.5	53.7	50.1
Nighttime (10 p.m. - 7 a.m.)	52.2	70.3	48.1	45.2

Percentage of Energy

Daytime	92%
Nighttime	8%

Calculated L_{dn}, dBA

55.4

Long-Term 24 Hour Continuous Noise Monitoring

Model Input Sheet

Project: 60642412 - Santa Clara Grant Ave CEQA

Date: **Wednesday, February 03, 2021** **to** **Thursday, February 04, 2021**

Site: LT-01

Hour	Leq	Lmax	L50	L90
15:00	56.1	91.7	52.9	48.9
16:00	53.4	89.0	51.8	48.3
17:00	56.1	91.7	52.6	48.2
18:00	51.9	87.5	49.8	45.7
19:00	51.8	87.3	48.7	44.6
20:00	57.0	92.6	47.2	43.3
21:00	48.9	84.5	45.3	42.2
22:00	46.8	82.4	42.4	39.8
23:00	45.6	81.2	40.8	38.2
0:00	42.2	77.7	38.7	36.3
1:00	41.0	76.6	37.8	35.6
2:00	38.7	74.3	37.4	35.5
3:00	40.6	76.2	39.5	37.4
4:00	43.8	79.4	42.3	40.0
5:00	47.2	82.8	45.0	43.0
6:00	52.2	87.8	48.1	45.2
7:00	57.2	92.8	50.6	48.1
8:00	57.7	93.2	53.7	50.1
9:00	54.2	89.8	49.6	45.7
10:00	52.5	88.0	49.3	45.7
11:00	54.0	89.6	51.0	46.5
12:00	54.4	90.0	51.0	46.6
13:00	54.5	90.1	51.6	46.9
14:00	55.2	90.7	51.3	46.8

Averages

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 7 p.m.)	55.1	90.3	51.3	47.3
Evening (7 p.m. - 9 p.m.)	53.9	88.1	47.1	43.4
Nighttime (9 p.m. - 7 a.m.)	46.2	79.8	41.3	39.0

Uppermost-Level

	Leq	Lmax	L50	L90
Daytime (7 a.m. - 7 p.m.)	57.7	93.2	53.7	50.1
Evening (7 p.m. - 9 p.m.)	57.0	92.6	48.7	44.6
Nighttime (9 p.m. - 7 a.m.)	52.2	87.8	48.1	45.2

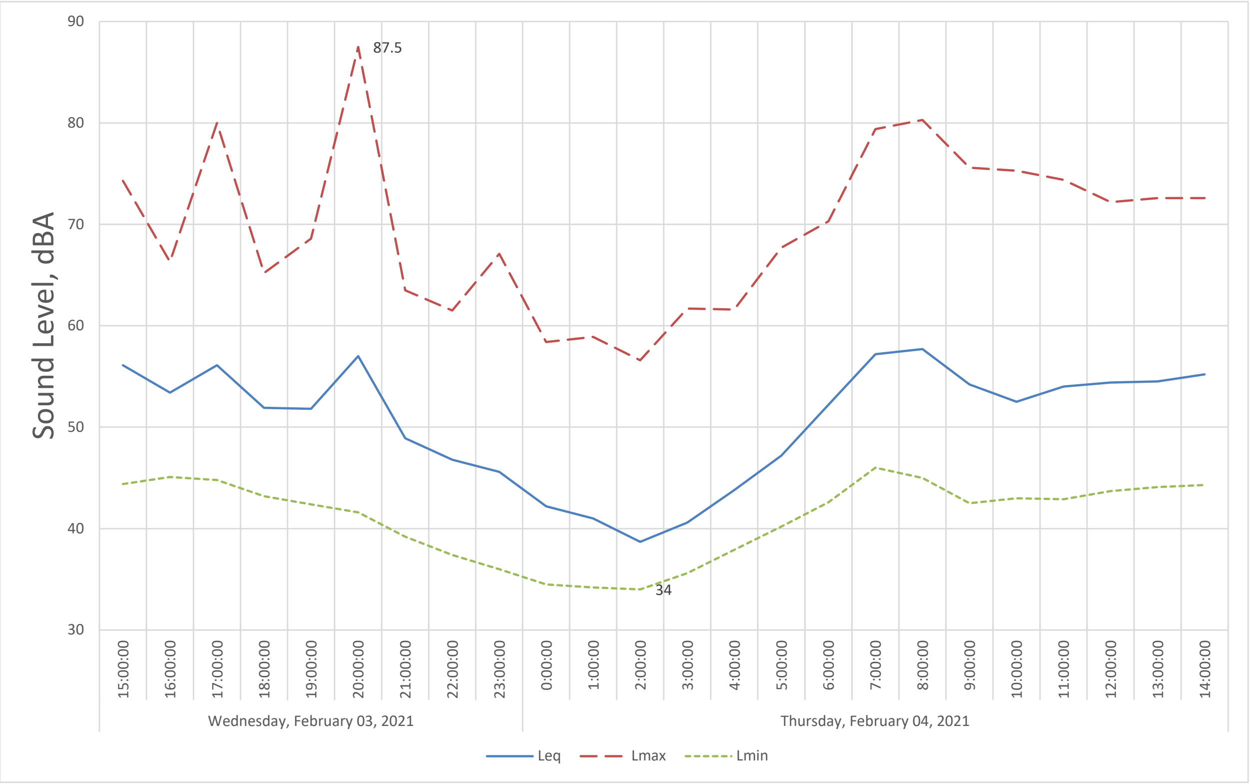
Percentage of Energy

Daytime	78%
Evening	15%
Nighttime	8%

Calculated CNEL, dBA

56.1

Date	Time	Leq	Lmax	Lmin
Wednesday, February 03, 2021	15:00:00	56.1	74.3	44.4
	16:00:00	53.4	66.3	45.1
	17:00:00	56.1	80	44.8
	18:00:00	51.9	65.2	43.2
	19:00:00	51.8	68.6	42.4
	20:00:00	57	87.5	41.6
	21:00:00	48.9	63.5	39.2
	22:00:00	46.8	61.5	37.4
	23:00:00	45.6	67.1	36
Thursday, February 04, 2021	0:00:00	42.2	58.4	34.5
	1:00:00	41	58.9	34.2
	2:00:00	38.7	56.6	34
	3:00:00	40.6	61.7	35.6
	4:00:00	43.8	61.6	37.9
	5:00:00	47.2	67.7	40.2
	6:00:00	52.2	70.3	42.6
	7:00:00	57.2	79.4	46
	8:00:00	57.7	80.3	45
	9:00:00	54.2	75.6	42.5
	10:00:00	52.5	75.3	43
	11:00:00	54	74.4	42.9
	12:00:00	54.4	72.2	43.7
	13:00:00	54.5	72.6	44.1
	14:00:00	55.2	72.6	44.3



Summary			
Filename	831_Data.001		
Serial Number	3940		
Model	Model 831		
Firmware Version	2.314		
User	Issa		
Location	Grant Ave Project		
Job Description	Ambient Air Noise Survey		
Note			
Measurement Description	GRAANT-AVE		
Start	2021/02/03 14:32:38		
Stop	2021/02/03 14:52:50		
Duration	0:20:11.7		
Run Time	0:20:11.7		
Pause	0:00:00.0		
Pre Calibration	2021/02/03 14:24:11		
Post Calibration	None		
Calibration Deviation	---		
Overall Settings			
RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRM831		
Microphone Correction	Off		
Integration Method	Linear		
OBA Range	Low		
OBA Bandwidth	1/1 and 1/3		
OBA Freq. Weighting	A Weighting		
OBA Max Spectrum	Bin Max		
Gain	0.0 dB		
Overload	143.9 dB		
	A	**C**	**Z**
Under Range Peak	**76.5**	73.5	78.5 dB
Under Range Limit	**26.4**	26.8	32.5 dB
Noise Floor	17.3	17.6	23.0 dB
Results			
LAeq	58.5 dB		
LAE	89.4 dB		
EA	96.136 µPa²h		
LApeak (max)	2021/02/03 14:37:52	92.7 dB	
LASmax	2021/02/03 14:37:04	69.8 dB	
LASmin	2021/02/03 14:33:21	43.2 dB	
SEA	-99.9 dB		

LAS > 60.0 dB (Exceedence Counts / Duration)	46	356.7 s
LAS > 70.0 dB (Exceedence Counts / Duration)	0	0.0 s
LApeak > 90.0 dB (Exceedence Counts / Duration)	12	9.6 s
LApeak > 100.0 dB (Exceedence Counts / Duration)	0	0.0 s
LApeak > 120.0 dB (Exceedence Counts / Duration)	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**
	58.5	58.5	-99.9	58.5	58.5	-99.9	-99.9

LCeq	67.6 dB
LAeq	58.5 dB
LCeq - LAeq	9.1 dB
LAIeq	62.3 dB
LAeq	58.5 dB
LAIeq - LAeq	3.8 dB
# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics

LAS2.00	66.1 dB
LAS8.00	63.2 dB
LAS25.00	59.6 dB
LAS50.00	54.7 dB
LAS90.00	47.5 dB
LAS95.00	46.6 dB

Record #	Record Type	Date	Time	LAeq	LAS	LASmax	LASmin
1	Run	2021/02/03	14:32:38	0.0	0.0	0.0	0.0
2		2021/02/03	14:32:38	61.0	52.3	65.2	52.0
3		2021/02/03	14:33:00	47.4	47.4	53.1	43.2
4		2021/02/03	14:34:00	59.2	57.8	67.4	47.1
5		2021/02/03	14:35:00	56.0	45.9	63.9	45.9
6		2021/02/03	14:36:00	53.6	54.9	62.8	43.5
7		2021/02/03	14:37:00	60.8	60.5	69.8	47.2
8		2021/02/03	14:38:00	59.4	53.3	66.6	52.2
9		2021/02/03	14:39:00	58.7	51.7	68.0	49.6
10		2021/02/03	14:40:00	59.9	64.0	67.0	51.5
11		2021/02/03	14:41:00	59.3	62.9	64.8	49.5
12		2021/02/03	14:42:00	63.0	58.3	68.7	54.1
13		2021/02/03	14:43:00	58.6	58.4	67.4	46.8
14		2021/02/03	14:44:00	60.0	53.7	67.8	48.3
15		2021/02/03	14:45:00	54.6	46.9	64.3	46.1
16		2021/02/03	14:46:00	52.9	49.9	58.9	46.6
17		2021/02/03	14:47:00	55.1	46.1	65.9	46.1
18		2021/02/03	14:48:00	55.9	59.3	63.3	45.8
19		2021/02/03	14:49:00	58.8	52.3	66.6	50.1
20		2021/02/03	14:50:00	59.8	60.8	67.4	51.1
21		2021/02/03	14:51:00	58.5	58.4	65.8	50.4
22		2021/02/03	14:52:00	57.2	57.5	67.9	48.5
23	Stop	2021/02/03	14:52:50	0.0	0.0	0.0	0.0

1/1 LAS 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000	1/1 LAeq 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-19.6	-0.8	18.5	29.4	35.2	40.5	44.6	48.1	47.3	37.4	26.4	10.3	-19.6	2.5	21.5	35.9	44.6	49.5	52.1	57.4	54.9	49.2	41.8	26.9
-16.6	-1.0	19.3	30.6	35.4	35.1	38.9	44.3	40.4	28.6	15.6	7.2	-15.9	3.3	18.9	29.2	35.3	36.2	39.4	43.1	40.9	33.9	31.2	20.1
-21.6	4.7	26.0	36.1	39.2	41.3	46.7	55.3	52.1	43.3	32.8	18.6	-18.7	7.0	31.4	40.5	46.8	47.9	49.1	55.5	53.5	47.1	37.8	23.6
-20.2	2.1	19.9	29.4	35.2	36.1	37.3	42.5	38.7	28.6	16.4	7.7	-20.0	4.7	25.0	34.4	39.6	43.9	46.3	52.4	50.3	44.3	37.2	22.3
-18.2	2.7	26.2	30.5	36.2	38.6	43.9	52.1	49.7	37.9	25.2	8.8	-20.2	3.2	20.1	31.0	37.1	41.0	44.5	50.2	47.7	40.9	31.5	17.7
-15.6	3.0	21.7	32.4	39.5	45.6	50.8	58.3	54.2	42.7	31.7	13.4	-9.1	8.3	22.5	33.6	40.3	46.7	51.4	57.5	55.4	48.6	40.1	29.2
-11.5	4.4	28.6	44.6	39.8	41.2	44.8	48.7	46.1	38.2	26.8	12.2	-6.4	8.8	30.5	41.4	44.4	48.8	51.0	55.7	53.0	46.3	37.1	21.9
-11.7	2.3	20.0	35.4	43.0	41.5	44.4	47.4	44.0	33.6	18.8	7.6	-15.2	3.8	27.1	43.5	43.2	45.1	49.9	54.3	53.1	46.5	45.0	23.1
-10.0	5.1	21.5	48.4	49.4	51.6	54.2	59.2	58.6	54.4	47.0	35.5	-12.5	5.3	31.1	40.7	43.6	47.3	51.4	56.6	53.8	46.6	38.0	24.4
-8.1	6.5	28.7	46.9	52.5	54.2	53.9	58.0	56.7	50.8	39.3	24.7	-11.0	5.2	29.5	40.6	43.3	48.0	51.1	55.6	53.4	46.0	36.7	21.6
-8.8	5.8	31.0	33.6	42.9	49.0	51.6	53.4	52.0	44.5	36.1	22.9	-2.2	16.4	33.6	42.6	47.6	50.8	54.6	58.7	57.2	51.9	47.0	28.7
-17.9	2.7	29.4	41.6	47.0	43.9	48.5	53.9	52.3	48.4	39.9	29.6	-16.7	2.7	27.9	37.7	42.7	45.4	49.5	54.9	53.1	46.4	38.4	39.4
-12.0	4.4	25.4	34.2	39.6	40.2	43.9	50.5	48.2	38.9	28.1	13.4	-17.0	4.5	24.6	37.8	43.4	47.0	51.4	56.1	54.6	48.9	40.6	35.0
-19.8	1.9	21.1	29.7	35.6	36.2	38.2	42.8	40.1	31.6	22.7	8.5	-18.9	2.4	21.7	35.5	39.0	42.7	45.1	51.0	49.1	41.3	33.2	18.1
-20.5	-0.9	17.8	31.2	35.6	37.2	40.6	46.7	44.3	32.9	21.3	8.9	-13.4	3.2	21.7	32.6	40.1	42.1	44.6	48.2	46.3	43.3	36.0	21.5
-11.4	1.9	20.5	30.3	36.0	36.8	37.7	42.5	38.0	30.3	23.3	13.4	-14.3	3.7	21.5	33.7	38.7	41.8	44.8	51.0	50.3	43.2	34.1	39.8
-7.7	8.0	26.6	44.8	43.1	53.5	50.0	51.9	52.8	48.5	42.9	29.0	-5.8	10.0	24.7	34.8	39.0	44.2	47.2	52.3	50.0	43.2	35.0	21.5
-16.5	4.2	21.9	30.4	35.5	40.4	42.6	49.1	46.8	36.3	26.7	13.3	-12.3	4.9	24.7	37.5	43.6	48.5	49.7	55.3	52.6	46.0	38.9	22.2
-14.7	5.2	19.7	36.2	48.5	52.8	56.7	56.1	48.7	41.7	35.9	24.4	-10.6	5.6	22.5	34.5	45.4	50.9	53.5	55.9	51.0	44.3	35.6	22.0
-18.4	2.2	21.2	33.7	38.7	42.6	48.5	56.0	52.3	42.8	33.0	16.3	-9.0	9.0	21.9	36.2	44.3	47.5	51.5	54.6	51.5	45.5	38.1	22.7
-3.7	8.8	19.9	38.6	40.6	42.9	49.5	54.8	50.4	40.1	30.7	16.1	-4.6	10.4	21.7	36.3	42.6	44.4	49.5	53.4	50.9	45.0	37.0	23.5
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1/1 LASmax 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000	1/1 LASmin 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-17.3	6.4	27.1	42.0	50.7	57.1	57.2	61.1	58.6	54.9	48.2	33.4	-23.2	-1.1	18.2	29.4	35.2	40.1	44.5	48.0	45.9	37.1	25.6	8.5
-8.7	8.7	22.2	31.5	39.1	42.5	44.5	48.1	49.8	47.2	48.2	37.0	-24.3	-2.0	14.7	26.7	33.2	33.0	35.5	38.6	35.6	26.3	14.9	7.1
-12.1	15.6	42.2	51.5	57.5	56.7	55.6	64.8	62.5	56.2	46.2	32.0	-24.3	-1.1	17.0	27.7	34.5	34.5	38.3	43.8	40.0	28.5	14.3	7.1
-12.4	14.2	31.9	43.0	48.6	54.9	55.4	61.0	58.6	54.6	48.0	33.0	-24.3	-0.6	17.6	28.9	34.8	35.2	36.7	42.4	38.6	27.9	15.2	7.4
-15.6	12.2	26.6	37.0	44.0	50.5	53.6	59.3	57.6	50.9	42.3	30.1	-24.3	-1.6	16.0	27.8	33.7	32.8	35.5	38.9	34.9	26.6	15.0	7.3
-3.4	20.0	30.0	39.0	46.9	54.5	60.1	66.5	64.6	58.8	50.6	39.1	-21.6	0.7	16.9	29.1	34.8	35.6	38.5	43.4	39.3	33.5	23.8	9.0
-0.2	14.4	40.1	48.8	54.3	59.7	59.6	62.3	59.8	55.3	45.3	31.6	-15.8	1.2	17.8	29.5	35.7	37.9	42.0	47.6	43.8	34.0	21.3	8.6
-7.1	9.9	33.3	48.5	47.7	52.2	56.5	63.3	64.8	55.8	59.4	31.5	-23.7	-0.3	17.5	32.9	38.7	39.4	42.3	45.0	41.1	30.9	17.5	7.3
-8.2	10.3	43.1	49.5	51.1	54.3	58.9	64.5	60.8	55.0	47.1	36.0	-17.8	1.0	18.2	30.9	37.5	38.2	43.1	47.1	44.0	33.4	18.3	7.5
-4.7	12.2	41.8	52.1	53.2	57.5	58.2	61.1	58.8	54.3	46.9	35.3	-21.1	0.7	15.8	30.5	36.5	35.5	39.8	46.2	43.5	32.1	20.3	8.4
8.8	29.8	44.5	52.1	53.8	58.8	62.6	64.6	63.9	58.3	60.7	36.7	-17.2	2.7	21.6	32.6	39.4	41.0	45.1	49.6	48.2	39.7	28.6	11.4
-6.3	8.0	37.1	47.0	47.8	52.5	57.8	63.8	63.5	55.4	45.2	54.9	-24.3	-1.4	15.4	28.3	34.9	34.7	38.4	43.2	38.8	28.0	15.3	7.2
-9.7	12.5	33.6	47.7	51.6	54.4	58.7	63.8	63.8	57.1	48.8	50.5	-23.5	-1.9	15.4	28.3	34.6	37.5	40.3	43.8	40.3	30.3	17.1	7.3
-12.1	6.4	28.3	46.1	47.2	52.2	53.9	60.7	59.4	52.8	44.6	29.3	-24.2	-0.6	17.4	28.1	33.5	34.7	37.9	42.0	38.9	29.3	17.3	7.3
-3.0	6.9	28.5	36.1	49.2	50.5	51.4	53.1	52.4	49.4	47.0	36.4	-24.3	-1.7	16.2	29.1	34.0	35.9	38.1	42.8	37.8	31.7	20.9	7.5
-4.6	13.0	28.9	39.2	45.4	49.3	54.8	61.3	62.3	55.0	44.9	56.0	-23.5	-2.2	15.1	28.1	33.9	34.2	37.6	42.4	37.9	28.3	17.6	7.5
2.0	16.1	31.7	44.9	44.7	53.7	54.5	61.2	58.1	53.6	45.8	33.3	-20.3	-0.1	15.0	28.6	34.9	34.8	37.1	41.9	37.2	28.1	19.1	8.4
-5.9	10.3	31.8	45.7	51.5	57.8	58.5	63.1	60.5	58.5	53.5	34.7	-21.2	-0.6	19.0	29.8	35.4	38.6	41.2	46.8	42.0	32.0	20.3	8.3
-4.0	9.8	28.1	40.0	48.8	56.2	58.9	65.6	59.2	52.8	45.3	33.6	-19.0	1.2	17.9	29.9	35.4	39.8	42.4	47.5	42.0	28.0	16.8	7.4
0.5	19.8	30.5	43.8	52.4	56.4	59.8	61.2	58.0	52.9	45.9	30.5	-20.0	-0.2	16.8	30.7	35.9	39.4	43.2	45.7	40.0	30.9	18.2	7.6
1.6	15.7	27.2	41.8	51.7	53.4	59.9	63.8	62.4	57.1	49.8	36.4	-22.6	1.5	16.3	30.4	36.0	36.5	40.6	44.5	39.7	31.0	20.4	8.3
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1/3 LAS	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-30.1	-29.2	-19.4	-13.0	-7.4	-2.1	8.3	11.5	16.2	23.6	25.1	25.7	28.6	32.3	30.5	36.4	35.5	34.5	38.7	40.3	39.9	42.7	44.1	43.3	44.9	42.2	38.4	35.1	31.7	28.4	24.9	19.7	14.7	8.3	3.9	0.0
	-30.1	-28.7	-16.8	-12.0	-3.1	-2.0	8.0	11.8	17.3	22.0	26.9	27.9	29.6	32.1	28.3	29.3	30.2	31.1	32.1	33.2	35.8	38.6	40.3	39.6	38.1	35.1	31.0	26.6	22.8	18.3	13.7	9.3	6.1	4.2	2.4	-0.2
	-30.1	-29.2	-22.7	-15.8	-0.7	2.8	24.1	17.2	18.8	33.5	28.7	31.4	33.6	34.4	35.4	34.0	37.3	37.9	37.8	41.1	44.6	49.3	52.1	49.7	49.2	47.3	43.7	41.7	37.6	33.4	29.9	28.2	23.3	17.6	9.0	3.7
	-30.1	-29.2	-25.3	-15.8	-9.1	-1.6	6.3	12.5	19.0	21.3	23.3	26.8	29.5	31.3	29.3	31.7	31.2	30.6	30.7	31.5	34.3	36.7	38.4	37.7	36.1	33.1	30.9	26.1	23.2	19.0	14.1	10.7	7.0	4.8	2.6	-0.3
	-30.1	-29.2	-21.9	-10.1	-5.0	3.1	9.2	13.5	24.2	23.6	24.6	28.3	32.5	31.7	30.7	32.2	34.4	34.0	37.1	37.3	41.3	45.9	46.6	49.0	47.2	44.1	41.0	36.0	31.9	27.4	23.7	19.0	11.6	6.5	3.0	-0.1
	-27.6	-23.4	-17.0	-11.8	-5.6	2.6	9.9	15.0	19.8	23.7	25.9	30.9	35.2	34.6	34.6	38.2	40.6	42.7	44.4	45.1	47.9	53.2	55.0	52.5	51.2	49.8	45.4	40.5	36.9	33.1	30.1	25.7	18.5	11.7	6.2	3.4
	-27.1	-19.5	-13.0	-7.0	-1.2	1.5	7.8	18.8	28.0	33.0	44.2	32.8	34.7	34.0	35.9	35.9	36.4	36.8	36.9	39.1	42.0	44.5	44.6	43.5	42.8	41.2	39.4	35.6	33.0	29.2	24.7	21.2	16.1	10.0	6.5	0.7
	-29.2	-20.4	-16.0	-8.5	-4.1	0.7	9.0	12.4	18.1	26.4	31.3	32.2	33.2	42.0	35.5	33.1	35.9	39.4	38.3	38.8	40.7	41.7	43.3	42.4	41.3	39.0	35.4	32.2	27.1	22.0	17.2	12.2	7.7	4.7	2.3	-0.1
	-29.3	-19.9	-11.3	-6.9	1.2	4.7	9.5	16.7	19.7	26.4	44.0	42.2	36.6	47.7	44.6	48.2	44.2	45.8	48.1	48.0	51.0	53.6	55.6	54.0	52.9	54.0	54.5	51.4	48.6	47.1	43.5	42.4	39.5	33.7	29.9	19.0
	-25.3	-18.6	-12.3	-9.0	1.0	5.5	17.7	24.6	18.6	24.8	47.4	35.2	38.5	51.6	45.3	50.4	50.0	48.9	47.5	49.2	50.7	49.7	54.7	53.9	52.2	51.6	52.0	49.3	43.5	40.8	37.3	33.3	29.0	23.5	17.0	8.7
	-29.4	-19.3	-11.2	-5.7	-3.0	5.6	7.9	22.8	30.5	24.9	27.3	31.4	35.2	38.5	39.3	40.0	45.9	45.3	47.7	47.0	46.0	47.4	48.0	50.2	48.4	47.2	45.0	42.4	38.3	35.7	33.0	32.0	26.6	21.1	17.0	7.3
	-30.1	-27.0	-17.2	-9.4	-5.9	1.4	8.8	23.1	29.2	23.4	30.9	38.8	44.3	41.2	40.7	39.0	39.8	38.2	39.8	43.8	45.9	47.9	50.0	49.6	48.8	47.4	46.1	46.2	42.6	39.5	37.8	34.6	29.3	24.1	18.0	27.7
	-30.1	-17.1	-11.8	-9.0	-0.4	1.7	8.6	11.6	24.2	23.1	28.5	32.1	35.5	34.6	33.4	34.8	34.9	36.4	36.4	38.2	41.3	44.4	46.9	45.7	45.4	43.3	40.0	36.8	33.3	29.0	26.2	22.2	17.8	12.0	5.9	0.7
	-30.1	-27.0	-19.6	-17.5	-5.2	0.2	6.2	17.9	17.0	21.2	24.7	27.2	29.2	33.4	28.9	29.7	32.2	32.0	31.9	32.5	35.5	38.6	38.3	37.5	37.9	34.2	32.0	29.4	26.0	22.3	20.6	16.9	11.5	5.7	3.3	-0.2
	-27.7	-25.2	-24.9	-17.9	-8.7	-2.2	4.6	10.4	16.0	22.1	27.6	28.1	30.5	31.8	30.7	31.5	32.8	33.0	34.0	36.7	37.0	38.9	41.1	44.3	41.6	38.5	34.0	30.4	27.7	23.6	19.1	16.5	9.8	6.4	3.6	0.1
	-22.9	-14.0	-11.2	-9.9	-5.3	1.6	8.9	12.0	19.0	20.2	26.9	27.3	30.3	33.4	28.9	30.1	33.7	32.1	32.0	32.5	34.7	37.1	38.5	37.3	34.9	32.6	30.2	27.4	25.0	22.8	21.2	18.0	13.6	10.9	8.5	2.8
	-19.4	-17.3	-10.7	-4.4	1.8	7.6	13.7	21.0	25.8	36.6	43.9	33.6	34.9	37.7	40.2	42.6	46.7	52.3	47.0	42.6	44.3	46.8	46.9	48.1	48.0	49.5	45.7	44.9	43.5	42.6	41.1	37.1	31.2	27.4	22.8	13.3
	-27.3	-20.5	-16.0	-10.3	0.8	0.5	9.4	18.8	18.3	23.5	24.1	27.7	30.0	30.8	30.7	31.2	36.3	37.0	36.3	37.0	39.4	43.2	44.0	45.5	44.7	41.2	37.7	33.7	31.1	28.1	24.9	20.0	16.8	11.7	6.7	1.5
	-25.1	-20.9	-15.0	-12.2	-3.2	2.0	8.2	15.1	17.6	30.1	28.3	33.0	42.2	42.7	44.8	43.0	51.1	47.1	51.8	51.4	51.5	52.7	51.0	49.7	46.2	43.4	40.5	37.8	37.6	34.6	32.3	31.5	27.4	23.7	14.1	8.5
	-30.1	-29.1	-18.3	-13.3	-4.0	-0.3	9.4	12.1	20.6	21.3	25.3	32.8	34.3	33.8	34.8	35.1	37.5	39.3	40.0	41.7	46.4	49.5	53.2	50.2	49.5	47.9	43.1	40.1	37.4	35.2	31.3	26.0	21.7	14.6	9.3	2.3
	-17.2	-10.7	-6.0	-2.6	4.3	6.8	11.3	12.5	19.3	22.2	26.2	38.4	35.8	34.5	36.8	36.4	38.5	39.1	41.5	42.8	47.1	48.4	49.8	51.6	47.8	45.2	41.0	37.9	34.3	31.0	28.7	25.4	19.0	14.6	9.0	4.2
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ST-01 Interval

1/3 LAeq	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-30.1	-28.2	-20.4	-12.4	-4.7	1.5	9.2	16.6	19.5	27.2	29.8	33.7	42.1	38.6	37.8	42.0	45.4	46.0	45.7	46.9	48.7	51.5	53.7	52.6	51.6	50.2	47.9	46.3	43.7	42.2	40.2	35.4	31.0	25.5	20.1	10.1
	-28.8	-24.3	-16.8	-10.4	-3.7	2.2	7.4	12.3	17.5	21.2	24.9	25.7	29.8	32.0	29.1	32.3	30.8	31.1	33.8	33.3	36.3	37.9	38.8	38.2	37.9	36.2	32.9	30.3	29.0	27.5	28.9	26.3	22.1	18.4	14.1	6.8
	-29.3	-25.8	-19.8	-11.0	1.5	5.2	15.9	21.4	30.7	34.0	37.8	34.5	35.6	40.6	45.1	40.6	41.5	45.6	41.9	44.4	46.0	50.1	51.5	50.2	49.5	48.6	47.5	44.9	41.5	38.8	35.9	32.0	27.3	22.3	16.4	8.1
	-30.1	-28.0	-21.1	-13.2	-3.2	3.8	19.9	19.3	21.5	24.0	27.8	32.8	32.0	35.6	36.1	37.6	40.7	38.8	39.8	40.6	43.3	45.8	48.5	48.1	47.2	45.0	43.9	41.7	38.6	36.7	35.3	31.5	26.8	21.0	14.7	7.2
	-29.9	-27.7	-21.5	-12.0	-4.9	2.3	7.8	12.2	19.0	22.0	25.8	28.8	32.4	32.9	31.7	35.2	36.8	36.8	36.9	39.5	41.5	44.3	46.5	45.5	44.6	42.8	40.2	38.0	35.3	34.2	29.1	25.8	21.6	16.3	10.5	3.3
	-22.4	-15.5	-10.6	-5.0	0.7	7.3	12.0	17.0	20.4	26.3	27.3	31.2	36.9	34.4	35.4	41.5	42.2	42.2	44.1	45.5	49.0	52.3	53.2	52.6	52.3	50.5	48.2	46.2	42.6	40.3	37.9	34.7	30.4	24.9	26.9	10.5
	-18.4	-13.1	-7.8	-2.0	3.1	6.9	12.1	26.7	27.8	32.5	37.5	38.1	41.6	37.4	39.4	45.2	43.6	43.3	43.5	46.2	47.9	50.5	51.6	50.4	49.5	48.5	46.2	43.4	41.1	38.6	35.3	31.0	26.0	20.6	14.4	7.0
	-27.0	-22.7	-16.4	-9.8	-3.6	2.7	10.3	22.8	25.0	31.7	41.9	37.6	37.4	39.9	37.7	39.0	40.6	41.1	42.2	44.7	47.0	49.4	49.9	49.3	49.8	48.6	45.7	43.4	41.7	38.6	45.1	32.1	27.6	21.8	15.7	8.5
	-23.4	-19.2	-14.1	-7.3	-1.2	3.9	9.4	22.7	30.4	31.4	36.7	36.8	37.0	39.8	39.2	42.2	42.5	42.9	44.1	45.3	48.9	51.6	52.3	51.3	50.6	49.0	46.7	44.1	41.0	38.6	35.5	32.7	28.4	22.9	18.1	9.1
	-23.5	-17.5	-12.6	-7.3	-1.4	3.8	11.3	20.9	28.7	28.7	37.0	38.1	35.7	40.3	38.2	43.3	43.0	43.7	44.5	46.4	47.7	49.8	51.4	51.1	50.1	48.5	46.3	44.0	39.8	37.1	34.7	31.2	26.2	20.3	14.1	6.8
	-21.2	-12.4	-2.8	4.1	5.6	15.7	25.1	27.7	31.2	33.3	35.7	40.9	43.2	41.9	43.4	45.7	45.9	46.5	48.3	49.7	51.0	53.4	54.7	53.8	53.3	52.5	51.3	49.2	46.7	44.0	41.6	44.6	38.0	27.2	22.0	13.2
	-26.4	-22.6	-17.7	-11.9	-4.9	1.8	8.7	21.8	26.7	26.9	34.3	34.0	37.5	39.0	37.0	39.0	41.4	41.3	42.8	44.1	46.7	49.0	51.2	50.0	49.9	48.2	45.4	44.0	41.1	37.9	36.1	33.4	28.3	23.3	17.4	39.5
	-28.8	-25.0	-18.2	-12.3	-4.0	3.7	14.6	17.6	22.9	25.3	28.9	37.1	35.6	39.7	39.5	39.9	42.0	43.7	44.7	45.8	48.2	50.7	52.1	51.1	50.2	50.6	48.2	46.3	43.7	40.7	38.8	34.5	30.2	25.1	33.9	26.7
	-29.8	-26.3	-19.7	-12.2	-3.8	1.1	9.1	16.2	20.0	24.5	33.7	29.7	34.0	34.7	34.4	36.3	39.2	37.8	37.7	40.0	42.1	45.2	46.9	46.3	45.3	44.7	42.5	38.5	35.9	33.6	31.2	27.6	22.3	16.7	10.8	3.9
	-25.7	-19.9	-14.9	-9.1	-3.8	1.7	10.0	15.5	20.2	24.7	27.5	29.8	33.0	36.0	36.3	35.5	38.1	38.0	39.7	38.8	40.8	43.6	43.6	43.3	42.7	41.5	40.2	38.7	38.7	38.0	33.7	27.7	30.4	15.7	9.6	2.9
	-26.4	-21.2	-15.6	-10.6	-4.6	2.9	8.6	13.1	20.7	24.3	27.1	32.0	32.9	33.1	35.2	35.9	37.5	37.7	37.9	39.7	41.8	43.9	47.3	46.9	46.8	45.7	43.3	40.7	37.9	34.9	32.1	28.2	23.9	19.4	39.1	32.6
	-16.6	-11.9	-7.7	-2.5	4.8	8.0	12.4	18.3	23.4	26.8	31.2	30.7	33.5	34.4	34.5	37.9	39.1	40.8	40.1	41.8	44.3	48.0	47.3	47.4	46.8	45.1	43.0	40.6	37.9	35.2	32.9	29.4	24.7	20.0	14.8	7.2
	-23.1	-19.0	-13.5	-8.6	-1.8	3.5	10.6	17.6	23.6	26.1	32.0	35.8	37.1	39.6	39.7	40.7	42.9	46.2	44.1	44.0	46.3	49.3	51.6	50.4	49.4	47.9	45.0	43.2	40.6	38.8	37.3	32.2	26.4	21.1	14.1	7.0
	-23.5	-18.5	-11.7	-6.4	-1.8	4.3	12.4	16.0	20.9	26.5	30.0	31.3	37.9	41.0	42.1	43.7	47.1	46.9	48.1	48.6	49.2	50.7	52.6	49.9	47.7	45.9	44.4	41.5	38.5	36.8	33.1	30.0	26.6	20.8	14.0	5.5
	-23.7	-17.5	-9.8	-5.7	4.4	7.1	12.4	14.8	20.5	31.1	28.9	33.5	38.6	37.5	41.9	41.6	42.3	43.8	45.9	46.7	47.6	49.8	50.1	49.8	48.1	46.5	44.9	42.5	40.1	38.5	35.8	32.0	29.8	21.2	15.5	7.4
	-16.8	-11.5	-6.0	-0.3	5.2	8.1	13.2	14.8	19.9	28.6	28.6	34.5	37.9	39.2	36.0	38.6	40.0	40.1	42.0	44.4	46.3	49.3	48.2	48.6	47.7	45.9	44.0	42.5	40.0	36.4	34.2	32.3	27.8	22.0	16.8	8.5
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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1/3 LASmax 6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-30.1	-25.5	-17.9	-8.8	-0.3	5.6	12.8	23.4	26.4	33.6	36.2	41.4	50.1	43.5	42.3	48.9	52.8	54.4	50.6	51.3	54.2	55.2	57.3	56.5	55.2	53.9	51.6	51.6	50.1	48.4	46.7	41.9	36.5	31.8	27.6	17.4
-23.3	-16.7	-8.9	-2.9	3.2	7.5	12.4	16.8	21.5	25.4	27.9	28.1	37.3	36.0	34.3	40.9	36.4	34.4	40.7	40.2	40.2	43.1	44.1	43.3	47.2	46.4	42.7	40.7	42.8	43.2	45.9	43.4	39.2	35.4	30.9	23.1
-23.5	-18.2	-13.3	-0.2	12.7	13.7	24.5	30.7	42.3	45.5	51.4	45.1	41.6	48.5	57.3	50.0	48.9	55.7	49.3	50.4	53.2	61.0	60.1	58.5	58.0	58.3	56.8	52.5	51.7	48.8	44.8	39.7	36.1	30.9	24.5	16.8
-30.1	-25.5	-12.7	-6.8	7.5	13.9	26.1	27.8	31.8	34.2	35.4	43.1	39.3	43.1	47.8	46.8	53.1	49.4	51.2	49.1	52.0	53.3	58.4	56.4	54.1	53.2	54.3	51.9	49.1	47.1	46.2	42.3	37.8	31.6	25.7	18.1
-26.4	-23.8	-16.1	-2.3	3.4	11.5	15.2	18.1	25.8	28.6	33.5	33.7	40.3	41.9	37.9	46.8	46.7	47.0	46.0	48.9	50.9	53.0	56.1	55.1	55.0	52.1	49.8	48.3	45.6	44.2	39.6	36.9	33.7	28.9	22.5	14.4
-15.4	-6.7	-4.1	1.8	10.3	19.4	23.4	27.8	26.2	36.8	33.9	37.5	45.1	40.6	42.7	50.7	49.8	50.6	53.4	54.3	57.7	61.8	62.1	61.2	61.1	59.4	59.0	56.3	53.1	50.8	48.2	45.7	41.5	35.4	39.1	20.9
-10.5	-5.2	-1.3	7.4	10.1	13.3	19.2	36.4	37.4	42.2	47.6	45.1	52.1	44.7	50.1	58.3	52.3	52.7	52.5	55.1	56.5	58.1	58.2	56.6	55.0	55.0	56.2	52.2	50.4	46.1	43.5	38.9	34.9	30.5	24.1	14.9
-20.8	-14.5	-7.7	-2.9	4.2	9.3	18.5	31.9	33.6	38.8	47.9	43.9	43.3	46.4	45.2	47.2	48.4	47.8	49.1	51.2	53.9	58.3	58.7	58.0	61.7	60.3	56.6	52.5	51.3	47.0	59.9	39.0	35.2	30.6	23.5	15.4
-17.3	-11.7	-10.2	-1.2	4.6	10.2	14.3	35.6	43.0	45.9	48.0	46.6	47.4	47.9	45.9	50.9	50.1	48.9	50.9	53.0	57.5	60.0	60.5	58.9	58.2	55.9	55.2	52.5	49.1	48.7	43.6	42.5	39.9	34.2	30.7	20.0
-14.2	-10.3	-6.8	-0.8	3.9	11.7	22.2	33.2	41.8	38.0	49.3	50.8	42.2	52.1	48.1	53.3	52.1	54.8	53.5	53.9	55.1	55.6	56.6	58.7	56.1	54.2	54.5	52.0	48.6	47.1	43.4	42.3	39.4	33.6	29.7	18.8
-12.0	-2.2	8.5	17.0	18.0	29.2	38.0	38.0	42.5	41.2	47.2	51.7	51.9	51.4	51.0	56.7	54.3	53.6	59.6	58.4	57.1	59.8	60.7	60.7	61.0	59.1	57.4	56.0	54.0	50.5	48.3	60.2	51.7	35.4	30.4	21.4
-15.7	-12.5	-7.6	-4.8	1.4	6.5	16.4	33.2	36.4	35.9	46.5	41.4	46.0	46.4	42.9	46.3	47.7	49.1	50.1	50.4	56.9	57.9	59.0	58.4	60.9	56.8	53.5	52.8	51.6	45.5	43.9	41.1	36.1	31.0	25.6	55.1
-20.1	-16.9	-11.7	-6.9	2.8	12.4	23.0	25.9	33.0	35.0	37.0	47.7	44.1	48.5	49.5	49.0	51.7	52.0	52.5	52.6	56.1	58.3	59.8	58.3	57.4	60.6	57.3	54.5	52.6	47.9	47.3	42.1	38.0	33.7	50.0	42.6
-27.7	-16.6	-11.9	-3.7	1.8	5.3	16.7	25.3	27.8	31.2	45.6	37.5	43.5	45.8	42.3	45.0	50.0	46.4	45.7	49.2	51.1	55.4	56.2	56.6	55.2	54.7	54.3	50.0	47.6	45.3	42.6	39.0	33.8	28.2	21.5	12.6
-18.3	-9.7	-4.9	-4.4	1.4	6.4	17.4	23.0	27.5	32.1	34.4	35.2	39.5	47.2	48.2	43.1	47.7	46.2	49.3	44.2	46.9	49.5	48.7	47.8	48.2	48.1	47.4	46.1	44.8	43.4	40.4	37.2	46.5	24.3	17.8	10.0
-16.3	-12.5	-6.1	-3.0	3.8	12.4	14.1	19.8	28.8	31.9	31.9	38.8	38.7	37.2	44.1	42.8	45.5	45.7	47.2	48.9	52.8	52.9	58.8	56.8	58.4	57.9	54.9	52.4	50.3	45.5	43.4	38.5	33.8	29.1	55.5	48.6
-7.7	-3.4	-0.8	4.7	13.7	13.5	17.2	27.6	30.4	37.3	43.9	36.7	40.4	40.7	40.4	46.0	47.0	52.5	48.1	49.5	53.2	58.8	55.7	54.2	54.1	53.3	53.1	51.1	48.3	45.3	43.7	40.2	36.4	31.8	26.9	19.5
-14.1	-12.6	-7.4	-2.2	3.4	9.0	14.5	28.6	31.5	36.4	43.9	45.4	47.1	49.7	48.2	49.7	51.9	56.1	54.3	53.2	55.3	58.1	59.4	57.4	57.0	55.2	55.7	55.5	53.3	51.7	52.3	46.2	39.8	33.8	25.9	18.1
-16.1	-10.6	-4.4	-0.2	2.5	8.5	19.3	21.4	27.6	34.8	37.0	35.5	43.0	46.2	47.0	49.3	53.5	52.0	54.8	53.8	54.8	57.5	64.8	57.1	55.2	55.1	53.9	49.9	47.5	45.7	42.4	40.0	38.1	32.4	26.0	15.5
-15.1	-10.7	0.1	5.1	15.6	18.4	21.6	22.1	29.4	39.9	39.8	41.3	47.4	45.8	50.5	49.4	52.8	52.2	54.7	55.3	55.9	57.5	56.8	57.3	54.6	52.7	52.3	49.7	47.5	46.4	43.8	39.5	41.0	28.9	24.3	16.0
-9.0	-4.2	-0.1	7.7	13.6	13.6	18.5	20.3	26.5	41.0	35.2	40.3	46.2	49.6	44.4	46.8	49.3	49.9	51.4	53.8	57.2	61.5	57.7	58.1	59.0	57.2	55.4	54.9	52.2	48.4	47.2	45.1	40.6	35.0	29.7	21.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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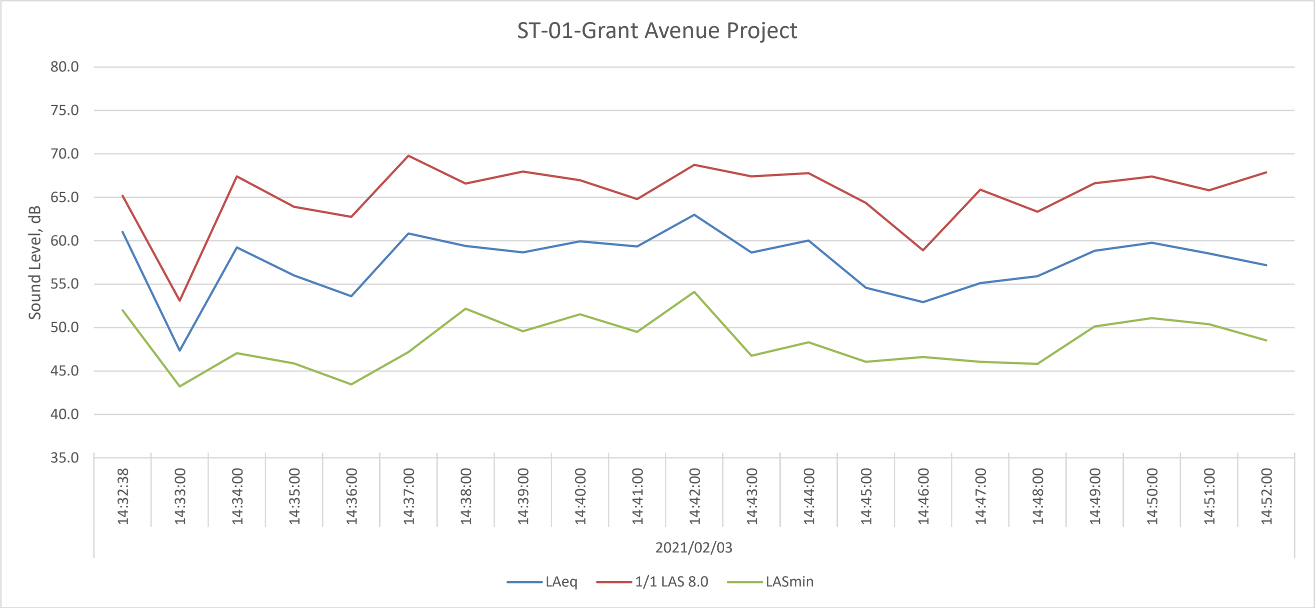
1/3 LASmin 6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-30.1	-29.2	-24.8	-16.4	-8.0	-2.4	6.2	10.3	16.1	20.9	25.0	25.6	28.6	31.6	30.5	32.8	35.4	34.4	36.1	40.2	39.7	42.7	44.1	43.3	43.0	40.6
-30.1	-29.2	-27.3	-21.7	-10.9	-2.9	3.4	7.6	12.7	18.3	21.1	23.3	26.4	29.8	26.9	26.4	28.3	28.5	29.3	29.8	31.8	33.2	34.3	33.6	33.0	29.8
-30.1	-29.2	-26.5	-20.8	-10.3	-3.2	4.7	9.0	15.8	18.5	21.7	24.4	27.7	30.9	28.3	28.3	29.7	29.7	30.7	32.3	35.4	38.1	39.6	38.7	37.5	34.5
-30.1	-29.2	-27.3	-18.3	-9.8	-1.6	3.2	9.7	13.3	18.4	22.9	25.7	27.7	30.8	27.2	29.1	30.9	30.2	29.8	31.3	33.3	36.5	38.3	37.7	36.0	33.0
-30.1	-29.2	-28.2	-20.5	-11.7	-2.6	1.7	7.5	14.2	17.2	22.2	24.5	27.9	29.2	27.3	27.1	28.0	27.8	28.9	29.8	32.1	34.0	34.6	33.7	32.1	29.0
-30.1	-29.2	-22.5	-15.3	-8.2	-0.7	5.8	10.5	14.1	18.5	22.5	26.2	29.4	30.3	28.3	29.8	30.3	30.9	31.5	33.3	35.3	38.3	39.1	37.8	36.8	33.7
-30.1	-25.2	-18.0	-13.2	-5.4	-1.4	5.4	8.9	15.9	21.2	22.6	28.8	32.0	29.8	28.8	30.8	33.0	34.0	35.4	36.1	38.6	42.5	43.3	42.4	41.0	38.6
-30.1	-29.2	-25.2	-16.6	-9.9	-1.4	5.3	10.3	15.6	19.8	24.5	31.2	31.3	31.0	30.8	31.5	33.2	35.9	36.0	37.2	38.8	40.2	40.6	39.7	38.2	35.9
-30.1	-26.8	-19.4	-14.3	-8.7	-1.6	4.5	10.2	16.1	20.4	24.2	28.3	29.6	34.1	30.8	31.5	34.0	33.8	34.6	36.4	40.6	41.6	42.7	42.1	41.3	39.1
-30.1	-29.0	-22.6	-14.7	-8.5	-1.4	4.7	10.2	13.7	21.3	23.2	29.3	30.1	33.5	29.2	30.0	30.3	31.1	32.5	34.6	37.2	39.9	41.9	41.7	41.1	38.2
-30.1	-26.6	-18.9	-15.0	-5.5	0.4	6.9	14.7	17.8	20.9	26.9	27.9	32.2	34.4	34.3	35.1	35.7	36.0	37.7	39.0	41.9	44.1	45.7	45.0	44.1	43.6
-30.1	-29.2	-25.9	-19.1	-11.6	-2.4	4.1	8.5	13.0	18.3	21.3	26.6	29.0	31.2	27.8	28.9	29.5	30.9	31.6	32.9	35.1	37.9	39.4	37.9	36.2	33.3
-30.1	-29.2	-24.0	-19.0	-9.9	-3.7	2.9	8.8	13.3	18.6	22.9	26.1	27.1	30.9	29.2	31.0	33.0	33.0	33.7	34.8	37.2	37.5	40.0	38.6	37.1	35.4
-30.1	-29.2	-25.6	-19.9	-8.5	-2.8	3.8	10.0	14.9	19.1	23.2	24.5	27.9	29.1	28.8	28.9	29.9	30.2	31.2	31.9	34.5	37.0	37.6	37.1	36.5	33.4
-30.1	-29.2	-25.9	-18.0	-9.9	-3.8	3.0	7.8	14.6	19.6	23.0	26.3	28.4	29.3	28.2	29.6	31.2	30.7	31.9	32.4	35.1	37.3	38.3	37.5	35.6	31.7
-30.1	-29.2	-26.4	-18.6	-10.8	-3.4	3.9	7.7	14.0	18.3	23.3	24.9	27.9	28.9	28.1	29.1	29.2	29.6	30.7	32.1	34.2	36.8	38.3	37.2	34.7	32.6
-30.1	-27.7	-22.0	-17.3	-8.2	-1.6	5.3	8.4	12.5	18.7	22.5	25.8	29.4	30.9	27.3	28.4	29.8	30.4	30.6	31.4	34.1	36.3	38.0	36.7	34.4	31.7
-30.1	-29.2	-22.6	-16.5	-8.7	-1.9	6.5	10.2	17.0	20.5	23.3	27.1	29.3	30.3	30.5	30.6	33.6	34.2	34.7	35.5	37.4	40.9	42.7	41.8	39.5	36.6
-30.1	-29.2	-20.2	-16.3	-8.3	-0.3	7.3	11.2	14.5	18.9	23.6	26.5	29.8	29.9	30.7	31.4	35.4	35.4	35.9	36.7	38.7	40.7	42.1	43.6	40.2	35.3
-30.1	-29.2	-20.7	-16.0	-7.2	-2.5	5.6	8.5	14.7	19.4	23.5	27.1	29.7	30.3	31.5	31.9	34.3	35.3	35.9	37.1	40.1	41.7	40.3	39.0	37.1	34.0
-30.1	-29.2	-24.5	-17.1	-6.1	-0.4	5.7	8.9	14.6	18.9	23.9	28.4	30.8	31.8	29.5	31.5	31.5	31.3	33.7	36.2	36.0	39.5	40.4	38.6	37.1	34.2
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ST-01 Interval

2500	3150	4000	5000	6300	8000	10000	12500	16000	20000	LAS2.00	LAS8.00	LAS25.00	LAS50.00	LAS90.00	LAS95.00	Ovrld.	OBA Ovrld.	Marker
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	No	No	
38.3	34.7	31.2	27.6	24.3	18.1	10.5	6.2	2.8	-0.3	65.1	64.1	62.7	60.9	53.4	53.1	No	No	
27.9	24.1	20.4	16.4	12.7	8.9	5.7	4.0	2.3	-0.4	52.6	50.2	47.8	47.2	44.1	43.6	No	No	
30.7	26.5	22.3	17.2	12.0	8.2	5.7	3.9	2.3	-0.4	65.3	63.1	61.1	56.9	47.7	47.2	No	No	
30.8	25.9	21.9	17.1	12.9	9.4	6.2	4.3	2.5	-0.4	63.3	61.8	56.4	52.6	48.1	46.5	No	No	
28.1	24.4	20.7	15.8	12.2	9.9	6.4	4.1	2.4	-0.4	62.0	59.9	52.8	48.4	44.3	43.9	No	No	
31.5	29.9	28.3	25.5	21.6	18.1	11.9	6.7	3.1	-0.1	68.6	65.0	61.5	58.6	48.7	47.9	No	No	
35.6	31.9	28.3	23.4	19.8	14.3	9.5	5.9	3.0	0.0	66.0	64.0	61.6	56.3	52.6	52.4	No	No	
32.8	28.9	24.7	20.1	15.5	11.1	6.9	4.3	2.2	-0.2	65.7	62.5	59.7	56.0	50.1	49.9	No	No	
35.3	31.8	26.6	21.7	16.6	11.9	7.4	4.5	2.3	-0.2	66.3	64.9	60.2	56.6	53.7	52.3	No	No	
34.1	30.1	26.1	22.3	18.5	14.3	9.9	5.8	2.8	0.0	64.2	63.6	61.0	57.8	50.8	49.8	No	No	
40.7	37.1	34.3	30.7	27.1	22.0	16.4	9.7	4.4	0.4	67.7	67.1	65.6	60.8	54.9	54.5	No	No	
30.0	25.9	22.0	17.5	13.3	9.2	6.1	4.0	2.1	-0.3	65.3	62.9	60.2	57.1	47.1	47.0	No	No	
32.3	28.3	24.4	20.2	15.4	10.3	6.6	4.3	2.3	-0.3	66.8	63.8	62.0	58.0	49.9	48.9	No	No	
30.1	26.8	24.0	19.2	15.4	10.4	6.8	4.1	2.3	-0.4	63.8	60.4	52.7	50.0	47.0	46.5	No	No	
28.7	26.0	26.1	22.3	19.0	11.9	7.1	4.5	2.5	-0.3	58.5	57.6	53.9	50.3	47.9	47.2	No	No	
29.4	25.8	22.6	19.6	15.2	11.8	6.7	4.4	2.6	-0.3	64.5	58.8	55.5	50.3	46.8	46.7	No	No	
28.6	25.4	22.9	19.8	16.9	13.6	9.2	5.8	2.9	-0.2	62.9	60.7	57.1	52.1	47.3	46.0	No	No	
33.1	29.8	25.9	22.4	18.6	13.7	9.2	5.6	2.8	-0.2	65.8	63.6	60.3	55.9	51.3	50.7	No	No	
30.8	25.9	21.3	17.4	14.5	10.3	6.9	4.4	2.4	-0.3	65.7	63.5	60.2	58.3	55.3	53.5	No	No	
32.2	28.7	25.1	20.3	16.4	12.0	7.7	4.7	2.4	-0.2	65.0	62.1	60.2	55.8	51.6	51.2	No	No	
31.2	27.6	25.2	21.6	18.4	14.1	9.8	5.7	2.9	-0.3	66.5	62.7	55.0	52.0	49.4	48.7	No	No	
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	No	No	

ST-01 Chart

Record #	Date	Time	LAeq	1/1 LAS 8	LASmin
1	2021/02/03	14:32:38	61.0	65.2	52.0
2		14:33:00	47.4	53.1	43.2
3		14:34:00	59.2	67.4	47.1
4		14:35:00	56.0	63.9	45.9
5		14:36:00	53.6	62.8	43.5
6		14:37:00	60.8	69.8	47.2
7		14:38:00	59.4	66.6	52.2
8		14:39:00	58.7	68.0	49.6
9		14:40:00	59.9	67.0	51.5
10		14:41:00	59.3	64.8	49.5
11		14:42:00	63.0	68.7	54.1
12		14:43:00	58.6	67.4	46.8
13		14:44:00	60.0	67.8	48.3
14		14:45:00	54.6	64.3	46.1
15		14:46:00	52.9	58.9	46.6
16		14:47:00	55.1	65.9	46.1
17		14:48:00	55.9	63.3	45.8
18		14:49:00	58.8	66.6	50.1
19		14:50:00	59.8	67.4	51.1
20		14:51:00	58.5	65.8	50.4
21		14:52:00	57.2	67.9	48.5



Summary			
Filename	831_Data.002		
Serial Number	3940		
Model	Model 831		
Firmware Version	2.314		
User	Issa		
Location	Grant Ave Project		
Job Description	Ambient Air Noise Survey		
Note			
Measurement Description	GRAANT-AVE		
Start	2021/02/03 14:55:21		
Stop	2021/02/03 15:15:23		
Duration	0:20:01.8		
Run Time	0:20:01.8		
Pause	0:00:00.0		
Pre Calibration	2021/02/03 14:24:11		
Post Calibration	None		
Calibration Deviation	---		
Overall Settings			
RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRM831		
Microphone Correction	Off		
Integration Method	Linear		
OBA Range	Low		
OBA Bandwidth	1/1 and 1/3		
OBA Freq. Weighting	A Weighting		
OBA Max Spectrum	Bin Max		
Gain	0.0 dB		
Overload	143.9 dB		
	A	**C**	**Z**
Under Range Peak	**76.5**	73.5	78.5 dB
Under Range Limit	**26.4**	26.8	32.5 dB
Noise Floor	17.3	17.6	23.0 dB
Results			
LAeq	59.3 dB		
LAE	90.1 dB		
EA	112.901 µPa²h		
LApeak (max)	2021/02/03 15:06:16	94.7 dB	
LASmax	2021/02/03 15:06:16	76.9 dB	
LASmin	2021/02/03 15:13:15	43.4 dB	
SEA	-99.9 dB		

ST-02 Summary

LAS > 60.0 dB (Exceedence Counts / Duration)	27	237.5 s
LAS > 70.0 dB (Exceedence Counts / Duration)	5	26.6 s
LApeak > 90.0 dB (Exceedence Counts / Duration)	1	1.0 s
LApeak > 100.0 dB (Exceedence Counts / Duration)	0	0.0 s
LApeak > 120.0 dB (Exceedence Counts / Duration)	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**
	59.3	59.3	-99.9	59.3	59.3	-99.9	-99.9

LCeq	70.9 dB
LAeq	59.3 dB
LCeq - LAeq	11.6 dB
LAIeq	61.1 dB
LAeq	59.3 dB
LAIeq - LAeq	1.9 dB
# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics	
LAS2.00	69.5 dB
LAS8.00	61.3 dB
LAS25.00	57.8 dB
LAS50.00	54.5 dB
LAS90.00	47.6 dB
LAS95.00	46.5 dB

Record #	Record Type	Date	Time	LAeq	LAS	LASmax	LASmin
1	Run	2021/02/03	14:55:21	0.0	0.0	0.0	0.0
2		2021/02/03	14:55:21	64.0	68.3	72.5	52.1
3		2021/02/03	14:56:00	64.3	49.1	76.0	46.5
4		2021/02/03	14:57:00	59.1	70.7	70.8	48.9
5		2021/02/03	14:58:00	62.6	61.4	72.7	48.0
6		2021/02/03	14:59:00	58.4	51.7	63.8	50.6
7		2021/02/03	15:00:00	64.3	58.4	73.6	51.6
8		2021/02/03	15:01:00	56.2	55.6	62.3	47.7
9		2021/02/03	15:02:00	56.0	49.8	63.4	46.0
10		2021/02/03	15:03:00	54.9	55.3	61.7	48.1
11		2021/02/03	15:04:00	54.0	47.6	63.2	45.8
12		2021/02/03	15:05:00	55.0	55.3	60.6	47.2
13		2021/02/03	15:06:00	63.2	54.6	76.9	46.9
14		2021/02/03	15:07:00	55.1	50.2	60.5	46.3
15		2021/02/03	15:08:00	54.3	48.5	58.3	47.0
16		2021/02/03	15:09:00	56.4	50.9	62.9	46.8
17		2021/02/03	15:10:00	56.9	55.4	64.2	48.0
18		2021/02/03	15:11:00	54.0	55.4	60.3	45.5
19		2021/02/03	15:12:00	50.3	45.2	57.4	44.5
20		2021/02/03	15:13:00	54.6	61.4	61.8	43.4
21		2021/02/03	15:14:00	58.1	54.9	62.3	52.9
22		2021/02/03	15:15:00	51.3	47.4	57.7	45.5
23	Stop	2021/02/03	15:15:23	0.0	0.0	0.0	0.0

1/1 LAS 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000	1/1 LAeq 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-9.1	8.4	28.4	44.7	55.9	53.9	60.3	62.2	62.6	60.6	55.5	41.1	-12.1	7.1	25.2	39.6	49.7	50.8	58.1	58.3	56.5	53.5	53.2	32.2
-18.1	2.6	19.2	35.3	40.4	39.2	39.5	43.8	43.4	33.9	20.6	8.6	-14.1	5.4	26.1	47.0	58.8	56.2	59.7	53.8	52.3	48.7	37.8	23.7
-16.7	4.9	27.4	42.3	68.4	64.0	60.6	56.9	54.3	49.4	44.0	29.0	-16.2	5.3	25.2	37.8	54.5	51.3	50.4	51.1	49.2	43.9	35.9	21.5
-15.0	5.7	21.6	33.6	44.9	46.9	51.8	58.1	56.5	47.7	35.7	19.0	-15.9	6.8	24.7	38.4	59.2	55.8	54.3	52.5	50.7	45.2	37.0	22.9
-18.9	4.8	24.2	37.7	42.6	43.2	43.4	47.0	44.4	36.5	26.9	13.8	-17.3	6.3	26.3	38.4	47.6	47.4	50.7	54.2	51.7	44.8	37.0	22.4
-11.9	5.6	27.9	36.0	43.9	47.8	50.6	53.6	52.2	48.4	40.7	23.2	-13.2	7.3	32.4	46.2	52.5	54.5	57.1	59.0	56.6	54.9	46.0	30.1
-17.3	6.3	27.8	35.7	39.8	46.2	47.9	51.4	48.8	42.0	32.3	15.7	-16.7	5.1	25.3	36.0	41.7	45.3	48.5	51.5	50.1	45.3	37.5	22.3
-18.6	3.5	19.9	30.6	35.1	39.3	42.0	45.6	43.2	37.2	28.9	9.1	-15.0	8.2	27.7	39.4	42.0	45.0	48.0	50.7	49.7	45.8	42.9	29.4
-11.2	4.8	18.9	36.1	38.2	40.9	48.0	51.7	49.1	41.4	34.7	17.7	-16.5	3.6	22.8	33.3	37.3	42.4	48.1	50.4	48.7	43.6	37.2	20.5
-15.9	6.5	23.9	33.5	38.1	38.2	39.6	43.3	39.6	29.9	29.1	7.7	-16.1	4.5	22.7	34.7	42.3	41.7	46.3	49.8	47.5	40.9	33.7	20.1
-15.9	7.5	23.8	40.8	49.7	42.8	46.0	49.6	45.5	41.4	30.5	36.3	-17.6	4.3	22.1	36.7	47.6	47.9	47.9	48.6	46.1	39.9	32.0	24.7
-17.7	2.7	21.4	31.6	37.4	41.0	47.8	50.0	48.4	44.6	34.9	15.9	-17.6	6.4	32.6	44.7	54.4	52.3	61.1	53.3	49.1	44.1	34.9	19.9
-19.9	1.6	22.8	35.3	38.0	40.5	40.5	44.4	43.4	42.3	37.3	20.7	-13.7	5.1	24.9	35.4	40.7	45.2	47.3	50.4	49.1	43.1	34.4	19.8
-18.7	1.1	25.3	32.8	35.6	38.3	40.4	45.2	40.3	30.4	19.3	7.7	-16.5	5.2	23.9	36.2	42.1	44.7	46.6	49.7	47.6	42.1	33.6	16.3
-16.2	6.3	21.7	31.2	34.6	37.0	39.2	46.0	47.8	35.2	25.2	7.6	-18.6	4.6	25.8	36.3	39.3	45.8	48.2	51.7	50.6	44.4	43.3	20.8
-17.8	5.5	23.0	32.7	40.1	44.0	47.8	50.9	50.1	43.0	33.3	16.4	-16.1	9.7	27.1	36.3	44.2	46.2	48.5	52.3	51.0	45.4	37.1	21.4
-20.1	1.5	24.0	33.7	38.2	41.7	47.2	51.4	49.6	44.2	35.6	22.2	-18.4	2.8	23.3	38.2	43.7	42.9	45.2	49.0	48.1	43.1	33.7	21.0
-20.6	3.5	18.7	32.3	36.2	34.5	37.4	40.6	36.3	33.8	16.9	7.5	-17.0	2.7	20.0	32.0	35.5	38.3	41.9	45.8	45.0	39.2	29.5	14.0
-17.0	5.6	24.0	43.0	42.5	49.4	54.1	56.8	55.6	50.7	41.4	24.7	-16.4	5.4	23.0	35.9	40.3	41.8	46.4	50.5	48.7	43.5	34.3	18.1
-19.1	1.9	27.3	38.6	45.7	45.8	48.2	48.4	48.4	41.4	33.2	19.3	-17.5	4.0	25.8	39.6	43.3	46.2	50.1	53.6	52.3	46.9	38.1	23.1
-18.3	1.0	19.4	35.4	36.3	41.5	41.4	41.5	37.4	26.8	16.8	8.6	-18.1	2.5	19.7	42.2	44.3	44.0	42.1	45.0	42.1	32.1	23.2	11.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1/1 LASmax 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000	1/1 LASmin 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-6.3	11.1	32.3	46.6	57.1	58.7	67.3	67.7	65.1	62.4	63.7	42.2	-21.8	2.8	19.9	30.8	39.4	43.3	44.0	45.7	40.1	32.3	30.6	8.6
-8.1	12.3	37.9	58.9	71.6	68.9	72.7	64.8	64.7	62.1	55.4	41.0	-20.7	1.6	18.1	27.5	33.0	36.2	37.9	42.1	39.8	32.5	20.2	8.5
-12.0	11.3	30.5	46.5	68.7	64.0	60.6	57.0	55.7	50.8	44.1	31.6	-20.2	1.1	17.5	29.4	37.3	38.2	39.0	43.2	41.5	32.0	18.4	7.6
-11.5	12.4	31.0	48.5	70.0	67.2	64.1	58.7	58.0	53.8	46.4	32.3	-20.7	2.5	19.7	30.4	37.6	37.6	39.4	42.9	39.9	31.8	17.3	7.4
-11.8	14.4	35.3	43.8	60.5	55.5	57.0	58.1	56.5	50.7	44.2	30.3	-21.7	1.4	20.2	32.2	37.7	39.5	42.3	45.6	43.3	34.2	22.3	8.7
-4.8	12.9	42.3	54.2	62.5	63.8	66.1	68.6	65.1	66.6	56.5	40.3	-22.6	2.7	23.7	35.5	39.8	43.1	43.1	46.9	43.9	36.0	25.3	11.0
-11.2	8.5	34.1	44.3	49.8	54.0	55.9	57.6	56.4	53.4	44.3	30.2	-21.6	2.1	19.3	30.3	35.3	37.2	39.9	43.7	38.8	30.2	23.7	7.4
-9.2	16.0	39.1	51.0	47.2	50.8	54.9	58.3	57.5	55.7	58.0	43.9	-20.5	0.5	17.1	28.9	34.0	35.6	38.6	41.5	38.1	31.9	25.3	7.9
-9.1	7.1	31.7	41.1	45.8	48.9	54.9	57.2	56.4	51.8	44.8	29.3	-23.7	1.2	17.7	27.9	32.4	36.0	39.7	43.4	40.3	32.4	24.5	8.3
-11.1	11.1	31.8	41.3	49.0	48.7	57.2	59.7	56.3	50.9	43.5	32.0	-21.1	0.7	17.0	27.5	32.7	35.8	36.7	40.1	35.9	28.0	19.6	7.5
-11.8	8.7	26.7	46.7	56.5	56.8	55.6	52.2	51.6	47.5	40.1	38.7	-22.9	0.7	18.2	29.8	36.9	38.0	39.6	42.3	38.4	28.8	17.2	7.5
-13.3	12.7	42.9	56.8	67.3	65.4	75.9	64.3	56.0	55.0	43.4	36.1	-22.1	2.0	19.4	31.5	35.8	36.9	39.0	41.8	37.1	30.9	18.5	7.5
-8.6	11.3	31.6	42.1	46.3	53.3	54.7	54.2	54.1	48.7	40.3	26.3	-21.1	1.1	19.5	28.3	33.3	35.7	37.3	40.9	40.1	34.2	24.5	8.2
-8.4	14.2	30.7	45.0	52.9	50.6	52.8	53.5	51.7	45.8	42.8	26.6	-23.6	0.3	17.4	28.5	33.7	38.0	38.8	42.5	39.8	30.3	19.3	7.4
-14.7	8.9	33.0	44.0	46.6	54.5	54.0	55.8	55.9	51.1	58.2	31.2	-23.6	0.6	19.0	28.7	33.7	36.6	39.1	42.6	38.2	27.7	16.1	7.4
-10.2	19.3	38.6	45.3	54.8	55.5	56.0	59.1	58.1	52.1	45.4	31.9	-22.0	2.8	19.5	29.6	33.8	36.0	38.1	43.6	42.3	32.7	21.2	7.5
-14.9	6.9	29.7	49.2	54.6	50.6	52.1	54.7	53.6	49.0	41.1	32.4	-22.4	-1.3	17.1	27.5	32.6	34.8	36.8	40.3	38.8	29.1	17.5	7.6
-10.6	7.1	27.3	37.0	40.7	45.2	50.0	53.5	51.6	46.4	39.6	25.3	-21.9	-0.3	16.8	28.0	32.3	34.3	36.6	40.2	36.3	27.9	16.0	7.4
-9.7	13.5	29.2	43.4	46.5	49.6	54.6	57.8	56.4	51.8	42.8	25.9	-22.3	0.1	16.4	28.1	32.2	33.4	36.2	38.3	35.0	29.2	14.6	7.4
-14.2	11.1	31.8	48.5	48.0	51.8	55.3	57.6	57.3	53.4	43.7	29.5	-20.5	1.1	19.6	32.7	37.2	41.6	44.3	48.3	45.8	36.6	27.0	12.9
-15.1	5.0	27.2	50.5	52.6	52.4	48.9	50.7	48.9	41.3	33.0	19.1	-22.4	0.5	17.3	29.0	32.9	34.8	37.5	41.5	37.1	26.7	16.7	8.4
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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1/3 LAS	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-19.6	-13.2	-11.9	-5.6	0.6	5.8	11.3	21.0	27.3	31.7	38.4	43.7	51.0	53.0	49.8	45.9	50.3	50.0	53.1	55.6	57.1	56.8	57.9	57.6	58.4	57.7	57.3	56.6	55.4	55.1	53.4	50.1	45.3	39.6	34.4	25.7
	-28.5	-21.4	-22.4	-10.3	-7.3	2.9	7.8	15.8	16.6	22.3	25.1	33.7	32.2	34.4	38.8	35.1	34.2	33.6	32.9	34.2	36.3	38.9	39.8	38.8	40.7	38.9	33.6	31.9	28.5	24.0	18.8	14.5	10.0	6.1	3.2	-0.1
	-30.1	-22.1	-16.9	-12.7	-7.0	3.8	8.7	13.3	27.6	26.1	34.8	41.3	57.2	68.1	51.2	53.0	61.9	58.4	56.8	55.3	55.1	53.9	52.2	50.2	49.0	49.5	50.0	46.1	43.8	43.1	41.9	38.7	33.8	27.7	21.5	13.4
	-28.8	-24.9	-15.4	-13.1	4.0	3.9	11.7	16.8	19.5	26.8	29.5	29.2	33.9	43.3	39.0	40.6	43.0	42.8	44.7	46.3	48.6	52.8	53.7	53.1	53.2	51.8	49.3	45.6	41.8	38.4	34.1	29.1	24.2	17.7	11.1	3.3
	-28.9	-28.6	-21.4	-12.0	-4.3	1.4	7.6	13.1	21.8	22.6	34.0	35.3	36.1	38.4	39.7	37.8	38.8	38.1	37.3	37.2	40.4	41.6	42.0	42.9	41.3	39.7	36.0	33.7	32.1	28.9	25.1	21.0	16.2	12.6	6.0	0.7
	-28.3	-23.0	-14.1	-8.8	-3.1	5.7	24.1	21.0	24.9	29.5	29.2	32.7	36.7	37.4	41.6	42.2	42.9	42.6	44.2	46.3	46.3	48.0	50.2	47.8	47.9	47.6	46.7	45.0	42.8	42.6	39.4	33.6	28.3	21.7	16.1	7.2
	-28.4	-25.7	-18.8	-12.1	-4.2	3.6	9.3	14.5	26.9	34.3	27.4	30.5	32.2	34.8	35.9	38.4	42.4	41.6	41.5	42.8	44.3	46.8	47.6	45.9	46.2	43.6	41.1	39.6	36.5	33.7	30.3	26.9	19.9	14.4	8.0	2.2
	-26.3	-24.9	-19.0	-11.8	-4.9	2.7	8.7	11.8	18.3	24.1	23.6	28.1	28.1	31.1	30.4	31.1	34.5	36.7	36.6	37.2	38.0	40.3	41.5	41.1	40.2	38.4	35.8	34.3	31.6	30.3	27.9	21.7	12.8	6.8	3.3	-0.2
	-30.1	-18.2	-11.0	-6.7	-4.3	5.0	8.0	12.4	16.9	24.4	32.9	33.6	27.3	30.7	37.0	35.8	36.3	36.4	41.4	43.5	44.8	47.3	46.8	47.0	46.8	43.7	40.5	38.4	35.9	34.4	32.8	29.4	22.2	16.6	9.4	1.9
	-30.1	-25.9	-17.5	-10.9	-4.6	5.1	9.4	19.9	22.1	22.0	26.3	32.4	28.8	36.1	31.6	32.4	33.8	33.6	34.1	34.4	36.4	38.9	38.9	37.8	37.0	34.5	31.2	27.3	24.5	21.7	23.4	27.7	6.5	4.3	3.3	-0.3
	-30.1	-22.1	-19.6	-10.9	-4.6	2.6	16.1	18.3	21.9	29.3	38.1	35.4	47.9	37.5	38.2	39.1	38.0	37.6	40.2	40.3	42.8	43.7	45.9	44.3	43.1	39.9	37.0	35.3	37.1	37.1	28.9	22.5	17.5	23.2	35.9	2.5
	-29.4	-25.4	-19.5	-12.8	-3.2	2.6	7.5	17.5	19.3	24.0	23.8	29.9	27.7	31.3	35.3	35.0	36.2	37.1	39.2	43.8	44.0	44.1	45.4	45.8	45.1	43.6	41.3	41.1	38.7	39.5	33.7	25.6	20.4	14.4	8.3	1.7
	-30.1	-29.2	-19.6	-11.2	-4.8	0.8	10.1	10.5	22.5	21.1	31.5	33.3	34.4	32.1	33.0	33.5	36.8	36.3	34.5	35.4	37.2	39.5	40.1	39.4	39.5	38.9	37.7	38.1	36.6	37.1	35.5	30.6	25.4	18.9	14.0	8.7
	-30.1	-27.0	-17.6	-14.6	-4.9	-0.2	8.4	15.1	25.2	21.1	24.8	31.7	27.0	31.1	32.5	32.8	34.0	34.5	34.5	35.3	37.2	39.9	41.9	39.7	37.7	35.2	32.0	28.1	24.6	21.6	17.5	13.3	7.3	4.3	3.4	-0.3
	-30.1	-28.4	-19.4	-16.6	-8.3	6.7	8.8	14.1	19.9	20.7	26.4	29.0	27.3	30.4	30.6	31.8	32.9	32.7	33.2	33.4	36.0	38.1	39.2	44.1	45.2	43.9	35.5	32.3	30.2	27.5	24.1	17.2	8.3	4.5	2.8	-0.4
	-30.0	-27.0	-17.5	-12.9	-4.5	4.2	10.0	17.5	22.3	24.4	27.5	29.4	37.7	34.2	34.1	34.9	40.3	40.6	39.2	43.8	44.4	45.5	46.8	46.5	46.9	45.4	43.2	40.4	37.5	35.6	31.8	26.5	20.9	15.1	8.5	1.4
	-30.1	-25.8	-20.1	-12.0	-4.9	1.7	8.8	21.4	21.3	25.0	30.3	29.3	33.9	32.7	33.5	34.5	37.1	38.0	40.5	41.8	44.0	46.0	46.7	47.3	46.5	44.2	42.8	41.5	38.7	36.2	33.6	29.9	24.8	19.5	13.3	17.0
	-30.1	-27.2	-22.8	-12.3	-6.9	2.3	7.4	12.8	18.0	18.8	27.5	30.2	27.5	34.1	29.7	28.2	29.9	30.6	32.0	31.8	33.6	35.3	36.0	36.2	33.5	31.3	27.8	32.5	27.2	21.4	15.3	9.6	5.8	4.2	3.0	-0.3
	-27.1	-22.1	-18.2	-13.8	-9.3	5.3	12.9	21.1	20.4	26.5	36.8	41.8	30.6	37.6	40.5	43.3	40.7	46.4	49.9	49.4	49.2	53.1	51.7	51.3	51.6	51.4	49.0	47.6	46.2	43.1	39.1	36.4	29.7	23.3	17.4	9.2
	-30.1	-26.2	-20.8	-13.0	-9.1	2.1	7.4	18.1	27.1	25.1	29.0	37.7	41.6	36.8	43.0	41.7	41.3	39.6	42.1	43.7	44.1	42.7	44.1	43.6	44.9	44.2	41.2	39.1	35.7	33.1	31.0	27.7	23.9	18.2	11.2	3.8
	-30.1	-27.1	-16.8	-14.7	-9.4	-0.1	7.2	12.8	17.7	22.9	29.0	34.5	30.1	32.7	32.4	38.6	35.5	35.2	37.6	37.0	34.7	37.0	37.7	36.1	34.5	32.7	28.0	24.1	21.7	18.3	14.4	11.2	8.0	5.8	3.6	-0.1
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ST-02 Interval

1/3 LAeq 6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-23.9	-18.2	-14.1	-7.2	-0.4	5.7	12.9	18.2	24.0	27.7	33.3	37.9	44.0	45.4	45.5	43.7	44.7	48.4	53.9	52.1	54.3	54.2	53.4	53.0	52.1	51.6	51.6	50.1	48.3	47.2	47.1	51.8	36.2	30.6	25.6	16.8
-25.4	-20.7	-15.4	-9.5	-2.6	4.5	8.8	16.1	25.7	34.3	40.3	45.8	52.1	57.0	50.5	49.3	52.5	51.7	56.1	56.2	50.9	49.4	49.5	48.2	46.9	45.2	49.5	47.4	40.0	38.4	35.6	32.3	28.4	22.3	16.6	8.2
-28.4	-24.1	-17.2	-10.1	-2.5	4.1	10.6	17.2	24.1	31.8	32.0	34.5	46.6	53.3	40.7	43.7	48.2	46.4	44.9	45.9	46.0	47.1	46.4	45.5	45.4	44.4	43.3	40.9	38.7	36.3	34.3	29.5	24.9	18.6	17.4	5.4
-29.0	-25.4	-16.7	-11.2	-1.1	5.8	12.1	19.8	22.6	24.5	35.1	35.3	56.0	56.2	43.6	49.5	53.4	48.9	48.5	51.0	48.8	48.2	48.0	46.7	46.2	45.9	45.9	42.3	39.8	37.6	34.9	31.5	27.1	21.6	15.1	7.6
-28.4	-24.8	-18.5	-12.4	-1.6	5.3	13.1	18.0	25.3	29.5	33.9	35.6	36.5	46.3	40.7	40.5	43.8	43.1	45.6	45.9	46.4	48.9	49.1	50.1	49.1	46.6	43.7	42.0	39.7	37.3	35.0	31.2	26.8	21.2	14.4	6.2
-25.3	-19.6	-14.8	-9.1	-1.0	6.5	19.6	23.4	31.6	32.6	42.1	43.8	47.0	45.9	49.7	48.0	48.7	51.6	52.7	52.7	51.8	53.0	55.1	54.5	53.5	51.1	50.0	51.6	50.0	48.2	43.7	40.9	34.6	29.2	20.9	11.6
-28.6	-24.4	-17.6	-11.2	-4.3	4.2	14.3	20.4	23.1	29.3	32.5	31.6	34.9	37.7	38.0	40.4	40.5	40.7	42.0	44.3	44.9	46.8	47.1	46.5	46.5	45.2	43.9	42.6	40.1	37.7	35.7	31.4	26.6	21.1	14.2	7.9
-27.0	-22.0	-16.5	-6.5	-2.6	7.6	14.3	20.3	26.3	38.4	30.8	29.8	35.1	38.0	38.0	39.3	40.7	40.7	43.3	43.2	43.2	44.8	47.6	45.0	45.1	45.2	44.6	43.7	38.8	38.2	35.1	39.3	39.0	27.9	19.2	18.0
-28.7	-25.7	-17.7	-12.4	-5.6	2.8	8.6	15.8	21.6	24.6	26.9	31.3	30.1	32.0	34.4	36.3	36.4	39.5	44.6	42.4	43.3	45.5	45.5	46.0	45.6	43.7	41.8	40.7	38.0	36.8	35.1	32.2	25.4	19.4	12.2	4.0
-26.4	-22.6	-17.5	-11.5	-5.2	3.7	10.2	16.3	21.2	24.8	29.9	32.2	37.0	36.7	38.8	35.9	37.5	37.1	38.7	42.4	42.9	44.4	46.0	44.5	43.7	43.2	40.8	37.9	35.7	33.5	30.6	29.8	23.3	18.8	12.4	4.2
-28.6	-25.3	-18.9	-12.9	-4.2	3.2	10.5	17.0	20.1	24.9	32.2	34.4	38.5	44.6	43.4	43.1	41.4	44.3	44.2	43.2	41.8	43.6	44.4	43.5	43.2	41.2	38.5	35.9	34.9	34.2	30.2	26.5	19.6	17.8	23.4	3.4
-28.2	-24.2	-19.1	-11.7	-2.6	5.7	12.7	24.2	31.9	34.6	41.6	40.8	44.9	50.8	51.1	48.6	47.2	45.8	56.8	58.6	48.9	49.4	49.1	46.8	45.5	44.5	42.5	41.4	38.7	36.5	33.0	28.9	24.1	18.8	11.8	4.4
-25.1	-21.1	-15.0	-8.8	-1.3	3.6	13.9	20.3	22.5	27.1	30.7	32.5	36.4	34.6	36.5	41.5	39.9	40.1	40.9	42.4	43.8	45.6	46.1	45.0	45.4	44.4	42.7	40.4	37.3	35.8	32.7	28.5	23.2	18.8	11.6	4.4
-28.8	-25.2	-17.4	-11.4	-5.1	4.1	13.4	18.0	22.1	26.5	30.0	34.4	33.4	37.4	39.4	39.7	40.2	40.0	40.6	41.8	42.9	44.4	45.5	44.9	44.3	42.7	40.8	39.1	36.7	35.2	32.4	26.1	21.8	14.7	9.2	3.4
-29.1	-26.8	-19.9	-10.9	-4.5	3.7	10.8	21.5	23.4	28.0	31.8	33.5	32.8	35.1	35.1	37.7	42.3	42.0	42.0	43.5	44.8	46.5	47.3	47.0	47.3	45.7	43.9	41.9	39.0	36.3	33.6	42.7	24.9	19.4	13.6	5.2
-28.7	-25.2	-17.0	-8.6	0.7	9.0	14.3	22.0	25.1	26.6	32.2	33.2	36.6	39.2	41.5	40.6	41.2	42.1	41.8	43.7	45.1	46.7	48.2	47.6	47.5	46.5	44.0	42.3	40.0	38.9	35.6	30.6	25.5	20.2	13.9	6.0
-29.2	-26.1	-19.7	-12.3	-5.1	1.7	9.9	16.5	22.0	26.0	31.7	36.8	35.9	35.3	42.2	37.5	37.5	38.8	39.5	40.5	41.3	43.5	44.6	44.5	44.4	43.5	41.9	40.5	37.4	35.2	32.3	27.1	21.9	16.4	16.6	15.8
-28.3	-25.2	-18.1	-12.6	-6.0	1.6	8.3	13.7	18.5	21.5	26.9	29.5	31.0	30.7	30.8	32.4	33.7	34.3	35.6	37.0	38.2	40.5	41.1	41.5	41.6	40.2	38.3	36.7	33.6	30.7	28.0	22.9	17.7	12.5	6.8	1.1
-28.0	-23.3	-17.8	-11.9	-5.1	4.7	13.6	17.1	21.0	23.3	30.6	33.9	35.2	36.2	34.9	35.3	37.1	37.9	40.9	41.4	42.6	45.2	46.3	45.7	45.0	43.9	42.4	40.3	38.7	36.2	32.2	28.9	23.0	16.7	10.8	3.6
-29.1	-25.8	-18.4	-12.1	-5.3	3.2	12.0	19.1	24.4	31.7	33.5	37.2	38.8	37.9	39.0	40.7	41.6	42.1	43.6	45.4	46.6	48.8	48.9	49.0	49.0	47.2	45.9	43.7	42.2	39.4	36.0	32.6	27.6	21.7	15.7	8.1
-29.0	-26.6	-19.0	-13.6	-7.9	1.5	8.0	12.8	18.5	27.0	34.9	40.9	41.6	37.3	39.2	40.8	38.7	37.8	38.1	37.4	36.3	38.3	39.0	42.2	39.4	37.6	32.5	29.3	27.2	23.6	21.8	15.9	12.4	9.2	5.2	0.5
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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1/3 LASmax	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-17.6	-9.2	-9.2	0.1	5.9	9.3	19.4	22.4	32.0	33.2	40.8	45.0	52.6	54.4	52.4	48.9	51.5	57.9	64.0	61.0	64.3	64.7	62.5	62.9	59.8	60.9	60.7	59.1	57.5	56.4	54.6	63.6	46.2	40.7	35.4	27.1
	-17.6	-13.2	-9.2	-3.1	6.3	10.6	15.6	22.6	38.0	45.6	52.7	58.8	63.7	71.0	64.8	62.9	65.8	63.3	69.7	69.3	62.5	60.9	61.0	58.8	58.4	57.7	63.6	61.6	55.4	55.0	53.3	50.0	45.1	39.5	34.2	25.5
	-24.2	-18.5	-13.2	-0.6	8.6	7.8	15.9	25.6	29.9	43.8	43.2	45.7	60.0	68.3	51.5	53.2	62.1	58.9	57.2	55.3	55.2	54.1	52.2	50.9	52.2	50.9	50.2	48.3	45.4	43.3	42.3	38.8	33.9	27.9	31.5	14.2
	-25.0	-19.0	-11.9	-5.9	5.5	11.7	22.4	30.2	27.4	32.8	47.2	43.6	67.8	68.2	54.5	61.7	65.4	59.7	57.9	61.8	57.1	56.0	54.9	53.1	53.3	53.1	55.9	50.9	48.0	46.0	44.2	41.2	36.5	30.9	25.1	18.2
	-22.7	-17.1	-13.1	-8.4	8.0	13.4	21.6	25.8	34.9	38.1	39.8	41.6	44.1	60.1	52.1	50.1	52.3	51.7	54.3	53.9	51.7	53.7	53.8	55.5	54.6	51.7	49.2	47.5	45.8	44.4	42.0	38.5	34.7	29.2	22.4	12.7
	-17.5	-9.9	-7.2	-2.1	4.5	12.8	30.5	29.4	42.3	40.4	51.4	54.1	57.6	57.6	61.0	59.3	57.1	61.4	61.9	62.5	60.2	63.0	64.7	63.7	62.4	59.3	59.0	63.2	61.5	60.3	53.8	51.7	44.4	39.3	31.7	22.3
	-23.5	-16.1	-12.3	-6.0	-0.7	7.5	24.1	31.8	31.3	38.0	43.8	38.2	45.9	48.0	47.1	51.5	47.6	48.8	50.9	52.0	52.3	54.1	53.0	51.5	51.6	51.8	52.0	51.5	47.9	45.4	42.5	38.5	34.2	29.2	21.8	16.4
	-21.2	-14.1	-10.7	3.0	3.5	15.7	24.4	32.4	38.9	51.1	40.6	34.6	43.2	45.7	43.9	44.9	49.3	48.4	51.1	50.2	49.1	50.8	56.6	51.2	51.3	53.0	53.9	53.9	47.9	48.7	44.7	55.2	54.9	43.4	33.5	33.2
	-24.8	-18.0	-10.1	-6.1	-1.6	6.6	11.9	24.5	31.9	31.9	33.7	40.7	35.7	39.6	45.3	46.0	42.3	46.4	54.8	51.1	50.9	52.9	52.2	52.5	53.3	51.3	50.1	48.6	46.4	45.3	43.2	38.7	33.3	28.3	20.6	10.7
	-20.6	-16.8	-11.2	-6.6	-1.5	11.2	18.8	26.1	30.5	35.6	39.5	39.6	43.6	44.6	47.9	41.9	45.7	44.1	47.7	54.4	53.5	55.2	56.1	52.5	52.1	52.1	49.9	48.1	46.1	43.2	40.9	38.5	34.5	30.9	24.2	14.6
	-23.1	-18.1	-12.8	-6.6	1.6	7.9	20.4	25.9	23.6	34.8	41.5	46.8	49.2	55.9	54.5	53.2	50.1	55.5	53.6	52.3	46.9	48.2	47.9	47.3	48.7	46.6	44.8	42.9	44.0	41.0	37.0	36.6	30.8	29.2	38.3	13.4
	-25.1	-15.8	-15.1	-5.7	3.9	12.5	22.1	35.4	42.9	45.3	56.0	51.4	55.2	65.4	65.4	62.0	60.6	58.5	70.2	74.4	62.1	62.6	59.8	53.1	51.2	51.7	52.4	52.9	50.0	43.2	41.5	37.9	34.4	29.6	35.7	12.5
	-20.3	-14.0	-9.8	-0.9	10.0	7.0	24.8	30.7	28.9	37.1	40.4	37.6	44.1	41.0	42.5	51.7	48.6	47.6	48.2	50.9	50.0	50.9	50.0	49.2	50.7	49.3	48.7	46.2	42.4	42.0	38.3	35.5	29.8	26.4	17.6	9.2
	-25.5	-20.5	-8.5	-4.4	-1.2	13.2	24.1	28.7	28.1	34.7	37.4	44.9	43.2	47.9	51.1	46.7	45.2	46.4	46.7	48.7	49.5	48.4	48.7	50.5	49.3	47.3	44.8	42.5	40.9	42.4	40.0	36.6	36.0	25.8	16.0	9.4
	-27.1	-24.1	-15.0	-3.8	1.7	8.9	20.1	32.0	32.2	37.1	43.2	41.7	41.7	44.1	42.3	44.8	53.1	49.4	48.6	50.1	49.8	51.7	52.4	51.3	52.5	51.3	49.9	48.9	45.9	44.4	42.6	58.1	34.9	30.0	23.4	14.0
	-25.7	-21.4	-10.6	0.8	11.6	18.7	24.5	33.0	37.7	37.9	42.2	42.2	46.9	51.5	53.8	53.1	48.2	54.0	51.7	50.8	51.3	52.6	55.0	55.0	55.3	53.6	50.7	48.6	47.5	45.6	43.3	40.2	35.4	30.7	24.5	16.7
	-26.3	-20.5	-15.5	-8.0	-0.8	6.8	17.0	22.0	29.4	35.4	42.5	48.0	46.0	48.5	54.3	46.6	44.4	46.6	47.2	48.2	47.9	49.9	50.4	49.3	50.2	49.2	48.3	46.8	42.9	41.4	39.4	35.0	30.3	24.2	32.2	29.5
	-21.8	-19.0	-11.9	-8.3	-2.6	6.1	11.7	24.2	26.1	28.5	32.6	35.7	38.2	35.4	37.6	39.6	40.5	41.2	44.2	45.4	46.4	49.1	48.2	48.4	48.7	46.8	44.8	43.9	40.9	39.1	37.5	34.0	29.2	23.9	17.0	16.8
	-20.4	-16.4	-11.0	-7.1	0.5	13.5	22.9	25.1	26.6	33.6	39.6	42.5	43.8	44.5	44.9	43.4	44.7	46.4	50.5	50.8	49.6	53.2	53.7	52.9	51.8	52.2	51.5	48.4	47.2	45.5	40.8	37.7	31.7	24.5	18.8	10.4
	-26.4	-20.9	-15.0	-5.8	1.3	10.4	19.7	28.5	29.9	40.6	41.9	47.3	47.1	46.5	45.3	49.1	45.0	50.4	50.1	51.2	52.1	53.0	53.2	53.0	55.1	53.9	52.4	49.3	50.1	46.3	42.3	38.1	34.8	27.7	23.3	16.2
	-27.2	-24.2	-15.5	-9.2	-4.3	4.5	11.1	18.0	27.0	34.9	43.8	50.0	52.0	45.5	47.0	49.5	46.8	45.8	45.4	44.0	43.9	42.7	44.3	48.6	45.7	44.6	41.1	39.0	35.6	33.0	30.9	27.6	23.7	18.0	11.1	3.7
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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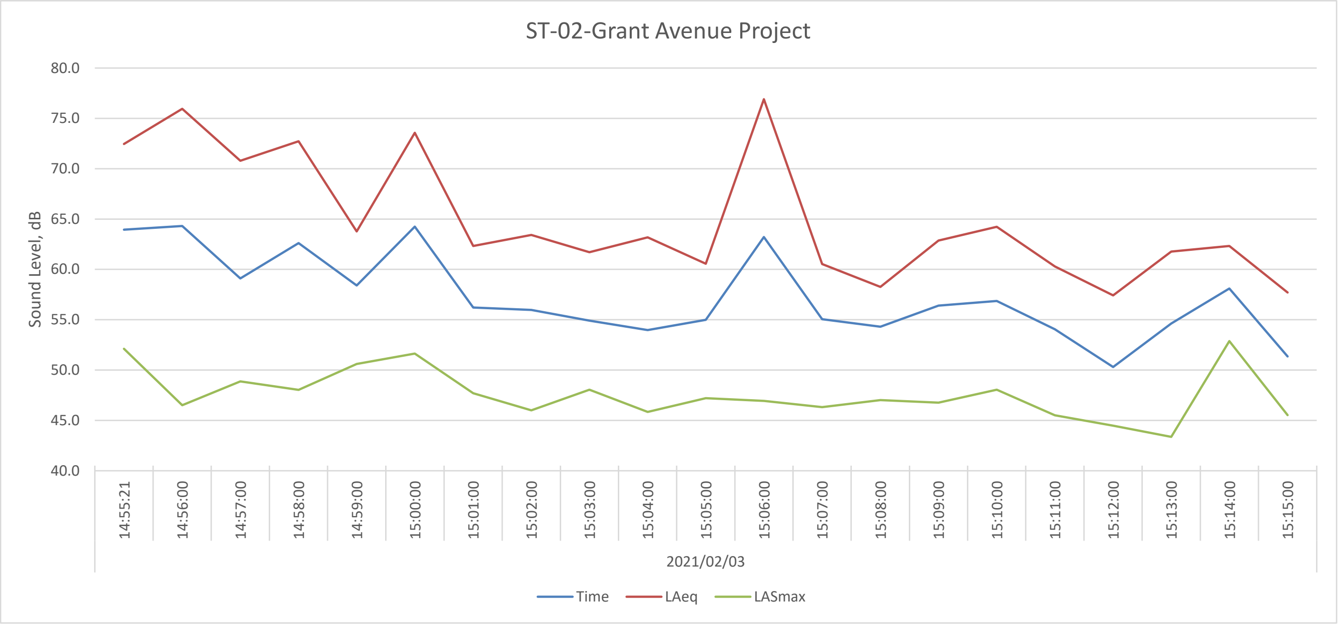
1/3 LASmin 6.3	**8.0**	**10.0**	**12.5**	**16.0**	**20.0**	**25.0**	**31.5**	**40.0**	**50.0**	**63.0**	**80.0**	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-30.1	-29.2	-23.7	-14.8	-6.2	1.3	6.4	11.6	17.5	22.0	23.8	28.1	30.4	32.5	36.0	36.0	36.3	38.8	38.8	38.8	40.0	40.6	40.7	39.5	37.2	34.8	31.7	29.6
-30.1	-28.8	-22.7	-17.6	-8.2	-0.4	4.6	9.4	16.1	19.2	22.1	23.7	25.7	28.3	28.3	29.6	32.0	32.2	31.8	32.7	34.2	36.3	36.6	36.7	36.2	35.1	32.2	29.3
-30.1	-29.2	-22.8	-17.5	-8.9	0.0	7.0	10.5	15.1	20.0	22.7	26.4	28.6	31.2	31.3	32.1	33.9	33.3	32.1	33.9	35.7	37.4	38.8	38.6	37.3	36.7	32.7	29.9
-30.1	-29.2	-21.6	-17.7	-8.7	0.8	5.0	12.0	18.7	20.4	23.4	28.7	31.0	33.4	30.7	30.7	31.9	33.4	33.2	33.8	35.5	37.1	38.5	37.5	36.5	35.2	32.5	29.5
-30.1	-29.2	-23.5	-16.7	-9.0	0.4	5.4	11.7	18.5	22.2	25.6	28.3	31.4	32.5	33.0	32.9	35.0	34.5	35.2	36.4	38.6	40.4	41.3	40.2	39.8	38.9	34.8	32.0
-30.1	-29.2	-24.2	-17.5	-9.5	1.4	5.8	13.1	18.7	22.3	28.5	32.5	30.5	34.3	35.1	37.0	38.8	36.9	37.2	37.1	39.9	40.7	42.0	42.2	40.9	39.2	35.1	32.7
-30.1	-29.2	-23.2	-16.3	-9.7	0.7	7.0	11.7	17.2	21.2	23.1	26.8	27.1	29.8	30.9	30.4	33.2	33.5	33.4	34.5	36.2	39.0	39.6	37.3	36.1	33.7	30.1	27.0
-30.1	-29.2	-22.4	-15.0	-7.9	-0.5	4.7	9.1	15.1	19.5	20.8	25.2	26.4	28.9	29.3	29.6	30.5	32.1	32.3	33.4	35.1	36.7	37.1	35.6	34.4	33.0	31.8	28.5
-30.1	-29.2	-25.7	-17.9	-10.7	-0.1	5.1	10.6	15.9	18.5	20.6	23.5	25.2	26.9	28.0	28.9	31.2	32.1	33.1	34.2	36.2	38.9	38.5	38.4	37.6	34.6	32.5	30.0
-30.1	-29.2	-23.0	-16.9	-9.8	-0.7	4.9	9.2	15.8	16.5	21.4	24.6	25.3	26.9	29.2	29.5	31.1	30.5	31.0	31.5	32.8	34.9	36.3	34.4	32.8	31.1	28.2	25.1
-30.1	-29.2	-24.4	-20.2	-10.7	-1.2	4.5	9.5	15.9	20.3	23.1	26.1	26.7	31.9	30.4	32.1	33.1	33.4	33.7	34.2	35.3	37.4	38.4	36.2	35.3	34.0	30.0	26.9
-30.1	-29.2	-25.5	-17.4	-10.8	0.1	6.3	12.5	16.8	20.6	23.5	29.8	27.2	31.1	31.4	30.4	31.7	33.0	33.9	33.8	34.7	36.8	37.6	35.1	34.1	31.9	29.6	26.8
-30.1	-29.2	-22.9	-17.9	-10.7	-0.4	5.3	10.3	17.7	18.6	20.7	25.8	25.5	28.4	28.6	28.5	31.3	31.6	31.0	31.6	33.4	35.9	37.2	35.4	35.5	36.0	33.1	31.7
-30.1	-29.2	-25.7	-17.0	-9.4	-1.1	4.8	10.0	15.4	19.5	22.5	24.7	26.8	28.8	29.5	30.5	33.9	33.4	32.6	33.9	35.1	37.3	38.4	37.0	36.3	34.3	32.0	28.1
-30.1	-29.2	-25.9	-16.7	-10.3	-0.8	4.9	12.6	15.8	18.7	22.4	25.4	25.2	29.3	28.8	29.9	31.8	32.5	32.5	33.3	36.0	38.0	38.8	36.5	35.7	32.9	29.3	25.5
-30.1	-29.2	-24.5	-17.7	-8.6	1.4	6.9	13.0	17.1	18.2	22.8	26.5	27.0	28.9	29.7	30.3	31.6	31.3	31.5	32.5	35.2	36.6	38.6	39.4	39.7	37.8	32.4	29.4
-30.1	-29.2	-23.8	-18.1	-10.1	-2.7	4.7	10.2	15.1	17.2	21.1	24.3	23.6	27.3	29.0	27.8	29.8	30.9	30.8	31.1	33.0	34.2	35.6	35.5	35.2	34.0	30.5	27.1
-30.1	-29.2	-23.3	-17.1	-10.5	-2.3	5.2	9.9	14.0	17.3	20.6	23.2	25.2	27.3	26.7	27.8	29.1	30.4	30.2	30.6	33.0	35.0	35.9	34.2	33.4	31.3	27.7	25.5
-30.1	-29.2	-24.6	-17.1	-9.5	-2.0	4.0	8.2	14.5	18.3	21.7	25.6	24.7	28.2	27.5	26.0	28.1	29.7	30.7	31.1	31.7	33.7	34.2	32.7	31.3	29.4	27.7	25.8
-30.1	-29.2	-22.2	-16.5	-9.9	0.0	6.3	10.8	17.8	21.9	25.5	28.6	27.6	30.1	32.1	34.1	37.0	36.4	37.5	38.8	40.6	42.7	44.0	43.4	43.6	39.9	36.8	33.7
-30.1	-29.2	-25.3	-16.7	-11.4	-1.1	4.8	6.0	15.1	19.3	22.1	26.7	26.8	27.9	29.2	28.9	29.8	30.7	31.6	32.3	33.6	36.0	36.7	35.9	34.4	32.2	28.0	24.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

4000	5000	6300	8000	10000	12500	16000	20000	LAS2.00	LAS8.00	LAS25.00	LAS50.00	LAS90.00	LAS95.00	Ovrld.	OBA Ovrld.	Marker
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	No	No	
26.9	24.2	29.6	21.0	10.9	6.0	3.1	0.2	72.2	70.0	64.6	59.7	53.5	52.5	No	No	
26.7	23.8	18.0	14.3	9.6	6.0	3.2	-0.2	75.5	69.9	61.7	51.9	47.3	46.9	No	No	
26.2	22.6	16.7	11.7	7.0	4.5	2.6	-0.4	66.6	61.4	56.8	54.0	49.7	49.3	No	No	
25.7	20.6	15.3	10.4	6.6	4.3	2.6	-0.4	72.3	71.0	59.8	55.3	50.0	48.4	No	No	
28.9	24.8	20.6	15.6	10.2	6.2	3.2	-0.1	62.9	61.3	59.9	58.0	52.0	51.2	No	No	
31.2	28.1	23.4	19.3	14.1	9.1	4.5	0.2	72.9	71.0	61.4	59.1	56.1	54.4	No	No	
23.9	24.3	23.4	13.1	7.1	4.4	2.5	-0.3	62.1	60.7	56.9	54.7	49.9	48.3	No	No	
25.1	24.9	23.1	14.4	9.1	4.9	2.6	-0.3	62.9	61.0	57.7	51.7	47.1	46.6	No	No	
26.8	24.0	20.7	19.4	9.7	5.7	2.9	-0.3	61.1	58.6	55.9	53.0	49.2	48.5	No	No	
22.3	19.1	16.8	14.6	6.3	4.3	2.9	-0.5	62.7	59.0	52.9	49.0	46.8	46.4	No	No	
22.9	18.4	14.5	11.1	6.1	4.2	3.1	-0.4	60.3	58.9	55.9	53.7	49.9	48.3	No	No	
24.9	20.5	15.2	11.5	5.8	3.9	3.3	-0.4	75.1	66.0	59.7	55.4	48.7	47.3	No	No	
28.0	25.9	23.7	15.9	9.2	5.1	3.5	-0.2	60.1	58.7	56.7	54.7	48.3	46.6	No	No	
24.5	21.5	17.5	13.2	7.3	4.3	2.3	-0.3	57.9	57.0	55.6	54.1	49.2	48.5	No	No	
22.0	17.3	13.5	11.2	5.8	3.9	2.8	-0.4	61.8	60.2	57.9	55.5	47.9	47.5	No	No	
27.2	23.0	17.9	12.5	7.0	4.5	2.7	-0.4	62.6	59.6	58.0	55.9	51.1	49.6	No	No	
23.3	18.8	15.2	11.9	6.7	4.6	2.8	-0.4	60.2	58.6	55.2	52.5	46.9	46.3	No	No	
22.0	17.4	13.6	9.4	5.8	4.1	2.9	-0.4	56.8	56.1	50.4	47.0	45.3	45.2	No	No	
24.9	17.9	12.3	8.8	5.6	4.1	2.9	-0.4	61.6	60.1	54.4	49.0	45.0	44.0	No	No	
31.1	28.3	25.4	20.5	15.7	11.2	5.7	0.7	61.8	61.0	59.3	57.7	54.9	53.9	No	No	
21.4	18.2	14.3	11.1	7.7	5.7	3.0	-0.3	57.3	56.7	51.8	48.4	45.9	45.8	No	No	
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	No	No	

ST-02 Chart

Record #	Date	Time	LAeq	LASma	LASmin
1	2021/02/03	14:55:21	64.0	72.5	52.1
2		14:56:00	64.3	76	46.5
3		14:57:00	59.1	70.8	48.9
4		14:58:00	62.6	72.7	48
5		14:59:00	58.4	63.8	50.6
6		15:00:00	64.3	73.6	51.6
7		15:01:00	56.2	62.3	47.7
8		15:02:00	56.0	63.4	46
9		15:03:00	54.9	61.7	48.1
10		15:04:00	54.0	63.2	45.8
11		15:05:00	55.0	60.6	47.2
12		15:06:00	63.2	76.9	46.9
13		15:07:00	55.1	60.5	46.3
14		15:08:00	54.3	58.3	47
15		15:09:00	56.4	62.9	46.8
16		15:10:00	56.9	64.2	48
17		15:11:00	54.0	60.3	45.5
18		15:12:00	50.3	57.4	44.5
19		15:13:00	54.6	61.8	43.4
20		15:14:00	58.1	62.3	52.9
21		15:15:00	51.3	57.7	45.5



Summary				
Filename	831_Data.003			
Serial Number	3940			
Model	Model 831			
Firmware Version	2.314			
User	Issa			
Location	Grant Ave Project			
Job Description	Ambient Air Noise Survey			
Note				
Measurement Description	GRAANT-AVE			
Start	2021/02/03 15:16:18			
Stop	2021/02/03 15:36:19			
Duration	0:20:00.7			
Run Time	0:20:00.7			
Pause	0:00:00.0			
Pre Calibration	2021/02/03 14:24:11			
Post Calibration	None			
Calibration Deviation	---			
Overall Settings				
RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRM831			
Microphone Correction	Off			
Integration Method	Linear			
OBA Range	Low			
OBA Bandwidth	1/1 and 1/3			
OBA Freq. Weighting	A Weighting			
OBA Max Spectrum	Bin Max			
Gain	0.0	dB		
Overload	143.9	dB		
	A		**C**	**Z**
Under Range Peak	**76.5**		73.5	78.5 dB
Under Range Limit	**26.4**		26.8	32.5 dB
Noise Floor	17.3		17.6	23.0 dB
Results				
LAeq	58.8	dB		
LAE	89.6	dB		
EA	100.958	µPa²h		
LApeak (max)	2021/02/03 15:25:47		87.8 dB	
LASmax	2021/02/03 15:33:11		71.3 dB	
LASmin	2021/02/03 15:28:07		43.3 dB	
SEA	-99.9	dB		

LAS > 60.0 dB (Exceedence Counts / Duration)	36	312.6 s
LAS > 70.0 dB (Exceedence Counts / Duration)	2	4.0 s
LApeak > 90.0 dB (Exceedence Counts / Duration)	0	0.0 s
LApeak > 100.0 dB (Exceedence Counts / Duration)	0	0.0 s
LApeak > 120.0 dB (Exceedence Counts / Duration)	0	0.0 s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**	**LNight 22:00-07:00**
	58.8	58.8	-99.9	58.8	58.8	-99.9	-99.9

LCeq	68.6 dB
LAeq	58.8 dB
LCeq - LAeq	9.8 dB
LAIeq	60.2 dB
LAeq	58.8 dB
LAIeq - LAeq	1.4 dB
# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics	
LAS2.00	66.5 dB
LAS8.00	64.1 dB
LAS25.00	59.1 dB
LAS50.00	54.1 dB
LAS90.00	48.7 dB
LAS95.00	47.4 dB

Record #	Record Type	Date	Time	LAeq	LAS
1	Run	2021/02/03	15:16:18	0.0	0.0
2		2021/02/03	15:16:18	58.2	51.7
3		2021/02/03	15:17:00	58.9	46.5
4		2021/02/03	15:18:00	57.2	57.7
5		2021/02/03	15:19:00	59.5	58.1
6		2021/02/03	15:20:00	61.5	59.4
7		2021/02/03	15:21:00	55.0	46.3
8		2021/02/03	15:22:00	49.6	57.3
9		2021/02/03	15:23:00	60.8	53.5
10		2021/02/03	15:24:00	58.8	59.4
11		2021/02/03	15:25:00	60.1	52.1
12		2021/02/03	15:26:00	59.5	51.7
13		2021/02/03	15:27:00	57.5	49.0
14		2021/02/03	15:28:00	57.3	52.6
15		2021/02/03	15:29:00	57.3	54.2
16		2021/02/03	15:30:00	57.1	55.6
17		2021/02/03	15:31:00	60.6	54.8
18		2021/02/03	15:32:00	55.7	51.0
19		2021/02/03	15:33:00	61.6	59.8
20		2021/02/03	15:34:00	58.1	55.3
21		2021/02/03	15:35:00	58.7	59.9
22		2021/02/03	15:36:00	59.6	55.0
23	Stop	2021/02/03	15:36:19	0.0	0.0

ST-03 Interval

LASmax	LASmin	1/1 LAS 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000	1/1 LAeq 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65.1	51.5	-12.8	1.2	19.6	38.3	38.7	43.8	45.0	47.4	42.3	32.3	22.3	11.2	-12.9	5.0	30.9	41.1	43.4	47.7	49.7	54.7	51.9	42.9	33.4	19.7
67.1	46.4	-14.4	6.2	18.9	30.4	37.2	36.0	40.3	42.6	37.6	25.9	14.6	7.4	-14.2	5.0	23.8	37.4	45.3	46.6	51.8	55.4	52.1	42.3	30.5	15.3
66.5	46.3	-10.7	3.2	20.4	31.9	38.2	45.6	51.1	54.7	49.6	41.2	30.6	13.2	-12.8	6.3	28.9	33.2	39.5	44.1	48.3	54.7	50.2	40.6	32.3	16.6
70.3	50.5	-9.3	7.1	24.9	39.0	46.9	47.0	51.4	52.9	51.3	47.6	42.2	27.9	-9.1	9.5	23.5	37.7	47.4	47.6	49.5	54.9	51.8	42.9	37.5	52.8
67.0	49.2	-9.6	5.9	22.5	35.9	40.8	47.0	50.0	56.9	53.0	43.3	33.7	14.5	-6.0	9.0	25.6	36.5	45.7	49.0	52.6	58.3	55.7	46.3	34.7	18.4
63.1	46.3	-13.0	7.2	19.5	30.9	36.8	35.2	38.7	42.8	37.7	30.5	19.8	9.0	-3.7	11.2	23.2	32.4	38.9	42.0	45.9	52.0	49.0	39.3	28.5	13.2
57.3	45.9	-10.4	3.9	21.6	33.5	39.7	41.8	46.1	53.4	53.2	43.3	30.0	8.5	-12.3	4.0	19.0	30.5	36.6	37.4	40.7	46.3	43.0	34.1	21.6	7.7
65.5	50.3	-19.2	1.9	20.9	33.2	39.5	43.2	45.3	50.7	45.8	36.2	23.5	9.0	-15.2	5.5	28.7	36.1	44.2	47.7	52.8	57.7	54.3	44.8	34.2	19.4
66.2	48.2	5.8	18.0	30.2	34.4	44.4	49.2	50.4	55.9	53.1	45.0	33.4	19.6	-1.2	14.0	30.7	34.1	42.0	45.8	49.1	55.9	52.9	44.2	32.8	20.8
66.4	52.0	-5.0	4.2	24.0	30.6	36.8	38.8	42.8	49.3	46.1	33.4	22.5	8.9	-0.4	14.3	32.0	35.5	40.7	47.1	51.3	57.2	53.8	44.5	33.0	18.1
67.3	49.2	-9.5	1.5	18.9	31.6	37.7	40.0	43.6	48.4	45.0	34.1	20.1	8.3	-9.0	6.8	23.2	33.5	42.7	46.0	50.8	56.6	53.3	43.2	32.0	17.3
69.6	44.8	-21.8	1.8	18.1	29.1	35.6	35.3	37.5	46.8	42.3	30.0	23.0	7.6	-11.6	4.3	19.2	32.3	37.3	42.8	48.5	54.6	51.5	41.2	29.8	12.7
65.3	43.3	-15.0	4.0	22.2	32.0	43.8	39.7	43.5	48.4	45.4	33.0	21.3	8.0	-17.0	6.4	26.5	34.7	40.2	44.9	48.2	54.1	51.6	42.1	31.0	16.3
63.7	48.2	-17.0	5.0	21.1	32.0	46.3	46.6	45.4	48.3	46.0	40.4	30.0	15.2	-14.5	8.5	27.6	33.6	40.4	44.6	48.1	54.0	51.3	41.8	30.8	43.0
64.7	49.6	-19.4	3.8	26.9	33.6	47.4	45.9	46.7	50.6	49.2	40.1	26.6	7.9	-16.9	4.8	27.9	38.2	45.0	45.2	49.0	53.8	50.2	41.3	30.0	13.0
68.5	50.3	-19.4	3.6	20.7	31.1	40.6	43.7	46.8	51.8	47.9	38.1	28.9	14.9	-18.9	4.7	28.7	33.7	54.9	51.4	50.4	55.6	52.6	42.9	31.8	16.7
65.5	48.3	-15.5	4.3	22.0	39.1	43.2	41.1	42.3	46.6	43.1	33.8	22.9	11.5	-13.5	4.9	25.8	33.7	42.1	43.6	46.2	52.1	50.2	40.9	28.0	12.7
71.3	50.9	-14.7	3.5	19.8	36.2	44.1	42.0	54.0	56.2	52.6	38.8	19.0	8.1	0.0	12.5	32.8	48.5	54.1	54.4	53.8	55.1	53.0	45.6	38.0	26.5
67.0	49.7	-15.3	4.2	21.8	36.9	44.8	44.7	46.3	51.3	48.8	41.2	29.6	11.6	-11.1	8.0	29.2	37.5	45.9	46.2	48.7	54.6	51.9	44.5	37.3	24.9
64.9	49.8	-9.1	10.6	32.2	40.4	45.9	48.2	51.5	56.3	52.8	47.7	40.5	28.5	-10.8	8.3	29.0	37.0	45.3	48.3	49.6	54.7	52.8	45.6	37.1	22.9
65.7	52.6	3.7	12.4	26.7	36.5	42.6	45.7	47.6	50.4	47.6	43.0	35.4	22.9	-0.9	15.5	29.6	39.5	42.5	47.0	50.8	56.5	53.3	45.5	37.1	24.4
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1/1 LASmax 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000	1/1 LASmin 8.0	16.0	31.5	63.0	125	250	500	1000	2000	4000	8000	16000
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-6.3	8.6	43.5	49.5	50.3	53.3	55.4	62.0	59.2	50.9	42.5	29.9	-20.0	0.8	18.4	32.2	37.4	41.1	44.6	47.1	42.0	31.7	21.5	8.8
-9.0	11.7	33.4	43.0	54.8	54.7	62.3	65.1	60.6	51.3	39.8	25.8	-18.8	0.8	15.5	30.2	35.8	35.5	39.6	42.1	37.5	25.6	14.5	7.3
-3.1	17.9	39.4	39.5	45.2	51.8	57.4	64.4	59.3	49.8	44.8	29.3	-20.6	1.0	17.2	28.9	35.1	35.6	39.3	42.4	37.6	25.7	14.5	7.3
-1.0	21.2	29.0	48.8	57.4	56.7	58.4	63.2	59.2	50.4	50.5	68.2	-19.4	1.0	18.1	30.7	37.6	37.9	40.6	46.1	41.3	28.7	16.2	7.5
2.6	15.6	34.3	44.3	54.2	54.7	58.6	63.8	61.8	52.6	42.1	29.8	-18.4	3.0	17.4	30.2	37.3	37.6	40.1	45.5	42.0	33.3	21.0	8.2
5.8	18.7	27.3	38.0	45.9	49.6	53.9	59.8	58.7	47.4	39.8	25.2	-14.1	2.5	19.0	28.8	35.0	34.5	38.5	42.7	37.6	30.3	19.2	8.1
-2.4	10.4	21.7	34.3	41.6	42.5	46.3	53.6	53.2	45.3	32.0	9.0	-23.6	0.3	15.9	27.7	34.5	34.4	38.0	42.2	37.3	28.0	15.7	7.4
-8.4	11.3	39.9	43.7	52.5	52.9	60.1	62.9	58.9	49.7	39.7	27.6	-21.7	0.8	19.6	30.4	39.1	38.2	41.4	47.0	42.4	32.8	20.2	7.6
12.6	24.2	41.0	42.1	49.7	52.9	55.7	63.8	60.4	52.0	40.6	34.9	-22.4	1.3	18.5	27.7	35.6	37.0	40.5	44.9	39.9	31.6	20.0	8.0
10.0	20.9	42.3	41.2	48.7	53.1	58.2	63.0	61.2	51.3	39.8	25.1	-7.9	3.8	21.2	30.4	36.6	38.4	42.0	48.8	45.0	33.3	22.4	8.9
-0.1	14.2	26.7	39.5	51.1	51.8	58.1	64.8	62.0	51.3	40.3	27.5	-21.3	0.2	17.8	28.9	35.5	37.6	40.4	45.1	42.2	32.5	19.2	7.8
-3.0	8.1	24.7	39.0	41.8	53.9	60.9	67.0	63.9	53.9	43.2	25.0	-21.9	1.1	15.3	28.1	33.9	33.8	36.4	41.2	36.7	26.2	16.2	7.3
-9.2	11.5	37.1	41.0	46.6	54.2	56.7	62.3	60.0	51.5	40.5	27.4	-23.0	-0.6	16.0	26.9	33.2	32.7	35.7	39.0	34.8	25.4	16.5	7.4
-4.4	16.9	36.9	41.7	47.7	51.2	55.4	61.1	58.1	49.3	37.9	58.2	-22.4	1.0	17.4	29.4	35.1	35.8	39.1	44.3	41.0	31.1	16.8	7.3
-11.1	9.4	39.0	47.0	50.7	50.4	57.2	62.2	57.9	48.5	36.9	21.2	-22.7	0.9	18.1	29.4	36.4	37.4	40.8	46.5	41.6	31.7	19.0	7.3
-14.0	12.8	37.8	39.0	65.6	60.1	57.8	62.3	60.0	50.7	37.8	24.3	-24.3	0.4	17.3	28.0	38.2	38.4	40.1	45.8	41.5	29.4	17.4	7.3
-4.0	10.5	37.0	39.9	49.4	50.6	54.9	62.2	61.1	52.3	39.4	23.3	-22.6	0.7	17.9	27.5	36.6	37.1	39.8	44.5	40.1	29.4	17.1	7.2
11.6	20.0	39.9	59.8	65.7	66.4	64.1	63.1	62.4	55.7	49.7	39.0	-21.6	2.0	19.6	34.6	41.1	39.5	41.3	46.0	42.8	32.3	18.6	7.8
-4.2	17.1	39.4	45.8	57.1	54.4	57.2	64.5	61.4	55.3	50.1	39.0	-22.4	1.4	18.6	29.5	36.3	37.9	42.0	46.0	42.2	33.1	17.7	7.7
-3.8	14.2	38.6	43.7	52.9	55.9	55.7	62.0	58.8	54.2	48.8	34.0	-20.7	1.5	17.5	30.1	37.5	37.5	41.2	46.3	42.2	35.2	25.9	10.5
3.7	23.2	33.0	44.2	46.7	51.2	56.6	63.4	59.5	49.2	40.5	28.8	-14.6	6.4	24.9	34.3	39.1	40.8	44.0	47.7	46.1	42.8	35.2	22.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ST-03 Interval

1/3 LAS	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-22.6	-19.3	-13.9	-8.3	-5.7	-0.7	11.9	15.6	16.3	20.7	22.3	38.2	29.1	33.3	35.6	33.1	39.4	41.0	39.4	39.4	41.7	42.5	43.8	41.4	39.9	37.0	33.4	29.8	27.2	23.3	19.8	17.2	13.3	9.1	5.3	1.0
	-30.1	-24.8	-14.9	-11.7	-4.9	5.1	5.4	11.9	17.4	20.1	23.9	29.2	29.4	34.2	32.1	32.2	31.2	30.6	33.3	36.7	35.9	37.7	38.3	36.9	35.4	32.3	28.0	23.8	20.1	15.7	12.2	9.0	6.2	4.2	2.6	0.0
	-28.8	-18.3	-16.5	-8.9	-3.2	2.1	10.7	12.4	19.2	21.5	26.2	29.2	30.8	33.6	35.4	37.2	40.3	43.0	45.9	46.4	46.9	49.9	51.4	48.3	47.2	44.2	40.9	39.0	35.7	32.3	28.8	24.6	18.2	11.7	5.5	0.6
	-18.7	-12.1	-10.1	-5.2	-0.7	5.1	12.4	16.5	24.4	23.7	37.7	33.0	44.7	42.0	37.7	40.2	42.1	44.0	45.8	47.4	46.6	47.2	48.0	49.2	47.6	46.6	45.0	43.9	42.0	42.4	40.6	35.2	32.4	25.7	22.5	13.6
	-19.4	-14.1	-11.5	-7.3	0.7	6.2	13.9	17.4	19.8	21.8	27.5	34.7	32.5	35.3	37.9	38.5	44.2	42.4	43.5	45.3	47.3	51.0	53.6	51.4	50.5	48.0	43.8	40.9	37.9	34.7	32.7	26.0	20.3	13.0	6.8	1.5
	-21.0	-15.3	-14.7	-6.6	0.5	5.7	9.7	14.8	17.1	20.2	26.0	28.5	28.7	32.8	33.1	30.7	30.5	29.3	30.9	33.8	35.6	37.5	39.0	37.0	35.1	32.3	29.7	27.5	24.9	23.9	18.0	13.7	9.8	6.3	3.9	0.7
	-28.2	-20.7	-9.3	-7.4	-4.0	1.4	8.8	12.4	20.6	22.5	27.6	32.1	34.9	35.5	34.3	35.6	37.9	37.9	38.4	40.0	43.1	47.5	49.1	49.1	50.4	48.2	45.0	41.1	37.8	33.7	29.2	22.1	12.8	5.9	3.1	0.1
	-28.5	-23.6	-21.9	-16.6	-6.7	1.9	8.8	13.9	20.2	26.9	28.9	29.4	31.4	36.9	34.8	36.6	40.5	37.8	38.5	40.2	42.4	45.8	46.8	45.2	42.9	40.6	37.4	34.0	30.5	27.1	21.8	17.2	11.4	6.5	3.4	0.2
	-5.3	0.9	3.0	14.6	14.4	16.7	21.2	22.7	29.3	25.5	30.5	32.1	37.7	42.3	38.8	41.0	47.2	42.7	42.6	45.5	47.2	49.7	52.5	51.0	49.9	48.5	45.6	43.0	39.2	35.4	31.4	27.7	22.6	17.3	14.4	6.4
	-12.1	-10.8	-5.1	-2.8	-2.3	3.2	8.7	15.1	23.3	27.3	24.3	24.9	30.5	33.6	31.9	34.2	34.3	34.3	34.5	36.6	40.8	43.6	45.1	44.5	44.4	40.7	35.0	30.6	28.6	25.1	20.8	16.2	10.5	6.3	3.7	0.2
	-19.1	-18.1	-9.0	-8.4	-4.9	0.3	9.6	11.8	17.5	21.0	23.9	30.3	30.1	32.4	34.4	34.7	35.9	35.4	36.3	38.3	40.8	43.3	44.2	43.6	42.1	40.5	37.0	32.2	28.0	23.6	18.2	13.8	9.3	5.4	3.4	0.1
	-30.1	-28.6	-21.8	-14.5	-6.7	0.9	4.6	12.9	16.2	19.3	26.3	25.5	26.1	32.9	30.8	29.3	31.1	31.2	30.6	32.0	34.9	36.5	38.1	45.9	40.4	35.7	29.3	27.1	24.9	21.9	19.6	20.2	6.6	4.2	3.0	0.0
	-30.1	-29.2	-18.1	-9.0	-2.6	2.0	11.2	15.6	21.5	23.6	25.0	30.8	34.9	37.8	41.1	35.1	34.2	34.9	35.2	38.5	41.1	42.0	44.3	44.5	42.9	40.7	35.3	31.1	27.2	22.1	18.2	17.9	8.3	4.9	3.2	0.0
	-30.1	-25.5	-15.0	-9.5	-5.7	5.5	9.7	11.1	20.8	21.1	25.2	27.9	33.9	35.3	44.9	42.1	40.6	39.7	39.9	39.9	41.7	44.9	43.7	41.4	42.0	41.0	40.7	37.6	35.3	31.6	28.5	23.6	18.5	13.6	8.5	2.6
	-30.1	-29.2	-20.9	-8.4	-4.1	3.6	9.8	13.2	26.8	27.2	27.8	31.0	33.6	46.2	36.8	42.4	41.4	38.5	39.1	41.0	44.0	44.8	46.5	45.5	46.1	44.0	42.0	37.8	35.0	29.9	25.2	20.1	10.5	5.1	2.7	-0.1
	-30.1	-29.2	-18.4	-13.0	-3.7	2.0	9.7	13.9	19.3	25.4	25.2	28.9	32.8	38.4	35.2	37.5	39.9	39.1	40.2	42.0	43.9	46.1	48.1	47.0	45.0	43.3	39.1	35.4	32.9	29.9	26.8	23.1	18.4	13.3	8.0	2.2
	-17.8	-17.9	-13.9	-11.1	-3.5	3.8	5.7	15.4	21.3	33.8	31.7	35.3	40.4	37.4	37.0	37.6	34.3	36.0	36.2	36.1	39.2	41.4	42.7	41.3	40.5	38.0	34.4	31.7	28.6	23.5	19.7	18.9	12.8	9.8	5.2	1.1
	-18.4	-14.2	-15.5	-8.3	-2.5	2.3	9.0	14.1	18.5	33.2	30.5	30.5	32.9	39.4	41.1	34.6	35.7	39.7	50.1	42.5	51.5	53.4	50.5	50.5	50.9	46.2	43.8	37.6	31.7	24.3	17.1	12.6	8.4	5.2	2.9	0.2
	-30.1	-25.8	-24.2	-11.0	-2.6	3.0	11.3	18.4	18.6	26.0	32.3	33.8	40.7	40.7	38.3	39.0	40.7	39.6	39.8	41.2	43.3	46.4	47.1	46.8	45.7	43.9	40.8	38.5	36.3	32.6	28.1	23.3	15.8	9.4	5.5	1.6
	-17.8	-16.1	-9.0	-5.2	3.1	9.0	21.3	29.8	28.7	29.7	36.4	37.8	42.5	39.6	41.0	42.8	43.7	44.5	44.9	46.2	47.9	51.6	52.1	51.3	50.2	47.2	46.1	45.1	42.4	40.0	37.5	35.9	32.1	27.2	20.9	14.1
	-14.0	-5.8	-2.9	6.1	6.1	9.7	21.8	15.6	23.0	25.4	24.5	36.4	38.3	37.6	36.2	37.7	38.9	43.6	43.3	41.9	43.5	46.0	45.9	45.3	44.8	42.7	39.5	40.6	38.2	34.6	32.1	31.2	27.2	21.7	15.4	9.1
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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1/3 LAeq 6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-23.4	-19.3	-14.1	-9.2	-3.6	4.1	11.4	20.1	30.4	32.8	31.3	40.0	40.2	36.6	38.3	39.6	44.8	43.0	43.6	44.4	46.3	48.7	50.5	50.3	49.0	47.0	43.7	40.4	37.2	34.5	31.3	28.1	22.9	18.0	13.3	5.8
-25.9	-20.7	-15.6	-9.2	-3.3	4.0	9.8	15.8	22.9	23.8	26.4	36.8	39.0	40.7	41.5	40.1	42.5	42.6	44.1	47.9	48.0	49.9	51.9	50.1	49.4	47.2	43.6	40.2	36.3	32.8	28.9	24.3	18.8	13.5	8.9	2.9
-24.9	-20.3	-14.3	-8.5	-1.0	5.2	11.1	23.4	27.4	26.0	26.4	30.8	31.4	35.8	35.8	38.4	39.0	40.2	42.3	42.8	44.8	49.1	51.5	49.0	47.4	45.5	41.7	38.3	34.9	31.6	29.3	28.1	23.0	15.1	9.0	2.7
-21.3	-16.8	-10.3	-2.7	2.4	8.2	13.3	16.9	21.9	25.3	31.3	36.2	44.6	42.6	39.2	42.4	43.5	42.8	43.8	43.9	46.2	49.5	50.8	49.8	48.8	47.4	43.5	40.4	37.1	35.0	33.5	32.1	32.5	25.1	47.9	51.2
-18.1	-12.5	-7.5	-1.6	2.5	7.4	13.7	21.9	22.7	26.5	31.5	34.5	38.3	39.9	43.2	42.4	44.7	45.1	46.7	47.4	49.2	52.9	54.2	53.6	52.9	50.8	47.6	44.2	40.4	36.9	33.3	28.0	22.3	16.8	11.7	5.0
-17.4	-10.4	-5.0	0.2	5.4	9.3	14.3	16.5	21.4	24.6	27.9	29.4	30.2	34.4	36.0	35.8	37.8	37.9	39.1	40.6	43.1	46.5	48.0	47.3	46.3	44.0	40.3	37.0	33.6	30.9	26.1	23.0	19.7	11.4	6.4	1.7
-24.9	-19.6	-13.5	-7.9	-3.2	2.6	8.5	12.7	17.3	19.8	25.5	28.3	29.4	33.1	32.2	32.6	32.5	32.8	32.9	35.2	38.1	41.0	42.1	41.5	40.4	38.1	34.2	30.6	29.1	27.8	20.8	12.6	7.3	4.5	3.0	0.0
-26.8	-23.0	-16.1	-11.1	-4.2	4.9	13.3	23.8	26.8	25.6	29.2	34.7	38.6	41.4	37.5	40.3	43.6	44.2	44.8	47.7	50.1	52.7	53.6	52.7	51.8	49.1	45.7	42.5	39.0	35.9	32.4	28.3	22.9	17.9	12.5	5.7
-15.7	-8.3	-3.3	4.1	7.6	12.2	16.7	26.4	28.6	25.2	28.8	31.8	37.4	38.0	36.1	39.7	41.8	41.4	41.6	44.0	46.2	49.9	52.1	51.3	50.0	47.9	44.8	42.2	38.1	34.9	30.9	26.7	22.3	18.1	16.5	3.7
-11.6	-5.8	-1.8	3.2	8.3	12.7	17.5	20.9	31.6	27.8	29.4	32.9	34.6	36.8	36.4	40.4	43.4	42.8	44.0	46.0	48.5	52.2	53.4	51.8	51.1	48.8	45.4	42.2	38.8	35.4	31.2	26.9	21.9	16.4	11.5	4.7
-21.8	-15.2	-10.3	-5.7	-0.3	5.4	13.4	16.3	21.6	26.4	27.0	31.0	35.1	38.2	39.5	41.1	41.3	41.2	43.6	45.1	48.2	52.0	51.9	51.7	51.3	47.4	44.0	41.0	37.5	33.9	30.2	26.0	20.6	15.7	10.9	4.2
-23.6	-18.3	-12.9	-8.8	-3.3	3.1	7.8	13.1	17.5	21.0	24.9	31.1	32.4	32.8	32.8	35.2	38.1	39.8	44.3	42.3	44.1	48.9	51.3	49.1	48.0	47.5	43.7	39.3	35.0	30.8	27.8	24.3	17.6	10.9	5.7	1.5
-29.4	-26.2	-17.9	-6.1	-0.1	4.8	10.7	19.7	25.3	24.7	28.7	32.8	33.9	36.4	35.5	38.0	40.8	41.3	40.7	42.9	45.5	48.0	49.7	50.1	48.8	46.7	43.4	40.1	36.2	32.2	28.4	25.4	23.1	14.6	9.5	3.4
-29.9	-24.5	-15.0	-8.0	-2.6	8.0	15.3	18.0	26.8	24.3	28.5	31.3	32.5	36.4	37.1	38.4	41.0	39.8	40.9	42.6	45.2	49.0	50.0	48.8	49.0	45.9	42.7	39.4	36.4	32.3	28.8	25.1	20.2	16.8	42.9	31.6
-29.9	-26.9	-17.6	-11.3	-3.5	3.9	11.8	24.2	25.2	27.7	34.5	35.1	37.4	43.0	37.6	40.0	40.4	40.7	42.2	43.4	46.1	48.9	49.7	48.4	47.8	44.7	42.1	38.9	35.9	31.8	28.3	24.0	17.0	11.4	6.0	1.0
-29.7	-27.9	-19.6	-10.9	-4.2	3.8	12.7	22.6	27.4	28.3	27.5	30.6	45.4	53.7	46.0	47.6	45.8	46.2	44.3	45.0	47.3	50.7	51.4	50.5	50.0	47.5	44.3	40.9	37.0	33.3	29.7	26.4	20.7	15.2	9.4	3.4
-25.2	-22.2	-14.5	-9.2	-3.6	3.9	13.4	21.4	23.7	26.5	28.1	31.0	33.9	39.8	36.1	37.7	38.3	40.3	40.7	41.0	42.4	46.0	48.6	47.0	46.9	45.9	42.6	39.1	34.6	30.6	26.1	22.4	16.3	11.0	6.1	1.3
-13.0	-8.1	-0.9	2.1	6.7	10.5	21.1	26.6	31.2	35.8	41.8	47.1	45.1	48.9	51.6	50.6	47.7	50.6	49.7	48.1	49.0	50.3	51.2	49.5	48.9	49.4	45.8	43.2	40.3	37.1	35.4	33.3	28.9	25.8	17.6	10.2
-23.9	-18.8	-12.2	-7.6	0.3	7.0	12.1	16.0	29.0	31.5	31.7	34.3	40.7	42.7	39.9	39.7	41.7	42.2	42.0	42.6	46.2	49.6	50.3	49.6	49.1	47.0	43.9	41.4	39.5	37.1	35.2	31.9	27.2	22.9	19.1	13.8
-22.5	-18.2	-12.1	-3.9	3.8	5.8	14.5	22.8	27.5	27.7	31.7	34.6	37.8	40.9	41.7	42.6	44.2	43.7	43.4	44.4	46.2	48.6	50.5	50.4	49.9	47.9	45.6	43.1	40.3	37.3	34.8	32.0	27.1	21.6	15.5	8.6
-16.2	-9.2	-3.1	3.0	7.6	14.4	23.0	25.6	26.1	28.1	33.6	37.8	38.2	37.8	37.0	40.5	42.2	43.5	43.5	44.8	48.3	52.1	52.0	51.4	51.1	47.7	44.4	43.0	40.2	36.9	34.1	32.5	28.5	23.1	16.9	10.5
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

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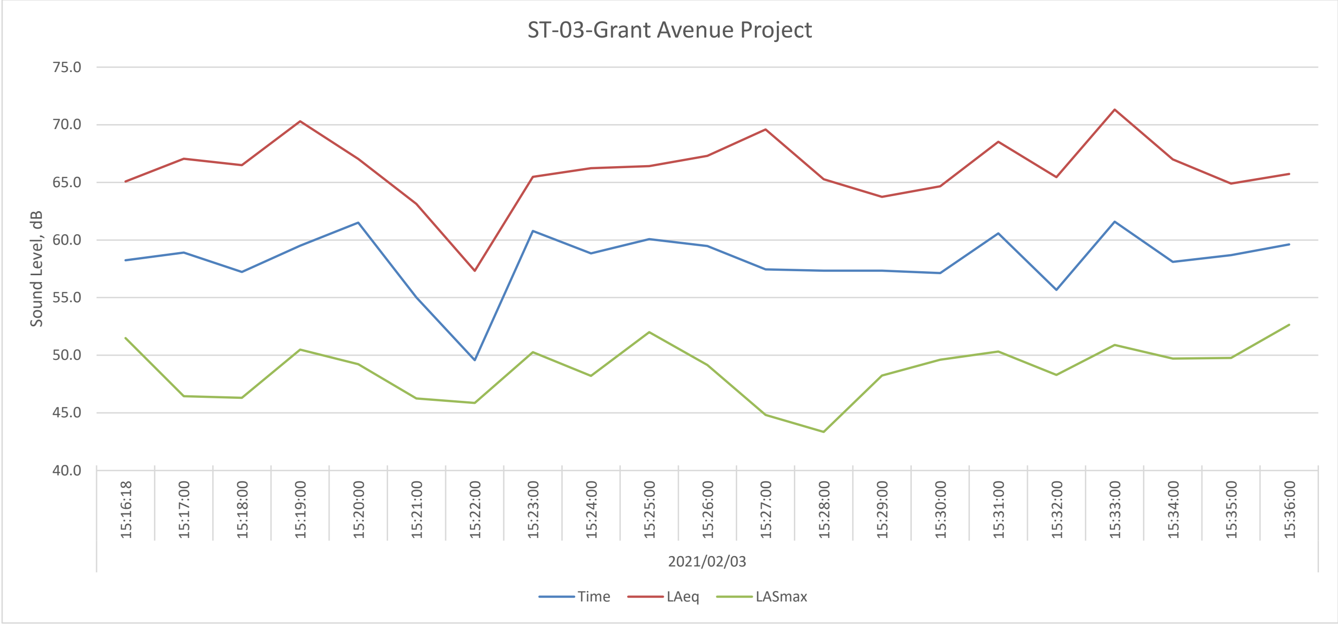
1/3 LASmax 6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500	16000	20000
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
-16.5	-11.9	-7.2	-4.3	2.3	8.2	17.2	30.5	43.4	45.4	38.1	46.5	48.4	43.6	45.0	46.9	50.6	47.9	48.9	51.0	52.2	55.8	58.1	58.3	56.7	54.7	51.5	48.3	45.3	43.2	39.9	37.9	32.7	28.0	24.0	15.8
-20.0	-13.3	-10.7	-3.7	1.8	11.1	17.6	26.2	33.2	30.6	32.9	42.8	53.3	52.8	53.1	51.1	50.1	52.8	53.0	59.7	57.5	60.1	62.1	58.3	57.9	55.6	52.6	49.5	45.2	41.9	38.0	33.8	28.4	24.0	19.9	12.3
-13.8	-11.0	-5.2	0.2	11.0	16.6	18.5	36.8	36.9	36.9	32.5	36.4	36.8	43.1	41.4	47.6	47.0	49.2	51.3	51.4	53.8	59.3	61.5	58.2	56.5	54.6	51.3	47.7	44.0	41.6	40.5	41.5	37.0	27.9	20.9	12.5
-12.1	-9.5	-1.6	8.2	12.7	20.0	23.9	26.2	27.7	32.0	42.0	48.5	57.2	51.3	44.5	53.8	54.5	52.6	53.6	51.4	55.1	58.9	59.3	57.3	56.4	55.2	50.7	47.4	44.9	44.7	43.7	45.9	47.7	40.3	63.4	66.6
-9.8	-2.5	0.6	7.1	11.3	13.0	22.4	31.7	32.6	34.1	39.3	43.1	48.1	47.4	53.9	50.4	51.0	52.8	54.5	53.5	55.7	59.4	59.9	60.1	58.8	57.2	54.0	50.7	46.6	42.7	40.5	35.5	32.3	27.8	24.2	16.8
-10.0	-2.5	4.7	10.1	13.5	17.1	20.0	21.7	26.9	33.2	36.3	34.9	33.8	38.2	45.3	43.0	46.4	44.5	47.5	48.9	51.0	53.6	56.0	56.1	56.1	54.1	49.5	46.4	40.7	38.0	35.5	35.8	33.5	23.7	17.3	10.4
-15.2	-7.3	-3.3	1.8	4.6	8.0	12.6	17.0	20.7	23.4	32.3	32.3	37.4	36.9	40.8	35.7	38.4	39.9	39.2	41.1	43.7	47.5	49.3	49.2	50.5	48.2	45.2	42.6	40.5	36.8	31.6	22.1	12.8	6.2	3.9	0.6
-21.6	-16.5	-9.3	-6.2	1.2	11.0	20.9	33.6	39.6	30.8	36.8	43.8	47.6	51.7	42.5	46.0	49.8	50.3	51.0	54.8	57.9	58.8	59.1	57.8	56.6	54.0	50.8	47.6	44.4	40.8	37.7	34.1	29.5	26.3	20.7	13.8
-1.2	6.0	10.6	15.8	19.9	23.1	26.8	40.1	40.6	32.8	36.0	42.3	47.8	46.9	41.3	46.1	49.5	49.7	48.3	51.6	52.9	57.1	60.3	59.6	57.2	56.0	52.7	50.6	44.9	42.0	38.6	35.0	34.3	31.8	32.8	11.6
-2.0	4.4	8.0	14.4	15.9	19.5	24.3	26.4	42.5	35.8	35.9	39.5	45.8	44.2	41.6	48.1	50.1	49.0	51.1	53.3	54.8	59.4	59.4	58.1	58.1	56.9	52.8	49.1	45.8	41.7	37.7	33.9	29.4	23.4	18.7	11.5
-12.2	-5.3	-1.4	2.3	7.9	12.7	22.5	20.7	25.8	35.3	31.7	36.4	42.4	46.2	50.7	48.6	47.7	47.1	50.8	53.0	56.0	61.1	60.4	60.6	60.3	55.4	52.4	49.1	45.8	42.2	38.5	35.0	29.9	26.1	21.2	13.2
-15.7	-11.5	-3.6	-1.6	3.6	6.7	12.4	16.6	24.0	26.2	32.3	38.7	39.6	36.8	37.9	45.2	49.1	51.9	57.6	54.9	56.5	61.3	64.1	61.0	59.6	60.5	56.6	52.4	47.4	42.9	41.4	38.0	31.1	23.9	16.3	11.4
-26.2	-20.5	-9.6	3.4	8.8	10.1	15.8	32.0	37.0	31.9	37.2	39.7	39.7	45.2	42.6	48.1	50.6	50.4	49.0	51.1	54.7	57.0	58.9	58.3	56.9	55.6	52.2	49.4	45.9	41.8	37.8	35.9	35.2	26.1	20.1	13.1
-29.5	-17.4	-4.9	-1.4	2.7	16.7	24.4	23.7	36.8	29.6	39.6	40.5	39.0	44.7	45.9	46.2	48.2	47.3	48.5	49.6	52.8	57.6	57.0	56.0	55.5	53.2	49.7	46.9	44.3	39.5	35.6	32.6	30.7	28.9	58.1	47.2
-28.3	-22.7	-11.4	-6.7	2.2	9.1	22.0	37.3	37.0	38.7	43.7	45.0	42.3	50.2	46.3	47.9	45.9	47.2	50.4	51.4	55.0	58.5	57.7	56.1	56.0	51.9	50.3	46.7	42.9	39.0	35.1	30.7	25.0	19.9	13.5	7.0
-28.9	-25.6	-14.6	-5.3	0.3	12.6	23.5	32.6	37.6	36.8	33.9	35.4	60.0	64.7	58.5	57.0	54.8	54.9	52.8	52.4	54.1	57.4	58.5	57.2	56.9	55.4	52.7	49.3	44.2	39.6	36.2	32.3	28.4	22.8	17.5	10.1
-16.7	-13.1	-5.1	0.0	2.9	9.7	26.6	35.5	34.4	34.9	36.6	37.2	40.7	48.9	43.6	44.5	46.7	47.4	48.2	50.8	51.3	56.0	59.0	56.9	57.5	57.1	54.1	50.6	45.7	42.3	37.8	32.9	28.1	22.0	15.7	8.2
-1.1	2.8	11.5	11.2	16.9	18.4	28.9	35.0	39.3	43.5	51.8	59.7	55.7	61.4	63.5	61.8	58.9	63.7	62.0	57.7	57.1	58.4	59.5	56.9	56.0	60.6	55.5	53.4	50.3	47.5	46.7	45.4	41.1	38.5	28.7	20.2
-14.9	-9.6	-4.3	-2.1	8.4	17.2	19.6	20.2	39.4	40.9	40.6	44.9	52.8	54.5	48.9	47.3	50.1	50.7	49.9	51.1	55.0	59.2	60.5	59.4	59.2	56.1	52.9	51.4	50.9	49.0	47.6	45.0	40.7	36.9	33.3	28.1
-12.0	-9.2	-4.4	6.5	12.6	12.7	22.6	32.0	37.8	35.0	41.8	41.6	43.3	48.6	50.3	49.8	52.2	51.4	50.9	51.0	51.6	55.0	58.5	58.3	55.7	54.2	51.9	51.2	49.0	47.2	46.5	44.1	37.8	32.6	26.9	20.9
-8.2	-3.8	2.9	9.6	13.5	22.9	26.2	31.5	29.8	31.5	41.4	41.9	43.5	40.5	41.4	45.3	46.6	47.0	47.6	50.5	54.6	59.3	58.4	58.3	57.8	53.2	50.2	46.9	43.7	40.6	37.6	35.8	32.3	27.6	20.9	14.3
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1/3 LASmin	6.3	8.0	10.0	12.5	16.0	20.0	25.0	31.5	40.0	50.0	63.0	80.0	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	-30.1	-29.2	-21.6	-15.8	-9.3	-1.0	6.0	10.8	15.2	17.6	21.4	31.7	27.9	31.5	34.2	31.3	36.7	36.5	37.6	37.7	41.3	42.1	42.1	41.3	39.8	36.5	32.1	29.3
	-30.1	-28.4	-21.0	-14.8	-9.4	-1.1	3.6	8.3	12.9	17.8	22.0	27.7	26.1	31.3	30.5	30.8	30.0	29.1	32.8	34.6	35.4	37.2	38.0	36.3	35.2	32.0	27.2	23.3
	-30.1	-29.2	-23.5	-15.4	-8.6	-1.6	4.8	9.6	14.9	16.9	22.6	25.1	25.0	32.2	30.8	31.0	29.5	30.1	32.2	34.3	35.7	37.3	38.1	36.6	35.3	32.1	27.6	23.4
	-30.1	-28.0	-20.4	-13.6	-7.2	-0.9	5.7	11.1	15.7	17.7	24.3	26.8	29.1	33.0	32.3	33.1	33.3	32.2	34.4	34.6	37.5	40.5	41.1	41.1	38.8	35.4	30.7	26.6
	-30.1	-26.8	-20.0	-13.4	-5.1	1.6	7.1	9.5	14.8	20.2	23.1	27.3	29.9	34.3	31.6	32.7	32.5	32.4	32.9	34.5	37.3	39.2	41.1	40.9	39.0	37.2	33.2	30.0
	-28.0	-21.3	-15.7	-9.9	-3.6	0.1	7.1	11.1	16.9	18.5	21.0	25.2	25.7	31.4	29.2	29.5	29.3	28.9	30.7	33.2	35.5	37.5	38.9	36.9	35.0	32.2	29.6	26.7
	-30.1	-29.2	-25.6	-16.7	-9.8	-1.3	4.8	8.5	13.4	16.6	20.7	25.7	25.1	31.0	28.9	29.1	29.7	29.2	30.1	32.6	34.9	37.3	38.0	36.5	34.6	32.0	28.2	24.6
	-30.1	-29.2	-22.4	-17.8	-8.2	-0.6	6.2	12.5	16.8	20.9	23.6	28.1	30.4	34.5	31.2	33.0	33.7	33.3	33.8	35.8	38.7	41.1	42.9	41.7	40.1	36.9	33.5	30.1
	-30.1	-29.2	-24.1	-17.6	-9.1	0.2	6.2	10.0	16.5	19.0	20.8	25.0	27.0	31.9	31.1	32.1	32.6	31.7	32.3	34.6	37.7	39.3	40.3	39.3	37.1	34.6	31.1	28.0
	-23.2	-18.5	-9.8	-5.9	-2.5	3.1	8.3	12.4	18.3	21.1	23.2	24.9	29.0	32.4	31.4	32.6	33.7	33.8	34.2	36.3	39.4	43.5	45.0	43.7	42.3	39.9	35.0	30.5
	-30.1	-29.2	-22.6	-14.8	-9.5	-1.3	6.1	10.4	15.1	20.2	22.2	25.0	29.1	31.0	30.3	32.3	33.1	32.2	33.1	35.1	37.1	40.3	40.8	39.9	39.3	37.5	32.8	29.6
	-30.1	-29.2	-22.5	-16.1	-9.4	-0.6	3.6	7.3	13.7	17.4	18.7	25.0	25.3	30.2	28.9	28.4	29.3	28.8	29.9	30.8	33.1	35.8	37.3	36.1	34.6	31.0	27.2	23.5
	-30.1	-29.2	-25.1	-18.2	-10.5	-2.0	2.9	9.2	13.5	16.8	19.4	24.7	24.7	28.9	28.5	27.4	28.4	27.6	28.7	30.7	32.2	34.1	35.1	33.6	32.4	29.5	26.0	22.5
	-30.1	-29.2	-23.3	-15.0	-8.8	-0.9	6.1	10.1	15.3	18.9	21.7	25.6	27.4	31.6	30.1	30.2	32.3	30.6	31.5	33.8	35.8	38.5	40.0	39.4	37.7	36.3	32.7	29.0
	-30.1	-29.2	-24.0	-16.4	-11.2	-0.7	6.0	9.6	16.6	18.0	21.6	26.5	28.3	32.6	30.4	31.5	32.8	32.3	33.5	35.1	37.7	41.2	42.6	40.6	38.9	36.4	32.8	29.6
	-30.1	-29.2	-26.6	-18.2	-9.2	-1.4	4.8	11.0	14.4	19.5	22.1	23.4	27.9	33.7	33.2	33.8	33.5	32.5	33.4	34.4	37.2	41.1	41.6	40.3	39.1	36.1	31.8	27.6
	-30.1	-29.2	-23.8	-16.9	-9.4	-0.7	4.5	9.0	15.9	19.1	20.5	24.8	27.8	33.2	30.8	31.4	31.7	33.2	33.1	34.3	36.6	39.0	40.0	38.6	37.4	34.9	31.1	27.2
	-30.1	-29.1	-22.8	-16.9	-8.2	0.7	5.2	12.5	18.1	23.1	27.7	29.8	32.6	36.6	35.8	33.7	33.6	34.7	35.0	35.7	37.4	40.6	41.6	40.9	39.4	37.5	33.8	30.4
	-30.1	-29.2	-24.6	-13.8	-10.8	-0.8	4.8	11.2	16.4	19.2	23.2	25.1	29.1	33.7	30.2	31.2	33.2	33.7	34.2	36.0	39.2	40.7	41.3	41.0	39.3	36.7	34.3	31.3
	-30.1	-29.2	-23.6	-14.8	-6.1	-1.6	5.5	11.5	15.5	20.6	24.9	26.3	30.2	33.2	31.3	33.1	32.5	32.8	34.2	35.4	37.9	40.6	41.9	41.0	39.8	36.7	33.8	32.0
	-29.0	-20.7	-16.5	-7.5	-3.9	5.3	15.7	14.9	22.3	24.8	24.4	31.4	33.0	35.2	31.7	34.6	36.8	36.2	37.0	38.5	40.6	42.3	43.4	43.2	42.7	41.3	38.7	40.3
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

4000	5000	6300	8000	10000	12500	16000	20000	LAS2.00	LAS8.00	LAS25.00	LAS50.00	LAS90.00	LAS95.00	Ovrld.	OBA Ovrld.	Marker
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	No	No	
26.1	23.0	19.7	15.0	10.2	6.4	3.2	0.1	64.9	64.2	57.7	56.4	52.1	51.8	No	No	
19.7	15.6	12.1	8.8	6.1	4.0	2.4	-0.1	66.5	65.6	58.4	52.7	47.0	46.7	No	No	
20.1	15.8	12.1	8.7	5.9	3.9	2.5	-0.1	65.6	62.5	56.9	52.6	47.3	47.1	No	No	
23.1	18.2	14.2	9.5	6.5	4.3	2.6	0.0	68.6	65.1	58.3	54.8	51.7	51.3	No	No	
27.8	24.8	19.7	12.7	8.0	5.0	3.2	0.1	66.7	66.1	63.9	58.5	50.8	50.0	No	No	
24.6	23.4	17.8	11.6	7.8	5.1	3.2	0.0	62.5	58.1	56.5	53.1	48.8	47.3	No	No	
22.5	20.0	14.0	8.4	5.6	4.0	2.8	-0.2	56.4	50.0	48.9	48.5	47.0	46.4	No	No	
27.2	24.2	18.6	13.4	7.7	4.4	2.8	-0.2	65.3	64.8	62.7	59.7	52.0	51.3	No	No	
26.6	24.4	18.4	13.3	8.6	5.0	2.9	-0.1	66.0	63.7	60.0	54.9	49.5	49.0	No	No	
28.5	25.0	20.7	16.1	10.4	6.3	3.6	0.2	65.7	64.2	61.4	58.2	53.7	53.0	No	No	
26.7	23.0	17.2	12.2	7.5	4.7	3.0	-0.1	67.1	65.1	59.8	53.4	50.5	49.9	No	No	
21.6	16.4	13.2	10.4	5.3	3.9	2.9	-0.2	68.9	61.8	52.4	50.2	47.0	45.4	No	No	
20.4	16.0	12.8	11.3	5.7	4.1	2.9	-0.1	65.0	63.2	58.1	51.2	43.9	43.6	No	No	
25.4	20.5	15.2	10.2	5.8	4.0	2.6	-0.2	63.5	62.9	58.8	52.4	48.8	48.6	No	No	
25.7	20.9	16.4	14.1	6.3	4.1	2.6	-0.1	63.9	62.4	56.6	54.6	51.1	50.5	No	No	
23.4	18.2	13.9	12.9	5.6	3.9	2.5	-0.1	68.0	66.1	60.8	57.6	51.3	50.8	No	No	
23.9	20.0	15.0	11.3	5.6	3.9	2.5	-0.1	64.6	59.7	54.7	52.3	49.0	48.5	No	No	
26.1	21.6	16.7	11.9	7.3	4.8	2.7	0.0	70.6	66.6	61.5	55.7	51.9	51.4	No	No	
26.5	21.5	15.9	11.2	7.0	4.7	2.8	0.0	66.7	65.2	56.1	52.9	50.9	50.5	No	No	
30.1	27.6	24.2	19.7	14.1	8.5	4.0	0.2	64.4	63.4	60.4	55.6	51.2	50.6	No	No	
37.9	34.2	31.7	31.1	27.0	21.2	15.4	8.7	65.5	64.8	61.1	55.3	53.1	52.8	No	No	
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	No	No	

ST-03 Chart

Record #	Date	Time	LAeq	LASma	LASmin
1	2021/02/03	15:16:18	58.2	65.1	51.5
2		15:17:00	58.9	67.1	46.4
3		15:18:00	57.2	66.5	46.3
4		15:19:00	59.5	70.3	50.5
5		15:20:00	61.5	67	49.2
6		15:21:00	55.0	63.1	46.3
7		15:22:00	49.6	57.3	45.9
8		15:23:00	60.8	65.5	50.3
9		15:24:00	58.8	66.2	48.2
10		15:25:00	60.1	66.4	52
11		15:26:00	59.5	67.3	49.2
12		15:27:00	57.5	69.6	44.8
13		15:28:00	57.3	65.3	43.3
14		15:29:00	57.3	63.7	48.2
15		15:30:00	57.1	64.7	49.6
16		15:31:00	60.6	68.5	50.3
17		15:32:00	55.7	65.5	48.3
18		15:33:00	61.6	71.3	50.9
19		15:34:00	58.1	67	49.7
20		15:35:00	58.7	64.9	49.8
21		15:36:00	59.6	65.7	52.6



Roadway	Existing Traffic Volumes (vph)	Cumulative without Project Traffic Volumes (vph)	Cumulative Plus Project Traffic Volumes (vph)	**Increase from Cumulative without Project**	**Increase from Cumulative without Project**	Increase from Cumulative with Project	Increase from Cumulative with Project	Project's Contribution to Cumulative **Increase (%)**
Park Boulevard	793	873	908	80	10%	115	15%	30%
Page Mill Road	571	635	668	64	11%	97	17%	34%
Sherman Avenue	159	263	263	104	65%	104	65%	0%
Birch Street	686	779	806	93	14%	120	17%	23%
Sheridan Avenue	289	315	323	26	9%	34	12%	24%
Grant Avenue	161	177	179	16	10%	18	11%	11%
El Camino Real	3,905	4,373	4,418	468	12%	513	13%	9%
Oregon Expressway	3,214	3,562	3,597	348	11%	383	12%	9%
California Avenue	508	550	550	42	8%	42	8%	0%
Middlefield Road	1,698	1,786	1,791	88	5%	93	5%	5%

Roadway	Existing Traffic Volume (vehicles per hour)	Existing Plus Project Traffic Volume (vehicles per hour)	Percent Increase	Estimated Increase in Noise Level due to Traffic Volume (dBA)
Park Boulevard	793	826	4.20%	0.2
Page Mill Road	571	604	5.80%	0.2
Sherman Avenue	159	159	0.00%	0.0
Birch Street	686	713	3.90%	0.2
Sheridan Avenue	289	297	2.80%	0.1
Grant Avenue	161	163	1.20%	0.1
El Camino Real	3,905	3,907	0.10%	0.0
Oregon Expressway	3,214	3,249	1.10%	0.0
California Avenue	508	508	0.00%	0.0
Middlefield Road	1,698	1,703	0.30%	0.0

Increase in noise due to traffic volume equals:

10*log(Existing+Project traffic/existing traffic)

Roadway	Existing (vph)	Cumulative without Project (vph)	Cumulative Plus Project (vph)	Total Cumulative Increase over Existing (%)[1]	Estimated Increase in Traffic Noise Level due to Cumulative Plus Project
Park Boulevard	793	873	908	15%	0.6
Page Mill Road	571	635	668	17%	0.7
Sherman Avenue	159	263	263	65%	2.2
Birch Street	686	779	806	17%	0.7
Sheridan Avenue	289	315	323	12%	0.5
Grant Avenue	161	177	179	11%	0.5
El Camino Real	3,905	4,373	4,418	13%	0.5
Oregon Expressway	3,214	3,562	3,597	12%	0.5
California Avenue	508	550	550	8%	0.3
Middlefield Road	1,698	1,786	1,791	5%	0.2

Increase in noise due to traffic volume equals:

10*log(Cumulative+Project traffic/existing traffic)

Equipment	Ref value (dB)	Ref Distance (ft)	Distance between source & receptor (feet)	Noise Reduced By (dB)	Adjusted value	Decibel Addition Factor	Combined Noise Value
HVAC1	59	5	28	-14.96	44.04	0	44.04
HVAC2	59	5	105	-26.44	32.56		
HVAC3	59	5	28	-14.96	44.04		
HVAC3	59	5	44	-18.89	40.11		

Decibel Addition

When Two Decibel Values Differ by:	Add This Amount to the Higher Value:	Example:
0 or 1 dB	3 dB	70 + 69 = 73 dB
2 or 3 dB	2 dB	74 + 71 = 76 dB
4 to 9 dB	1 dB	66 + 60 = 67 dB
10 dB+	0 dB	65 + 55 = 65 dB

Equipment	Reference Vibration Level PPV at 25 feet (in/sec)	Reference Vibration Level Lv at 25 feet (in VdB)
Impact Pile Driver[1]	0.644 (1.518)	104 (112)
Sonic Pile Driver[1]	0.170 (0.734)	93 (105)
Vibratory Roller	0.21	94
Large Bulldozer/Hoe Ram	0.089	87
Drill	0.089	87
Truck	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Source: FTA 2018, Caltrans 2020.

Acronyms: in/sec = inches per second; Lv = velocity level in decibels, based on the root mean square velocity amplitude; PPV = peak particle velocity; VdB = velocity decibels.

Notes:

1. Vibration levels shown for pile drivers are typical values, with upper range values in parentheses.

Reference PPV @25 ft (in/sec)	Reference Lv @25 ft (VdB)	Vibration Source	Sensitive Receptor	Minimum distance between Source and Receptor (Feet)	Estimated PPV at receptor (in/sec)	Estimated Lv at receptor (VdB)	Threshold for structural damage (in/sec PPV)	Threshold for human annoyance (VdB)
0.089	87	Drill Rig	Apartment Building	12	0.268	97	*0.5*	*80*
0.089	87	Drill Rig	Courthouse Plaza	12	0.268	97	*0.5*	*80*
0.089	87	Drill Rig	Palo Alto Courthouse	230	0.003	58	*0.5*	*80*
0.035	79	Jackhammer	Apartment Building	8	0.193	94	*0.5*	*80*
0.035	79	Jackhammer	Courthouse Plaza	8	0.193	94	*0.5*	*80*
0.035	79	Jackhammer	Palo Alto Courthouse	65	0.008	67	*0.5*	*80*
0.089	87	Large Excavator	Apartment Building	8	0.492	102	*0.5*	*80*
0.089	87	Large Excavator	Courthouse Plaza	8	0.492	102	*0.5*	*80*
0.089	87	Large Excavator	Palo Alto Courthouse	65	0.021	75	*0.5*	*80*
0.003	58	Small Excavator	Apartment Building	8	0.017	73	*0.5*	*80*
0.003	58	Small Excavator	Courthouse Plaza	8	0.017	73	*0.5*	*80*
0.003	58	Small Excavator	Palo Alto Courthouse	65	0.001	46	*0.5*	*80*
0.076	86	Trucks	Apartment Building	8	0.420	101	*0.5*	*80*
0.076	86	Trucks	Courthouse Plaza	8	0.420	101	*0.5*	*80*
0.076	86	Trucks	Palo Alto Courthouse	50	0.027	77	*0.5*	*80*
0.089	87	Large Crane	Apartment Building	100	0.011	69	*0.5*	*80*
0.089	87	Large Crane	Courthouse Plaza	100	0.011	69	*0.5*	*80*
0.089	87	Large Crane	Palo Alto Courthouse	50	0.031	78	*0.5*	*80*
0.21	94	Sheepsfoot Roller	Apartment Building	8	1.160	109	*0.5*	*80*
0.21	94	Sheepsfoot Roller	Courthouse Plaza	8	1.160	109	*0.5*	*80*
0.21	94	Sheepsfoot Roller	Palo Alto Courthouse	65	0.050	82	*0.5*	*80*

Source: calculated by AECOM 2020, based on reference values from FTA 2018, Caltrans 2020.

Notes: Vibration levels for large and small excavators are conservatively based on reference values for large and small bulldozers, respectively, as reference values were not available for all equipment types. Similarly, vibration levels for a crawler crane are conservatively based on reference values for a large bulldozer due to lack of equipment-specific reference values. Vibration levels for "sheepsfoot

Acronyms: in/sec = inches per second; Lv = velocity level in decibels, based on the root mean square velocity amplitude; PPV = peak particle velocity; VdB = velocity decibels.

Appendix E – Transportation Supporting Documentation

Contains:

- Vehicle Miles Traveled (VMT) Analysis
- Level of Service (LOS) Analysis

AECOM

Traffic Impact Analysis 231 Grant Avenue Educator Workforce Housing

Project Number: 60642412

July 2021

Delivering a better world

Prepared for:

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1 Executive Summary

This report presents the evaluation of roadway facilities for pedestrians, cyclists and transit users as part of the Traffic Impact Analysis (TIA) conducted for the 231 Grant Educator Workforce Housing project (the project) which proposes construction of an educator workforce housing complex with parking located at 231 Grant Avenue, in the City of Palo Alto, California. The project site is owned by the County of Santa Clara.

The site is approximately 61,000 square feet in area and currently contains a one-story office building with surface parking stalls. The proposed new development would have 110 residential dwelling units ranging from studios to 2-bedroom apartments, 1,120 square feet of 'flex space' that would potentially be used for retail or commercial activities and would be served by 112 parking spaces.

The purpose of this evaluation is to identify any potential impacts on the roadway facilities, excluding intersections, in the project vicinity and their corresponding potential mitigation measures. Intersection analysis is presented in a separate report for information only.

1.1 Transit, Pedestrian, and Bicycle Facilities

1.1.1 Existing Plus Project Conditions

Based on current observations, the existing transit, pedestrian and bicycle facilities in the project vicinity can support the additional users generated by this project. While a slight increase in delay for some transit routes is expected at intersections due to the added project vehicular trips, the total increase is expected to be less than one minute. In addition, the project would not include facilities or designs that impede the use of these infrastructures. The project therefore would not have adverse impacts on the surrounding transit, pedestrian and bicycle facilities under existing conditions and no mitigation measures are proposed.

1.1.2 Background Plus Project Conditions

The project would not include facilities or designs that impede the use of the surrounding transit, pedestrian and bicycle infrastructures. These facilities, under background conditions, are expected to support the additional users generated by this project. While a slight increase in delay for some transit routes is expected at intersections due to the added project vehicular trips, the total increase is expected to be less than one minute. The project therefore would not have adverse impacts on the surround transit, pedestrian and bicycle facilities under the background conditions and no mitigation measures are proposed.

1.1.3 Cumulative Plus Project Conditions

The project would not include facilities or designs that impede the use of the surrounding transit, pedestrian and bicycle infrastructures. These facilities are expected to continue to accommodate the additional users generated by this project under the cumulative conditions, especially with the planned improvements envisaged in the Palo

Alto Comprehensive Plan 2030. The total increase in delay for some transit routes expected at intersections due to the added project vehicular trips, would remain at less than one minute. The project therefore would not have adverse impacts on the surround transit, pedestrian and bicycle facilities under the cumulative conditions and no mitigation measures are proposed.

1.2 Site Access and Circulation

The project will have two access points (driveways); one each on Birch Street and Park Boulevard. The access points lead to a street-level parking garage for the development. The Birch Street access will be a ‘right-in-right-out’ configuration while the Park Boulevard access will cater to all movements. It is expected that these two driveways will be stop-controlled. The proposed 20-feet driveway width for both accesses meets the City’s minimum design requirement and is sufficient for emergency vehicles (e.g. an ambulance) to access the garage. The proposed aisle width of at least 26 feet meets the City design requirements of 25 feet based on the proposed stall size except along the section with ADA compliant stalls which measures about 24 feet. However, this is unlikely to affect the maneuverability of vehicles as they would be ‘nicely’ arranged by the proposed stacked parking system. While the access on Birch Street is new, the project will close off the three accesses along Grant Avenue currently. As a result, there is a net decrease of two accesses for the project site as a result of the proposed development.

As on-street parking is allowed along Birch Street on the same side as the project site, parking prohibition for at least one car length immediately south of the proposed access is recommended to provide for additional sight-distance even though the intended landscaping is not expected to adversely affect sight-distance of the driveway. Audio and visual warning devices should be provided to warn cyclists and pedestrians when a vehicle is approaching the Birch Street garage exit. Warning signs reminding exiting motorists to watch out and yield to pedestrians should also be provided in the garage before/near the egress. These will serve a mitigation measures to the expected increase in conflicts with pedestrians and cyclists due to the new driveway (along Birch Street) and additional trips generated by the project.

There is a Class II bike lane along both sides of Park Boulevard. Therefore, audio warning should also be provided to warn cyclists and pedestrians when a vehicle is approaching the Park Boulevard garage exit. Warning signs reminding exiting motorists of crossing pedestrians/cyclists should also be provided. There is currently an access point to the project site along Park Boulevard. The proposed Park Boulevard driveway would relocate this current access point approximately 25 feet north. No new or additional access points are being created by the project along Park Boulevard and the proposed landscaping is not expected to adversely affect sight-distance of the driveway. However, the additional trips generated by the project will increase the frequency for conflict. As such, audio and visual warning devices should be provided to warn cyclists and pedestrians when a vehicle is approaching the garage exit to serve as a mitigation measure.

1.3 Parking

The project proposes a stacked parking system to manage its parking. No adverse queuing is expected on the public street due to this system based on the expected average arrival time of vehicles at the project driveways and system efficiency.

The minimum number of automobile parking required based on City of Palo Alto's requirements is 108 spaces, including five (5) ADA compliant spaces and 10 percent of electric vehicle spaces (11 spaces). The project is proposing to provide 112 parking spaces that include five (5) ADA compliant spaces. The project proposes to include 12 electric vehicle (EV) ready parking spaces. This meets the City's parking requirement for both gasoline and electrical vehicles.

Based on the City's code, the project needs to provide at least 114 long-term and 16 short-term bike parking. The project is planning to provide 134 long-term bike parking spaces within a secure, ground floor bicycle storage room, as well as 20 short-term bike parking spaces in the exterior public open spaces. The project would therefore exceed the City's minimum requirements for bicycle parking.

1.4 Vehicle Miles Traveled (VMT)

Using the Santa Clara Countywide VMT Evaluation Tool provided by the Valley Transportation Authority, the residential portion of this proposed development is screened out under the City's screening criteria for being located in a low VMT area, with 6.05 home-based VMT per capita, which is more than 15 percent less than the countywide average of 13.33 VMT per capita. The proposed 1,120 square feet of 'flex space', potentially to be used for retail services like a small eatery or coffee shop, qualifies as small local-serving retail of less than 10,000 square feet. As such, it is also screened out under the modified CEQA guidelines adopted by the City. Because both the residential and retail portions of the project meet the screening criteria, no significant VMT impact is expected.

1.5 Transportation Demand Management (TDM)

The developer for this project is committed to ensure that alternatives to drive-alone commute trips are available to the project residents. Work is therefore currently in progress to develop a comprehensive transportation demand management program that will be shared and discussed with the County and City of Palo Alto in due course.

1.6 Construction Traffic

The project developer recognizes that some inconvenience to nearby road users and residents during the construction is inevitable. However, such inconvenience will be minimized through working closely with the City of Palo Alto and coordinating with other construction in the vicinity. The developer will adhere to the guidelines laid out by the City in its 'Traffic Control Plan Requirement' and 'Public Works Standard Specifications' and will provide a feedback channel for any affected public. Construction traffic will adhere to the permitted City truck route and approval from the City will be sought for any deviations needed.

2 Introduction

This report presents the evaluation of roadway facilities for pedestrians, cyclists and transit users as part Traffic Impact Analysis (TIA) conducted for the 231 Grant Educator Workforce Housing project, which proposes construction of a mixed-use development with parking located at 231 Grant Avenue, Palo Alto, California. The project site is owned by the County of Santa Clara but is within the incorporated area of the City of Palo Alto.

The purpose of this evaluation is to identify any potential impacts on the roadway facilities, excluding intersections, in the project vicinity and their corresponding potential mitigation measures. Analysis of level of service (LOS) for intersections is presented in a separate report for information only.

2.1 Project Description

2.1.1 Existing Site

The site is located at 231 Grant Avenue, near Oregon Expressway. An existing one-story building (approximately 6,800 square feet) used by approximately 10 employees currently occupies the site bounded by, Grant Avenue to the north, Park Boulevard to the east and Birch Street to the west. Access to the existing building is via four driveways, three on Grant Avenue and one on Park Boulevard. The Park Boulevard driveway is accessible by all movements as Park Boulevard is undivided. The Grant Avenue driveways, on the other hand, have a ‘right-in-right-out’ configuration because the section of Grant Avenue fronting the project site is one-way eastbound.

2.1.2 Proposed Site

The proposed development includes a new four-story mixed-use building of 110 residential units and associated amenities such as a residents’ lounge, activity room, and laundry. The project would also include a ‘flex space’ of 1,120 square feet, which could be used for retail or commercial purposes, and approximately 6,400 square feet of outdoor public open space. A total of 112 (car) parking spaces and 146 bicycle parking spaces would be provided. One full movement driveway will be provided along Park Boulevard and the second access along Birch Street will be of a ‘right-in-right-out’ configuration as Birch Street is divided. **Figure 2-1** shows the Project site plan.

2.2 Study Area

The study area is bounded by California Avenue to the north, Page Mill Road to the south, Alma Street to the east and El Camino Real (ECR) to the west. While Oregon Expressway and California Avenue provide local access to the project site, freeway US 101 provides regional access to the project site. U.S. 101 can be accessed via the interchange at Oregon Expressway. Further to the west, I-280 and Foothill Expressways bring motorists from the region to the study area.

2.3 Study Scope and Approach

The following six scenarios were evaluated to identify the potential transportation impacts of the project on the roadway facilities:

1) Existing Conditions – Current conditions
2) Existing plus Project Conditions – current conditions from *Scenario 1* plus the proposed project.
3) Background Conditions – Current conditions with approved but not completed projects. This is defined as the ‘Background without project’ conditions.
4) Background plus Project Conditions – Background conditions from *Scenario 3* plus the proposed project.
5) Cumulative – Conditions in 2030 as proposed in the 2030 Palo Alto Comprehensive Plan
6) Cumulative plus Project Conditions – Cumulative conditions from *Scenario 5* plus the proposed project

Figure 2-1 Conceptual Site Plan

Source: Mercy Housing and Abode Communities, 2020

3 Existing, Background, and Cumulative Conditions

This section describes the existing, background and cumulative conditions in the vicinity of the project in terms of the general roadway, transit, pedestrian, and bicycle facilities.

3.1 Major Roadways in Study Area

Regional access to the Project site is provided by US 101 and I-280.

- US 101 – This eight-lane freeway extends from San Francisco to San Jose with a posted speed limit of 65 mph. In the vicinity of the Project site, this freeway runs in the north-south direction. It has three mixed-flow lanes in both directions, and one carpool lane in each direction with hours of operation during 5am-9am and 3pm-7pm. US 101 is under the jurisdiction of Caltrans. Access to the freeway from the project site is provided via ramps at Oregon Expressway Interchange.
- I-280 – This north-south freeway also connects San Francisco and San Jose. It has four mixed-flow lanes in each direction in the vicinity of the project although a short section of the southbound drops to three lanes between the Page Mill Road On/Off Ramps. Access to the freeway from the project site is provided via ramps at Page Mill Road Interchange.

Local access to the Project site is provided by Oregon Expressway, Page Mill Road, ECR and California Avenue. Direct access to the project site is from Grant Avenue and Park Boulevard. These roadways are described below.

- Oregon Expressway – This east-west 4-lane divided expressway connects ECR to US-101, with accesses to local residential areas in between. Oregon Expressway has a posted speed limit of 35mph and connects to Page Mill Road west of ECR. Project site access to/from eastbound Oregon Expressway is via Park Boulevard and the short section of Page Mill Road. Project access to westbound Oregon Expressway is via Birch Street.
- El Camino Real (ECR) – Also known as SR 82, ECR is a major north-south arterial extending from the San Francisco area all the way to San Jose with a posted speed limit of 35mph. It provides direct access to developments along both approaches. Under existing conditions, Grant Avenue provides direct ingress to the project site from ECR.
- Page Mill Road – This east-west roadway extends from Skyline Boulevard west of the project site to ECR, connecting to Oregon Expressway. It is a 4-lane divided arterial road between ECR and I-280. The posted speed limit is 50mph between I-280 and Foothill Expressway but drops to 35mph between Foothill Expressway and ECR. Page Mill Road transitions to Oregon Expressway east of ECR with a short section of the roadway that continues to the California Avenue Transit Station. A Class 2 bike-lane is provided from ECR to Foothill Expressway on both approaches.

- California Avenue – This east-west collector roadway connects Amherst Street to Park Boulevard. It is primarily 2-lane undivided with Class 2 bike lanes along both approaches between Amherst Street and ECR. On-street parking is provided along California Avenue with a posted speed limit of 25mph.
- Grant Avenue – This east-west local roadway connects ECR to Park Boulevard. It is primarily 2-lane undivided except between Birch Street and Park Boulevard (i.e., immediately adjacent to the project site) where it is one-way eastbound. It has a posted speed limit of 25mph with on-street parking allowed on both approaches. It provides direct access to the project site under existing conditions but will not have access to the project site under the proposed project layout.
- Park Boulevard – This roadway starts at the intersection of ECR and Serra Street, first going east-west for a short section before becoming north-south, extending past West Charleston Road where it connects to Whitclem Drive. In the project vicinity, it is 2-lane undivided, with a Class 2 bike lane on both approaches up to Chestnut Avenue. On-street parking with a 2-hr limit is provided between California Avenue and Sheridan Avenue. In the project vicinity, Park Boulevard is designated as a collector road with posted speed limit of 25mph. It provides direct access to the project site under existing conditions as well as under the proposed project layout.
- Birch Street – This north-south local street starts at the east-west section of Park Boulevard and continues to Oregon Expressway. It is 2-lane undivided with on-street parking up to California Avenue. It becomes divided from California Avenue to Oregon Expressway. This latter section in the project vicinity is designated as a collector road with a posted speed limit of 25mph. Northbound Birch Street will provide direct access under the proposed project layout.

3.2 Existing Traffic Conditions

Due to the global COVID pandemic that was occurring during preparation of this study, existing traffic volumes in the project vicinity would not be an accurate representation of normal conditions. Therefore, past data provided by the County and from two recently approved developments in the project vicinity were used as base volumes from which the 2020 (‘Existing’) volumes were extrapolated. This is a conservative approach as it assumes ‘pre-COVID’ level of traffic, rather than the dampened traffic volumes present during the pandemic. The County provided the PM peak hour data for the intersection of ECR/Page Mill Road (int #5) and Middlefield Road/Oregon Expressway (int #8), for the year 2019 and 2018 respectively. Remaining volume data were obtained from the studies for housing development at 2755 ECR (Hexagon Transportation Consultants, Inc., January 2018) and the Palo Alto Public Safety Building and Public Parking Structure (Fehr & Peers, May 2018). Counts for these two projects were collected between 2016 and 2017.

Volumes from the different sources mentioned above were compared and a growth factor was determined. The average growth was determined to be about 1.7% per year. This growth factor was used to grow the latest counts available to the existing year of 2020. The calculated traffic volumes for selected intersections in the project vicinity, as agreed after consultation with City staff, are presented in **Figure 3-1.**

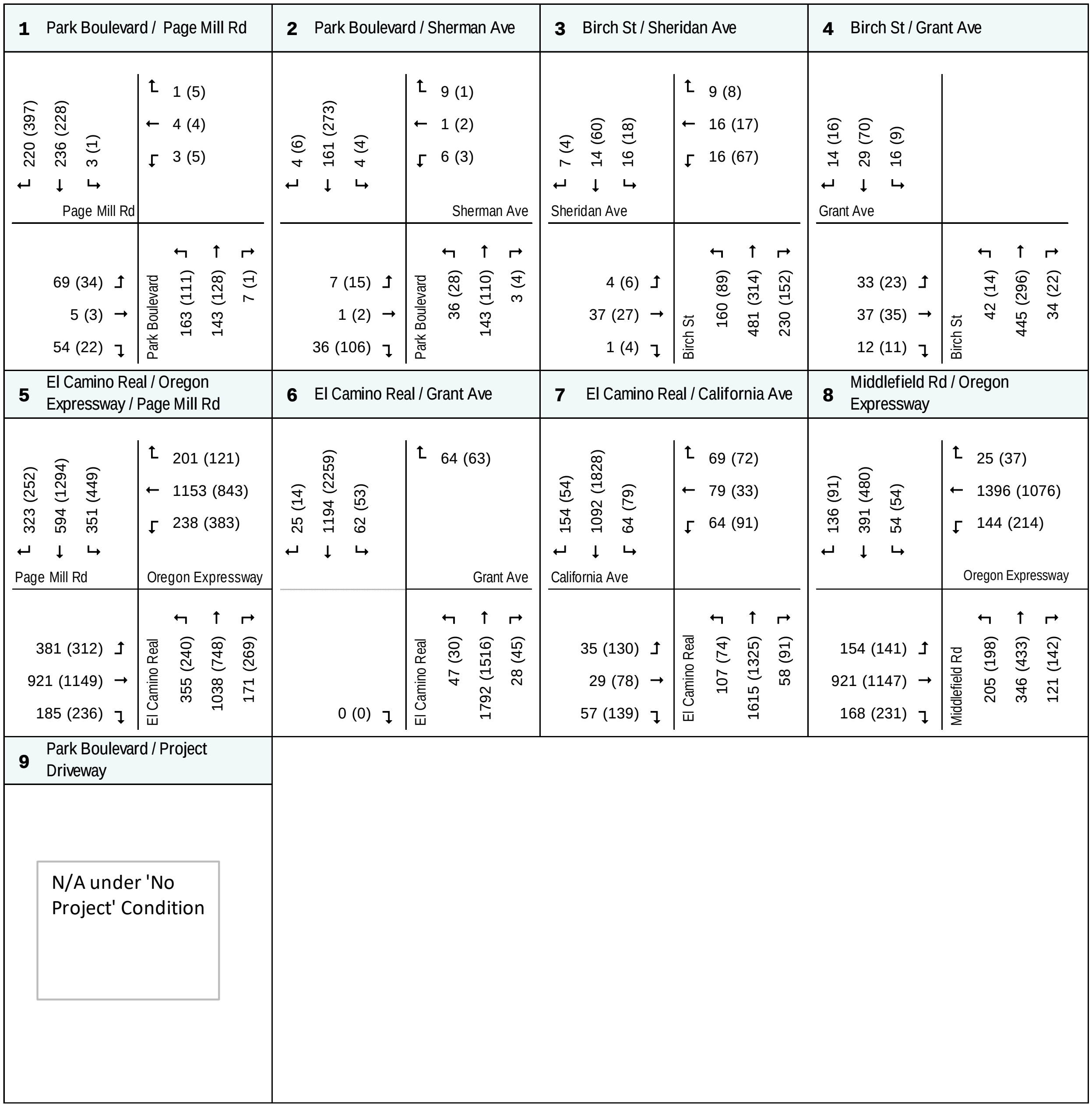


Figure 3-1 Existing Traffic Volumes

Source: AECOM 2021

3.3 Existing Transit Facilities

While there are no transit stops along the streets bordering the project site, the project site is still well served by public transportation. It is approximately one-third of a mile from the California Avenue Transit Station for Caltrain. Caltrain runs between 4:30AM to midnight on weekdays serving commuters between San Francisco and Gilroy. On the weekends, services are only between San Francisco and Diridon Station in San Jose, with shuttle bus service to Tamien Station. The California Transit Station is also a stop for the Valley Transportation Authority (VTA) Line 89 as well as the California Avenue

Foothill Express (CAFX) Shuttle by Stanford Research Park. Due to the COVID-19 global pandemic, the CAFX Shuttle is on hold until further notice; however, the latest schedule that operated prior to COVID-19 restrictions is presented for completeness.

The project site is approximately one-third of a mile from the bus stops along ECR. The bus stops along ECR serve VTA Lines 22, 89, 522 and the Stanford Marguerite Research Park Shuttle (Line RP). Another bus stop about half a mile from the project site along Page Mill Road (west of ECR) serves several VTA express services and the Dumbarton Express DB1. Details of the different public transit service schedules are presented in **Table 3-1**, while **Figure 3-2** presents the transit routes in the vicinity of the project site.

Table 3-1 Existing Transit Service Schedule

Provider & Route	From	To	Weekday Operating Hours and Frequency	Weekend Operating Hours and Frequency
VTA 22	Palo Alto Transit Center	Eastridge Transit Center	4:30 AM to 12:30AM with 15-minute headway	4:45 AM to 12:30AM with 15-minute headway
VTA 89	California Ave Caltrain Station	Palo Alto VA Hospital	6:35AM to 6:06PM with 20-minute headway	NA
VTA 101 (Express)	Camden & Highway 85	Stanford Research Park	Northbound @ 6:20AM and 7:09AM only. Southbound @ 4:10PM and 5:10PM only.	NA
VTA 102 (Express)	South San Jose	Stanford Research Park	Westbound 5:52AM to 7:10AM with 50- to 75-minute headway. Eastbound 2:41PM to 5:05PM with 60- to 85-minute headway	NA
VTA 103 (Express)	Eastridge	Stanford Research Park	Westbound 5:05AM to 10:13AM with 20- to 40-minute headway. Eastbound 3:43PM to 6:48PM with 20- to 40- minute headway.	NA
VTA 104 (Express)	Milpitas BART Station	Stanford Research Park	Westbound @ 6:09AM and 6:43AM only. Eastbound @ 4:01PM and 4:30PM only.	NA
VTA 522	Palo Alto Transit Center	Eastridge Transit Center	5:20AM to 9:45PM with 15-minute headway	5:50AM to 8:50PM with 20-minute headway
Caltrain California Ave Station	San Francisco	Gilroy	4:57AM to 1:10AM with 11- to 23- minute headway	7:37AM to 1:15AM with 90-minute headway
Dumbarton Express DB1	Union City BART Station	3475 Deer Creek Rd	5:10AM to 7:28PM with 30-minute headway	NA
Stanford Marguerite Shuttle RP	Palo Alto Transit Center	3475 Deer Creek Rd	Westbound 6:32AM to 10:13AM with 20- to 40-minute headway. Eastbound 3:43PM to 6:48PM with 20- to 40-minute headway.	NA
Stanford Research Park Transportation CAFX	*California Ave Caltrain Station*	*3475 Deer Creek Rd*	*Westbound 7:41AM to 10:46AM with approx. 60-minute headway. Eastbound 3:39PM to 6:41PM with approx. 60-minute headway.*	*NA*

Sources: Valley Transit Authority (VTA) Services effective 10/12/2020, expected to run through 2/7/2021 (https://www.vta.org/go/routes); Caltrain Service effective 6/15/2020 (https://www.caltrain.com/schedules.html); Dumbarton Express effective 6/14/2020 (https://dumbartonexpress.com/line-db1-schedule/); Stanford Marguerite Shuttle effective 6/15/2020 (https://transportation.stanford.edu/marguerite); Stanford Research Park Transportation March 2020 - on hold until further notice (https://d29vmu15ua1e0a.cloudfront.net/uploads/SRP-CAFX-Sched-Updated-MAR2020.pdf).

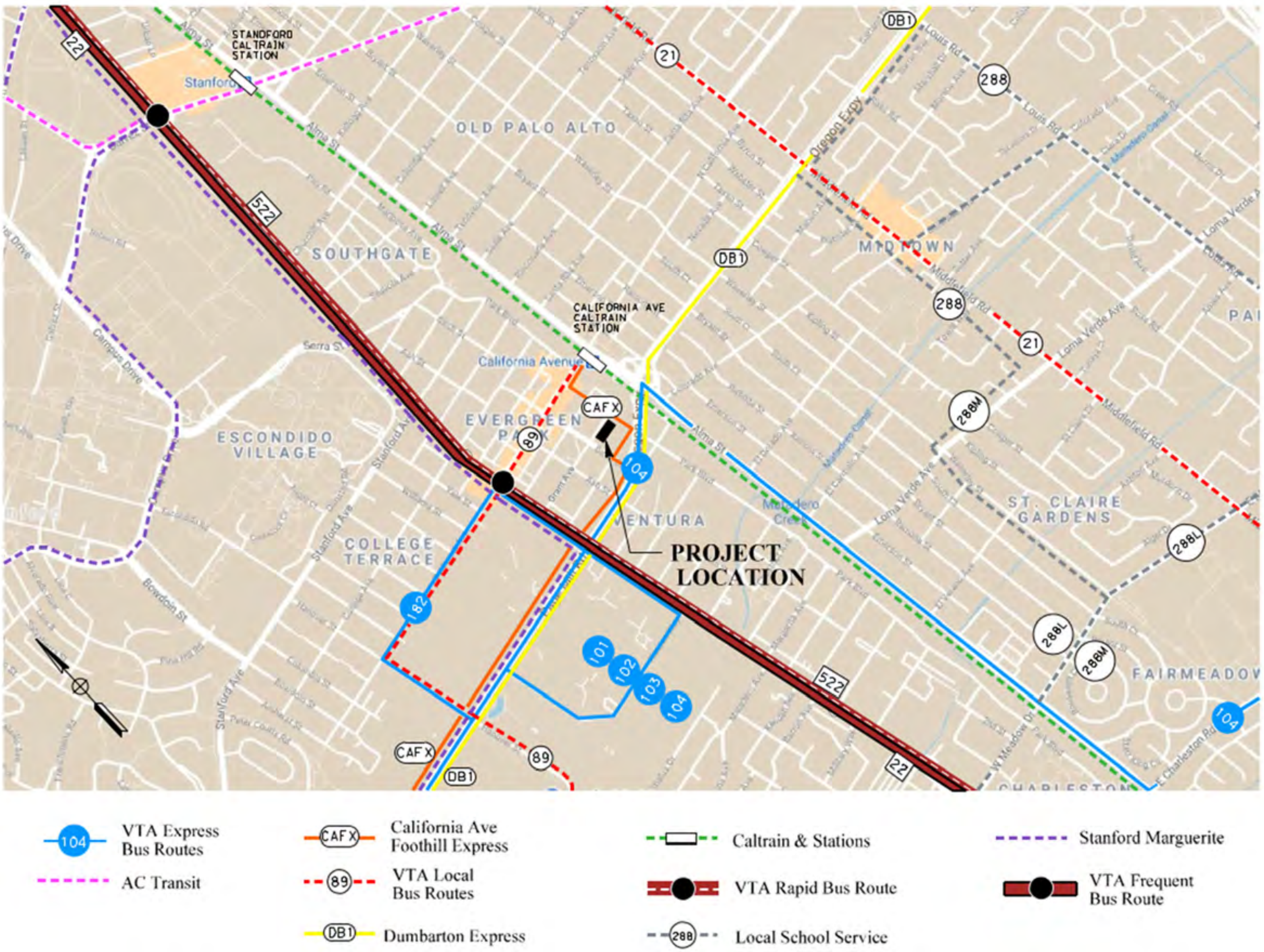


Figure 3-2 Existing Transit Facilities

Source: AECOM 2021 based on VTA Transit Map December 2019

3.4 Existing Pedestrian and Bicycle Facilities

Sidewalks are provided along both sides of Grant Avenue, Birch Street, and Park Boulevard surrounding the project site. Marked crosswalks are provided at the Two-Way Stop-Controlled intersection of Grant Avenue and Park Boulevard, as well as the All-Way Stop-Controlled intersection of Grant Avenue and Birch Street. The nearest signalized pedestrian crossing is at Page Mill Road and Park Boulevard. Signalized pedestrian crossing is also provided at the intersection of ECR and California Avenue.

In the immediate vicinity of the project site, Class II bike lanes are provided along both sides of Park Boulevard up to Lambert Avenue. South of Lambert Avenue, Park Boulevard is designated as a bike boulevard. Class III bike route is provided along the section of California Avenue between ECR and Park Boulevard. In addition, bicycles are allowed on ECR and Oregon Expressway. The existing bicycle facilities in the vicinity of the project are illustrated in **Figure 3-3.**

Definitions of the different bike facilities are as follow:

- Class I (bike path): a paved trail that is separate from roadways (there are no Class I facilities in the immediate project area).
- Class II (bike lane) provides a restricted right-of-way designated for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and cross flows by pedestrians and motorists permitted.
- Class III (bike route) provides a right-of-way designated by signs or permanent markings indicating the roadway is shared by pedestrians and motorists.
- Bike Boulevards are streets prioritized for bicycle use through advisory warning to motorists, traffic calming measures and guidance to encourage bicycle use over less attractive routes.

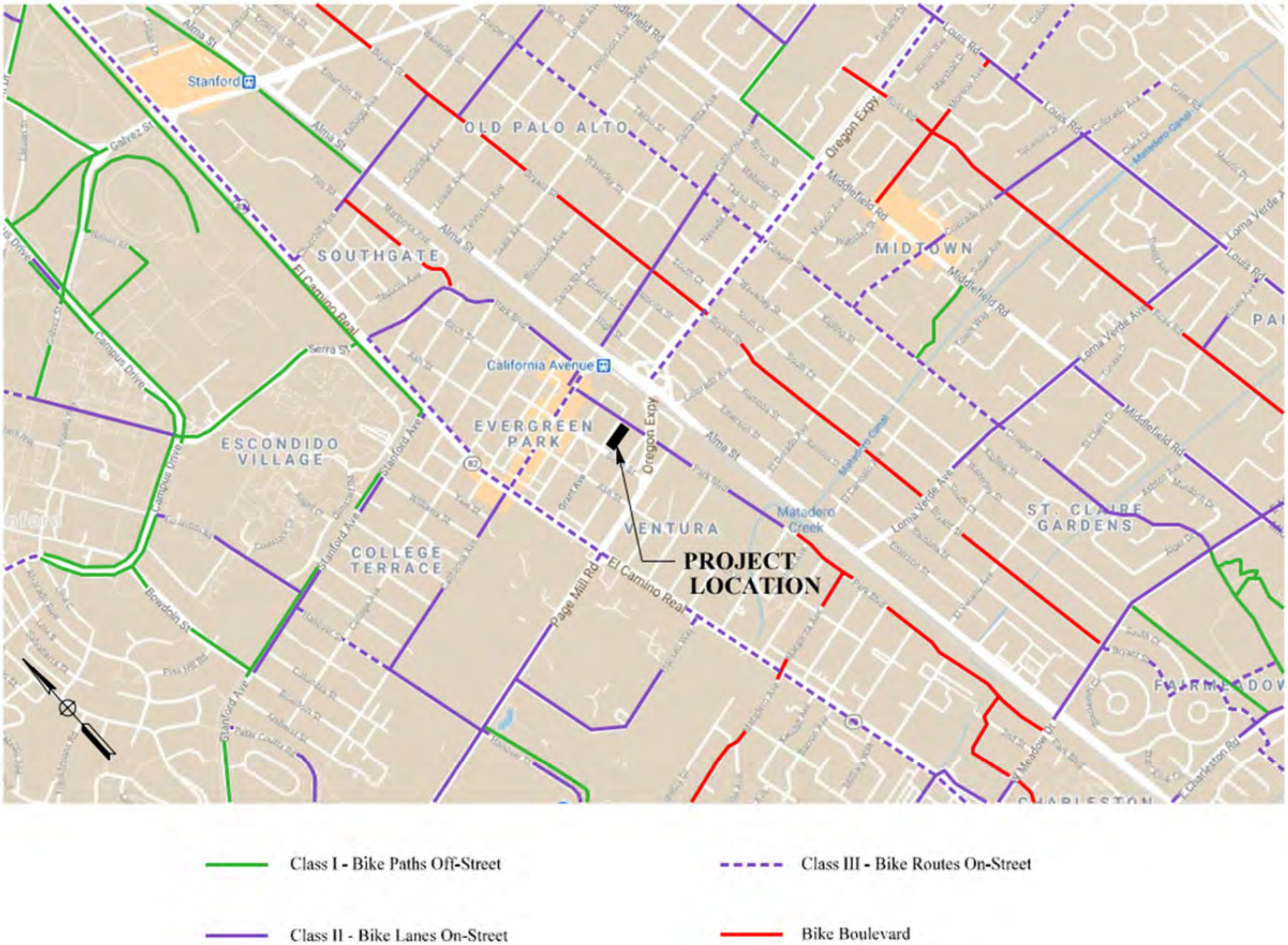


Figure 3-3 Existing Bicycle Facilities

Source: AECOM 2021 based on VTA Bikeways Map June 2020

3.5 Background Conditions

The list of approved projects (as obtained from the City of Palo Alto) in the vicinity of this project is shown in Table 3-2 below.

Table 3-2 List of Approved Projects

Project Name	Project Location	Land Use
2755 El Camino Real Redevelopment	2755 El Camino Real	Residential
Palo Alto Public Safety Building and Public Parking Structure	250 Sherman Avenue	Public Services/Office

Source: City of Palo Alto, 2020.

The pedestrian and bicycle facilities under the background conditions will largely be similar to the existing conditions. While no new pedestrian and bicycle infrastructures are proposed by the approved projects, the re-development of sidewalks, (e.g., with landscaping) fronting these projects will enhance the pedestrian experience in the project vicinity.

For transit facilities, the 2755 ECR Development plans to relocate the bus stop that is currently about 80 feet north of the ECR/Page Mill Road intersection, along northbound ECR. The new bus stop will be about 50 feet from the intersection. In addition, both of the approved projects are expected to generate some new pedestrians, cyclists, and transit users in the project vicinity.

3.6 Cumulative Conditions

The horizon year for the cumulative conditions was determined to be 2030 after consulting with City of Palo Alto so as to coincide with its current Comprehensive Plan adopted in 2017 (Comprehensive Plan 2030, City of Palo Alto). As part of the comprehensive plan study process, the City of Palo Alto evaluated a total of six scenarios with varying degrees of growth for the year 2030. Its City Council eventually adopted a scenario with growth approximately mid-way of the evaluated scenarios. **Appendix A** presents a summary of the Comprehensive Plan study scenario parameters.

In particular, the North Ventura Planning Area, which is adjacent to the project area, south of Oregon Expressway, will be defined as a Transit Oriented Development (TOD) area. This area will create and enhance non-motorized connections to take advantage of its proximity to the California Caltrain Station, the California Business District, and ECR. As a result, the number of pedestrians, cyclists, and transit users are expected to increase in the project vicinity under the Cumulative Conditions.

It was outlined in the 2030 Comprehensive Plan that the City of Palo Alto will continue to capitalize on its complete streets resolution adopted in 2015 to ensure that the city is conducive to non-motorized road users. Older sidewalks in the city will be upgraded or redeveloped with adjacent projects. Bicycle and other facilities will also be improved according to the City's Bicycle and Pedestrian Transportation Plan (May 2012). In the project vicinity, the bikeway map from the 2030 Comprehensive Plan, presented in **Appendix B,** indicates that the Class I bike path along Hanover Street that currently ends at Page Mill Road will be extended eastward to the ECR / Oregon Expressway /

Page Mill Rd intersection in the future. The City will continue to work with other agencies to expand facilities for pedestrians and cyclists. Envisioned improvements include, but are not limited to, full grade-separations for vehicles, pedestrians, and cyclists at Caltrain crossings and new pedestrian and bicycle grade-separated crossings of Caltrain in North and South Palo Alto.

The City will also work closely with VTA to enhance transit services for the community such as improving circulation at the Palo Alto Transit Center to allow direct access to ECR (for transit) and the introduction of Bus Rapid Transit along ECR.

4 Plus Project Conditions

This chapter looks at the future transportation conditions in the study area as a result of the proposed project. Additional usage of the roadway facilities by the proposed development are added to the 'no project' scenarios discussed in the earlier chapter to determine the effects of this project. Any mitigation measures necessary to alleviate potential impacts will also be discussed.

4.1 Trip Generation, Trip Distribution and Project-Only Trip Assignment

This section presents the number of vehicle trips generated by the proposed development. Trip generation rates from the Institute of Transportation Engineers' (ITE) Trip Generation Manual (10th Edition, 2017) were used for determining the number of trips of the future land use at the project site. Trip generation rates and estimates are summarized in **Table 4-1** and **Table 4-2**. As this project replaces an existing office area, the net additional trips will be considered 'project trips'.

Table 4-1 Trip Generation for Proposed Project – AM Peak Hour

Land Use	Size	Rate	In%	In	Out%	Out	Total
Residential (Land Use 221)	110 DU	0.36 per DU	26%	10	74%	29	39
Trip Adjustment for TOD		9 %		(1)		(3)	(4)
Café (Land Use 936)	1,120 SF	101.14 per SF		58		56	113
Total Proposed Trips			**51**	**67**	**49**	**82**	**149**
Office (Land Use 710)	10 employees	0.37 per employee	83%	3	17%	1	4
Total Existing Trips				**3**		**1**	**4**
Net New Trips				**64**		**81**	**145**

Source: Calculated by AECOM 2021 based on generation rates from ITE 2017.

Acronyms: DU = dwelling unit; SF = square feet; TOD = transit oriented development

Table 4-2 Trip Generation for Proposed Project – PM Peak Hour

Land Use	Size	Rate	In%	In	Out%	Out	Total
Residential (Land Use 221)	110 DU	0.44 per DU	61%	30	39%	18	48
Trip Adjustment for TOD		9 %		(3)		(2)	(4)
Café (Land Use 936)	1,120 SF	36.31 per SF		20		20	41
Total Proposed Trips			**50**	**47**	**50**	**38**	**85**
Office (Land Use 710)	10 employees	0.4 per employee	20%	1	80%	3	4
Total Existing Trips				**1**		**3**	**4**
Net New Trips				**46**		**35**	**81**

Source: Calculated by AECOM 2021 based on generation rates from ITE 2017.

Acronyms: DU = dwelling unit; SF = square feet; TOD = transit oriented development

According to VTA's guidelines, because this proposed development is located within 2,000 feet of walking distance from a major transit facility (no more than 0.3 mile, or 1,600 feet from California Avenue Caltrain Station), it is considered a transit-oriented development and a reduction of 9% can be applied to the number of trips generated by the housing portion. This should be coupled with implementing a Transportation Demand Management (TDM) Program. The developer of the project is currently developing a comprehensive TDM program and will be discussed with the County, followed by the City of Palo Alto when more details are available.

Although tenant for the proposed 'flex space' has not been decided at the point of this report, a café type land use (ITE Land Use 936 - Coffee/Donut Shop without Drive-Through Window) was chosen to represent the potential use of this area, as a café is likely to be one of the higher trip generating uses that might use the flex space, and is therefore a conservative assumption. Furthermore, Land Use 936 has a higher trip generation rates compared to another similar café type (ITE Land Use 939 – Bread/Donut/Bagel Shop Without Drive-Through Window) which will result in a more conservative analysis. The project trip generation did not further reduce for pass-by and diverted trips even though a café type use could see some of such trips. Trip generation for the existing office use were determined based on the number of employees rather than by the area of the building. This is because the number of trips calculated using the latter method would generate a higher number of trips which will lower the net new project trips to be generated. Therefore, to maintain a conservative approach, a lower number of existing trips based on actual employee numbers at the existing office were used.

As a result, the proposed project is estimated to generate 145 net new AM peak hour vehicle trips (64 inbound trips and 81 outbound trips) and 81 net new PM peak hour vehicle trips (46 inbound trips and 35 outbound trips).

Trip distribution is defined as the direction of approach and departure that vehicles would use to arrive at and depart from the site. The trip distribution pattern of the traffic generated by the project onto the roadway system was based on recent TIA's completed in the area, prevailing traffic patterns and the site access locations. The project trips were distributed and assigned to the selected intersections based on the trip distribution percentages shown in **Figure 4-1.** The resulting project only volumes at each of these intersections are presented in **Figure 4-2**, and existing plus project traffic volumes at each intersection are shown in **Figure 4-3.**

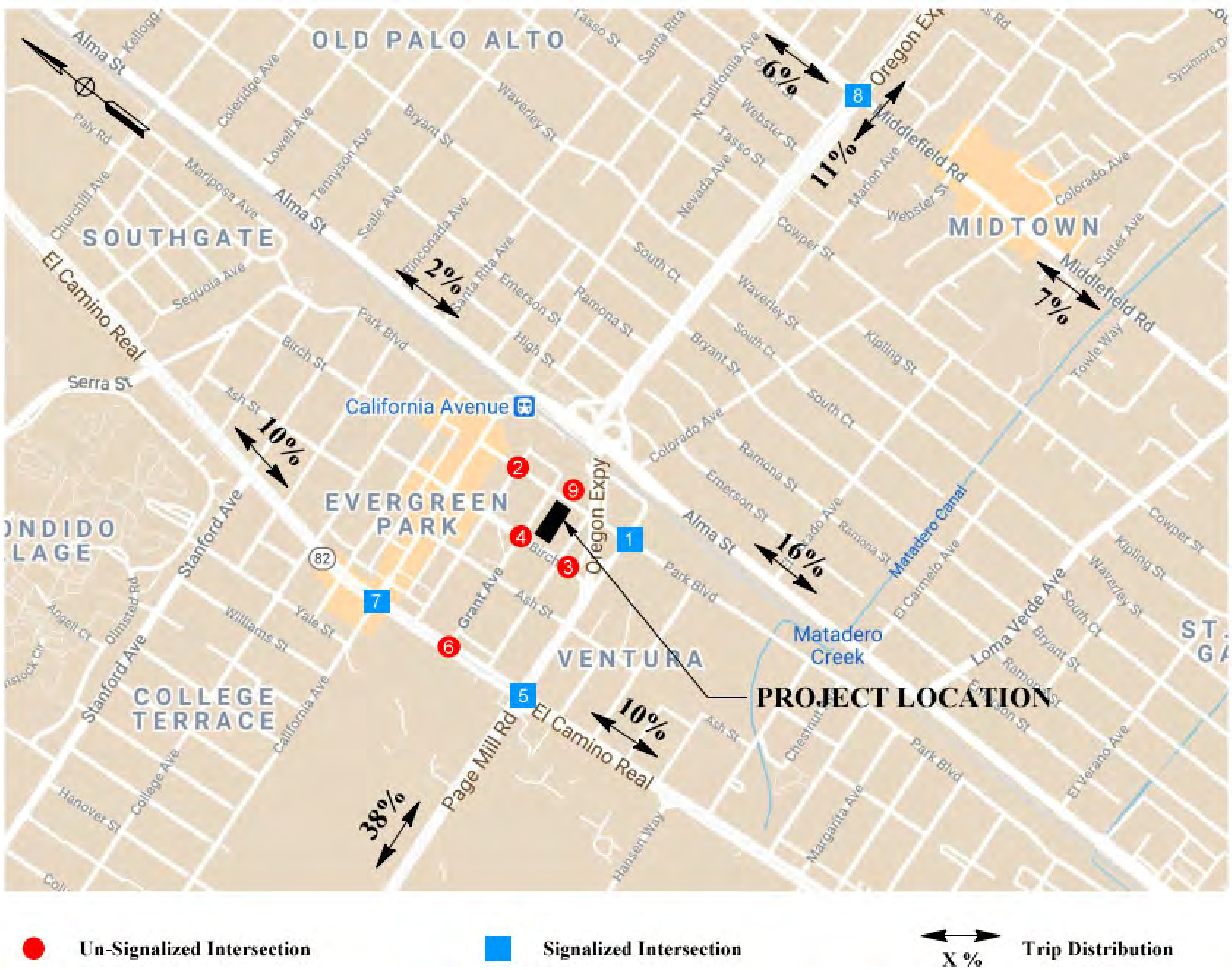


Figure 4-1 Project Trip Distribution

Source: AECOM 2021

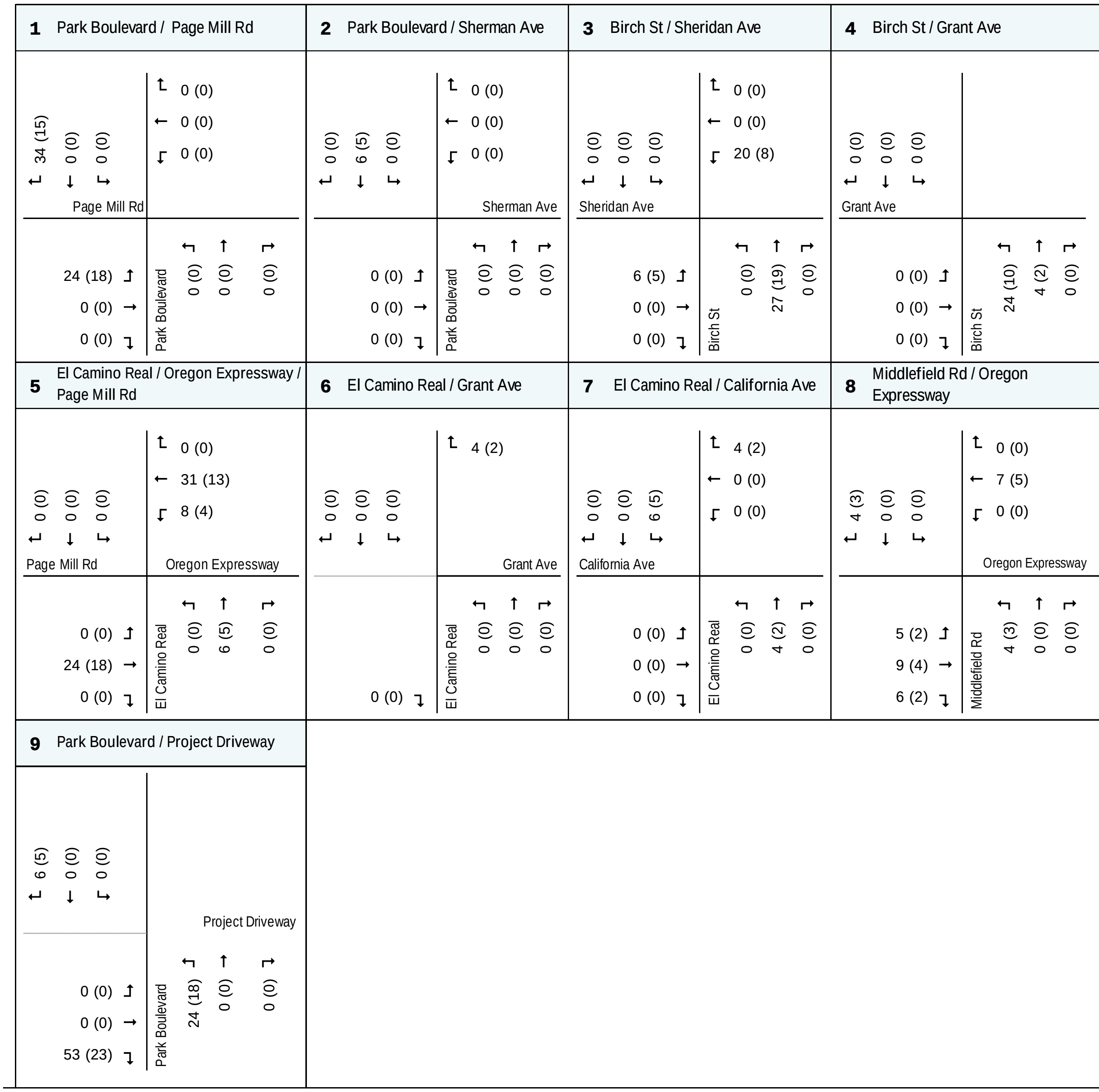


Figure 4-2 Project Only Traffic Volumes

Source: AECOM 2021

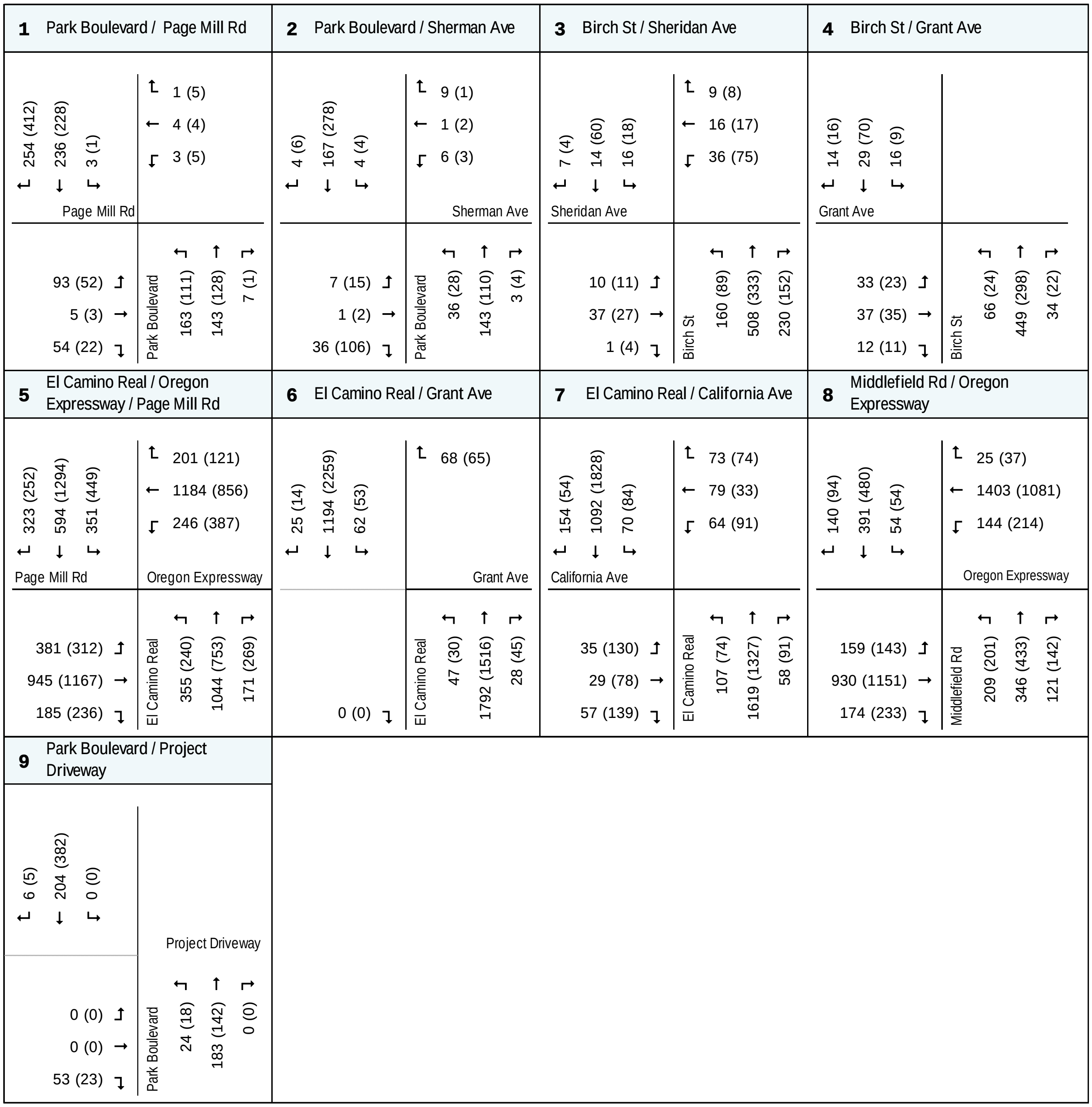


Figure 4-3 Existing plus Project Traffic Volumes

Source: AECOM 2021

4.2 Existing plus Project Conditions

4.2.1 Transit Facilities Impacts

The existing transit facilities in the project vicinity are expected to support the project usage under the 'plus project' conditions. Based on current observations, the bus services and Caltrain would continue to serve the project vicinity and the new transit users from the project are not expected to adversely affect public transit services. In addition, the project would not implement or install any transit impeding facilities that could negatively impact the transit infrastructure. However, due to the additional vehicular project trips, there could be some delay to the bus services in the project area during the AM and PM peak hours. **Table 4-1** summarizes the movement delays through the selected intersections along the routes of the bus service within the study area.

Table 4-3 Transit Impact Analysis - Existing plus Project Conditions

Transit Line	Intersection	Direction/ Movement	Existing Delay (sec)		Existing plus Project Delay (sec)		Change in Delay (sec)	
			AM	PM	AM	PM	AM	PM
22/522	ECR / Oregon Expressway / Page Mill	NB/THRU	56.1	52.9	57.3	53.4	1.2	0.5
		SB/THRU	43.7	44.1	43.9	44.4	0.2	0.3
	ECR / California Ave	NB/THRU	12.8	22	13.2	22.2	0.4	0.2
		SB/THRU	17.4	22.1	17.2	22.1	-0.2	0
89	ECR / California Ave	EB/THRU	64.9	57.2	65.1	57.2	0.2	0
		WB/THRU	63.3	57.2	63.5	57.2	0.2	0
101/102/103 Express	ECR / Oregon Expressway / Page Mill	NB/LEFT	65.6	68.3	66.4	68.9	0.8	0.6
		EB/RIGHT	25.2	30.5	25	30.3	-0.2	-0.2
104 Express	ECR / Oregon Expressway / Page Mill	EB/THRU	30.1	41.5	30.2	41.7	0.1	0.2
		WB/THRU	43.4	36.2	44.1	36	0.7	-0.2
	Middlefield Rd / Oregon Expressway	EB/THRU	31.7	40.2	31.8	40.1	0.1	-0.1
DB1	ECR / Oregon Expressway / Page Mill	EB/THRU	30.1	41.5	30.2	41.7	0.1	0.2
		WB/THRU	43.4	36.2	44.1	36	0.7	-0.2
	Middlefield Rd / Oregon Expressway	EB/THRU	31.7	40.2	31.8	40.1	0.1	-0.1
		WB/THRU	35.2	33.4	35.8	33.5	0.6	0.1
Marguerite RP	ECR / Oregon Expressway / Page Mill	SB/RIGHT	59.9	38.5	60.9	38.7	1	0.2
		EB/LEFT	76.5	58	78.6	58.3	2.1	0.3
	ECR / California Ave	NB/THRU	12.8	22	13.2	22.2	0.4	0.2
		SB/THRU	17.4	22.1	17.2	22.1	-0.2	0
CAFX	ECR / Oregon Expressway / Page Mill	EB/THRU	30.1	41.5	30.2	41.7	0.1	0.2
		WB/THRU	43.4	36.2	44.1	36	0.7	-0.2
	Birch St / Sheridan Ave*	NB/RIGHT	N/A	N/A	N/A	N/A	N/A	N/A
		WB/LEFT	24.2	19.3	30.9	20.5	6.7	1.2
	Park Boulevard / Sherman Ave*	NB/THRU	N/A	N/A	N/A	N/A	N/A	N/A
		SB/THRU						

Source: AECOM, 2021

Notes: Asterisk (*) indicates two-way stop-controlled intersections; N/A = not applicable as movement is uncontrolled; ECR = El Camino Real.

As shown in the table, the expected delay caused by the proposed project for most movements is less than one second, except for the following traffic movements:

- Northbound through movement at the ECR / Oregon Expressway / Page Mill Road intersection (int #5) affecting VTA Line 22 and 522 in the AM peak with a possible added delay of 1.2 seconds.
- Eastbound left movement at the ECR / Oregon Expressway / Page Mill Road intersection (int #5) affecting Marguerite Line RP in the AM peak with a possible added delay of 2.1 seconds.
- Westbound left movement at the Birch Street / Sheridan Avenue intersection (int #3) affecting CAFX Line in the AM peak with a possible added delay of 6.7 seconds.

The total delay increase expected to be experienced by each of these bus services as a result of the project would be less than one minute and, therefore, would not be considered as an adverse impact. Some movements would have a decreased delay, which is likely due to the redistribution of the 'green' time to accommodate the prevailing traffic volumes, which would in turn benefit the bus movements. As such, the project is not expected to significantly impact the transit facilities and services under existing conditions.

4.2.2 Pedestrian and Bicycle Facilities Impacts

The project will not provide additional sections of sidewalks along the project boundary but will re-develop the sidewalks with landscaping features to improve the pedestrian experience. In addition, based on observations of the current usage, the existing sidewalks and crosswalks in the project vicinity are expected to accommodate the usage under the 'plus project' conditions.

Similarly, based on the observations of current usage, the existing bicycle facilities in the project vicinity presented earlier would be sufficient to meet the expected demand of the proposed project. The proposed project would not provide any hazardous design features impeding the use of bicycles; the proposed landscaping near the project driveways is not expected compromise the sight-distance of vehicles (turning in/out), cyclists or pedestrians. Therefore, the project is not expected to adversely impact the pedestrian and bicycle facilities under existing conditions.

Additional discussion of the project site access and circulation is presented later in the report.

4.3 Background plus Project Conditions

4.3.1 Transit Facilities Impacts

The transit facilities in the project vicinity are expected to support the project usage under the background 'plus project' conditions as no changes are expected from the existing conditions. The bus services and Caltrain would continue to serve the project vicinity and the new transit users from the proposed project are not expected to adversely affect public transit services. In addition, the project would not implement or install any transit impeding facilities that could negatively impact the transit infrastructure.

However, due to the additional vehicular project trips in the vicinity, there could be some delay to the bus services in the project area during the AM and PM peak hours. **Table 4-2** summarizes the movement delays through the selected intersections along the routes of the bus service within the study area.

Table 4-4 Transit Impact Analysis - Background plus Project Conditions

Transit Line	Intersection	Direction/ Movement	Background Delay (sec)		Background plus Project Delay (sec)		Change in Delay (sec)	
			AM	PM	AM	PM	AM	PM
22/522	ECR / Oregon Expressway / Page Mill Rd	NB/THRU	49.9	53.6	50.6	54.2	0.7	0.6
		SB/THRU	41.4	43.8	41.7	44.1	0.3	0.3
	ECR / California Ave	NB/THRU	13.6	22.8	14	23.3	0.4	0.5
		SB/THRU	17.7	22.5	17.5	22.5	-0.2	0
89	ECR / California Ave	EB/THRU	65.2	57.5	65.4	57.5	0.2	0
		WB/THRU	62.9	56.8	63.1	56.8	0.2	0
101 / 102 / 103 (Express)	ECR / Oregon Expressway / Page Mill Rd	NB/LEFT	59.6	67.8	60.1	68.4	0.5	0.6
		EB/RIGHT	27.5	30.9	27.3	30.7	-0.2	-0.2
104 (Express	ECR / Oregon Expressway / Page Mill Rd	EB/THRU	33.1	42.6	33.3	42.8	0.2	0.2
		WB/THRU	42.3	36.2	42.4	36	0.1	-0.2
	Middlefield Rd / Oregon Expressway	EB/THRU	31.8	40.8	31.8	41.1	0	0.3
DB1	ECR / Oregon Expressway / Page Mill Rd	EB/THRU	33.1	42.6	33.3	42.8	0.2	0.2
		WB/THRU	42.3	36.2	42.4	36	0.1	-0.2
	Middlefield Rd / Oregon Expressway	EB/THRU	31.8	40.8	31.8	41.1	0	0.3
		WB/THRU	35.6	34.2	36.2	34.6	0.6	0.4
Marguerite RP	ECR / Oregon Expressway / Page Mill Rd	SB/RIGHT	52.6	38.3	53.3	38.6	0.7	0.3
		EB/LEFT	66.6	53.7	68	53.9	1.4	0.2
	ECR / California Ave	NB/THRU	13.6	22.8	14	23.3	0.4	0.5
		SB/THRU	17.7	22.5	17.5	22.5	-0.2	0
CAFX	ECR / Oregon Expressway / Page Mill Rd	EB/THRU	33.1	42.6	33.3	42.8	0.2	0.2
		WB/THRU	42.3	36.2	42.4	36	0.1	-0.2
	Birch St / Sheridan Ave*	NB/RIGHT	N/A	N/A	N/A	N/A	N/A	N/A
		WB/LEFT	25.9	20.8	34.1	22.3	8.2	1.5
	Park Boulevard / Sherman Ave*	NB/THRU	N/A	N/A	N/A	N/A	N/A	N/A
		SB/THRU						

Source: AECOM, 2021

Notes: Asterisk (*) indicates two-way stop-controlled intersections; N/A = not applicable as movement is uncontrolled; ECR = El Camino Real.

As shown in the table, the expected delay caused by the proposed project for most movements is less than one second except for the following traffic movements:

- Eastbound left movement at the ECR / Oregon Expressway / Page Mill Road intersection (int #5) affecting Marguerite Line RP in the AM peak with a possible added delay of 1.4 seconds.
- Westbound left movement at the Birch Street / Sheridan Avenue intersection (int #3) affecting CAFX Line in the AM and PM peak with a possible added delay of 8.2 seconds and 1.5 seconds respectively.

The total delay increase expected to be experienced by each of these bus services as a result of the project would be less than one minute and, therefore, would not be considered as an adverse impact. Some movements would have decreased delay, which could be due to the redistribution of the 'green' time to accommodate the prevailing traffic volumes, which would in turn benefit the bus movements. As such, the project is not expected to significantly impact the transit facilities and services under the background conditions.

4.3.2 Pedestrian and Bicycle Facilities Impacts

No change to the existing pedestrian and bicycle facilities in the project vicinity is expected under the background conditions. Therefore, similar to the 'existing plus project conditions', the bicycle facilities in the project vicinity presented earlier would be sufficient to meet the expected demand of the proposed project. The proposed project would not provide any hazardous design features impeding the use of bicycles; the proposed landscaping near the project driveways is not expected to compromise the sight-distance of vehicles (turning in/out), cyclists or pedestrians. Therefore, the project is not expected to adversely impact the pedestrian and bicycle facilities under the background conditions.

4.4 Cumulative plus Project Conditions

4.4.1 Transit Facilities Impacts

The transit facilities in the project vicinity are expected to support the project usage under the cumulative 'plus project' conditions as transit services evolve to meet the demand of the Bay Area. Bus services and Caltrain are expected to continue serving the project vicinity and new transit users from the proposed project are not expected to adversely affect public transit services. In addition, the project would not implement or install any transit impeding facilities that could negatively impact the transit infrastructure.

However, due to the additional vehicular project trips in the vicinity, there could be some delay to the bus services in the project area during the AM and PM peak hours. **Table 4-3** summarizes the movement delays through the selected intersections along the routes of the bus service within the study area.

Table 4-5 Transit Impact Analysis - Cumulative plus Project Conditions

Transit Line	Intersection	Direction/ Movement	Cumulative Delay (sec)		Cumulative plus Project Delay (sec)		Δ Delay (sec)	
			AM	PM	AM	PM	AM	PM
22/522		NB/THRU	52.1	60.3	53.2	61.3	1.1	1

Transit Line	Intersection	Direction/ Movement	Cumulative Delay (sec)		Cumulative plus Project Delay (sec)		Δ Delay (sec)	
			AM	PM	AM	PM	AM	PM
	ECR / Oregon Expressway / Page Mill Rd	SB/THRU	40.1	46.4	40.3	46.8	0.2	0.4
	ECR / California Ave	NB/THRU	14	23	14.4	23.4	0.4	0.4
		SB/THRU	17.6	23.1	17.5	23.1	-0.1	0
89	ECR / California Ave	EB/THRU	66.9	61.6	67.2	61.6	0.3	0
		WB/THRU	64.1	58.4	64.2	56.4	0.1	-2
101 / 102 / 103 (Express)	ECR / Oregon Expressway / Page Mill Rd	NB/LEFT	62.3	76.9	63.1	77.7	0.8	0.8
		EB/RIGHT	29.4	32.3	29.2	32	-0.2	-0.3
104 (Express	ECR / Oregon Expressway / Page Mill Rd	EB/THRU	35.8	50.3	36	51.1	0.2	0.8
		WB/THRU	48.1	38.4	48.7	38.2	0.6	-0.2
	Middlefield Rd / Oregon Expressway	EB/THRU	35.4	42.8	35.4	43.1	0	0.3
DB1	ECR / Oregon Expressway / Page Mill Rd	EB/THRU	35.8	50.3	36	51.1	0.2	0.8
		WB/THRU	48.1	38.4	48.7	38.2	0.6	-0.2
	Middlefield Rd / Oregon Expressway	EB/THRU	35.4	42.8	35.4	43.1	0	0.3
		WB/THRU	41.6	35.2	42.3	35.6	0.7	0.4
Marguerite RP	ECR / Oregon Expressway / Page Mill Rd	SB/RIGHT	54.7	38.6	55.6	38.8	0.9	0.2
		EB/LEFT	74.7	56.8	76.6	57	1.9	0.2
	ECR / California Ave	NB/THRU	14	23	14.4	23.4	0.4	0.4
		SB/THRU	17.6	23.1	17.5	23.1	-0.1	0
CAFX	ECR / Oregon Expressway / Page Mill Rd	EB/THRU	35.8	50.3	36	51.1	0.2	0.8
		WB/THRU	48.1	38.4	48.7	38.2	0.6	-0.2
	Birch St / Sheridan Ave*	NB/RIGHT	N/A	N/A	N/A	N/A	N/A	N/A
		WB/LEFT	30	23.7	41.9	25.7	11.9	2
	Park Boulevard / Sherman Ave*	NB/THRU	N/A	N/A	N/A	N/A	N/A	N/A
		SB/THRU	N/A	N/A	N/A	N/A	N/A	N/A

Source: AECOM, 2021

Notes: Asterisk (*) indicates two-way stop-controlled intersections; N/A = not applicable as movement is uncontrolled; ECR = El Camino Real.

As shown in the table, the expected delay caused by the proposed project for most movements is less than one second except for the following traffic movements:

- Northbound through movement at the ECR / Oregon Expressway / Page Mill Road intersection (int #5) affecting VTA Line 22 and 522 in the AM and PM peak with a possible added delay of 1.1 seconds and 1.0 second respectively.
- Eastbound left movement at the ECR / Oregon Expressway / Page Mill Road intersection (int #5) affecting Marguerite Line RP in the AM peak with a possible added delay of 1.9 seconds.
- Westbound left movement at the Birch Street / Sheridan Avenue intersection (int #3) affecting CAFX Line in the AM and PM peak with a possible added delay of 11.9 seconds and 2 seconds respectively.

The total delay increase expected to be experienced by each of these bus services as a result of the project would be less than one minute and, therefore, would not be considered as an adverse impact. Some movements would have a decreased delay, which could be due to the redistribution of the 'green' time to accommodate the prevailing traffic volumes, which in turn would benefit the bus movements. As such, the project is not expected to significantly impact the transit facilities and services under the cumulative conditions.

4.4.2 Pedestrian and Bicycle Facilities Impacts

The pedestrian and bicycle facilities in the project vicinity are expected to gradually be upgraded or improved as outlined in the Palo Alto 2030 Comprehensive Plan. It is therefore envisaged that the facilities can satisfy the added demand brought about by users from this project under the cumulative conditions. In addition, the proposed project would not provide any hazardous design features impeding the use of bicycles; the proposed landscaping near the project driveways is not expected to compromise the sight-distance of vehicles (turning in/out), cyclists or pedestrians. Therefore, the project is not expected to adversely impact the pedestrian and bicycle facilities under the cumulative conditions.

4.5 Site Access and Circulation

4.5.1 Project Site Access

As shown in **Figure 2-1**, the project will have two access points (driveways); one each on Birch Street and Park Boulevard. The access points lead to the street-level parking garage for the development.

The access on Park Boulevard would be located approximately 25 feet north of the existing project site access, which would be removed as part of the Project along with the three existing access points on Grant Avenue. The proposed access on Birch Street would be new. Therefore, there would be a net decrease of two access points for the project site as a result of the proposed development. It is expected that the two project driveways will be stop-controlled.

The access on Birch Street will be a 'right-in-right-out' configuration due to the existing center divider. On-street parking is allowed along Birch Street on the same side as the project site. As such, parking prohibition for at least one car length immediately south of the proposed access is recommended to provide additional sight distance for straight-through vehicles as well as those exiting the project site. The project plans to remove all the tress currently lining Birch Avenue at the project perimeter except the one Valley Oak tree at each end. No new trees will be planted between the existing south-end Valley Oak tree and the driveway. As a result, the sight-distance for vehicles looking south of the driveway will not be obstructed. The right-turn sight-triangle measured by AECOM appeared to be more than 200 feet. The project should verify and provide this information. As there is currently no driveway along the project perimeter section of Birch Street, the proposed access presents a new conflicting point for pedestrians and cyclists, especially given that this area is highly walkable and footpaths are provided on both sides of the driveway. Provision of audio and visual warning devices is therefore recommended as a mitigation measure to warn cyclists and pedestrians when a vehicle is approaching the garage exit. Warning signs reminding exiting motorists to watch out and yield to pedestrians should also be provided in the garage before/near the egress. Designs of any sign or devices deviating from the California Manual of Uniform Traffic Control Devices (CA MUTCD) will need approval from both the County and City.

All movements will be possible at the Park Boulevard access. While parking is not allowed adjacent to the proposed driveway, there is a Class II bike lane along both sides of Park Boulevard. On-street parking on the same side as the project is provided north of Grant Avenue which would unlikely affect the sight distance of motorists exiting the project site. There are footpaths on both sides of the proposed access. The project is proposing to retain the existing trees along Park Avenue abutting the site, except the two affected by the new driveway. The current size and spacing of the remaining four trees along Park Avenue are not expected to hinder the sight-distance of the project driveway as the situation will essentially be similar to existing condition. The sight-triangle for both left and right-turn measured by AECOM appeared to be more than 200 feet. . The project should verify and provide this information. The City of Palo Alto was concerned with additional/new access points along the bike boulevard (Park Boulevard). There is currently an access to the project site along Park Boulevard, adjacent to development at 200/230 Sheridan Avenue. The proposed Park Boulevard driveway merely relocates this current access point approximately 25 feet north. No additional access point will be created by the project along Park Boulevard and the exposure to conflict for a pedestrian or cyclist along Park Boulevard remain similar to current condition. However, given the net increase in vehicular trips expected at the driveway, more pedestrians and cyclists are expected to encounter vehicular movement at this driveway. As such, similar to the Birch Street access, provision of audio and visual warning devices is recommended to warn cyclists and pedestrians when a vehicle is approaching the Park Boulevard garage exit. Warning signs reminding exiting motorists to watch out and yield to pedestrians/cyclists should also be provided near the egress. Designs of any sign or devices deviating from the California Manual of Uniform Traffic Control Devices (CA MUTCD) will need approval from both the County and City.

The proposed driveway width for both accesses is 20 feet. This meets the City's minimum design requirement for multi-family parking facility[1]. In addition, this width is sufficient for emergency vehicles, such as ambulances, to access the garage.

4.5.2 Project Site Circulation

The project proposes 90 degree at-grade parking along both sides of a single aisle of the garage, using a stacked system described in more details below. Based on the proposed 8.5 feet wide 90-degree parking stalls provided, a minimum aisle width of 25 feet is needed to meet the City's design requirement. The proposed aisle width is at least 26 feet for the entire span except for the section with ADA compliant stalls which measured to be about 24 feet. This section of under-provision is unlikely to cause any operational issues since the (regular) cars will be mechanically parked and would fit 'nicely' in each stall, giving ample space for vehicles to maneuver. As the parking aisle spans across the entire building (more than 330 feet) and a stacked parking system is proposed, it is recommended that variable message signs displaying parking availability be installed at both entrances to provide advanced information to drivers, avoiding the need to drive down the aisle and turn around unnecessarily.

[1] City of Palo Alto Municipal Code, Section 18.54.070, Table 5

4.5.3 Stacked Parking

The project proposes to implement a stacked parking system for its street-level garage. While the five (5) ADA compliant spaces will be accessed directly at-grade, the remaining 107 spaces will be stacked over two levels. Mechanical lifts with pit will be installed. The project would determine the most efficient way to assign each individual space to the user. A vehicle would drive up to an open space provided in the lift to park. When requested to retrieve a vehicle, the lift will move it to the ground level where the driver would be able get it and drive out like a standard at-grade parking space. During the worse-case scenario, the project could see up to 64 inbound vehicles to the site during the morning peak hour. These 64 vehicles would be distributed about equally between the 2 driveways (34 vehicles via Birch Street and 30 vehicles via Park Boulevard, see **Figure 4-1** for project trips assignment), which means an average of one vehicle entering each driveway almost every 2 minutes. While more details on the stacked parking system, its operation and efficiency will be provided in due course, some systems can park a car in about half a minute[2]. Given the average arrival time of one vehicle per two minutes, it is unlikely that the stacking process would result in significant queuing along the streets.

4.6 Parking Adequacy

This section presents the evaluation of the proposed parking spaces, for both automobile and bicycle, to determine if adequate number of parking spaces will be provided. An evaluation of the proposed number of spaces against requirements from the City of Palo Alto Zoning Code is made for informational purposes only, because County projects are exempt from City zoning and building regulations due to intergovernmental immunity. The County Zoning Ordinance is also not applicable to the project site as it applies to only the unincorporated areas of the County.

4.6.1 Automobile Parking

This project will provide a total of 112 automobile parking spaces, which include five (5) ADA compliant spaces.

The City of Palo Alto Zoning Code for Workforce Housing[3] requires the provision of the greater of one space per unit or bedroom, which equates to 135 spaces based on the number of bedrooms, before any concession or allowable reduction. This should include at least five (5) ADA compliant spaces, based on the 2019 CA Building Code[4]. The required number of automobile parking spaces for the flex space based on the City's code[5] (1 space / 60sf) is 19, including one ADA compliant space.

Table 4-4 below shows how the number of parking spaces is calculated based on the City's requirements.

[2] 2755 El Camino Real Development TIA, Hexagon Transportation Consultants, Inc, January 2018
[3] https://codelibrary.amlegal.com/codes/paloalto/latest/paloalto_ca/0-0-0-55146
[4] https://up.codes/viewer/california/ibc-2018/chapter/new_11B/accessibility-to-public-buildings-public-accommodations-commercial-buildings-and#new_11B-208 (Table 11B-208.2)
[5] https://codelibrary.amlegal.com/codes/paloalto/latest/paloalto_ca/0-0-0-36359#JD_18.52.040 (Table 1)

Table 4-6 Automobile Parking Spaces Calculation

Unit/Area	Requirement Description or Calculation	# of Spaces Required
110 Dwelling Units	Greater of one space per unit or bedroom (Chapter 18.30(K) Table 1)	135
Adjustment 1	*20% reduction due to housing near transit facilities with TDM program (Chapter 18.52.050 Table 4)*	*(27)*
Adjustment 2	*20% reduction due to joint use (shared) parking facilities (Chapter 18.52.050 Table 4)*	*(27)*
Housing Subtotal		**81**
1,120 SF Commercial	1 space / 60 SF	19
Adjustment 1	*20% reduction due to joint use (shared) parking facilities (Chapter 18.52.050 Table 4)*	*(3)*
Commercial Subtotal		**16**
Total Project	Without adjustments = 135 + 19	154
Total Project	With adjustments = 81 + 16	97
Max allowable reduction	*30% of non-adjusted total*	*(46)*
Total required spaces	**= 154 – 46**	**108**

Source: AECOM 2021.

Acronyms: SF = square feet

Given the project is located within the Pedestrian/Transit Oriented area and will have a transportation demand management (TDM) plan, a reduction of 20% of the housing parking space provision is allowed. A further 20% reduction can also be taken due to the shared parking with the flex space. Similarly, a 20% reduction of the required flex space parking is allowed. The total number of automobile parking spaces needed for this development would be 97. However, Chapter 18.52.050 of the code states that "parking reductions may be granted for any combination of circumstances, prescribed by this chapter, so long as in total no more than a 30% reduction of the total parking demand otherwise required occurs…". As such, based on the non-adjusted total of 154 (135 + 19) spaces, the maximum allowable reduction is 46 spaces. The required automobile parking spaces for this development is therefore 108. This should include at least five (5) ADA compliant spaces. The proposed parking provision of 112 spaces including five that are (5) ADA compliant therefore meets the minimum requirements of the City.

According to the 2019 CA Green Building Standards Code, Title 24, Part 11, Section 4.106.4.2 for new multifamily dwelling units, presented in **Appendix C**, 10 percent of the total proposed parking spaces needs to be EV charging spaces. The project proposes to include 12 EV-ready parking spaces (one of which would be van accessible) and therefore meets the requirements of the Green Building Standards Code.

4.6.2 Bicycle Parking

The project will provide a total of at least 154 bicycle parking spaces (134 long-term and 20 short-term). The City of Palo Alto's code (footnote 4) requires one long-term bicycle parking space be provided for each residential unit which equates to 110 spaces and 1 short-term space per 10 DU which equates to 11 spaces. In addition, nine (9) more bicycle parking spaces will be needed for the flex space portion, of which four (4) should be long-term parking. The total number of long and short-term bike spaces required by the City is 114 and 16 respectively. The project's proposal of 134 long term parking spaces and 20 short term bicycle parking spaces will therefore meet and exceed the City’s requirement.

4.7 Vehicle Miles Travelled (VMT)

In September 2013, California Governor Jerry Brown Signed 4.106.4.2 into law. This resulted in the elimination of the traditional measurements in determining significant transportation impact under the California CEQA Guidelines, which took effect statewide as of July 1, 2020. Factors like vehicular delay and intersection levels of service (LOS) that have long been used to quantify roadway capacity and congestion levels will no longer be used. In replacement, the new CEQA Guidelines require the use of VMT as a metric for analysis.

4.7.1 City of Palo Alto Thresholds

While the County of Santa Clara has yet to adopt a VMT Policy, the City of Palo Alto adopted a new set of VMT thresholds of significance for CEQA analysis in June 2020. The new CEQA thresholds of significance for transportation impacts are consistent with the Transportation Element of the City’s Comprehensive Plan. The relevant goals and policies are:

> GOAL T-1: Create a sustainable transportation system, complemented by a mix of land uses, that emphasizes walking, bicycling, use of public transportation and other methods to reduce GHG emissions and the use of single-occupancy motor vehicles.
>
> Policy T-1.3: Reduce GHG and pollutant emissions associated with transportation by reducing VMT and per-mile emissions through increasing transit options, supporting biking and walking, and the use of zero-emission vehicle technologies to meet City and State goals for GHG reductions by 2030.
>
> GOAL T-2: Decrease delay, congestion and VMT with a priority on our worst intersections and our peak commute times, including school traffic.
>
> Policy T-2.3: Use motor vehicle LOS at signalized intersections to evaluate the potential impact of proposed projects, including contributions to cumulative congestion. Use signal warrants and other metrics to evaluate impacts at unsignalized intersections.
>
> Program T2.3.1: When adopting new CEQA significance thresholds for VMT for compliance with SB 743 (2013), adopt standards for vehicular LOS analysis for use in evaluating the consistency of a proposed project with the Comprehensive Plan, and also explore desired standards for MMLOS, which includes motor vehicle LOS, at signalized intersections.
>
> GOAL T-3: Maintain an efficient roadway network for all users.
>
> Policy T-3.3: Avoid major increases in single-occupant vehicle capacity when constructing or modifying roadways unless needed to remedy severe congestion or critical neighborhood traffic problems. Where capacity is increased, balance the needs of motor vehicles with pedestrians and bicyclists.

The adopted VMT thresholds of significance for the City of Palo Alto by project type are presented in **Table 4-5**.

Table 4-7 City of Palo Alto VMT Thresholds of Significance by Project Type

Land Use / Project Type	Threshold of Significance
1. Residential Projects	A proposed project exceeding a level of 15% below existing (baseline) County home-based VMT per resident may indicate a significant transportation impact.
2. Office Projects	A proposed project exceeding a level of 15% below existing (baseline) regional home-based work VMT per employee may indicate a significant transportation impact.
3. Retail Projects	A proposed project that results in a net increase in total (boundary) VMT may indicate a significant transportation impact.
4. Mixed-Use Projects	Each component of a proposed mixed-use project should be evaluated independently and apply thresholds of significance for each project type separately (i.e., residential, office, and retail).
5. Other Project Types	The City will either develop an ad hoc (i.e., project specific) VMT threshold for a unique land use type or apply the most applicable of the above thresholds depending on project characteristics.
6. Redevelopment Projects	Where a proposed project replaces existing VMT-generating land uses, if the replacement leads to a net overall decrease in VMT, the project may cause a less than significant transportation impact. If the redevelopment project leads to a net overall increase in VMT, it may cause a significant transportation impact if proposed new residential, office, or retail land uses would individually exceed their respective thresholds.

Source: City of Palo Alto 2020

In addition, certain projects may qualify for VMT screening based on six criteria presented in **Table 4-6**. Projects screened from requiring a VMT analysis would be considered to have no VMT impact under the State CEQA Guidelines Section 15064.3.

Table 4-8 City of Palo Alto VMT Screening Criteria

Land Use / Project Type	Screening Criteria
1. Small Development	Projects that generate fewer than 110 trips per day. This may equate to non-residential projects of 10,000 sq. ft., or less and residential projects of 20 units or less.
2. Projects in Low-VMT Areas[1]	Residential and office projects located in low-VMT areas that have similar features (i.e., density, mix of uses, transit accessibility) as existing developments in these areas.
3. Projects in Proximity to Major Transit Stops	Projects that are located within a half mile of an existing or planned high-quality transit corridor or major transit stations, and meet the following additional criteria: (1) is high density (minimum floor area ratio of 0.75), (2) does not exceed parking requirements, (3) is consistent with *Plan Bay Area 2040* (http://2040.planbayarea.org/), and (4) does not replace affordable units with smaller numbers of moderate- or above moderate-income units.
4. Affordable Housing	100% affordable housing projects in infill locations.
5. Local-Serving Retail[2]	Retail projects of 10,000 sq. ft. or less.
6. Transportation Projects	Roadway, transit, bicycle and pedestrian projects that do not lead to a measurable increase in vehicle travel.

Source: City of Palo Alto 2020.

Notes:

1. Residential projects located in areas where baseline VMT is 15 percent below the existing county average per resident and office projects located in areas where baseline VMT is 15 percent below the existing regional average per employee could be considered to be in low-VMT areas and presumed to have a less than significant VMT impact.
2. OPR indicates that local-serving retail up to 50,000 square feet may be presumed to create less-than-significant VMT impact. However, local-serving retails and lots in Palo Alto are typically smaller. Thus, Palo Alto adopts 10,000 square feet as the City's local-serving retail screening criteria, which also constitutes a small project that would be screened out under CEQA.

4.7.2 Evaluation Results

In accordance with the City's VMT threshold of significance #4, each component of a proposed mixed-use project should be evaluated independently and apply thresholds of significance for each project type separately (i.e., residential, office, and retail).

The proposed 1,120 square feet of proposed flex space, potentially to be used for retail services like a small eatery or coffee shop, would qualify as small local-serving retail of less than 10,000 square feet. As such, the retail component of the Project meets the City's screening criteria #5 and, therefore, a significant VMT impact would not be anticipated for the retail component of the project.

The Santa Clara Countywide VMT Evaluation Tool provided by the Valley Transportation Authority (VTA), shows that the county average for Home-Based VMT per Capita is 13.33 for 2020. Using this VMT Evaluation Tool, it is determined that the existing (baseline) Home-Based VMT per Capita for the project area is 6.05, estimated based on similar developments in the planning zone (refer **Appendix D**). This is significantly lower than the applicable threshold of 11.33 (i.e., 15 percent less than the countywide average of 13.33), meaning that the project site is within a "low-VMT area." Because the project site is within a low-VMT area, and because the project would have a similar density, mix of uses, and transit accessibility as other existing developments in the area, the project meets the City's Screening Criteria 2 and, therefore, a significant VMT impact would not be anticipated for the residential component of the Project.

Because both the retail and residential components of the Project would meet the City's screening criteria for VMT analysis, the project would be screened out from further analysis and the VMT impact can be assumed to be less than significant.

Although the retail and residential portions of the project meet the City's screening criteria, VMT for the Project was still calculated using the Santa Clara Countywide VMT Evaluation Tool, for information only (refer Appendix D). Based on the key project characteristics (110 residential units, 1,125 SF retail use[6], 112 parking spaces, and 134 bicycle parking spaces), the expected Home-Based VMT per Capita for the project would be 5.45. This is also significantly lower than the applicable threshold of 11.33 (i.e., 15 percent less than the countywide average of 13.33). Therefore, the project would not be expected to create a significant VMT impact.

In conclusion, this project, both the residential development and the small commercial/retail area, is not expected to have any VMT impacts based on the screening process adopted by the City of Palo Alto.

[6] The VMT Evaluation Tool requires rounding to the nearest 1,000 square feet, therefore 1,125 was rounded down to 1,000 square feet.

4.8 Transportation Demand Management (TDM)

The developer for this project is committed to ensure that alternatives to drive-alone commute trips are available to the project residents. Work is currently in progress to develop a comprehensive TDM program that will be shared and discussed with the County and City of Palo Alto.

It is recommended that a monitoring program of the proposed TDM measures should also be in placed to ensure the effectiveness of the proposal.

4.9 Construction Traffic

Construction for this project is expected to begin in mid-2022 and could coincide with the construction of the Palo Alto Public Safety Building and Public Parking Structure (PSB) located one block north of the project site. The project developer is committed to work with the City of Palo Alto and contractors of the PSB to ensure the construction activities are coordinated as much as practically feasible to minimize inconvenience to residents and road users in the affected areas. The construction of this project will adhere to the permitting guidelines set out by the City of Palo Alto. In particular, the Traffic Control Plan will follow the City's latest 'Traffic Control Plan Requirement' and 'Public Works Standard Specifications', such that the required notices are posted timely, making sure that work is performed within the allowable time periods and construction trucks use the designated truck routes, for example. The contractors will also adhere to stipulated requirements for working in the City's right-of-way, including dust, noise, and pollution controls. In addition, on-site staff will park at public parking areas within a quarter mile of the project site.

Construction staging will be along the street frontages immediately abutting the site. Before construction begins, the construction contractor will prepare and implement a traffic control plan as part of the project, in consultation with the City of Palo Alto. The traffic control plan (TCP) would include the following:

- Development and implementation of a process for communicating with affected residents and landowners about the Project. The public notice will include the posting of notices and the installation of appropriate signage regarding construction activities. The written notifications will consist of information related to the construction schedule, the exact location and duration of activities on each roadway, detours and alternative routes that may be available to avoid delays and contact information for questions and complaints.
- Identification of work hours and haul routes, road and lane closures, detour routes, work areas, staging areas, worker parking areas, and determination of traffic control methods to reduce conflicts, and will include identification and coordination with potential road or lane closures or detours associated with construction of the nearby Public Safety Building project at 350 Sherman Street.
- Posting of appropriate warning signs in advance of construction activities, alerting bicyclists and pedestrians to any closures of nonmotorized facilities.
- Notification of administrators of any affected police and fire stations, ambulance service providers, transit providers, and recreational facility managers regarding the timing, location, and duration of construction activities and the locations of detours

and road or lane closures. Access for emergency vehicles in and/or adjacent to roadways affected by construction activities will be maintained at all times.

- The repair and restoration of any damaged or deteriorated roadway rights-of-way / facilities according to the agency's guidelines after construction is completed.
- Scheduling equipment/deliveries during off-peak vehicular commuter hours and use of flaggers for large equipment.

While some road, lane, and sidewalk closures or narrowing are expected during certain phases of project construction, adequate notices and warning signs will be put up to inform and direct the affected road users to keep the inconvenience to a minimum. In particular, one-way traffic controls and temporary closure of on-street parking would be required on Grant Avenue between Park Boulevard and Birch Avenue throughout the majority of the construction period. Periodical closure of Grant Avenue is also expected to allow for crane mobilization and/or concrete pours, including a full closure for 4 to 8 weeks during crane setting of modular units. Lane closures on Birch Avenue (northbound side of median only) and Park Boulevard may also be required occasionally, including two days each for crane setting of the far southwest and far southeast modular units, respectively.

The transportation of construction material and modular components to the project site will be via the City's permitted truck entry/exit point of US 101-Oregon Expressway and adhere to the City's allowable truck route. Any deviation, if needed will be approved by the City. Full police escort will be deployed when transporting wider modular units.

5 Conclusions

This proposed educator workforce housing project is located at 231 Grant Avenue in the City of Palo Alto, California. The proposal is to develop a new four-story mixed-use complex on an existing office area. Having evaluated the current and future conditions of the pedestrian, bicycle, and transit infrastructures in the vicinity of the project, the study concluded that this project would not lead to any significant impacts these facilities in general except at the project access points. The expected VMT for the development falls below the City's threshold and no significant impact is expected. In addition, the evaluation also concluded that the number of proposed automobile parking meets the City of Palo Alto's requirement for the overall total number of spaces (for both gasoline and electric vehicles) and ADA compliance. The geometric design of its driveways also meets the City standard. The City's requirements for bicycle parking are also met by the project.

The project would not provide installations that could interfere with the transit facilities in the project vicinity under the 'existing', 'background' and 'cumulative' conditions and the infrastructure is expected to accommodate the additional users from the project. A slight increase in delay is expected to be experienced by several bus services at the selected intersections in the project vicinity. However, the total increase for each of the affected line is expected to be less than one minute. Considering all aspects, the project will not have significant impacts on the transit facilities in the project vicinity.

The re-developed sidewalks with landscaping surrounding the project site would enhance the walking experience and is not expected to compromise the sight-distance of the project driveways. While the public pedestrian and bicycle infrastructure is expected to accommodate the additional users due to the project, the new access along Birch Street and the expected increase in trips using the Park Boulevard driveway could increase the frequency for conflicts between motorized and non-motorized road users. However, the project would result in a net decrease in the number of driveways (by two accesses) thereby reducing the overall conflict among the different road users. Installation of audio and visual warning devices (of exiting vehicles from the project garage) and warning signs for exiting drivers is recommended for both the Birch Street and Park Boulevard project site accesses.

The geometric design of the driveways and the proposed parking aisle meet the City's design standards which also allows emergency vehicles, such as ambulances, to access the garage. However, a short section of the parking aisle width measures less than the City's design requirement of 25 feet. No operational issues are expected as the (regular) vehicles will be neatly arranged by the stacked parking system giving ample space for vehicles to maneuver. The proposed stacked parking system is also unlikely to cause significant queuing along the public given the longer average vehicle arrival time compared to the expected efficiency of the system.

The number total number of proposed automobile parking spaces, including ADA compliant spaces, on-site meets the City's requirement. The EV parking provision also satisfies the City's code. Similarly, the long and short-term bicycle parking spaces to be provided meet and exceed the City's requirement.

The project is expected to produce VMT below the City's threshold and no significant impact is expected. The residential portion is screened out based it being located within a low VMT area and the project specific VMT is also below the City's threshold. The commercial/retail portion is screened out based on its small size and local serving feature.

For temporary traffic conditions during project construction, the contractor will work closely with the City of Palo Alto, adhering to the permitting requirements in preparing and implementing the traffic control plan. Coordination with other concurrent constructions in the vicinity will be made to minimize the convenience to affected road users.

6 References

City of Palo Alto, 2017. City of Palo Alto Comprehensive Plan.

City of Palo Alto, December 2020. Personal Communication. Emails between Shrupath Patel, City of Palo Alto Transportation Planner, and Nichole Seow, AECOM Transportation Planner.

Fehr & Peers, May 2018. Traffic Impact Analysis, Palo Alto Public Safety Building and Public Parking Structure.

Hexagon Transportation Consultants, Inc., January 2018. Traffic Impact Analysis, 2755 El Camino Real Redevelopment Project.

Institute of Transportation Engineers' (ITE) 2017. Trip Generation Manual (10th Edition).

Mercy Housing and Abode Communities, 2020. Conceptual Project Plans for 231 Grant Educator Workforce Housing project.

VTA Bikeways Map June 2020

APPENDICES

APPENDIX A

City of Palo Alto Comprehensive Plan 2030

Study Scenarios Summary

Comp Plan Key Characteristics

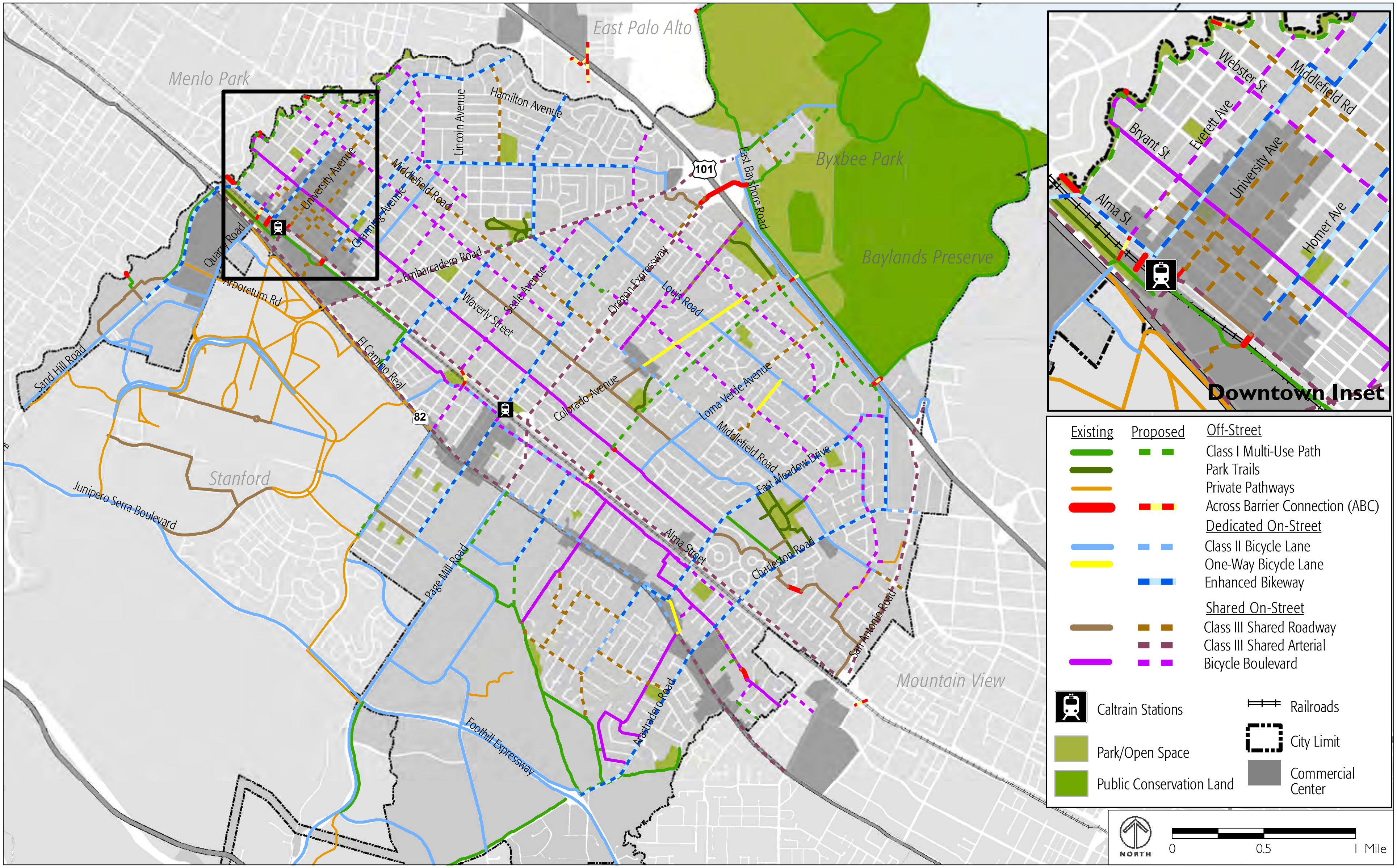
	Existing (2014)	Scenario 1 (2030)	Scenario 2 (2030)	Scenario 3 (2030)	Scenario 4 (2030)	Scenario 5 (2030)	Scenario 6 (2030)	Preferred Scenario - Low (2030)	Preferred Scenario - High (2030)	Preferred Scenario - Mid-Point (2030)	Preferred Scenario - Council Reduced (2030)	No Growth (2030)	
POPULATION													
Additional residents in City	--	6,599	6,599	8,436	10,455	8,436	14,078	8,432	10,455	9,444	9,444	1,233	
Additional residents in City + SOI	--	9,405	9,405	11,242	13,261	11,242	16,884	11,238	13,261	12,250	12,250	1,233	
Total in City	65,686	72,284	72,284	74,121	76,141	74,121	79,764	74,118	76,141	75,130	75,130	66,919	
Total in City + SOI	80,806	90,210	90,210	92,047	94,067	92,047	97,690	92,044	94,067	93,056	93,056	82,039	
Average household size in City	2.40	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.40	
Average household size in SOI	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
HOUSING													
Additional housing units in City	--	2,720	2,720	3,546	4,418	3,546	6,000	3,547	4,418	3,983	3,983	540	
Additional housing units in City + SOI	--	3,881	3,881	4,707	5,579	4,707	7,161	4,707	5,579	5,143	5,143	540	
Total in City	28,546	31,266	31,266	32,092	32,964	32,092	34,547	32,093	32,964	32,529	32,529	29,086	
Total in City and SOI	33,071	36,952	36,952	37,778	38,650	37,778	40,233	37,778	38,650	38,214	38,214	33,611	
JOBS													
Gain in City	--	15,482	9,853	12,758	15,482	8,869	8,869	9,853	11,500	10,677	7,321	3,882	
Total in City	95,458	110,940	105,311	108,216	110,940	104,327	104,327	105,311	106,958	106,135	102,779	99,340	*Note: assumes same SOI*
Total in City + SOI	100,829	116,700	111,071	113,977	116,700	110,087	110,087	111,072	112,719	111,895	108,539	104,711	*buildout as Scenarios 1-4*
EMPLOYED RESIDENTS													
City	31,165	34,696	34,696	35,578	36,548	35,578	38,287	35,577	36,548	36,062	36,062	32,121	
City + SOI	36,004	40,595	40,595	41,421	42,330	41,421	43,960	41,420	42,330	41,875	41,875	36,918	
JOBS/EMPLOYED RESIDENTS RATIO													
City	3.06	3.20	3.04	3.04	3.04	2.93	2.72	2.96	2.93	2.94	2.85	3.09	
City + SOI	2.80	2.87	2.74	2.75	2.76	2.66	2.50	2.68	2.66	2.67	2.59	2.84	

Date Modified: 5/26/2017

APPENDIX B

City of Palo Alto Comprehensive Plan 2030

Bikeway Map



Source: City of Palo Alto, 2016; PlaceWorks, 2016.

MAP T-3

BIKEWAYS IN PALO ALTO

APPENDIX C

2019 CA Green Building Standards

Code for EV Provision

3. Compliance with a lawfully enacted storm water management ordinance.

Note: Refer to the State Water Resources Control Board for projects which disturb one acre or more of soil, or are part of a larger common plan of development which in total disturbs one acre or more of soil.

(Website: https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html)

4.106.3 Grading and paving. Construction plans shall indicate how the site grading or drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales
2. Water collection and disposal systems
3. French drains
4. Water retention gardens
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.

Exception: Additions and alterations not altering the drainage path.

4.106.4 Electric vehicle (EV) charging for new construction. New construction shall comply with Section 4.106.4.1, 4.106.4.2, or 4.106.4.3, to facilitate future installation and use of EV chargers. Electric vehicle supply equipment (EVSE) shall be installed in accordance with the *California Electrical Code,* Article 625.

Exceptions:

1. On a case-by-case basis, where the local enforcing agency has determined EV charging and infrastructure are not feasible based upon one or more of the following conditions:
   1.1. Where there is no commercial power supply.
   1.2. Where there is evidence substantiating that meeting the requirements will alter the local utility infrastructure design requirements on the utility side of the meter so as to increase the utility side cost to the homeowner or the developer by more than $400.00 per dwelling unit.
2. Accessory Dwelling Units (ADU) and Junior Accessory Dwelling Units (JADU) without additional parking facilities.

4.106.4.1 New one- and two-family dwellings and townhouses with attached private garages. For each dwelling unit, install a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device.

4.106.4.1.1 Identification. The service panel or subpanel circuit directory shall identify the overcurrent protective device space(s) reserved for future EV charging as "EV CAPABLE". The raceway termination location shall be permanently and visibly marked as "EV CAPABLE".

4.106.4.2 New multifamily dwellings. If residential parking is available, ten (10) percent of the total number of parking spaces on a building site, provided for all types of parking facilities, shall be electric vehicle charging spaces (EV spaces) capable of supporting future EVSE. Calculations for the required number of EV spaces shall be rounded up to the nearest whole number.

Notes:

1. Construction documents are intended to demonstrate the project's capability and capacity for facilitating future EV charging.
2. There is no requirement for EV spaces to be constructed or available until EV chargers are installed for use.

4.106.4.2.1 Electric vehicle charging space (EV space) locations. Construction documents shall indicate the location of proposed EV spaces. Where common use parking is provided at least one EV space shall be located in the common use parking area and shall be available for use by all residents.

4.106.4.2.1.1 Electric vehicle charging stations (EVCS). When EV chargers are installed, EV spaces required by Section 4.106.4.2.2, Item 3, shall comply with at least one of the following options:

1. The EV space shall be located adjacent to an accessible parking space meeting the requirements of the *California Building Code*, Chapter 11A, to allow use of the EV charger from the accessible parking space.
2. The EV space shall be located on an accessible route, as defined in the *California Building Code,* Chapter 2, to the building.

Exception: Electric vehicle charging stations designed and constructed in compliance with the *California Building Code*, Chapter 11B, are not required to comply with Section 4.106.4.2.1.1 and Section 4.106.4.2.2, Item 3.

Note: Electric vehicle charging stations serving public housing are required to comply with the *California Building Code*, Chapter 11 B.

4.106.4.2.2 Electric vehicle charging space (EV space) dimensions. The EV spaces shall be designed to comply with the following:

1. The minimum length of each EV space shall be 18 feet (5486 mm).

APPENDIX D

VMT Evaluation Summary

Project Details

Timestamp of Analysis: February 08, 2021, 11:51:47 PM

Project Name: 231 Grant Avenue Educator Housing Development Project

Project Description: To provide 110 Units of housing development that includes a small flex space for potential commercial use.

Project Location

Jurisdiction:
Palo Alto

APN	TAZ
13231005	441
13231074	440

Inside Transit Priority Area (TPA)?
Yes (Pass)

Analysis Details

Santa Clara Countywide VMT Evaluation Tool Version: 1

Data Version: VTA Countywide Model December 2019

Analysis Methodology: TAZ

Baseline Year: 2020

Project Land Use

Residential:

Single Family DU:

Multifamily DU:

Total DUs: 0

Non-Residential:

Office KSF:

Local Serving Retail KSF:

Industrial KSF:

Residential Affordability (percent of all units):

Extremely Low Income: 0 %

Very Low Income: 0 %

Low Income: 0 %

Parking:

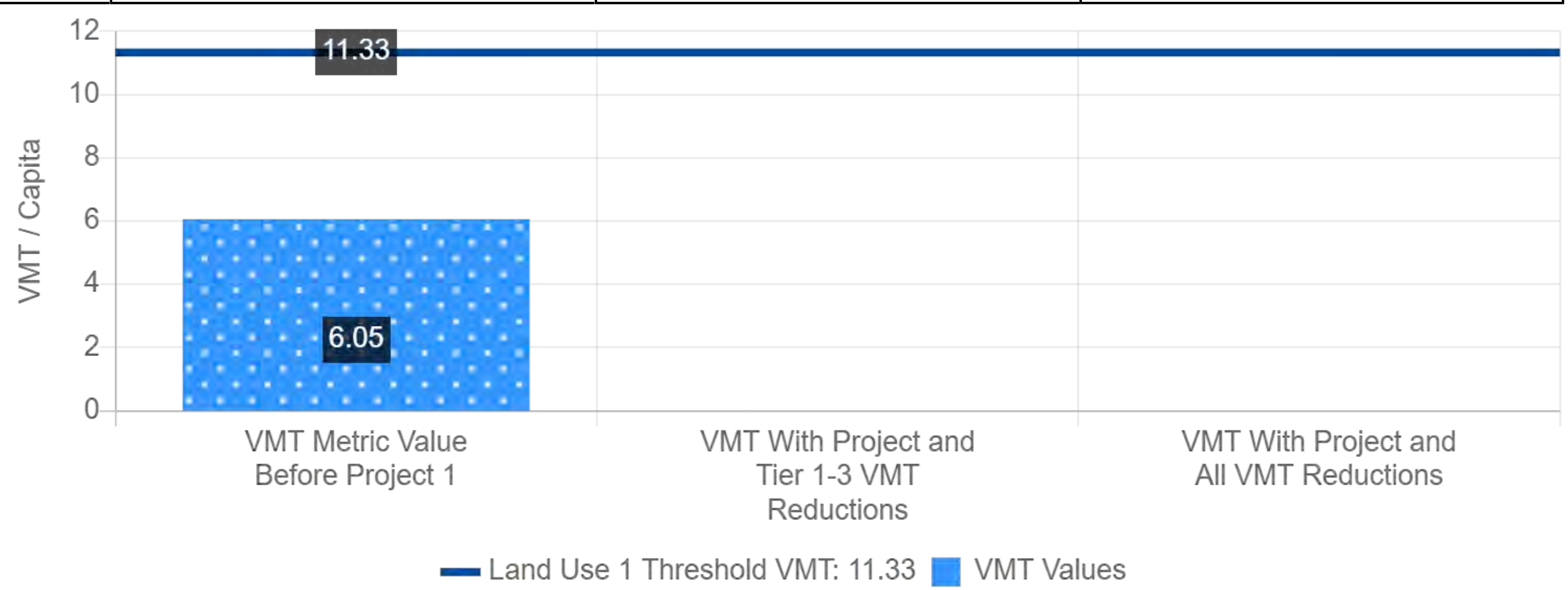
Motor Vehicle Parking:

Bicycle Parking:

Residential Vehicle Miles Traveled (VMT) Screening Results

Land Use Type 1:	Residential
VMT Without Project:	Home-based VMT per Capita
VMT Baseline Description 1:	County Average
VMT Baseline Value 1:	13.33
TAZ:	440
VMT Threshold Description 1:	-15%
Land Use 1 has been Pre-Screened by the Local Jurisdiction:	N/A

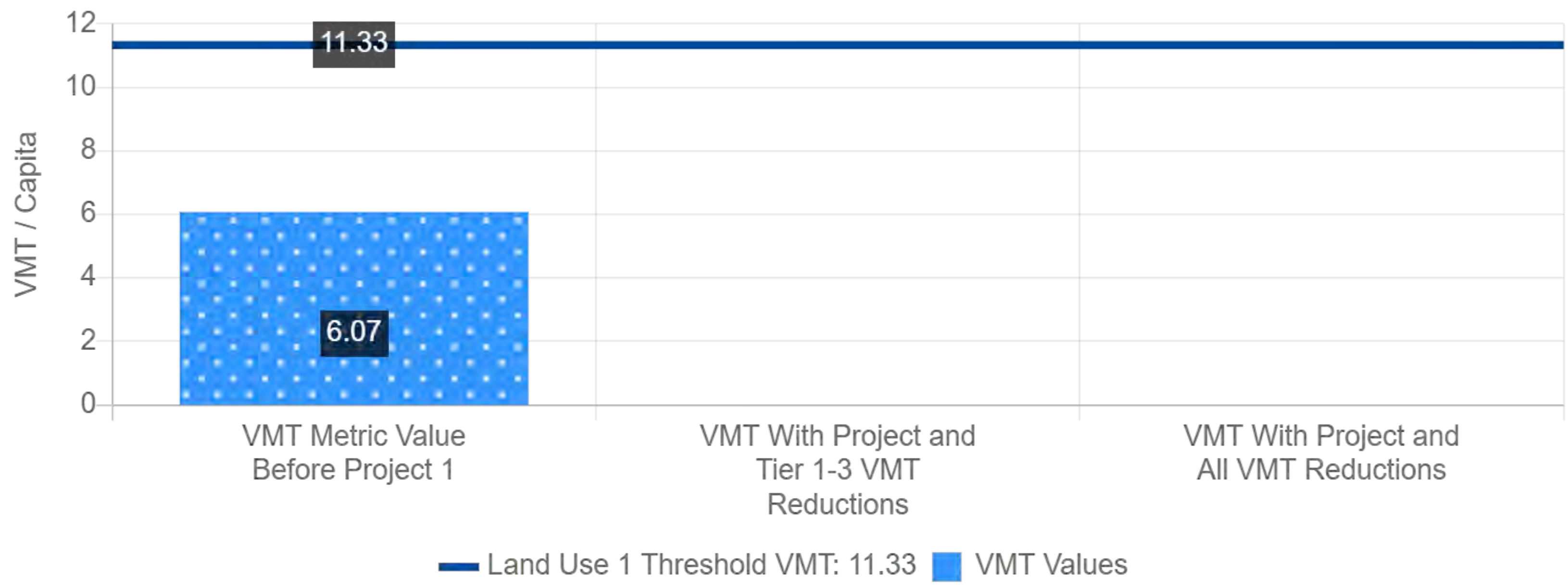
	Without Project	With Project & Tier 1-3 VMT Reductions	With Project & All VMT Reductions
Project Generated Vehicle Miles Traveled (VMT) Rate	6.05	null	null
Low VMT Screening Analysis	Yes (Pass)	null	null



Residential Vehicle Miles Traveled (VMT) Screening Results

Land Use Type 1:	Residential
VMT Without Project:	Home-based VMT per Capita
VMT Baseline Description 1:	County Average
VMT Baseline Value 1:	13.33
TAZ:	441
VMT Threshold Description 1:	-15%
Land Use 1 has been Pre-Screened by the Local Jurisdiction:	N/A

	Without Project	With Project & Tier 1-3 VMT Reductions	With Project & All VMT Reductions
Project Generated Vehicle Miles Traveled (VMT) Rate	6.07	null	null
Low VMT Screening Analysis	Yes (Pass)	null	null



Santa Clara Countywide VMT Evaluation Tool Report

Project Details

Timestamp of Analysis:	July 20, 2021, 03:48:35 PM
Project Name:	231 Grant Educator Workforce Housing Project
Project Description:	110 residential units with 1,100 SF of "flex space" for commercial (cafe or other retail) use.

Project Location

Jurisdiction:
Palo Alto

APN	TAZ
13231074	440

Inside Transit Priority Area (TPA)?
Yes (Pass)

Analysis Details

Santa Clara Countywide VMT Evaluation Tool Version:	1
Data Version:	VTA Countywide Model December 2019
Analysis Methodology:	TAZ
Baseline Year:	2020

Project Land Use

Residential:

Single Family DU:	
Multifamily DU:	110
Total DUs:	110

Non-Residential:

Office KSF:	
Local Serving Retail KSF:	1
Industrial KSF:	

Residential Affordability (percent of all units):

Extremely Low Income:	0 %
Very Low Income:	0 %
Low Income:	0 %

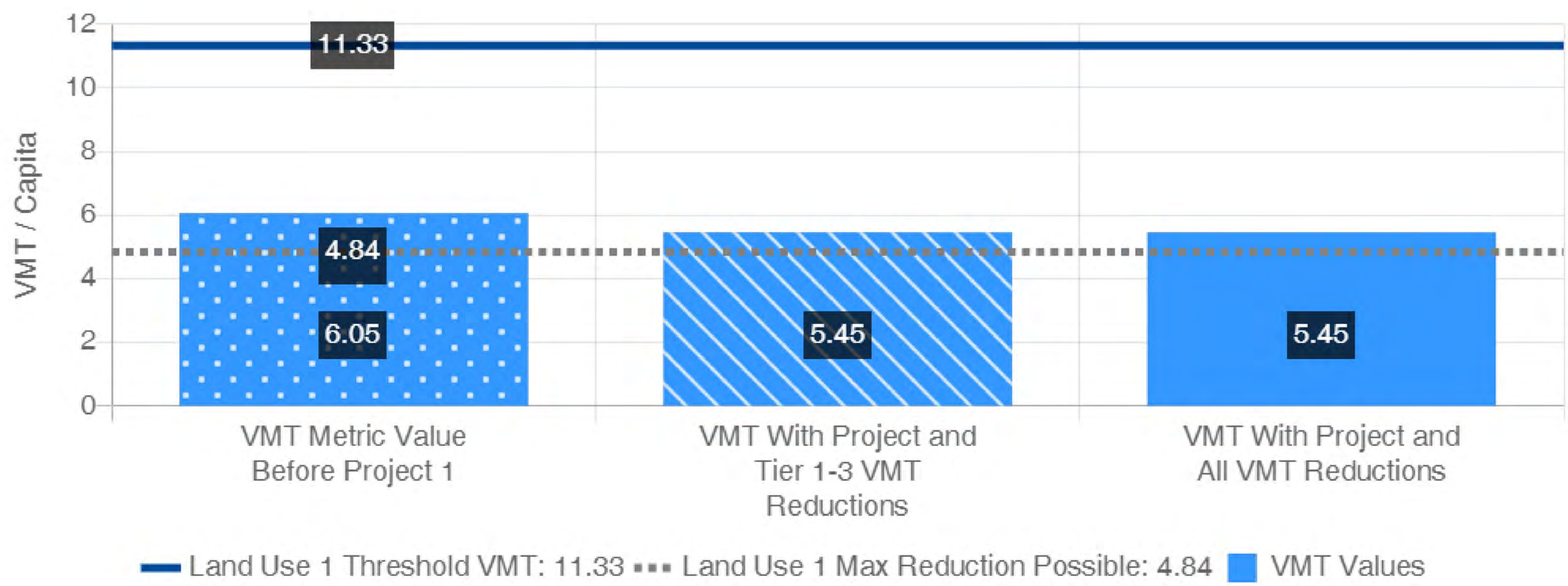
Parking:

Motor Vehicle Parking:	112
Bicycle Parking:	134

Residential Vehicle Miles Traveled (VMT) Screening Results

Land Use Type 1:	Residential
VMT Without Project:	Home-based VMT per Capita
VMT Baseline Description 1:	County Average
VMT Baseline Value 1:	13.33
VMT Threshold Description 1:	-15%
Land Use 1 has been Pre-Screened by the Local Jurisdiction:	N/A

	Without Project	With Project & Tier 1-3 VMT Reductions	With Project & All VMT Reductions
Project Generated Vehicle Miles Traveled (VMT) Rate	6.05	5.45	5.45
Low VMT Screening Analysis	Yes (Pass)	Yes (Pass)	Yes (Pass)



Tier 1 Project Characteristics

PC01 Increase Residential Density

Existing Residential Density:	15.95
With Project Residential Density:	83.44

PC02 Increase Residential Diversity

Existing Residential Diversity Index:	0.86
With Project Residential Diversity Index:	0.77

PC03 Affordable Housing

PC04 Increase Employment Density

Existing Employment Density:	166.38
With Project Employment Density:	167.04

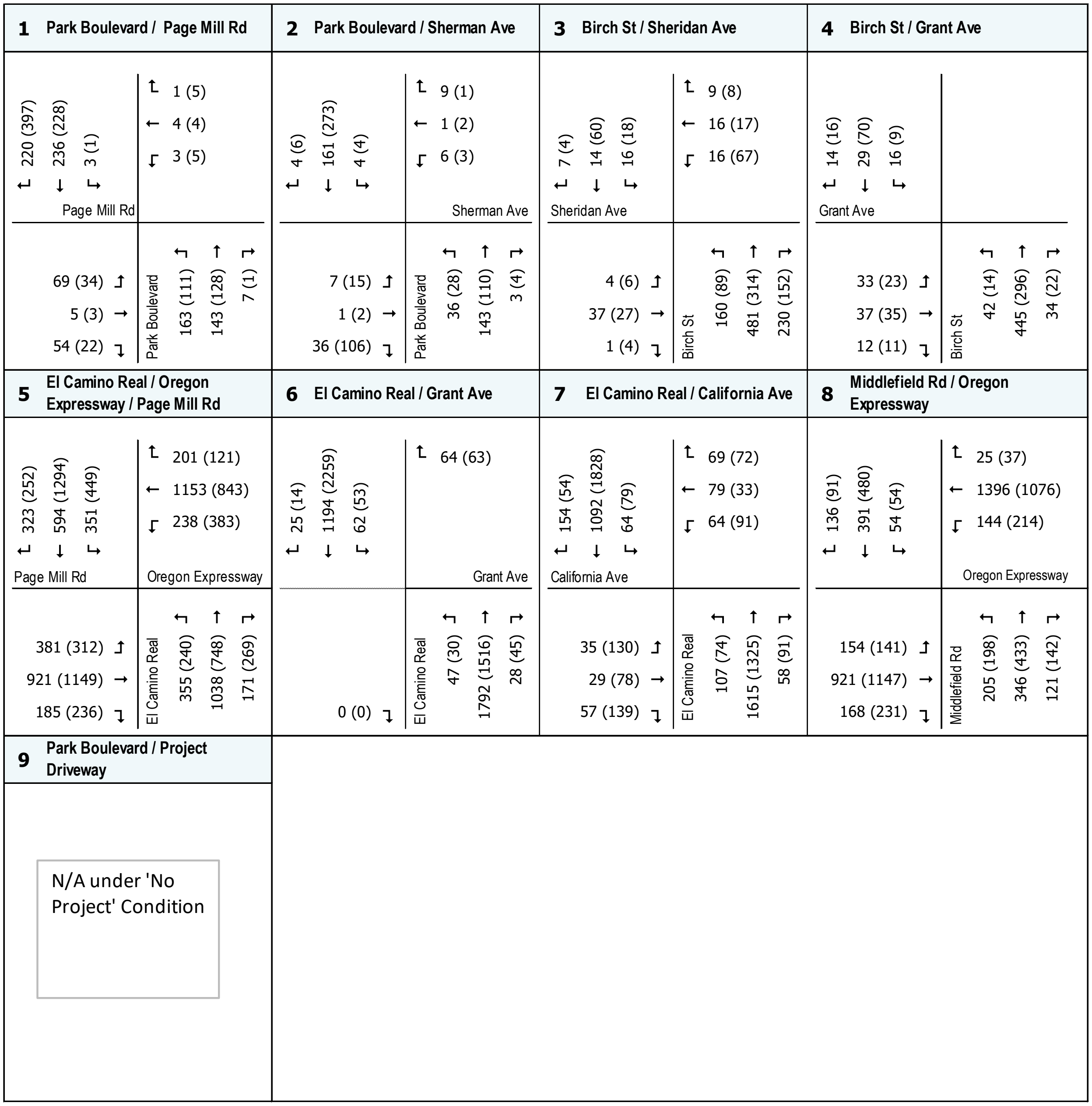
Tier 2 Multimodal Infrastructure

Tier 3 Parking

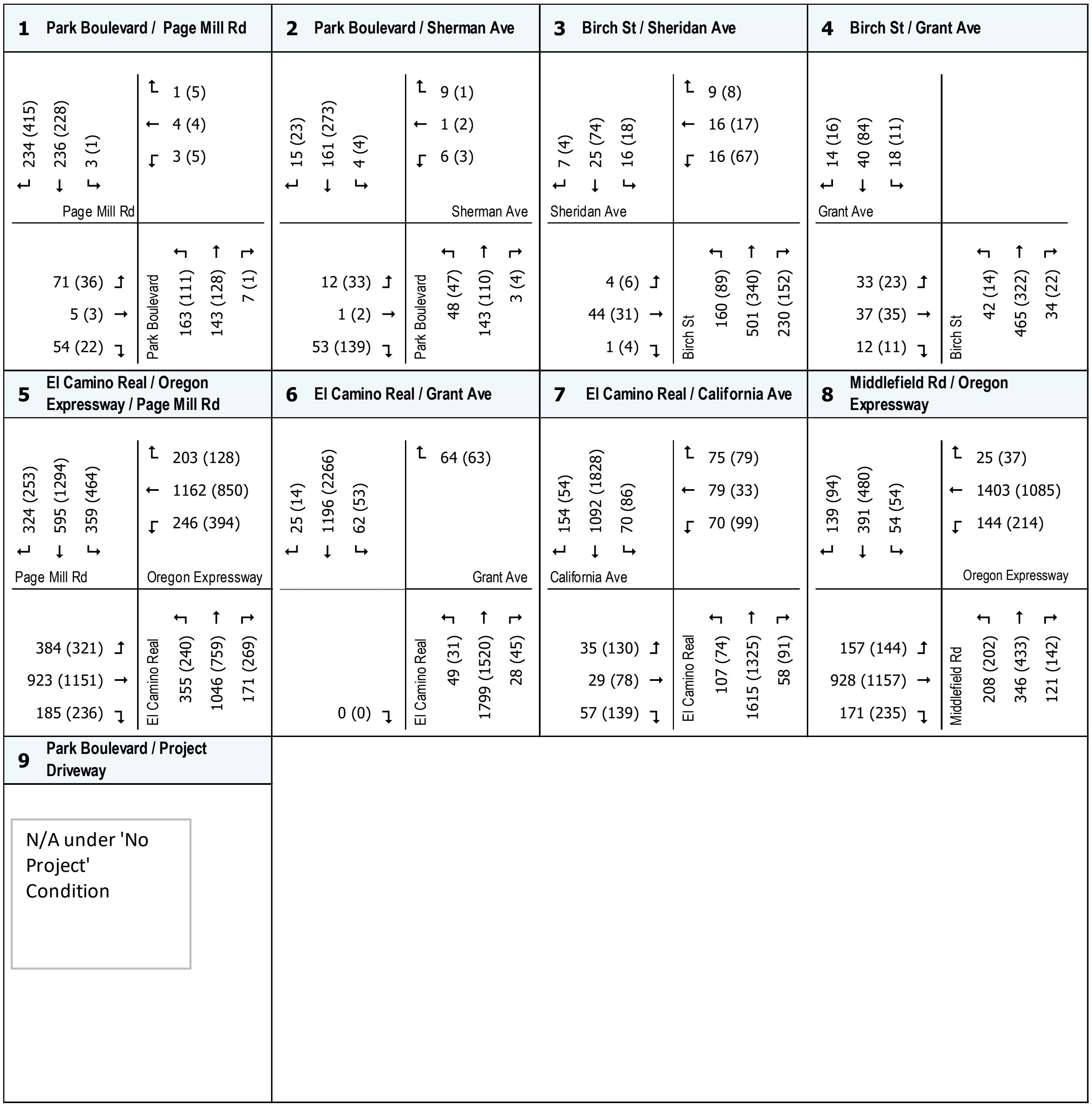
Tier 4 TDM Programs

APPENDIX E

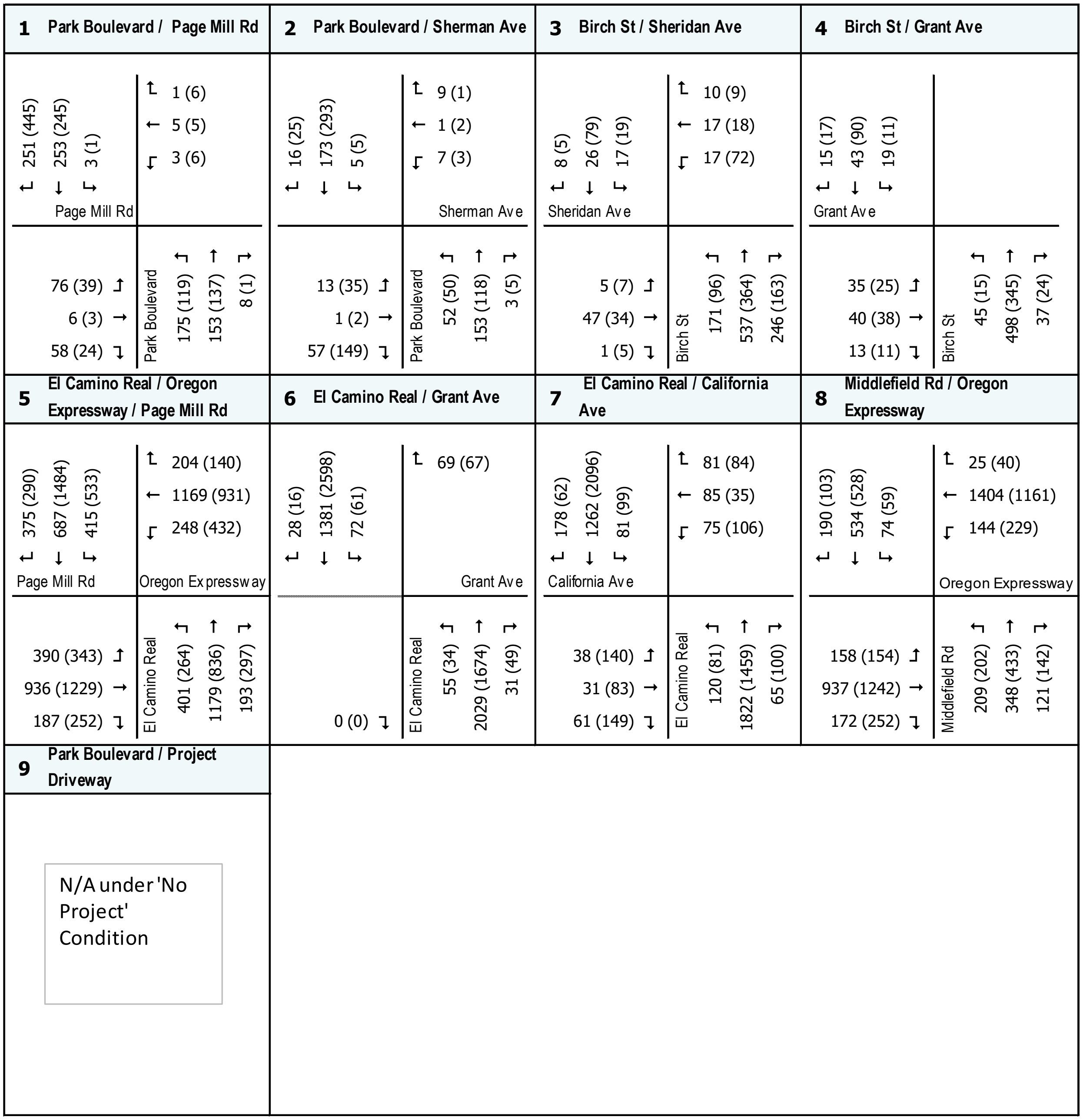
Intersection Volumes



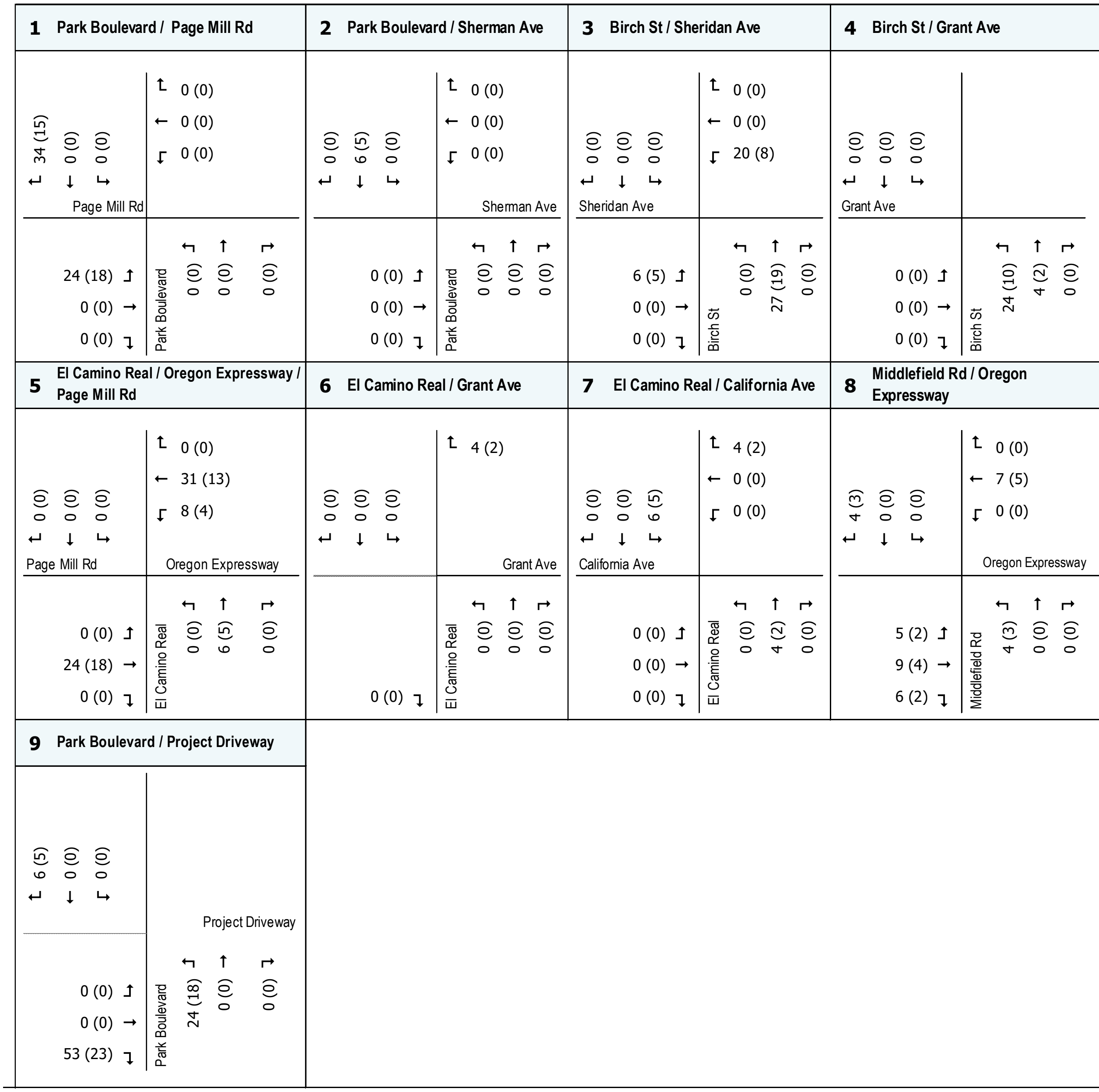
Appendix E-1 Existing Traffic Volumes



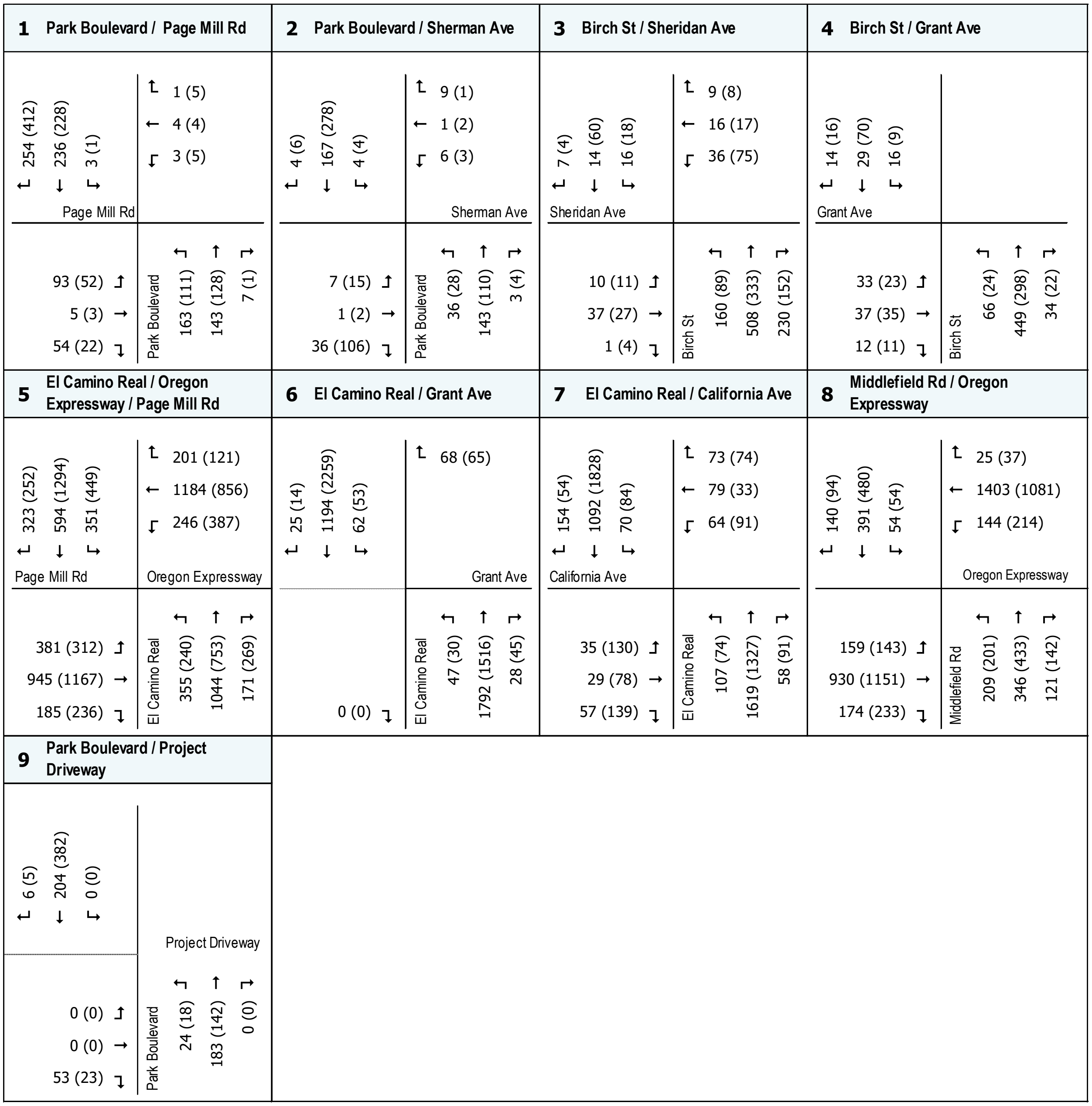
Appendix E-2 Background Intersection Traffic Volumes



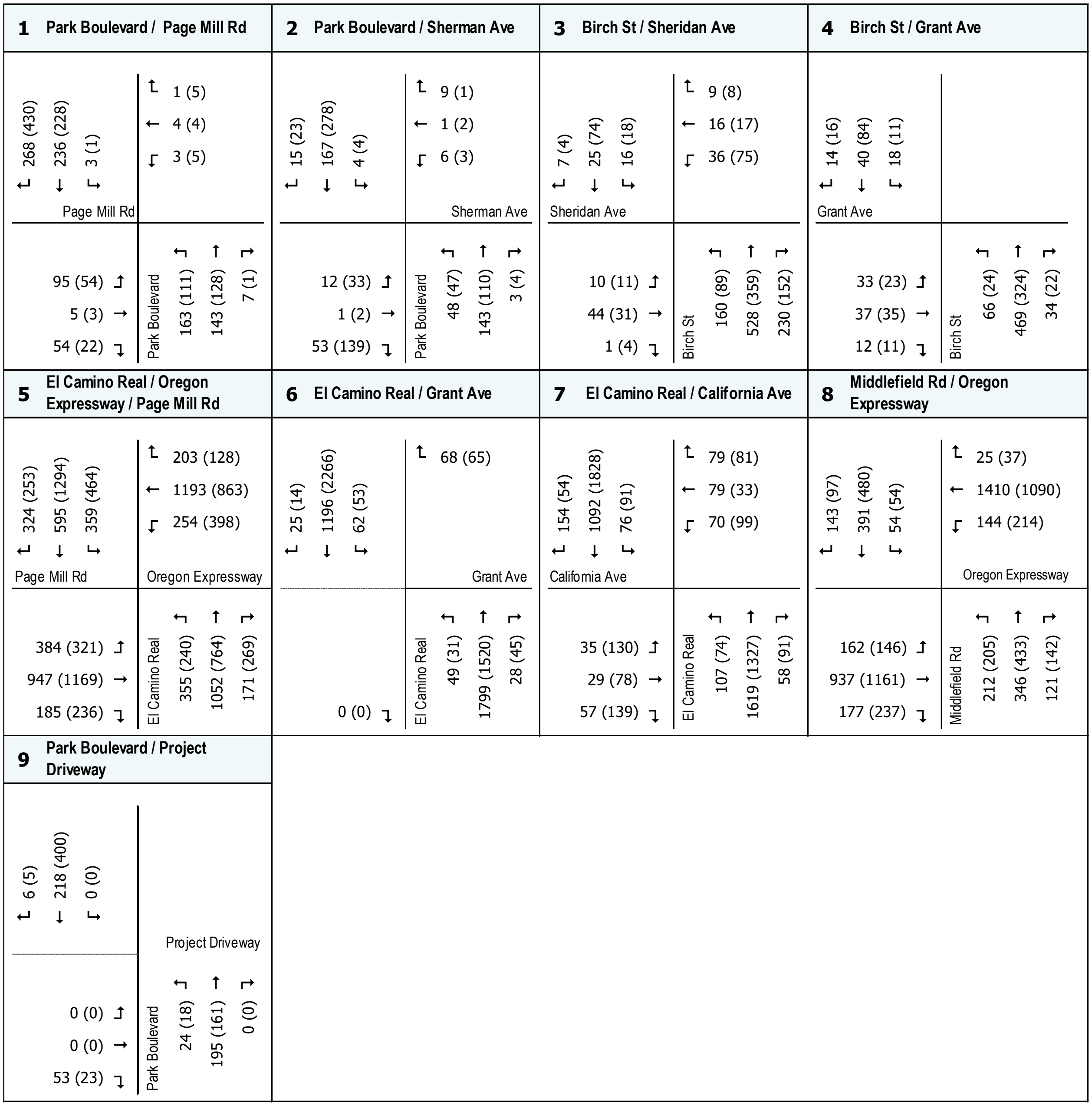
Appendix E-3 Cumulative Intersection Traffic Volumes



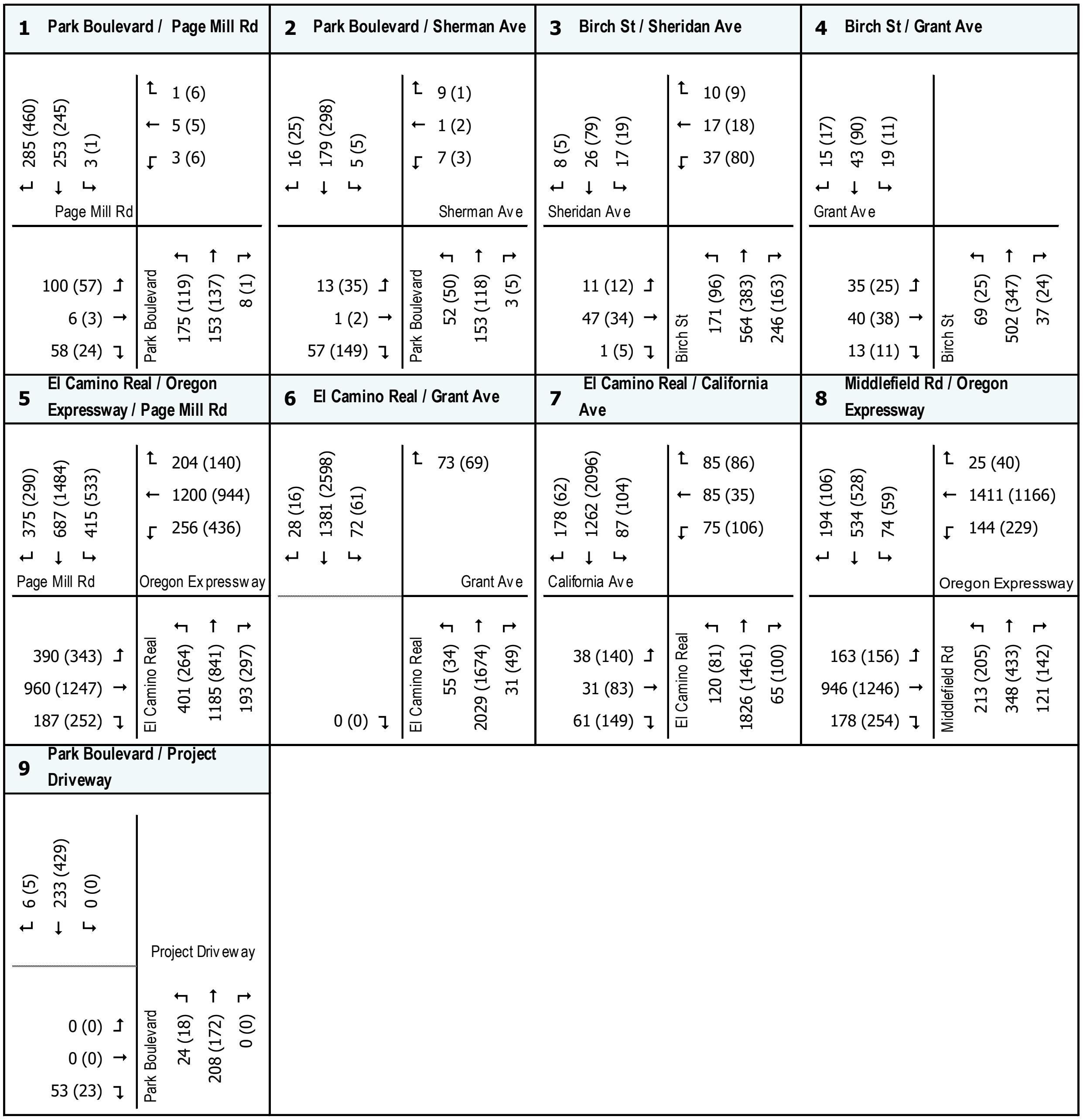
Appendix E-4 Project Only Traffic Volumes



Appendix E-5 Existing+ Project Traffic Volumes



Appendix E-6 Background plus Project Traffic Volumes



Appendix E-7 Cumulative plus Project Traffic Volumes

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AECOM

Intersection Level of Service (LOS) Evaluation

231 Grant Avenue Educator Workforce Housing

Project Number: 60642412

July 2021

Delivering a better world

Prepared for:

County of Santa Clara
Facilities and Fleet Department
2310 North First Street, Suite 200
San Jose, CA 95131

Prepared by:

AECOM
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San Jose, CA 95113
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1 Executive Summary

This report presents the results of a Traffic Impact Analysis (TIA) conducted for the 231 Grant Educator Workforce Housing project (the project), which proposes construction of a mixed-use development at 231 Grant Avenue in the City of Palo Alto, California.

The project would involve the construction of a four-story residential/commercial/retail complex with a parking garage. The site is approximately 61,000 square feet in area and currently contains a one-story office building with surface parking stalls. The proposed new development would have 110 residential dwelling units ranging from studios to 2-bedroom apartments, 1,120 square feet of ‘flex space’ that would potentially be used for retail or commercial use and would be served by 112 parking spaces.

The impacts of the proposed project were evaluated following the guidelines of the City of Palo Alto and the Santa Clara Valley Transportation Authority (VTA), which is the Congestion Management Agency for Santa Clara County. Intersection operations were evaluated for level of service (LOS) and queuing impacts under the following study scenarios:

- Existing Conditions
- Existing plus Project Conditions
- Background Conditions
- Background plus Project Conditions
- Cumulative Conditions

1.1 Project Trip Generation

Project generated trips were estimated using vehicle trip rates published by the Institute of Transportation Engineers (ITE) and the allowable reduction due to proximity to transit according to VTA’s guidelines. The proposed project is estimated to generate 145 net new AM peak hour trips (64 inbound trips and 81 outbound trips) and 81 net new PM peak hour trips (46 inbound trips and 35 outbound trips).

1.2 Project Impacts

This analysis aims to identify potentially significant LOS and queuing intersection impacts of the proposed project, if any, on the identified intersections and recommends measures to mitigate these impacts.

A potentially significant LOS impact would be identified if the project would result in deterioration of an intersection’s LOS to worse than the applicable City or CMP LOS standard; or, for intersections already operating at below the applicable LOS standard, if the project would result in an increase in average control delay for the critical movements by four seconds or more and would increase the critical V/C ratio value by 0.01 or more.

A potentially significant queuing impact would be identified if the project would increase queue length by more than one vehicle length (25 feet) and if the queue exceeds the available turn pocket length.

1.2.1 Existing Plus Project Conditions

Intersection Analysis

Under this scenario, all the study intersections are expected to operate at acceptable LOS during both peak hours, with and without the project. Therefore, the proposed development is not expected to create a significant impact and no mitigation measures are recommended at the study intersections.

Queuing Analysis

A total of four movements are expected to have queues exceeding the provided storage capacity. Southbound right-turn (both peak hours) and westbound left-turn (PM peak) for the El Camino Real / Oregon Expressway / Page Mill Road intersection are expected to have queues longer than the provided storage lane with and without the project. Queues at northbound left-turn (both peak hours) and the eastbound right-turn (both peaks) for the Middlefield Road / Oregon Expressway intersection are expected to exceed the storage with and without the project.

However, for both intersections, the increase in queue length under the ‘with project’ conditions is less than one car-length and, therefore, is not considered as an impact. Queues at all other analyzed intersections and movements are expected to be accommodated within their provided storage lanes. Hence, no mitigation measures are recommended.

1.2.2 Background Plus Project Conditions

Intersection Analysis

Under this scenario, all the study intersections are expected to operate at acceptable LOS during both peak hours, with and without the project. Therefore, the proposed development is not expected to create a significant impact and no mitigation measures are recommended at the study intersections.

Queuing Analysis

A total of four movements are expected to have queues exceeding the provided storage capacity. Southbound right-turn (both peak hours) and westbound right-turn (AM peak) for the El Camino Real / Oregon Expressway / Page Mill Road intersection are expected to have queues longer than the provided storage lane with and without the project. The westbound left-turn queue at this intersection is expected to be accommodated by the lengthened storage lane that will be implemented by end of 2022 as part of the County’s Expressway 2040 Program. Queues at northbound left-turn (both peak hours) and the eastbound right-turn (both peaks) for the Middlefield Road / Oregon Expressway intersection are expected to exceed the storage with and without the project.

However, for both intersections, the increase in queue length under the ‘with project’ conditions is less than one car-length and it therefore not considered as an impact. Queues at all other analyzed intersections and movements are expected to be accommodated within their provided storage lanes. Hence, no mitigation measures are recommended.

1.2.3 Cumulative Plus Project Conditions

Intersection Analysis

Under this scenario, all the study intersections are expected to operate at acceptable LOS during both peak hours, with and without the project, with the exception of the Birch Street / Sheridan Avenue. This intersection is expected to operate at LOS E during the AM peak with and without project, which is considered at an unacceptable level. However, the project is not expected to cause a significant impact as the Volume to Capacity ratio (V/C) did not meet the significance threshold. Therefore, the proposed development is not expected to create a significant impact and no mitigation measures are recommended at all study intersections.

Queuing Analysis

A total of six movements are expected to have queues exceeding the provided storage capacity. Southbound left-turn (PM peak), southbound right-turn (both peak hours) and westbound right-turn (AM peak) for the ECR / Oregon Expressway / Page Mill Road intersection are expected to have queues longer than the provided storage lane with and without the project. The westbound left-turn queue at this intersection is still expected to be accommodated by the lengthened storage lane that will be implemented by end of 2022 as part of the County's Expressway 2040 Program. Westbound left-turn (PM peak) at the El Camino Real / California Ave is expected to exceed the provided storage capacity with and without the project. Queues at northbound left-turn (both peak hours) and the eastbound right-turn (both peak hours) for the Middlefield Road / Oregon Expressway intersection are expected to exceed the storage with and without the project.

However, for all three intersections, the increase in queue length under the 'with project' conditions is less than one car-length and, therefore, is not considered as an impact. Queues at all other analyzed intersections and movements are expected to be accommodated within their provided storage lanes. Hence, no mitigation measures are recommended.

2 Introduction

This report presents the results of intersection level of service (LOS) analysis for the proposed construction of an educator workforce housing complex with parking located at 231 Grant Avenue on county land in the City of Palo Alto, California.

The purpose of this intersection evaluation is to identify the potential traffic impacts on the study intersections and to recommend corresponding mitigation measures, if required, in accordance with the guidelines of the City of Palo Alto and the Santa Clara Valley Transportation Authority (VTA), which is the Congestion Management Agency for Santa Clara County. Impacts considered in this study include level of service (LOS) delays and queuing impacts at the identified study intersections. The scope of work was prepared in consultation with staff from the County of Santa Clara and City of Palo Alto.

2.1 Project Description

2.1.1 Existing Site

The site is located at 231 Grant Avenue, near Oregon Expressway. An existing one-story building (approximately 6,800 square feet) used by approximately 10 employees currently occupies the site bounded by, Grant Avenue to the north, Park Boulevard to the east and Birch Street to the west. Access to the existing building is via four driveways, three on Grant Avenue and one on Park Boulevard. The Park Boulevard driveway is accessible by all movements as Park Boulevard is undivided. The Grant Avenue driveways, on the other hand, have a ‘right-in-right-out’ configuration because the section of Grant Avenue fronting the project site is one-way eastbound.

2.1.2 Proposed Site

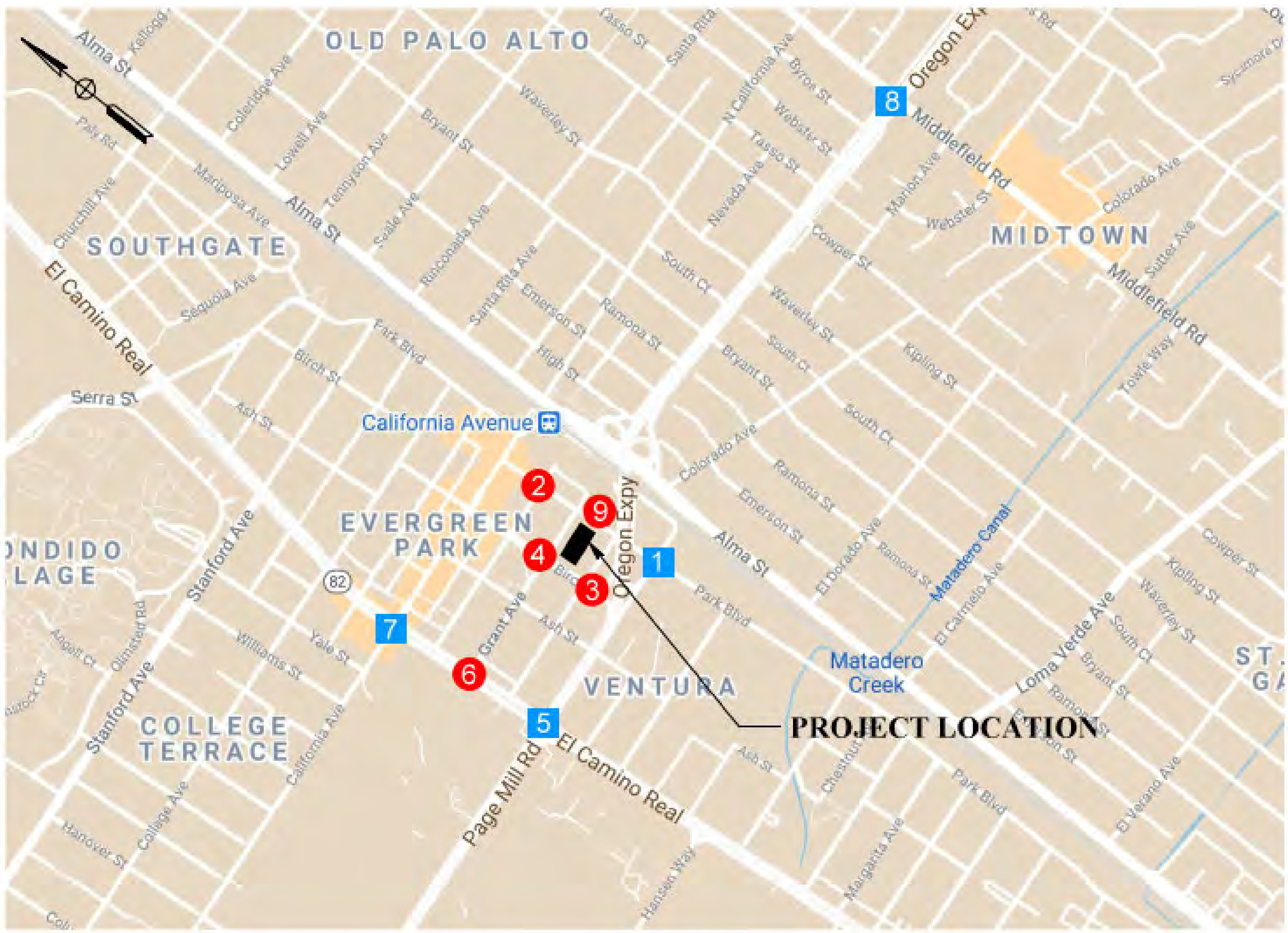
The proposed development includes a new four-story mixed-use building of 110 residential units and associated amenities such as a residents’ lounge, activity room, and laundry. The project would also include a ‘flex space’ of 1,120 square feet, which could be used for retail or commercial purposes, and approximately 6,400 square feet of outdoor public open space. A total of 112 (car) parking spaces and 146 bicycle parking spaces would be provided. One full movement driveway will be provided along Park Boulevard and the second access along Birch Street will be of a ‘right-in-right-out’ configuration as Birch Street is divided. **Figure 2-1** shows the Project site plan.

2.2 Study Area

The study area is bounded by California Avenue to the north, Page Mill Road to the south, Alma Street to the east and El Camino Real (ECR) to the west (**Figure 2-2**). While Oregon Expressway and California Avenue provide local access to the project site, freeway US 101 provides regional access to the project site. U.S. 101 can be accessed via the interchange at Oregon Expressway. Further to the west, I-280 and Foothill Expressways bring motorists from the region to the study area.

Figure 2-1 Conceptual Site Plan

Source: Mercy Housing and Abode Communities, 2020



Un-Signalized Intersection

Signalized Intersection

Figure 2-2 Project Vicinity and Intersections

Source: AECOM 2021

The roadway impacts of the proposed Project were evaluated by measuring the effect that project traffic would have on intersection operations, in accordance with City and VTA guidance. The nine study intersections shown in **Figure 2-2** and listed in **Table 2-1**, as agreed with staff from City of Palo Alto, include two intersections being monitored under the VTA Congestion Management Program (CMP) and one full movement project driveway along Park Boulevard.

Table 2-1 List of Study Intersections

Intersection #	Location	Control Type
1	Park Boulevard / Page Mill Rd	Signalized
2	Park Boulevard / Sherman Ave	TWSC
3	Birch St / Sheridan Ave	TWSC
4	Birch St / Grant Ave	AWSC
5	ECR / Oregon Expressway / Page Mill Rd (CMP)	Signalized
6	ECR / Grant Ave	TWSC
7	ECR / California Ave	Signalized
8	Middlefield Rd / Oregon Expressway (CMP)	Signalized
9	Park Boulevard / Project Driveway	TWSC

Source: Compiled by AECOM 2021.

Acronyms: CMP = monitored by Congestion Management Program; AWSC = All-way-stop controlled; TWSC= Two-way-stop controlled; ECR = El Camino Real

2.3 Study Scope and Approach

The following six scenarios were evaluated to identify the potential transportation impacts of the project on the study intersections:

1. Existing Conditions – Calculated intersection volumes for 2020 based on historical traffic counts collected. [1]
2. Existing plus Project Conditions – Existing volumes from Scenario 1 plus the trips from the proposed project.
3. Background Conditions – Existing volumes plus trips from approved but not completed projects. This is defined as the 'Background without Project' conditions.
4. Background plus Project Conditions – Background volumes from Scenario 3 plus the trips from the proposed project.
5. Cumulative Conditions – Volumes from Scenario 3 grown to year 2030. This is defined as the 'Cumulative without Project' conditions.
6. Cumulative plus Project Conditions – Cumulative volumes from Scenario 5 plus the trips from the proposed project.

Intersection LOS was analyzed for the weekday AM peak hour and PM peak hour.

[1] Due to Shelter-In-Place order in response to COVID-19, on-site traffic counts cannot be conducted. Historical traffic counts obtained from earlier projects were grown to 2020, as described in Section 3.3.

2.4 Analysis Methodology

The LOS method approved by VTA and adopted by the City of Palo Alto for signalized intersections is the method described in Chapter 16 of the 2000 Highway Capacity Manual (HCM) (Special Report 209, Transportation Research Board 2010) with adjusted saturation flow rates to reflect conditions in Santa Clara County. This method bases signalized intersection operations on the average control vehicular delay.

Control delay includes initial deceleration delay, queue move-up time, stopped delay, and acceleration delay. The average control delay for signalized intersections is calculated using TRAFFIX analysis software and is correlated to a LOS designation as shown in **Table 2-2.**

Levels of service at an intersection can range from A, which represents free flow or excellent conditions with insignificant delays, to F, which represents congested or over-saturated conditions with unacceptable delays. **Table 2-2** shows the LOS thresholds for signalized intersections.

Table 2-2 Level of Service Thresholds for Signalized Intersections

Level of Service	Description	Average Control Delay (seconds/vehicle)
A	Free-flow speeds prevail. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.	delay ≤ 10.0
B+	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	10.0 < delay ≤ 12.0
B	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	12.0 < delay ≤ 18.0
B-	Free-flow speeds are maintained. The ability to maneuver with the traffic stream is only slightly restricted.	18.0 < delay ≤ 20.0
C+	Flow with speeds at or near free-flow speeds. Freedom to maneuver with the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	20.0 < delay ≤ 23.0
C	Flow with speeds at or near free-flow speeds. Freedom to maneuver with the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	23.0 < delay ≤ 32.0
C-	Flow with speeds at or near free-flow speeds. Freedom to maneuver with the traffic stream is noticeably restricted, and lane changes require more care and vigilance on the part of the driver.	32.0 < delay ≤ 35.0
D+	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	35.0 < delay ≤ 39.0
D	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	39.0 < delay ≤ 51.0
D-	Speeds decline slightly with increasing flows. Freedom to maneuver with the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort.	51.0 < delay ≤ 55.0

E+	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing	55.0 < delay ≤ 60.0
E	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing	60.0 < delay ≤ 75.0
E-	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	75.0 < delay ≤ 80.0
F	Operation at capacity. There are virtually no usable gaps within the traffic stream, leaving little room to maneuver. Any disruption can be expected to produce a breakdown with queuing.	delay > 80.0

Source: Traffic Level of Service Analysis Guidelines (VTA 2003) and Highway Capacity Manual (Transportation Research Board 2010).

LOS rating for unsignalized intersections is based on the weighted average control delay expressed in seconds per vehicle for all approaches. Control delay includes initial deceleration delay, queue move-up time, stopped delay and final acceleration. For single lane approaches, the control delay is computed as the average of all movements in that lane. At two-way or side-street controlled intersections, the average control delay is calculated for each stopped movement and not for the intersection as a whole.

There is no specific methodology for analyzing unsignalized intersections in the CMP. For this report, the 2000 Highway Capacity Manual (HCM) methodology for unsignalized intersection (supported by TRAFFIX software) was used for the unsignalized intersection LOS calculations. **Table 2-3** shows the thresholds for the different LOS conditions at unsignalized intersections. In addition, the City of Palo Alto uses the California Manual on Uniform Traffic Control Devices (CA MUTCD) peak hour volume signal warrant to evaluate operations at unsignalized intersections (Caltrans 2020).

Table 2-3 Unsignalized Intersection Level of Service Definitions

Level of Service	Description	Average Control Delay (seconds/vehicle)
A	Little or no delay	delay ≤ 10.0
B	Short traffic delays	10.0 < delay ≤ 15.0
C	Average traffic delays	15.0 < delay ≤ 25.0
D	Long traffic delays	25.0 < delay ≤ 35.0
E	Very long traffic delays	35.0 < delay ≤ 50.0
F	Extreme traffic delays with intersection capacity exceeded	delay > 50.0

Source: Highway Capacity Manual (Transportation Research Board 2010).

The LOS standard for City of Palo Alto intersections is LOS D or better. The LOS standard for CMP intersections is LOS E. CMP intersections are indicated as such in **Table 2-1** above.

As such, for this report, a traffic impact would be considered significant if the project would:

- cause a local (City of Palo Alto) intersection to deteriorate below LOS D; or
- cause a CMP intersection to deteriorate from LOS E or better to LOS F; or
- cause a local intersection already operating at LOS E or F to deteriorate in the average control delay for the critical movements by four seconds or more and the critical volume to capacity (V/C) ratio value to increase by 0.01 or more; or
- cause a CMP or regionally significant intersection already operating at LOS F to deteriorate in the average control delay for the critical movements by four seconds or more and the critical V/C ratio value to increase by 0.01 or more.

For unsignalized intersections, the City's LOS standard is also level D. Significant impacts are defined to occur when the addition of project traffic causes the LOS of an unsignalized intersection to degrade to LOS E or worse. Project impacts are also considered significant if the intersection satisfies the peak hour traffic signal warrant from the CA MUTCD. For an all-way stop intersection already operating at LOS E or F without the project, significant impacts are deemed to have occurred if the average intersection delay increases by four seconds or more and the V/C ratio value increases by 0.01 or more. For a side-street stop-controlled intersection already operating at LOS E or F without the project, project impacts will be considered significant if the worst movement delay increases by four seconds or more and the critical V/C value increases by 0.01 or more.

For queuing analysis, an operational deficiency is assumed to occur if the queue increases by the length of one or more vehicles (25 feet) and if the queue exceeds the available turn pocket length.

3 Existing, Background, and Cumulative Conditions

This section describes the existing, background and cumulative conditions in the vicinity of the project in terms of the existing roadways and traffic operations. These conditions do not take account of traffic generated by the proposed project and are therefore considered “no project” conditions.

3.1 Major Roadways in Study Area

Regional access to the Project site is provided by US 101 and I-280.

- US 101 – This eight-lane freeway extends from San Francisco to San Jose with a posted speed limit of 65 mph. In the vicinity of the Project site, this freeway runs in the north-south direction. It has three mixed-flow lanes in both directions, and one carpool lane in each direction with hours of operation during 5am-9am and 3pm-7pm. US 101 is under the jurisdiction of Caltrans. Access to the freeway from the project site is provided via ramps at Oregon Expressway Interchange.
- I-280 – This north-south freeway also connects San Francisco and San Jose. It has four mixed-flow lanes in each direction in the vicinity of the project although a short section of the southbound drops to three lanes between the Page Mill Road On/Off Ramps. Access to the freeway from the project site is provided via ramps at Page Mill Road Interchange.

Local access to the Project site is provided by Oregon Expressway, Page Mill Road, ECR and California Avenue. Direct access to the project site is from Grant Avenue and Park Boulevard. These roadways are described below.

- Oregon Expressway – This east-west 4-lane divided expressway connects ECR to US-101, with accesses to local residential areas in between. Oregon Expressway has a posted speed limit of 35mph and connects to Page Mill Road west of ECR. Project site access to/from eastbound Oregon Expressway is via Park Boulevard and the short section of Page Mill Road. Project access to westbound Oregon Expressway is via Birch Street.
- El Camino Real (ECR) – Also known as SR 82, ECR is a major north-south arterial extending from the San Francisco area all the way to San Jose with a posted speed limit of 35mph. It provides direct access to developments along both approaches. Under existing conditions, Grant Avenue provides direct ingress to the project site from ECR.
- Page Mill Road – This east-west roadway extends from Skyline Boulevard west of the project site to ECR, connecting to Oregon Expressway. It is a 4-lane divided arterial road between ECR and I-280. The posted speed limit is 50mph between I-280 and Foothill Expressway but drops to 35mph between Foothill Expressway and ECR. Page Mill Road transitions to Oregon Expressway east of ECR with a short

section of the roadway that continues to the California Avenue Transit Station. A Class 2 bike-lane is provided from ECR to Foothill Expressway on both approaches.

- California Avenue – This east-west collector roadway connects Amherst Street to Park Boulevard. It is primarily 2-lane undivided with Class 2 bike lanes along both approaches between Amherst Street and ECR. On-street parking is provided along California Avenue with a posted speed limit of 25mph.
- Grant Avenue – This east-west local roadway connects ECR to Park Boulevard. It is primarily 2-lane undivided except between Birch Street and Park Boulevard (i.e., immediately adjacent to the project site) where it is one-way eastbound. It has a posted speed limit of 25mph with on-street parking allowed on both approaches. It provides direct access to the project site under existing conditions but will not have access to the project site under the proposed project layout.
- Park Boulevard – This roadway starts at the intersection of ECR and Serra Street, first going east-west for a short section before becoming north-south, extending past West Charleston Road where it connects to Whitclem Drive. In the project vicinity, it is 2-lane undivided, with a Class 2 bike lane on both approaches up to Chestnut Avenue. On-street parking with a 2-hr limit is provided between California Avenue and Sheridan Avenue. In the project vicinity, Park Boulevard is designated as a collector road with posted speed limit of 25mph. It provides direct access to the project site under existing conditions as well as under the proposed project layout.
- Birch Street – This north-south local street starts at the east-west section of Park Boulevard and continues to Oregon Expressway. It is 2-lane undivided with on-street parking up to California Avenue. It becomes divided from California Avenue to Oregon Expressway. This latter section in the project vicinity is designated as a collector road with a posted speed limit of 25mph. Northbound Birch Street will provide direct access under the proposed project layout.

3.2 Field Observations

This traffic analysis and report were prepared in the midst of the COVID-19 pandemic which started in the first quarter of 2020. During this period, varying degrees of stay-at-home orders were issued by the counties in the Bay Area, resulting in significantly less than usual traffic on the roads of the Bay Area. Data collected by the Metropolitan Transportation Commission (MTC) in July 2020 indicated that traffic on the San Mateo-Hayward Bridge was at 64 percent of the previous year and traffic on the Dumbarton Bridge was just 56 percent of the previous year[2]. In addition, traffic in the project vicinity has also decreased significantly as big trip generators like the Stanford University moved most of its teaching online and encouraged staff to work from home as much as possible during this period. Similarly, many major employers in the peninsula/south bay area have also seen many of their staff working from home during this period. When AECOM visited the project site in February 2021, the section of California Avenue,

[2] https://abc7news.com/san-francisco-bay-area-traffic-sf-report-current/6417391/

between ECR and Birch Avenue was closed to vehicular traffic. This was to allow for outdoor dining to be set up along California Avenue for eateries fronting this roadway.

Due to the unusual situation brought about by the pandemic, no traffic count was collected on site for this project. Similarly, it would not be meaningful to make field observations in the project vicinity given that the traffic conditions changed depending on the degree of stay-at-home orders. It is noted that while the pandemic may only be temporary, its effect on commuter behavior could be long-term. More companies are seen expanding their flexible work schemes to allow increased opportunities of working remotely, for example. Separate studies at a later date would need to be conducted to determine the long-term effects this pandemic has on the traffic patterns in the Bay Area. It is still too early to tell at this point as employers carve out new policies regarding working remotely. Another area of consideration is the use of public transportation and carpooling; the level of willingness to travel via transit and carpool post-COVID would also affect the traffic conditions as life returns to normal.

However, based on past studies of other projects in the vicinity and AECOM's knowledge of the surrounding, the intersection of ECR and Page Mill Road/Oregon Expressway has been experiencing heavy traffic during both AM and PM peaks in all directions. The cycle length was long to allow for more through put during each green phase, but also resulted in long queue lengths for the waiting approach. It has been observed that motorists could clear the intersection within two cycles, with most vehicles clearing it in one cycle unless joining the queue late. The left-turn queues on the east-west approach along Page Mill Road/Oregon Expressway were observed to frequently exceed their storage capacity. The lead left-turn phase, however, was able to clear the left-turn vehicles, thus making room for the through traffic to join the queue. The LOS of this intersection for the PM peak was reported at level D in the latest 2018 CMP Monitoring and Conformance Report by VTA.

At the intersection of Grant Avenue and ECR, only right-turns to northbound ECR are allowed. Left-turns from Grant Avenue to southbound ECR are prohibited. Recent improvements were made along ECR to curb the left-turn movements by installing a raised median. Approximately 4-car storage lanes are provided for U-turning or left-turning vehicles from both approaches of ECR and the new raised median now prevents the illegal left-turns movements from both Grant Avenue and the driveways along southbound ECR. The traffic volumes on ECR have been observed to be relatively high during both peak hours in the pre-pandemic conditions. However, due to the proximity of the signalized upstream intersection (ECR/Page Mill Road/Oregon Expressway), right-turning vehicles from Grant Avenue (on to northbound ECR) have been observed to find adequate gaps for this maneuver. Similarly, left-turning or U-turning vehicles along both directions of ECR were observed to be able to find adequate gaps to maneuver without exceeding the storage lane provided; thus, not impeding the through traffic.

Along Birch Street, due to the high volume coming off Oregon Expressway during both peak hours, the northbound through volume has been observed to be relatively high, which is reflected in the volumes used for this project's analysis. The sight-distance for the westbound movement (on Birch Street) at the stop line is obstructed by the garage at the southeast corner. Motorists on Birch have to inch out from the stop line in order to get a good view of the oncoming traffic from Oregon Expressway.

The intersection of Middlefield Road and Oregon Expressway is another busy intersection in proximity to the project site. The 2018 CPM Monitoring and Conformance Report states that the LOS for this intersection is E+ during the PM peak, but still within acceptable standards defined by VTA and the City of Palo Alto.

3.3 Intersection Volumes

Due to the inability to collect traffic counts on site for the project, past data provided by the County and from two recently approved developments in the project vicinity were used as base volumes from which the 2020 (‘Existing’) volumes were extrapolated. This is a conservative approach as it assumed the ‘pre-COVID’ level of traffic growth, rather than the dampened traffic volumes present during the pandemic. The County provided the PM peak hour data for the intersection of ECR/Page Mill Road (int #5) and Middlefield Road/Oregon Expressway (int #8), for the year 2019 and 2018 respectively. Remaining volume data were obtained from the studies for housing development at 2755 ECR (Hexagon Transportation Consultants, Inc., January 2018) and the Palo Alto Public Safety Building and Public Parking Structure (Fehr & Peers, May 2018). Counts for these two projects were collected between 2016 and 2017. **Appendix A** provides the data used for this project.

Volumes from the different sources mentioned above were compared and a growth factor was determined. The average growth was determined to be about 1.7% per year. This growth factor was used to grow the latest counts available to the existing year of 2020. This set of volumes constitutes the input for Scenario 1 (existing conditions) of the LOS analysis.

3.4 Existing Intersection Operations

The intersection geometry and (calculated) existing traffic volumes are shown in **Figure 3-1** and **Figure 3-2** respectively. The performance of each intersection under existing conditions is presented in **Table 3-1**. The results of the LOS calculations indicate that all the study intersections operate at acceptable levels of service according to their LOS standard and the peak hour signal warrant for all unsignalized intersections is not met during both peak hours. Details for the intersection analysis are presented in **Appendix B.**

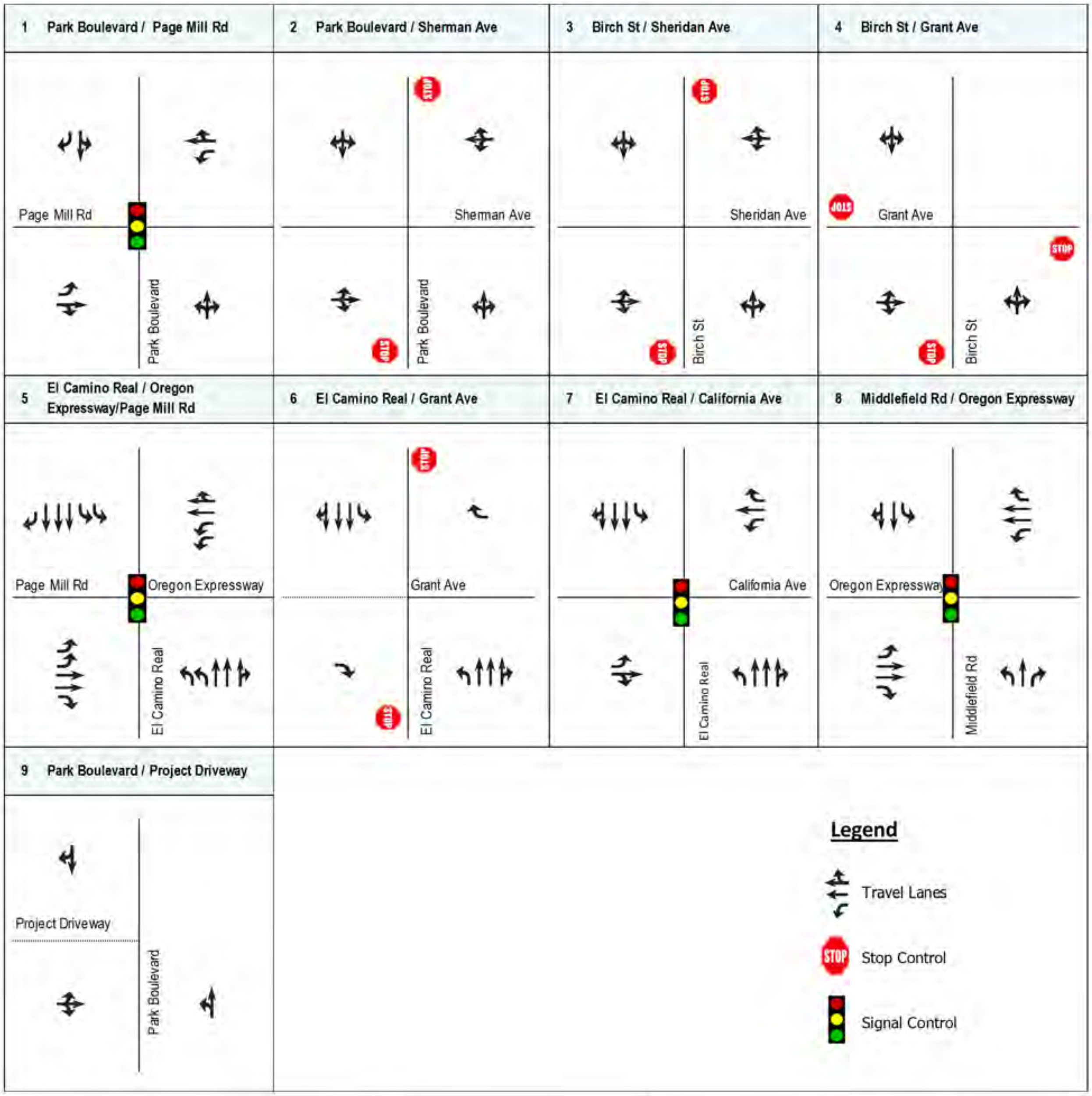


Figure 3-1 Intersection Geometry

Source: AECOM 2021

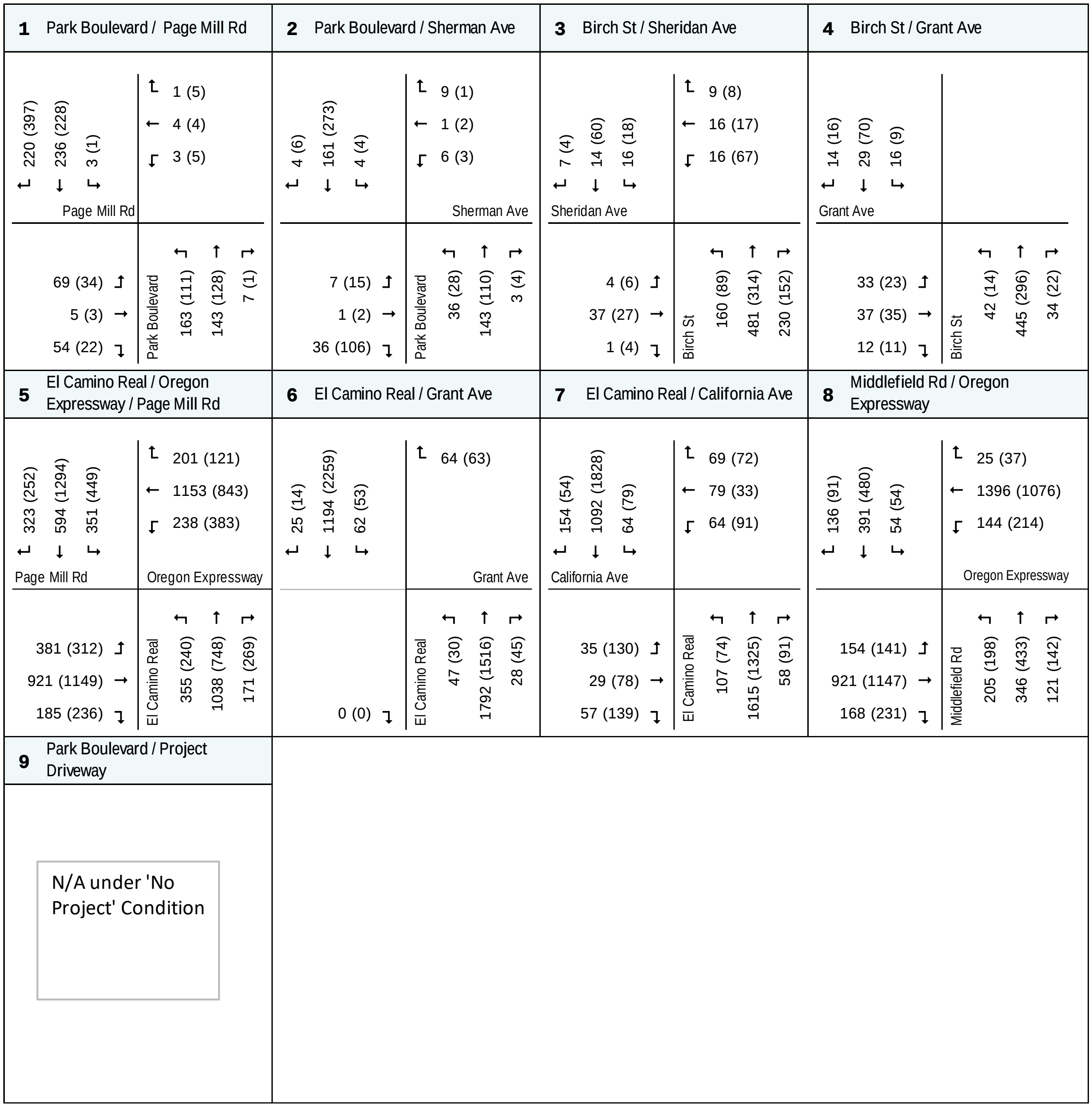


Figure 3-2 Existing Traffic Volumes

Source: AECOM 2021. See Section 3.3 for discussion of how existing traffic volumes were calculated.

Table 3-1 Intersection Performance – Existing Conditions

Int #	Intersection	Peak Hr	LOS Standard	Existing Conditions LOS	Existing Conditions Delay (sec)	Existing Conditions Critical V/C
1	Park Boulevard / Page Mill Rd	AM	D	A	8.4	0.232
1	Park Boulevard / Page Mill Rd	PM	D	A	4.8	0.261
2	Park Boulevard / Sherman Ave*	AM	D	B	10.4	0.010
2	Park Boulevard / Sherman Ave*	PM	D	B	12.6	0.010
3	Birch St / Sheridan Ave*	AM	D	D	28.3	0.190
3	Birch St / Sheridan Ave*	PM	D	C	19.3	0.210
4	Birch St / Grant Ave**	AM	D	B	12.2	0.606
4	Birch St / Grant Ave**	PM	D	A	9.1	0.385
5	El Camino Real / Oregon Expressway/Page Mill Rd (CMP)	AM	E	D	50.3	0.897
5	El Camino Real / Oregon Expressway/Page Mill Rd (CMP)	PM	E	D	47.3	0.824
6	El Camino Real / Grant Ave*	AM	D	B	14.5	0.140
6	El Camino Real / Grant Ave*	PM	D	B	13.2	0.130
7	El Camino Real / California Ave	AM	D	C+	22	0.456
7	El Camino Real / California Ave	PM	D	C	29.1	0.599
8	Middlefield Rd / Oregon Expressway	AM	E	D	44.7	0.777
8	Middlefield Rd / Oregon Expressway	PM	E	D	46.4	0.742
9	Park Boulevard / Project Driveway**	AM	D	N/A	N/A	N/A
9	Park Boulevard / Project Driveway**	PM	D	N/A	N/A	N/A

Source: AECOM 2021

Acronyms: LOS = level of service; V/C = volume to capacity ratio; ECR = El Camino Real; CMP = Congestion Management Plan intersection; AM = morning; PM = afternoon; N/A = not applicable

Notes:

*LOS and delay reported for worst movement for 2-way stop controlled intersections

**Overall delay reported for AWS controlled intersection

3.5 Approved Projects

The list of approved projects (as obtained from the City of Palo Alto) in the vicinity of this project is shown in **Table 3-2** below.

Table 3-2 List of Approved Projects

Project Name	Project Location	Land Use
2755 El Camino Real Redevelopment	2755 El Camino Real	Residential
Palo Alto Public Safety Building and Public Parking Structure	250 Sherman Avenue	Public Services/Office

Source: City of Palo Alto, 2020.

Background Condition traffic volumes were developed by adding the trips generated by the above projects to the existing traffic volumes. Appendix C presents the approved project trips. Background Condition traffic volumes for the AM and PM peak hours are presented in Figure 3-3.

An additional project that has been included in the Background scenario is the intersection improvements at the intersection of ECR / Oregon Expressway / Page Mill Road (int #5). Design is underway to add an exclusive westbound right-turn lane and to extend the two westbound left-turn storage lanes by more than two hundred feet in total. These improvements, part of the County's Expressway 2040 Program, are expected to be completed by the end of 2022. They are therefore considered as 'approved but not yet completed' projects like the above and reflected under the Background scenario and subsequently in the Cumulative scenario. Figure 3-4 presents the new lane configuration at intersection #5. Appendix D presents the proposed new striping plans at this intersection.

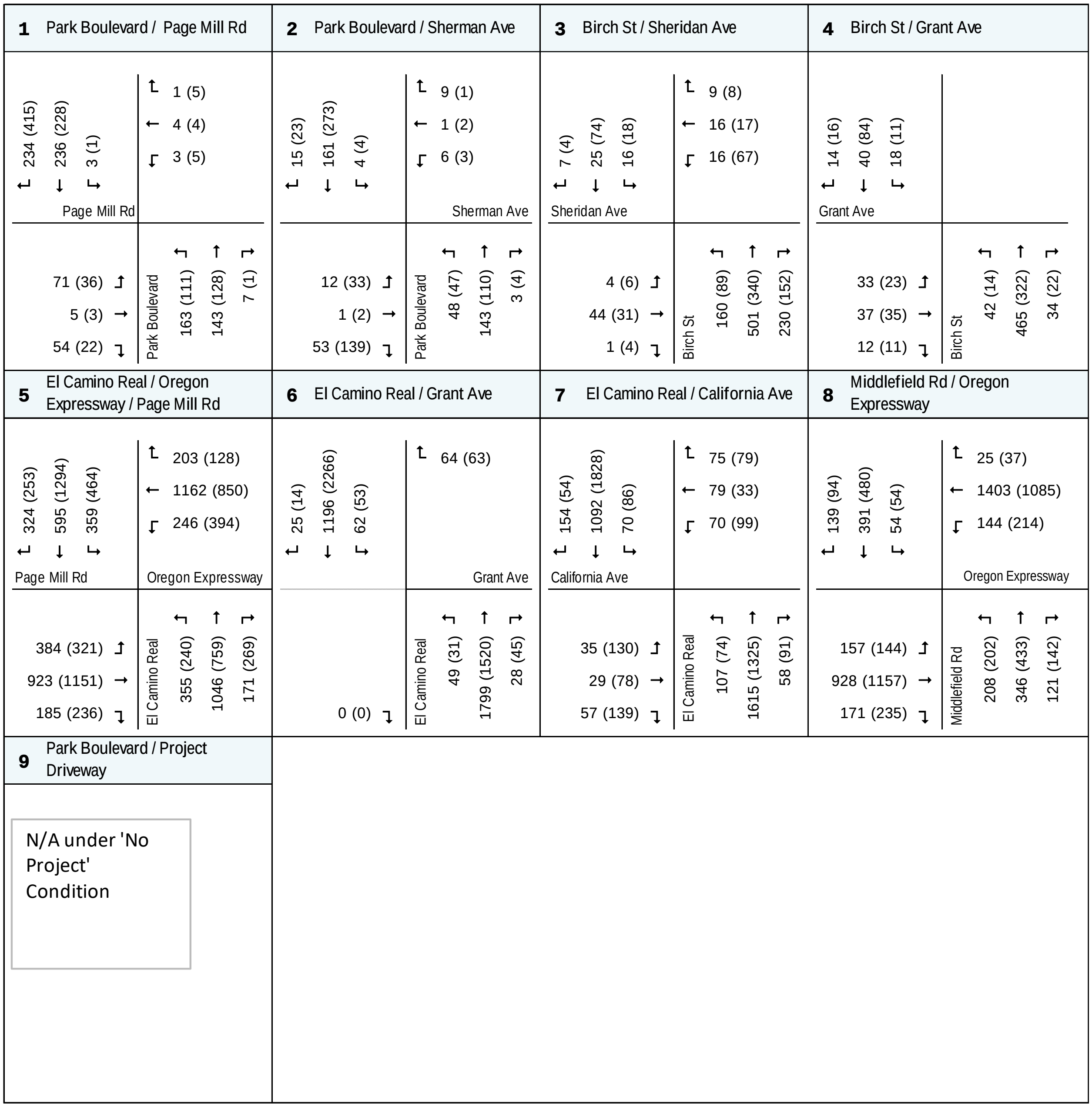


Figure 3-3 Background Intersection Traffic Volumes

Source: AECOM 2021

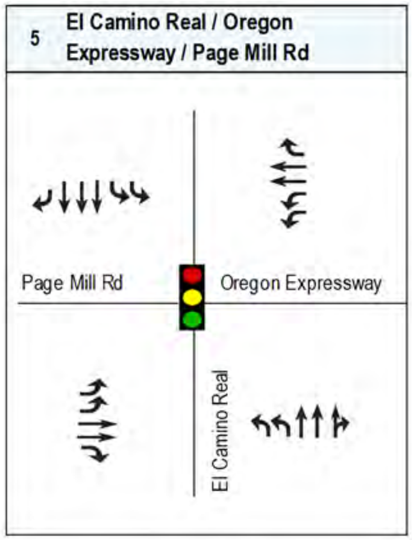


Figure 3-4 New Intersection Geometry for Intersection #5

Source: AECOM 2021

3.6 Background Conditions

Based on the existing traffic volumes and approved project trips and intersection improvements presented earlier, intersection analysis was performed at all the study intersections for the Background Conditions. Lane geometries for this scenario are same as that for the Existing Condition except for intersection #5 as discussed above. **Table 3-3** presents the results and the analysis details are presented in **Appendix E**. All the intersections operated within acceptable levels under the Background Conditions. The peak hour signal warrant for all the unsignalized intersection is also not met during both peak hours.

Table 3-3 Intersection Performance – Background Conditions

Int #	Intersection	Peak Hr	LOS Standard	Background Conditions LOS	Background Conditions Delay (sec)	Background Conditions Critical V/C
1	Park Boulevard / Page Mill Rd	AM	D	A	8.4	0.233
1	Park Boulevard / Page Mill Rd	PM	D	A	4.9	0.273
2	Park Boulevard / Sherman Ave*	AM	D	B	10.6	0.010
2	Park Boulevard / Sherman Ave*	PM	D	B	13.7	0.010
3	Birch St / Sheridan Ave*	AM	D	D	30.9	0.240
3	Birch St / Sheridan Ave*	PM	D	C	20.8	0.230
4	Birch St / Grant Ave**	AM	D	B	12.7	0.632
4	Birch St / Grant Ave**	PM	D	A	9.4	0.418
5	El Camino Real / Oregon Expressway/Page Mill Rd (CMP)	AM	E	D	46.8	0.836
5	El Camino Real / Oregon Expressway/Page Mill Rd (CMP)	PM	E	D	47.3	0.836
6	El Camino Real / Grant Ave*	AM	D	B	14.6	0.150
6	El Camino Real / Grant Ave*	PM	D	B	13.2	0.130
7	El Camino Real / California Ave	AM	D	C+	22.7	0.464
7	El Camino Real / California Ave	PM	D	C	29.8	0.604
8	Middlefield Rd / Oregon Expressway	AM	E	D	44.9	0.784
8	Middlefield Rd / Oregon Expressway	PM	E	D	46.9	0.758
9	Park Boulevard / Project Driveway**	AM	D	N/A	N/A	N/A
9	Park Boulevard / Project Driveway**	PM	D	N/A	N/A	N/A

Source: AECOM 2021

Acronyms: LOS = level of service; V/C = volume to capacity ratio; ECR = El Camino Real; CMP = Congestion Management Plan intersection; AM = morning; PM = afternoon; N/A = not applicable.

Notes:

*LOS and delay reported for worst movement for 2-way stop controlled intersections

**Overall delay reported for AWS controlled intersection

3.7 Cumulative Conditions

The horizon year for the Cumulative Conditions was determined to be 2030 after consulting with City of Palo Alto so as to coincide with its current Comprehensive Plan adopted in 2017 (Comprehensive Plan 2030, City of Palo Alto). As part of the comprehensive plan study process, the City of Palo Alto evaluated a total of six scenarios with varying degrees of growth for the year 2030. Its City Council eventually adopted a scenario with growth approximately mid-way of the evaluated scenarios.

In order to calculate the volumes at the project study intersections under the Cumulative Conditions, a growth factor will need to be determined. Given that no detailed intersection analysis was needed for the adopted scenario under City of Palo Alto 2030 Comprehensive Plan study, no corresponding intersection volume data was available for use by this project. City staff then advised that data from the studied scenario most closely matching the adopted scenario can be used in developing the growth factor to be used for this project. The selected study scenario from the Comprehensive Plan Study for the purpose of this project analysis was Scenario 5. **Appendix F** presents a summary of the Comprehensive Plan study scenario parameters.

Comparing the intersection volumes from the 'Existing' scenario and '2030 Scenario 5' of the City of Palo Alto 2030 Comprehensive Plan study, an average growth of 0.7% per year was determined. **Appendix G** shows the relevant intersection volumes extracted from the Comprehensive Plan. This growth factor was used to calculate the 2030 volumes for the local/collector roadways around the project where the surroundings are mostly developed and no significant growth would be expected. For the volumes along major roadways like ECR and Middlefield Road, the specific growth for each roadway was used instead of the average which ranged from 1% to 3% per year. These growth factors were applied to the Background Conditions volumes to arrive at the 2030 cumulative volumes for this project analysis. **Figure 3-5** presents the cumulative intersection volumes. Lane configuration for 2030 is expected to be the same as the Background Conditions. The analysis results for the Cumulative Scenario are presented in **Table 3-4** and the analysis details are presented in **Appendix H**. All the study intersections are expected to operate within acceptable levels under the Cumulative Conditions and the peak hour signal warrant for all the unsignalized intersection is also not met during both peak hour except for intersection #3, Birch Street and Sheridan Avenue**.**

The intersection of Birch Street and Sheridan Avenue is expected to operate at LOS E in the AM peak hour of 2030, below its acceptable standard of LOS D. However, the peak hour signal warrant is not met as shown in the detailed TRAFFIX analysis output.

Table 3-4 Intersection Performance – Cumulative Conditions

Int #	Intersection	Peak Hr	LOS Standard	Cumulative Conditions LOS	Cumulative Conditions Delay (sec)	Cumulative Conditions Critical V/C
1	Park Boulevard / Page Mill Rd	AM	D	A	8.3	0.241
1	Park Boulevard / Page Mill Rd	PM	D	A	5.0	0.286
2	Park Boulevard / Sherman Ave*	AM	D	B	11.0	0.020
2	Park Boulevard / Sherman Ave*	PM	D	B	14.3	0.010
3	Birch St / Sheridan Ave*	AM	D	**E**	**36.5**	**0.290**
3	Birch St / Sheridan Ave*	PM	D	C	23.7	0.270
4	Birch St / Grant Ave**	AM	D	B	14.0	0.681
4	Birch St / Grant Ave**	PM	D	A	9.7	0.451
5	El Camino Real / Oregon Expressway/Page Mill Rd (CMP)	AM	E	D	50.2	0.890
5	El Camino Real / Oregon Expressway/Page Mill Rd (CMP)	PM	E	D-	52.6	0.917
6	El Camino Real / Grant Ave*	AM	D	C	16.2	0.180
6	El Camino Real / Grant Ave*	PM	D	B	14.1	0.150
7	El Camino Real / California Ave	AM	D	C+	22.8	0.519
7	El Camino Real / California Ave	PM	D	C	30.5	0.675
8	Middlefield Rd / Oregon Expressway	AM	E	D	48.9	0.842
8	Middlefield Rd / Oregon Expressway	PM	E	D	48.7	0.808
9	Park Boulevard / Project Driveway**	AM	D	N/A	N/A	N/A
9	Park Boulevard / Project Driveway**	PM	D	N/A	N/A	N/A

Source: AECOM 2021

Acronyms: LOS = level of service; V/C = volume to capacity ratio; ECR = El Camino Real; CMP = Congestion Management Plan intersection; AM = morning; PM = afternoon; N/A = not applicable.

*LOS and delay reported for worst movement for 2-way stop controlled intersections

**Overall delay reported for AWS controlled intersection

Deficient operations are indicated in **bold**

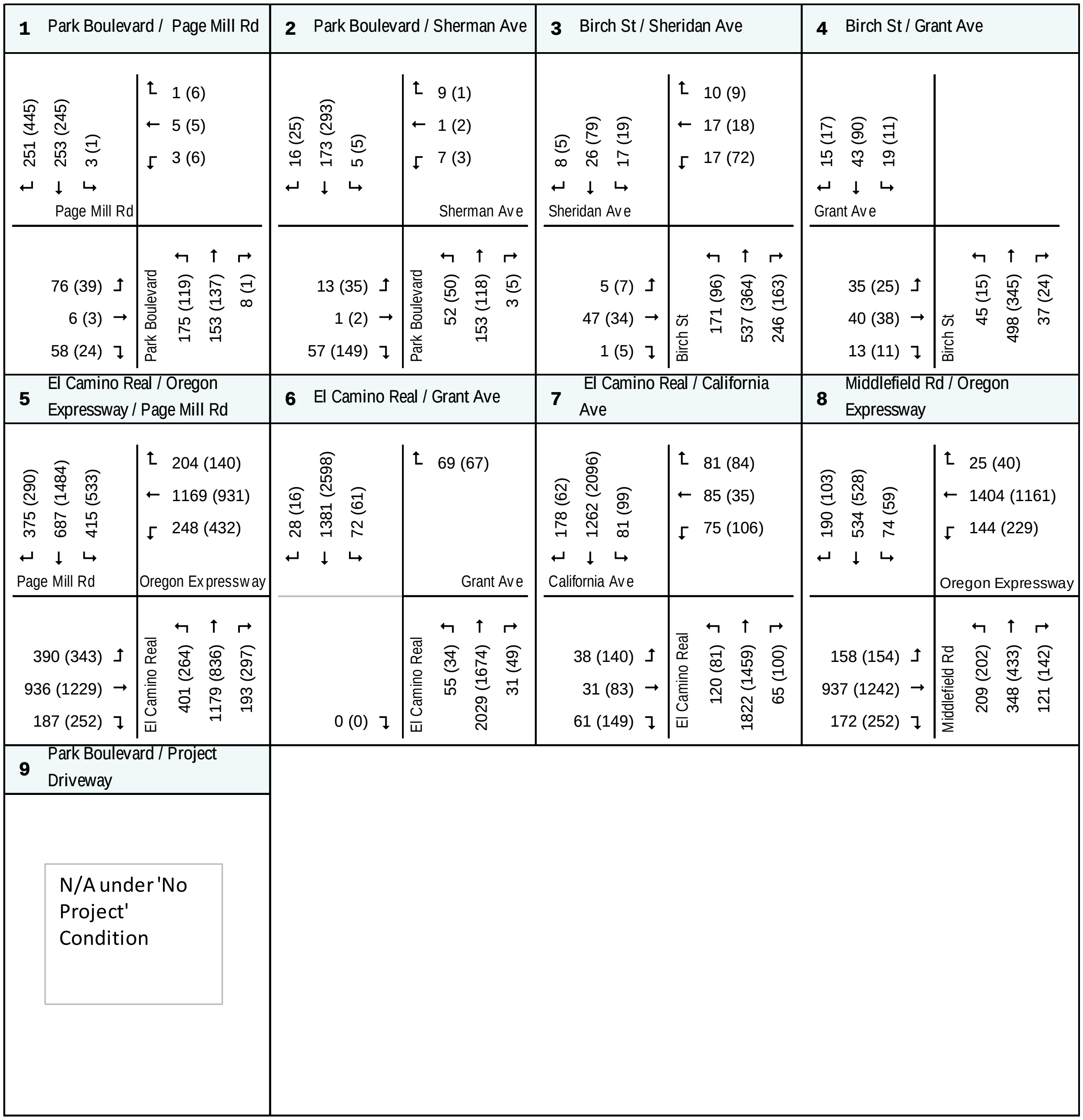


Figure 3-5 Cumulative Intersection Traffic Volumes

Source: AECOM 2021

4 Plus Project Conditions

This chapter looks at the future transportation conditions in the study area as a result of the proposed project. Trips generated by the proposed development are added to the 'no project' scenarios discussed in the earlier chapter to determine the effects of this project. These scenarios are therefore referred to as "plus project" conditions. Any mitigation measures necessary to alleviate potential impacts will also be discussed.

4.1 Trip Generation, Trip Distribution and Project-Only Trip Assignment

This section presents the number of vehicle trips generated by the proposed development. Trip generation rates from the Institute of Transportation Engineers' (ITE) Trip Generation Manual (10th Edition, 2017) were used for determining the number of trips of the future land use at the project site. Trip generation rates and estimates are summarized in **Table 4-1** and **Table 4-2**. As this project replaces an existing office area, the net additional trips will be considered 'project trips'.

Table 4-1 Trip Generation for Proposed Project – AM Peak Hour

Land Use	Size	Rate	In%	In	Out%	Out	Total
Residential (Land Use 221)	110 DU	0.36 per DU	26%	10	74%	29	39
Trip Adjustment for TOD		9 %		(1)		(3)	(4)
Café (Land Use 936)	1,120 SF	101.14 per SF		58		56	113
Total Proposed Trips			**51**	**67**	**49**	**82**	**149**
Office (Land Use 710)	10 employees	0.37 per employee	83%	3	17%	1	4
Total Existing Trips				**3**		**1**	**4**
Net New Trips				**64**		**81**	**145**

Source: Calculated by AECOM 2021 based on generation rates from ITE 2017.

Acronyms: DU = dwelling unit; SF = square feet; TOD = transit oriented development

Table 4-2 Trip Generation for Proposed Project – PM Peak Hour

Land Use	Size	Rate	In%	In	Out%	Out	Total
Residential (Land Use 221)	110 DU	0.44 per DU	61%	30	39%	18	48
Trip Adjustment for TOD		9 %		(3)		(2)	(4)
Café (Land Use 936)	1,120 SF	36.31 per SF		20		20	41
Total Proposed Trips			**50**	**47**	**50**	**38**	**85**
Office (Land Use 710)	10 employees	0.4 per employee	20%	1	80%	3	4
Total Existing Trips				**1**		**3**	**4**
Net New Trips				**46**		**35**	**81**

Source: Calculated by AECOM 2021 based on generation rates from ITE 2017.

Acronyms: DU = dwelling unit; SF = square feet; TOD = transit oriented development

According to VTA's guidelines, because this proposed development is located within 2,000 feet of walking distance from a major transit facility (no more than 0.3 mile, or 1,600 feet from California Avenue Caltrain Station), it is considered a transit-oriented development and a reduction of 9% can be applied to the number of trips generated by the housing portion. This should be coupled with implementing a Transportation Demand Management (TDM) Program. The developer of the project is currently developing a comprehensive TDM program and will be discussed with the County, followed by the City of Palo Alto when more details are available.

Although tenant for the proposed 'flex space' has not been decided at the point of this report, a café type land use (ITE Land Use 936 - Coffee/Donut Shop without Drive-Through Window) was chosen to represent the potential use of this area, as a café is likely to be one of the higher trip generating uses that might use the flex space, and is therefore a conservative assumption. Furthermore, Land Use 936 has a higher trip generation rates compared to another similar café type (ITE Land Use 939 – Bread/Donut/Bagel Shop Without Drive-Through Window) which will result in a more conservative analysis. The project trip generation did not further reduce for pass-by and diverted trips even though a café type use could see some of such trips. Trip generation for the existing office use were determined based on the number of employees rather than by the area of the building. This is because the number of trips calculated using the latter method would generate a higher number of trips which will lower the net new project trips to be generated. Therefore, to maintain a conservative approach, a lower number of existing trips based on actual employee numbers at the existing office were used.

As a result, the proposed project is estimated to generate 145 net new AM peak hour vehicle trips (64 inbound trips and 81 outbound trips) and 81 net new PM peak hour vehicle trips (46 inbound trips and 35 outbound trips).

Trip distribution is defined as the direction of approach and departure that vehicles would use to arrive at and depart from the site. The trip distribution pattern of the traffic generated by the project onto the roadway system was based on recent TIA's completed in the area, prevailing traffic patterns and the site access locations. The project trips were distributed and assigned to the study intersections for traffic impact determination based on the trip distribution percentages shown in **Figure 4-1.** The resulting project only volumes at each of the study intersections are presented in **Figure 4-2**, and existing plus project traffic volumes at each intersection are shown in Error! Reference source not found.**.**

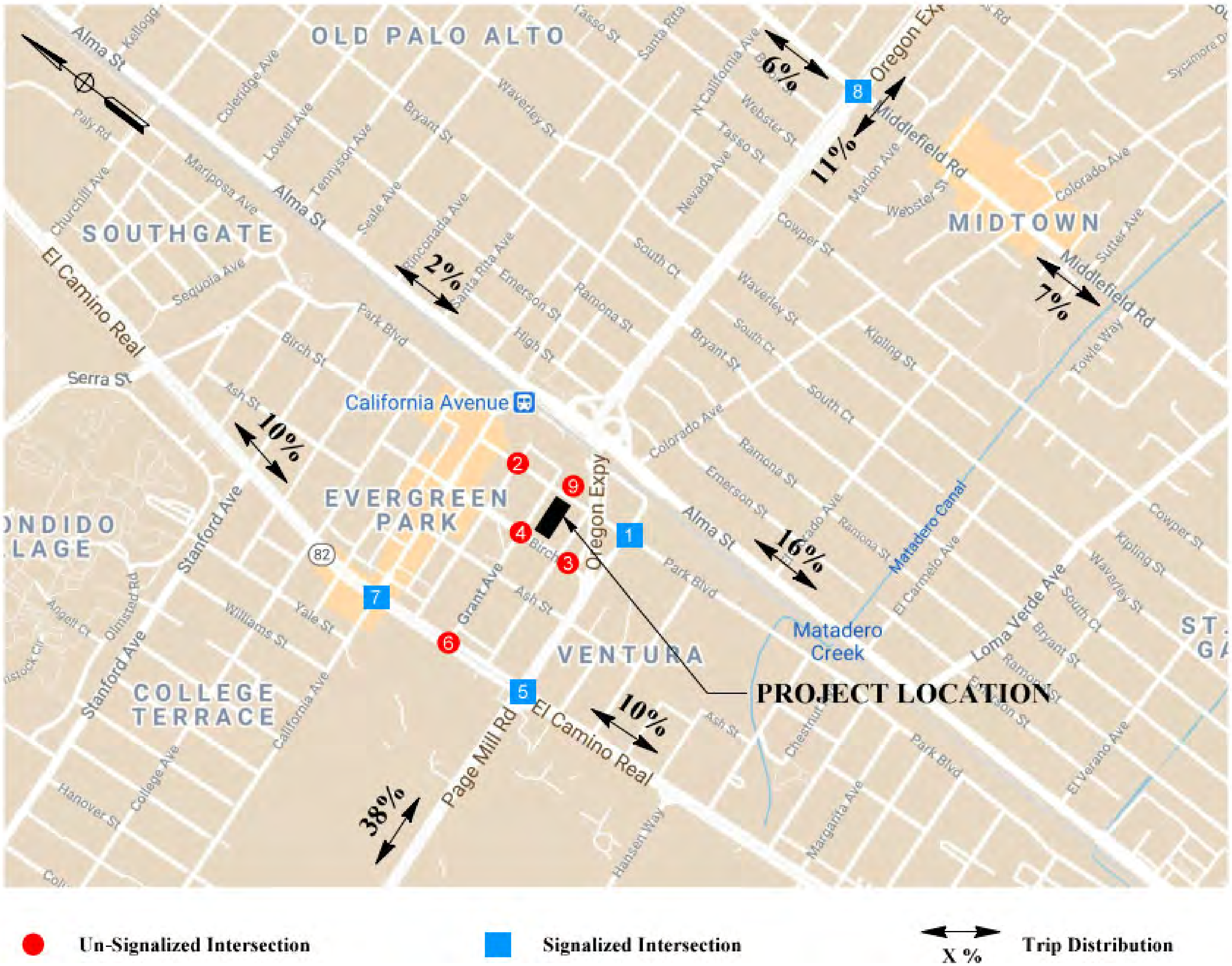


Figure 4-1 Project Trip Distribution

Source: AECOM 2021

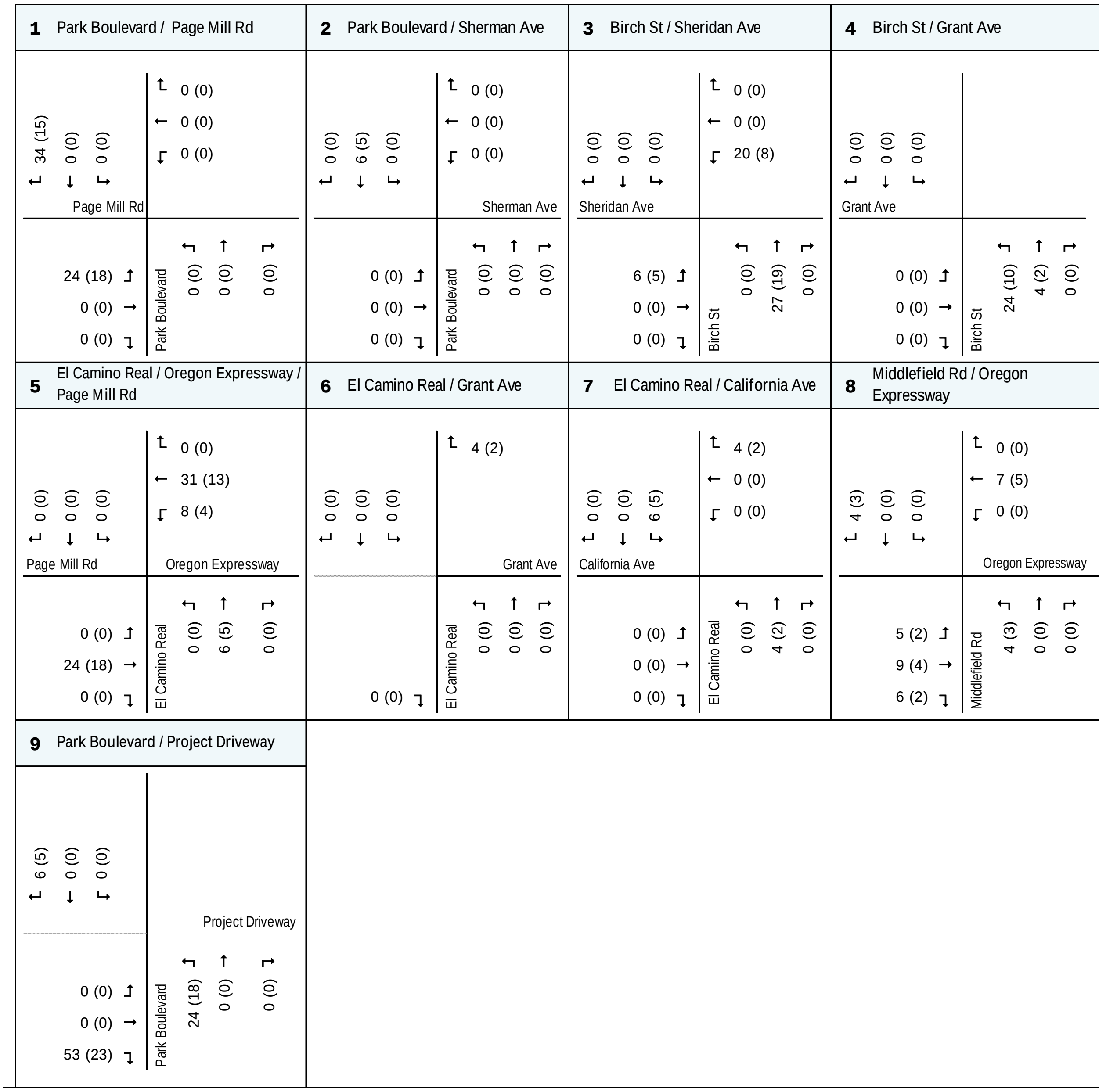


Figure 4-2 Project Only Traffic Volumes

Source: AECOM 2021

4.2 Existing plus Project Conditions

4.2.1 Intersection Operations

A project impact is determined by comparing the operating conditions of 'plus project' and the 'no project' scenarios. The total 'plus project' traffic volumes for all the study intersections under the Existing Conditions are presented in **Figure 4-3**. The comparison table is shown in **Table 4-3.** All the intersections operated within acceptable LOS and the peak hour signal warrant for all unsignalized intersections is not met with and without project. Therefore, no intersection impacts are expected under the 'Existing plus Project' scenario. Details of this analysis are presented in **Appendix B**.

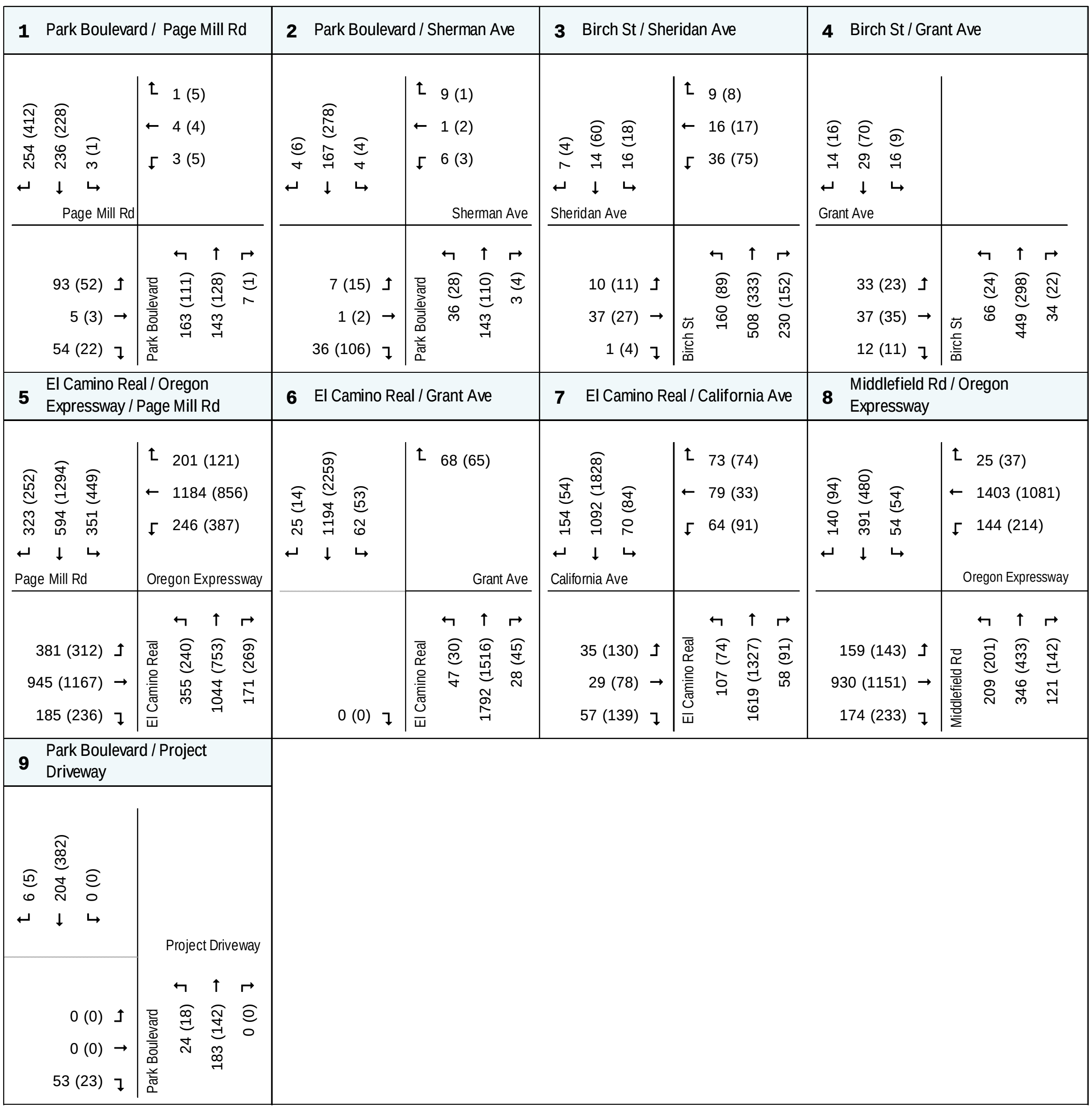


Figure 4-3 Existing+ Project Traffic Volumes

Source: AECOM 2021

Table 4-3 Comparison of Study Intersections LOS – Existing plus Project Conditions

Int #	Intersection	Peak Hr	Existing LOS	Existing Delay (sec)	Existing Critical V/C	Existing Avg Crit Delay (sec)	Existing + Project LOS	Existing + Project Delay (sec)	Existing + Project Critical V/C	Existing + Project Avg Crit Delay (sec)	Δ Delay	Δ Crit V/C	Δ Avg Crit Delay	Impact ?
1	Park Boulevard / Page Mill Rd	AM	A	8.4	0.232	9.6	A	9.5	0.246	11.5	N/C	N/C	N/C	N
1	Park Boulevard / Page Mill Rd	PM	A	4.8	0.261	5.0	A	5.6	0.281	6.6	N/C	N/C	N/C	N
2	Park Boulevard / Sherman Ave*	AM	B	10.4	0.010	2.2	B	10.4	0.010	2.2	N/C	N/C	N/C	N
2	Park Boulevard / Sherman Ave*	PM	B	12.6	0.010	3.0	B	12.7	0.010	3.0	N/C	N/C	N/C	N
3	Birch St / Sheridan Ave*	AM	D	28.3	0.190	3.6	D	30.9	0.210	4.5	N/C	N/C	N/C	N
3	Birch St / Sheridan Ave*	PM	C	19.3	0.210	4.2	C	20.5	0.240	4.5	N/C	N/C	N/C	N
4	Birch St / Grant Ave**	AM	B	12.2	0.606	12.2	B	13	0.640	13.0	N/C	N/C	N/C	N
4	Birch St / Grant Ave**	PM	A	9.1	0.385	9.1	A	9.2	0.400	9.2	N/C	N/C	N/C	N
5	ECR / Oregon E'way / Page Mill Rd (CMP)	AM	D	50.3	0.897	55.6	D-	51	0.908	56.7	N/C	N/C	N/C	N
5	ECR / Oregon E'way / Page Mill Rd (CMP)	PM	D	47.3	0.824	51.4	D	47.5	0.832	51.9	N/C	N/C	N/C	N
6	ECR / Grant Ave*	AM	B	14.5	0.140	0.8	B	14.6	0.150	0.8	N/C	N/C	N/C	N
6	ECR / Grant Ave*	PM	B	13.2	0.130	0.6	B	13.3	0.130	0.6	N/C	N/C	N/C	N
7	ECR / California Ave	AM	C+	22	0.456	19.0	C+	22.2	0.461	19.4	N/C	N/C	N/C	N
7	ECR / California Ave	PM	C	29.1	0.599	29.2	C	29.3	0.599	29.2	N/C	N/C	N/C	N

Int #	Intersection	Peak Hr	Existing LOS	Existing Delay (sec)	Existing Critical V/C	Existing Avg Crit Delay (sec)	Existing + Project LOS	Existing + Project Delay (sec)	Existing + Project Critical V/C	Existing + Project Avg Crit Delay (sec)	Δ Delay	Δ Crit V/C	Δ Avg Crit Delay	Impact ?
8	Middlefield Rd / Oregon E'way	AM	D	44.7	0.777	48.6	D	45.1	0.786	49.3	N/C	N/C	N/C	N
8	Middlefield Rd / Oregon E'way	PM	D	46.4	0.742	47.9	D	46.6	0.743	47.9	N/C	N/C	N/C	N
9	Park Boulevard / Project Driveway*	AM	N/A	N/A	N/A	N/A	A	9.6	0.060	1.5	N/A	N/A	N/A	N
9	Park Boulevard / Project Driveway*	PM	N/A	N/A	N/A	N/A	B	10.6	0.030	0.7	N/A	N/A	N/A	N

Source: AECOM 2021

Acronyms: LOS = level of service; V/C = volume to capacity ratio; ECR = El Camino Real; E'way = Expressway; CMP = Congestion Management Plan intersection; AM = morning; PM = afternoon; sec = seconds; Δ = difference between existing and existing plus project conditions; N/A = not applicable. N/C = not calculated (Δ only calculated for deficient operations)

Notes:

*LOS and delay reported for worst movement for 2-way stop controlled intersections

**Overall delay reported for AWS controlled intersection

Deficient operations are indicated in **bold**. Δ only calculated for deficient operations.

4.2.2 Queuing Analysis

This section presents the evaluation of the queuing conditions at signalized intersections that have turning pockets using the Traffix software, which is based on the HCM 2000 Methodology. The average queue length under the Existing plus Project Traffic conditions was compared with the existing left-turn storage lengths to identify if there is any queue that spills back out of the turn pockets. A typical vehicle length of 25 feet was used for the queuing analysis. An operational deficiency is assumed to occur if the queue increases by one or more vehicles and if the queue exceeds the turn pocket length. The queue details are provided in Appendix B as part of the intersection analysis results.

Table 4-4 summarizes the queues under the Existing plus Project Conditions. Existing with project queues at all analyzed intersections can be accommodated within storage lane provided during both peak hours except the following:

- Intersection #5 – ECR / Oregon Expressway/Page Mill Rd – southbound right-turn in both the AM and PM peak
- Intersection #5 – ECR / Oregon Expressway/Page Mill Rd – westbound left-turn in the PM peak
- Intersection #8 – Middlefield Rd / Oregon Expressway – northbound left-turn in both the AM and PM peak
- Intersection #8 – Middlefield Rd / Oregon Expressway – eastbound right-turn in both the AM and PM peak

The queue at these movements already exceeded the storage lane provided without the project. In particular, no project trips are expected to make the southbound right movement at the ECR / Oregon Expressway / Page Mill Road (int #5) intersection. However, queuing condition can still be indirectly affected by volume changes in other movements of the intersection.

The queues these two intersections are expected to increase slightly under the 'with project' conditions but would not be considered an impact as the change due to the project would be less than one-car length.

For the intersection of ECR / Oregon Expressway / Page Mill Road, work is underway to improve the intersection by providing an exclusive westbound right-turn lane (from Oregon Expressway / Page Mill Road to southbound ECR) and to extend the westbound storage lane by more than two hundred feet (8-car length) in total. This part of the County's Expressway 2040 Program and will be reflected in the Background Conditions.

Table 4-4 Queuing Analysis – Existing plus Project Conditions

Int #	Intersection	Storage Length (ft)	Movement	Existing AM Peak Hr (Ft)[1,2]	Existing PM Peak Hr (Ft)[1,2]	Existing + Project AM Peak Hr (Ft)[1,2]	Existing + Project AM Peak Hr (Ft)[1,2]
1	Park Boulevard / Page Mill Rd	275	SBR	50	70	70	80
1	Park Boulevard / Page Mill Rd	165	EBL	55	30	70	45
1	Park Boulevard / Page Mill Rd	110	WBL	0	5	0	5
5	ECR / Oregon E'way / Page Mill Rd (CMP)	300	NBL	260	185	265	185
5	ECR / Oregon E'way / Page Mill Rd (CMP)	350	SBL	285	315	290	320
5	ECR / Oregon E'way / Page Mill Rd (CMP)	140	SBR	**385**	**225**	**385**	**230**
5	ECR / Oregon E'way / Page Mill Rd (CMP)	340	EBL	305	210	305	210
5	ECR / Oregon E'way / Page Mill Rd (CMP)	290	EBR	125	185	125	185
5	ECR / Oregon E'way / Page Mill Rd (CMP)	255	WBL	155	**280**	160	**285**
7	ECR / California Ave	235	NBL	125	115	125	115
7	ECR / California Ave	135	SBL	90	105	95	110
7	ECR / California Ave	170	EBL	45	160	45	160
7	ECR / California Ave	150	WBL	90	130	90	130
7	ECR / California Ave	105	WBR	85	85	90	85
8	Middlefield Rd / Oregon E'way (CMP)	235	NBR	115	130	115	130
8	Middlefield Rd / Oregon E'way (CMP)	235	NBL	**290**	**275**	**295**	**280**
8	Middlefield Rd / Oregon E'way (CMP)	155	SBL	80	95	80	95
8	Middlefield Rd / Oregon E'way (CMP)	370	EBL	230	190	240	195
8	Middlefield Rd / Oregon E'way (CMP)	100	EBR	**125**	**190**	**130**	**195**
8	Middlefield Rd / Oregon E'way (CMP)	405	WBL	180	290	180	290
8	Middlefield Rd / Oregon E'way (CMP)	100	WBR	15	25	15	25

Source: AECOM, 2021. Notes: 1. Average queue length rounded up to nearest 5 feet. 2. Queue exceeding storage lane shown in **bold**, queue exceeding storage lane by more than one car length (25 feet) shown in underline, see text for more discussion. Acronyms: ft = feet; ECR = El Camino Real; E'way = Expressway; CMP = Congestion Management Plan intersection; AM = morning; PM = afternoon; NB = northbound; SB = southbound; EB = eastbound; WB = westbound; L = left-turn; R = right-turn; > = more than.

4.3 Background plus Project Conditions

4.3.1 Intersection Operations

Traffic volumes under background plus project conditions are shown in **Figure 4-4**, while **Table 4-5** compares the intersection performance under the Background Conditions. All the intersections operated within acceptable LOS with and without project. In addition, the peak hour signal warrant is also not met for all the unsignalized intersections during both peak hours. As such, no intersection impacts are expected under the ‘Background plus Project’ scenario. Details of this analysis are presented in **Appendix E.**

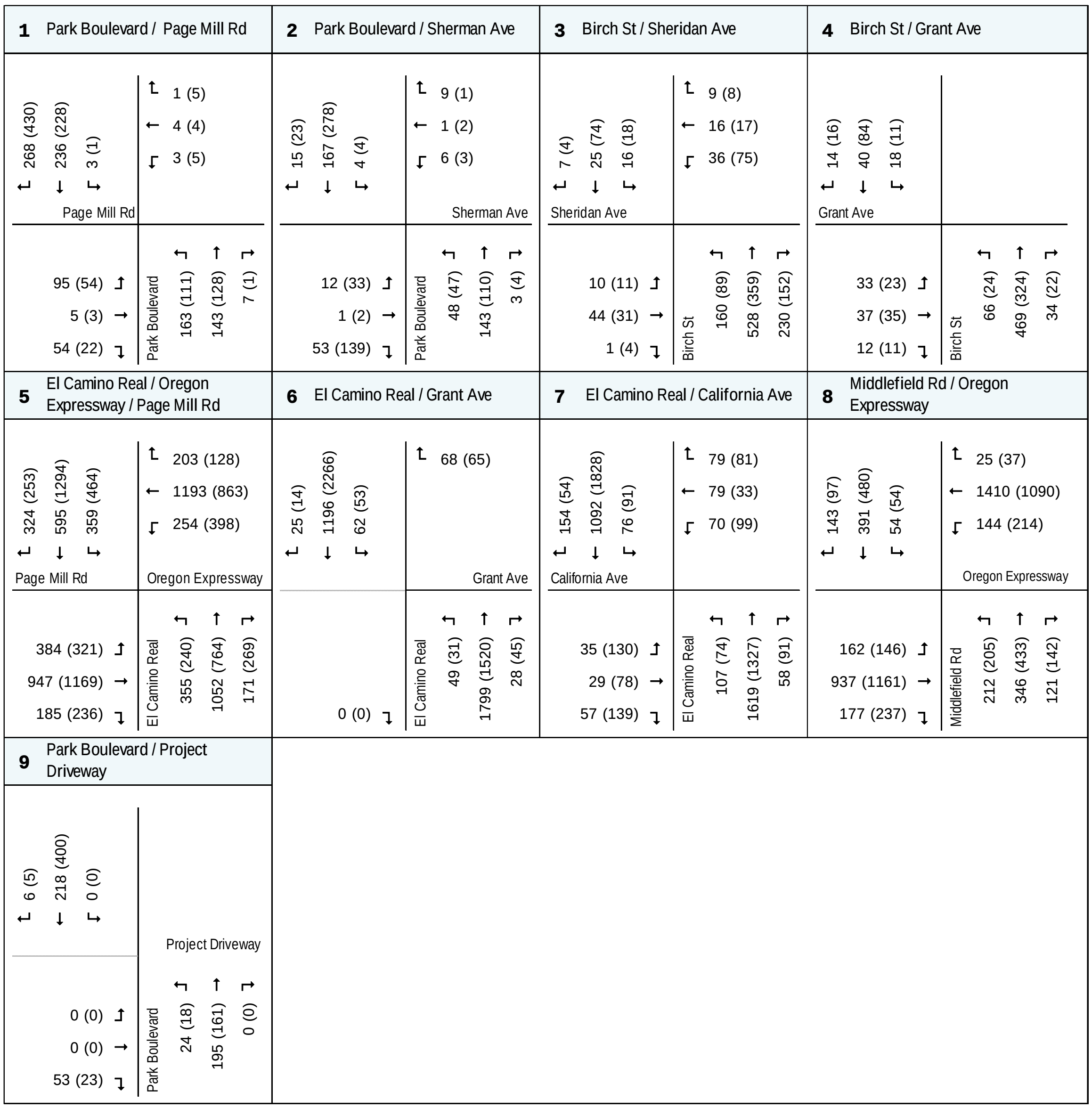


Figure 4-4 Background plus Project Traffic Volumes

Source: AECOM 2021

Table 4-5 Comparison of Study Intersections LOS – Background plus Project Conditions

Int #	Intersection	Peak Hr	Backgrd LOS	Backgrd Delay (sec)	Backgrd Critical V/C	Backgrd Avg Crit Delay (sec)	Backgrd + Project LOS	Backgrd + Project Delay (sec)	Backgrd + Project Critical V/C	Backgrd + Project Avg Crit Delay (sec)	Δ Delay	Δ Crit V/C	Δ Avg Crit Delay	Impact ?
1	Park Boulevard / Page Mill Rd	AM	A	8.4	0.233	9.8	A	9.5	0.247	11.7	N/C	N/C	N/C	N
1	Park Boulevard / Page Mill Rd	PM	A	4.9	0.273	5.1	A	5.7	0.294	6.6	N/C	N/C	N/C	N
2	Park Boulevard / Sherman Ave*	AM	B	10.6	0.010	2.7	B	10.7	0.010	2.7	N/C	N/C	N/C	N
2	Park Boulevard / Sherman Ave*	PM	B	13.7	0.010	4.1	B	13.7	0.010	4.1	N/C	N/C	N/C	N
3	Birch St / Sheridan Ave*	AM	D	30.9	0.240	3.8	D	34.1	0.240	4.9	N/C	N/C	N/C	N
3	Birch St / Sheridan Ave*	PM	C	20.8	0.230	4.3	C	22.3	0.260	4.6	N/C	N/C	N/C	N
4	Birch St / Grant Ave**	AM	B	12.7	0.632	12.7	B	13.6	0.666	13.6	N/C	N/C	N/C	N
4	Birch St / Grant Ave**	PM	A	9.4	0.418	9.4	A	9.5	0.432	9.5	N/C	N/C	N/C	N
5	ECR / Oregon E'way / Page Mill Rd (CMP)	AM	D	46.8	0.836	51.2	D	47.2	0.846	51.8	N/C	N/C	N/C	N
5	ECR / Oregon E'way / Page Mill Rd (CMP)	PM	D	47.3	0.836	52.4	D	47.6	0.844	52.9	N/C	N/C	N/C	N
6	ECR / Grant Ave*	AM	B	14.6	0.150	0.8	B	14.7	0.150	0.8	N/C	N/C	N/C	N
6	ECR / Grant Ave*	PM	B	13.2	0.130	0.6	B	13.3	0.130	0.6	N/C	N/C	N/C	N
7	ECR / California Ave	AM	C+	22.7	0.464	19.9	C+	22.9	0.468	20.4	N/C	N/C	N/C	N
7	ECR / California Ave	PM	C	29.8	0.604	29.8	C	30	0.604	29.8	N/C	N/C	N/C	N

Int #	Intersection	Peak Hr	Backgrd LOS	Backgrd Delay (sec)	Backgrd Critical V/C	Backgrd Avg Crit Delay (sec)	Backgrd + Project LOS	Backgrd + Project Delay (sec)	Backgrd + Project Critical V/C	Backgrd + Project Avg Crit Delay (sec)	Δ Delay	Δ Crit V/C	Δ Avg Crit Delay	Impact ?
8	Middlefield Rd / Oregon E'way	AM	D	44.9	0.784	49.1	D	45.3	0.793	49.8	N/C	N/C	N/C	N
8	Middlefield Rd / Oregon E'way	PM	D	46.9	0.758	52.2	D	47.1	0.762	52.4	N/C	N/C	N/C	N
9	Park Boulevard / Project Driveway*	AM	N/A	N/A	N/A	N/A	A	9.7	0.060	1.4	N/A	N/A	N/A	N
9	Park Boulevard / Project Driveway*	PM	N/A	N/A	N/A	N/A	B	10.7	0.040	0.6	N/A	N/A	N/A	N

Source: AECOM, 2021

Acronyms: LOS = level of service; V/C = volume to capacity ratio; ECR = El Camino Real; E'way= Expressway; CMP = Congestion Management Plan intersection; AM = morning; PM = afternoon; sec = seconds; Backgrd = Background; Δ = difference between background and background plus project conditions; N/A = not applicable. N/C = not calculated (Δ only calculated for deficient operations)

Notes:

*LOS and delay reported for worst movement for 2-way stop controlled intersections

**Overall delay reported for AWS controlled intersection

Deficient operations are indicated in **bold**. Δ only calculated for deficient operations.

4.3.2 Queuing Analysis

Queuing analysis was conducted for the Background plus Project Traffic conditions at signalized intersections that have turning pockets using the Traffix software, based on the HCM 2000 Methodology. A typical vehicle length of 25 feet was used for the queuing analysis. An operational deficiency is assumed to occur if the queue increases by one or more vehicles and if the queue exceeds the turn pocket length. The queue details are provided in **Appendix E** as part of the intersection analysis results**.**

Table 4-6 summarizes the queues under the Background plus Project Conditions. The queues at all analyzed intersections can be accommodated within the provided storage lanes during both peak hours except the following:

- Intersection #5 – ECR / Oregon Expressway/Page Mill Rd – southbound right-turn in both the AM and PM peak
- Intersection #5 – ECR / Oregon Expressway/Page Mill Rd – westbound right-turn in the AM peak
- Intersection #8 – Middlefield Rd / Oregon Expressway – northbound left-turn in both the AM and PM peak
- Intersection #8 – Middlefield Rd / Oregon Expressway – eastbound right-turn in both the AM and PM peak

Similar to the Existing Conditions, the southbound right-turn queue at the ECR / Oregon Expressway/Page Mill Road intersection (int #5) is expected to exceed the storage capacity provided during both peak hours, without the project. No project trips are expected to be added to this movement and no change to the queue length is expected under the 'with project' conditions.

The queue at the westbound left-turn movement of intersection #5 is expected to be accommodated by the improved (lengthened) left-turn storage that is being planned as part of the County's Expressway 2040 program, with and without the project during both peak hours. However, the westbound right-turn queue could exceed the new right-turn pocket to be provided in the near future during the AM peak hour. No project trips are expected to be added to this movement and no change to the queue length is expected with project.

At the Middlefield Road / Oregon Expressway intersection (int #8), the northbound left-turn and eastbound right-turn continue to see queue exceeding the provided storage lane in both peak hours similar to the Existing Conditions without project. The queues under the 'with project conditions are not expected to increase by more than one-car length and would not be considered to have significant impacts.

Table 4-6 Queuing Analysis – Background plus Project Conditions

Int #	Intersection	Storage Length (ft)	Movement	Backgrd AM Peak Hr (Ft) [1,2]	Backgrd AM Peak Hr (Ft) [1,2]	Backgrd + Project AM Peak Hr (Ft) [1,2]	Backgrd + Project AM Peak Hr (Ft) [1,2]
1	Park Boulevard / Page Mill Rd	275	SBR	55	75	75	85
1	Park Boulevard / Page Mill Rd	165	EBL	55	35	70	50
1	Park Boulevard / Page Mill Rd	110	WBL	0	5	0	5
5	ECR / Oregon E'way / Page Mill Rd (CMP)	300	NBL	245	185	245	185
5	ECR / Oregon E'way / Page Mill Rd (CMP)	350	SBL	270	330	275	330
5	ECR / Oregon E'way / Page Mill Rd (CMP)	140	SBR	<u>**360**</u>	<u>**230**</u>	<u>**360**</u>	<u>**230**</u>
5	ECR / Oregon E'way / Page Mill Rd (CMP)	340	EBL	285	205	290	205
5	ECR / Oregon E'way / Page Mill Rd (CMP)	290	EBR	135	185	135	185
5	ECR / Oregon E'way / Page Mill Rd (CMP)	360	WBL	165	290	170	295
5	ECR / Oregon E'way / Page Mill Rd (CMP)	120	WBR	<u>**155**</u>	95	<u>**155**</u>	95
7	ECR / California Ave	235	NBL	125	115	125	115
7	ECR / California Ave	135	SBL	95	115	100	120
7	ECR / California Ave	170	EBL	45	155	45	155
7	ECR / California Ave	150	WBL	95	140	95	140
7	ECR / California Ave	105	WBR	95	90	100	95
8	Middlefield Rd / Oregon E'way (CMP)	235	NBL	<u>**295**</u>	<u>**280**</u>	<u>**300**</u>	<u>**285**</u>
8	Middlefield Rd / Oregon E'way (CMP)	235	NBR	115	130	115	130
8	Middlefield Rd / Oregon E'way (CMP)	155	SBL	80	80	80	80
8	Middlefield Rd / Oregon E'way (CMP)	370	EBL	235	195	245	200
8	Middlefield Rd / Oregon E'way (CMP)	100	EBR	<u>**130**</u>	<u>**195**</u>	<u>**130**</u>	<u>**200**</u>
8	Middlefield Rd / Oregon E'way (CMP)	405	WBL	180	295	180	295
8	Middlefield Rd / Oregon E'way (CMP)	100	WBR	15	25	15	25

Source: AECOM, 2021. Notes: 1. Average queue length rounded up to nearest 5 feet. 2. Queue exceeding existing storage length shown in **bold**, queue exceedance more than one car length shown in <u>underline</u>, as discussed in text. Acronyms: Backgrd = Background; ft = feet; ECR = El Camino Real; E'way = Expressway; CMP = Congestion Management Plan intersection; AM = morning; PM = afternoon; NB = northbound; SB = southbound; EB = eastbound; WB = westbound; L = left-turn; R = right-turn; > = more than.

4.4 Cumulative plus Project Conditions

4.4.1 Intersection Operations

Traffic volumes under cumulative plus project conditions are shown in **Figure 4-4**, while **Table 4-7** compares the intersection performance under the Cumulative Conditions. It can be seen that all intersections would either operate within acceptable LOS with and without the Project, or that it would already operate at LOS E without the Project as in the case of the Birch Street / Sheridan Avenue intersection (int #3). Although the change in delay at the Birch Street / Sheridan Avenue intersection due to the project is expected to be more than four seconds (threshold for impact determination), the intersection would operate without significant change in the V/C ratio. In addition, the peak hour signal warrant for this intersection would not be met during both peak hours. The peak hour signal warrant for the other unsignalized intersections is also not met during both peak hours. Therefore, the project has no significant impact on any of the study intersections under this scenario. Analysis details are presented in **Appendix H**.

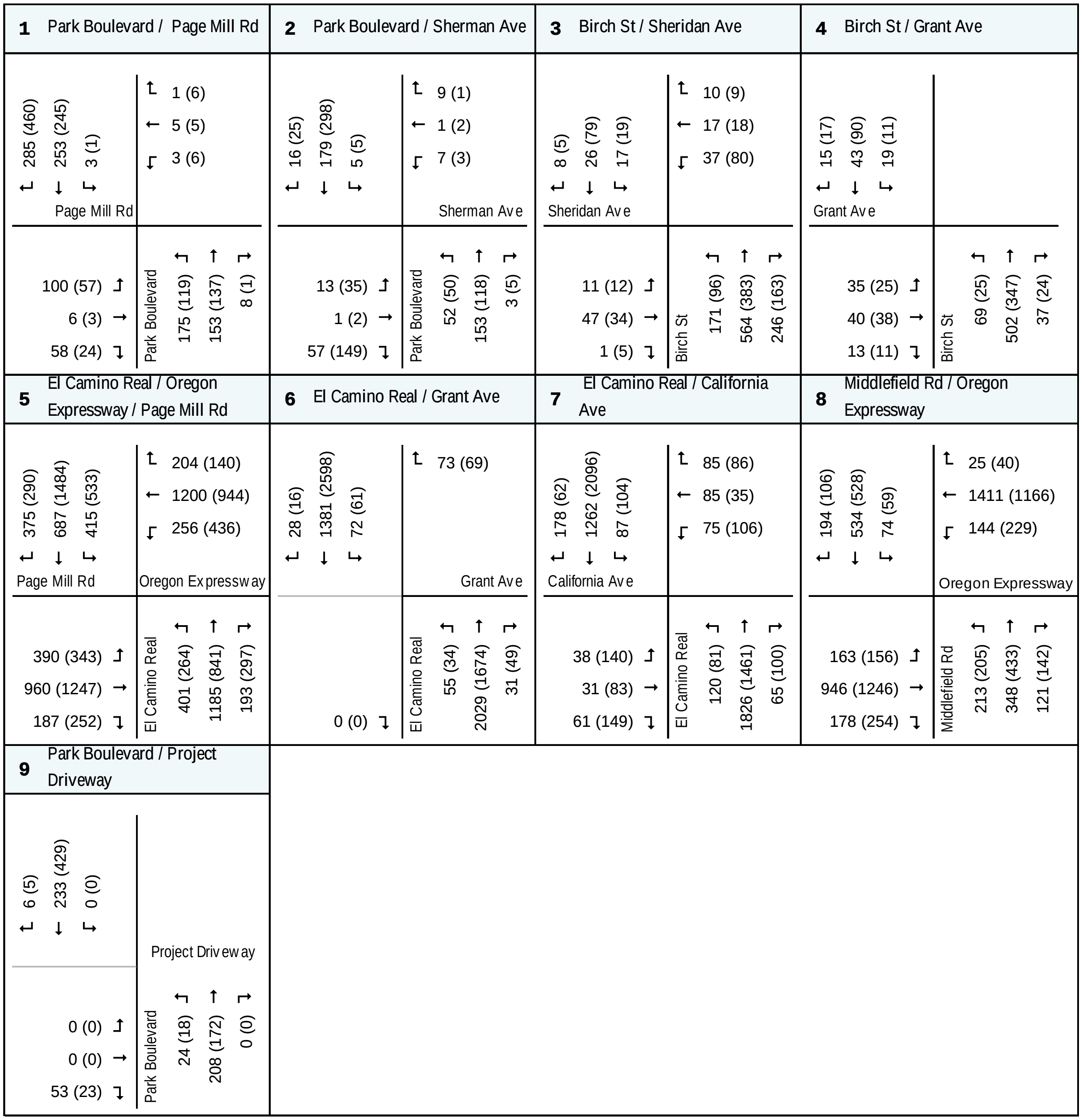


Figure 4-5 Cumulative plus Project Traffic Volumes

Source: AECOM 2021

Table 4-7 Comparison of Study Intersections LOS – Cumulative plus Project Conditions

Int #	Intersection	Peak Hr	Cumul LOS	Cumul Delay (sec)	Cumul Critical V/C	Cumul Avg Crit Delay (sec)	Cumul + Project LOS	Cumul + Project Delay (sec)	Cumul + Project Critical V/C	Cumul + Project Avg Crit Delay (sec)	Δ Delay	Δ Crit V/C	Δ Avg Crit Delay	Impact ?
1	Park Boulevard / Page Mill Rd	AM	A	8.3	0.241	8.7	A	9.6	0.264	11.7	N/C	N/C	N/C	N
1	Park Boulevard / Page Mill Rd	PM	A	5	0.286	4.2	A	5.7	0.314	6.6	N/C	N/C	N/C	N
2	Park Boulevard / Sherman Ave*	AM	B	11	0.020	2.8	B	11	0.020	2.7	N/C	N/C	N/C	N
2	Park Boulevard / Sherman Ave*	PM	B	14.3	0.010	4.2	B	14.4	0.010	4.2	N/C	N/C	N/C	N
3	Birch St / Sheridan Ave*	AM	**E**	**36.5**	**0.290**	**4.3**	**E**	**41.9**	**0.290**	**5.6**	5.4	0.000	1.3	N
3	Birch St / Sheridan Ave*	PM	C	23.7	0.270	4.7	C	25.7	0.310	5.1	N/C	N/C	N/C	N
4	Birch St / Grant Ave**	AM	B	14	0.681	14.0	C	15.1	0.716	15.1	N/C	N/C	N/C	N
4	Birch St / Grant Ave**	PM	A	9.7	0.451	9.7	A	9.9	0.466	9.9	N/C	N/C	N/C	N
5	ECR / Oregon E'way / Page Mill Rd (CMP)	AM	D	50.2	0.890	56.0	D	50.9	0.901	57.0	N/C	N/C	N/C	N
5	ECR / Oregon E'way / Page Mill Rd (CMP)	PM	D-	52.6	0.917	60.6	D-	53.2	0.924	61.6	N/C	N/C	N/C	N
6	ECR / Grant Ave*	AM	C	16.2	0.180	0.9	C	16.3	0.190	1.0	N/C	N/C	N/C	N
6	ECR / Grant Ave*	PM	B	14.1	0.150	0.7	B	14.2	0.150	0.7	N/C	N/C	N/C	N
7	ECR / California Ave	AM	C+	22.8	0.519	20.3	C	23.1	0.523	20.7	N/C	N/C	N/C	N
7	ECR / California Ave	PM	C	30.5	0.675	30.6	C	30.7	0.675	30.6	N/C	N/C	N/C	N

Int #	Intersection	Peak Hr	Cumul LOS	Cumul Delay (sec)	Cumul Critical V/C	Cumul Avg Crit Delay (sec)	Cumul + Project LOS	Cumul + Project Delay (sec)	Cumul + Project Critical V/C	Cumul + Project Avg Crit Delay (sec)	Δ Delay	Δ Crit V/C	Δ Avg Crit Delay	Impact ?
8	Middlefield Rd / Oregon E'way	AM	D	48.9	0.842	54.5	D	49.4	0.851	55.5	N/C	N/C	N/C	N
8	Middlefield Rd / Oregon E'way	PM	D	48.7	0.808	54.8	D	48.9	0.812	55.1	N/C	N/C	N/C	N
9	Park Boulevard / Project Driveway*	AM	N/A	N/A	N/A	N/A	A	9.8	0.070	1.3	N/A	N/A	N/A	N
9	Park Boulevard / Project Driveway*	PM	N/A	N/A	N/A	N/A	B	10.9	0.040	0.6	N/A	N/A	N/A	N

Source: AECOM, 2021

Acronyms: Cumul = Cumulative; LOS = level of service; V/C = volume to capacity ratio; ECR = El Camino Real; E'way = Expressway; CMP = Congestion Management Plan intersection; AM = morning; PM = afternoon; sec = seconds; Δ = difference between cumulative and cumulative plus project conditions; N/A = not applicable. N/C = not calculated (Δ only calculated for deficient operations)

Notes:

*LOS and delay reported for worst movement for 2-way stop controlled intersections

**Overall delay reported for AWS controlled intersection

Deficient operations are indicated in **bold**. Δ Only calculated for deficient operations

4.4.2 Queuing Analysis

Queuing analysis was conducted for the study intersections under the Cumulative plus Project Traffic conditions at signalized intersections that have turning pockets using the Traffix software, based on the HCM 2000 Methodology. A typical vehicle length of 25 feet was used for the queuing analysis. An operational deficiency is assumed to occur if the queue increases by one or more vehicles and if the queue exceeds the turn pocket length. The queue details are provided in **Appendix H** as part of the intersection analysis results**.**

Table 4-8 summarizes the queues under the Cumulative plus Project Conditions. The queues at all analyzed intersections can be accommodated within provided storage lanes during both peak hours except the following:

- Intersection #5 – ECR / Oregon Expressway/Page Mill Rd – southbound left-turn in both the PM peak
- Intersection #5 – ECR / Oregon Expressway/Page Mill Rd – southbound right-turn in both the AM and PM peak
- Intersection #5 – ECR / Oregon Expressway/Page Mill Rd – westbound right-turn in the AM peak
- Intersection #7 - ECR / California Ave – westbound left-turn in the PM peak
- Intersection #8 – Middlefield Rd / Oregon Expressway – northbound left-turn in both the AM and PM peak
- Intersection #8 – Middlefield Rd / Oregon Expressway – eastbound right-turn in both the AM and PM peak

Southbound left-turn and right-turn queues at the ECR / Oregon Expressway/Page Mill Road intersection (int #5) are expected to exceed the storage capacity provided during the PM and AM peak hour respectively, without the project. No project trips are expected to be added to these movement. However, queuing condition can still be indirectly affected by volume changes in other movements of the intersection. The queue at the westbound left-turn movement of this intersection is expected to still be accommodated by the improved (lengthened) left-turn storage that is being planned, with and without the project during both peak hours. However, the westbound right-turn queue could exceed the new right-turn pocket during the AM peak hour. No project trips are expected to be added to this movement and the queue length is expected to remain the same with project.

Similar to the Background Conditions, the northbound left queue at the Middlefield Rd / Oregon Expressway intersection (int #8) is expected to exceed the storage capacity provided during both peak hours, with and without the project. Since the queue already exceeded the storage lane provided without the project and the change in queue length is less than one car, the project would not be considered to have a significant impact.

Table 4-8 Queuing Analysis – Cumulative plus Project Conditions

Int #	Intersection	Storage Length (ft)	Movement	Cumul AM Peak Hr (Ft)[1]	Cumul AM Peak Hr (Ft)[1]	Cumul + Project AM Peak Hr (Ft)[1,2]	Cumul + Project AM Peak Hr (Ft)[1,2]
1	Park Boulevard / Page Mill Rd	275	SBR	55	85	80	90
1	Park Boulevard / Page Mill Rd	165	EBL	65	35	75	55
1	Park Boulevard / Page Mill Rd	110	WBL	0	5	0	5
5	ECR / Oregon E'way / Page Mill Rd (CMP)	300	NBL	285	215	285	220
5	ECR / Oregon E'way / Page Mill Rd (CMP)	350	SBL	320	<u>**405**</u>	325	<u>**410**</u>
5	ECR / Oregon E'way / Page Mill Rd (CMP)	140	SBR	<u>**425**</u>	<u>**265**</u>	<u>**430**</u>	<u>**265**</u>
5	ECR / Oregon E'way / Page Mill Rd (CMP)	340	EBL	305	225	310	230
5	ECR / Oregon E'way / Page Mill Rd (CMP)	290	EBR	140	205	140	205
5	ECR / Oregon E'way / Page Mill Rd (CMP)	360	WBL	170	340	180	350
5	ECR / Oregon E'way / Page Mill Rd (CMP)	120	WBR	<u>**160**</u>	105	<u>**160**</u>	105
7	ECR / California Ave	235	NBL	140	130	140	130
7	ECR / California Ave	135	SBL	110	130	120	135
7	ECR / California Ave	170	EBL	50	170	50	170
7	ECR / California Ave	150	WBL	105	**160**	105	**160**
7	ECR / California Ave	105	WBR	105	100	**110**	105
8	Middlefield Rd / Oregon E'way (CMP)	235	NBL	<u>**315**</u>	<u>**295**</u>	<u>**320**</u>	<u>**300**</u>
8	Middlefield Rd / Oregon E'way (CMP)	235	NBR	110	135	110	135
8	Middlefield Rd / Oregon E'way (CMP)	155	SBL	110	90	110	90
8	Middlefield Rd / Oregon E'way (CMP)	370	EBL	250	215	260	215
8	Middlefield Rd / Oregon E'way (CMP)	100	EBR	<u>**135**</u>	<u>**210**</u>	<u>**140**</u>	<u>**215**</u>
8	Middlefield Rd / Oregon E'way (CMP)	405	WBL	185	325	190	325
8	Middlefield Rd / Oregon E'way (CMP)	100	WBR	15	25	15	25

Source: AECOM, 2021. Notes: 1. Average queue length rounded up to nearest 5 feet. 2. Queue exceeding existing storage length shown in **bold**, queue exceedance more than one car length shown in <u>underline</u>, as discussed in text. Acronyms: Cumul = Cumulative; ft = feet; ECR = El Camino Real; E'way = Expressway; CMP = Congestion Management Plan intersection; AM = morning; PM = afternoon; NB = northbound; SB = southbound; EB = eastbound; WB = westbound; L = left-turn; R = right-turn> = more than.

5 Conclusions

The proposed 231 Grant Educator Workforce Housing project is located at 231 Grant Avenue in the City of Palo Alto, California. The proposal is to develop a new four-story mixed-use complex on a site with an existing office building. Having evaluated the current and future traffic conditions at the local intersections in the vicinity of the project, the study concluded that this proposed project would not lead to any significant impacts at the 9 study intersections.

The intersection levels of service analysis showed that all the study intersections are expected to operate within acceptable levels during both peak hours under all scenarios with the exception of the Birch Street / Sheridan Avenue intersection (int #3). This intersection is expected to operate at LOS E in the AM peak under the Cumulative Conditions. However, the project is not expected to cause a significant impact as the increase in V/C ratio is not significant to be considered an impact. In addition, a traffic signal is not warranted at this location. Therefore, it can be concluded that the project will not significantly worsen this intersection performance.

Similarly, the queuing analysis concluded that the project is not expected to significantly worsen the queuing conditions at the analyzed intersections. The storage capacity at all analyzed intersections is expected to accommodate the traffic queues, with and without the project except at three locations. Several movements at ECR / Oregon Expressway / Page Mill Road intersection (int #5) are expected to exceed its storage capacity in one of the peak hours, with and without the project under all scenarios. However, any increase in queue length under the 'with project' conditions was found to be less than one-car length and, therefore, would not constitute a significant impact. In addition, the proposed lengthening of the westbound left-turn storage, to be implemented in the near future under the County's Expressway 2040 Program, is expected accommodate the future queue under the Background and Cumulative Conditions.

Queues at two movements of the Middlefield Road / Oregon Expressway intersection (int 8) are expected to exceed the provided storage capacity in both peak hours under all three scenarios. However, the increase in queue length under the 'with project' conditions is expected to be less than one-car length and, therefore, would not constitute a significant impact.

Under the Cumulative Scenario, the westbound left-turn queue at the ECR / California Avenue intersection (int #7) is expected to exceed the provided storage capacity in the PM peak with and without project. However, the queue length change under the 'with project' condition would not be considered a significant impact as it is expected to be less than one-car length.

6 References

California Department of Transportation (Caltrans). 2020. California Manual on Uniform Traffic Control Devices (CA MUTCD).

City of Palo Alto, 2017. City of Palo Alto Comprehensive Plan.

City of Palo Alto. 2020. Personal Communication. Email from Shrupath Patel, City of Palo Alto Transportation Planner to Nichole Seow, AECOM Transportation Planner dated December 22nd.

Fehr & Peers, May 2018. Traffic Impact Analysis, Palo Alto Public Safety Building and Public Parking Structure.

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Institute of Transportation Engineers' (ITE) 2017. Trip Generation Manual (10th Edition).

Mercy Housing and Abode Communities, 2020. Conceptual Project Plans for 231 Grant Educator Workforce Housing project.

Transportation Research Board. 2010. Special Report 209, Highway Capacity Manual (HCM).

Valley Transportation Authority (VTA). 2003. Traffic Level of Service Analysis Guidelines. Adopted January 1995, updated June 2003.

APPENDIX A

Traffic Counts

Traffic Data Service

San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name : 3AM FINAL
Site Code : 00000003
Start Date : 9/27/2016
Page No : 1

Groups Printed- Vehicles

	PARK BLVD Southbound					PAGE MILL RD Westbound					PARK BLVD Northbound					PAGE MILL RD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	18	17	0	0	35	0	0	1	6	7	0	8	8	4	20	1	1	8	7	17	79
07:15 AM	31	29	1	0	61	0	0	0	9	9	0	10	11	5	26	7	2	10	0	19	115
07:30 AM	38	39	1	1	79	1	0	2	54	57	0	16	17	39	72	7	1	13	6	27	235
07:45 AM	59	33	1	0	93	1	0	2	3	6	0	29	34	1	64	8	1	9	6	24	187
Total	146	118	3	1	268	2	0	5	72	79	0	63	70	49	182	23	5	40	19	87	616
08:00 AM	47	52	2	0	101	0	0	1	3	4	1	32	41	2	76	14	1	9	2	26	207
08:15 AM	52	53	1	3	109	0	3	1	20	24	2	23	29	9	63	12	1	17	0	30	226
08:30 AM	49	64	0	0	113	0	0	1	99	100	4	38	37	82	161	17	0	21	4	42	416
08:45 AM	58	52	0	0	110	1	1	0	23	25	0	41	46	18	105	8	3	18	6	35	275
Total	206	221	3	3	433	1	4	3	145	153	7	134	153	111	405	51	5	65	12	133	1124
Grand Total	352	339	6	4	701	3	4	8	217	232	7	197	223	160	587	74	10	105	31	220	1740
Apprch %	50.2	48.4	0.9	0.6		1.3	1.7	3.4	93.5		1.2	33.6	38	27.3		33.6	4.5	47.7	14.1		
Total %	20.2	19.5	0.3	0.2	40.3	0.2	0.2	0.5	12.5	13.3	0.4	11.3	12.8	9.2	33.7	4.3	0.6	6	1.8	12.6	

	PARK BLVD Southbound				PAGE MILL RD Westbound				PARK BLVD Northbound				PAGE MILL RD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	47	52	**2**	101	0	0	**1**	1	1	32	41	74	14	1	9	24	200
08:15 AM	52	53	1	106	0	**3**	1	**4**	2	23	29	54	12	1	17	30	194
08:30 AM	49	**64**	0	**113**	0	0	1	1	**4**	38	37	79	**17**	0	**21**	**38**	**231**
08:45 AM	**58**	52	0	110	**1**	1	0	2	0	**41**	**46**	**87**	8	**3**	18	29	228
Total Volume	206	221	3	430	1	4	3	8	7	134	153	294	51	5	65	121	853
% App. Total	47.9	51.4	0.7		12.5	50	37.5		2.4	45.6	52		42.1	4.1	53.7		
PHF	.888	.863	.375	.951	.250	.333	.750	.500	.438	.817	.832	.845	.750	.417	.774	.796	.923

Traffic Data Service

San Jose, CA
(408) 622-4787
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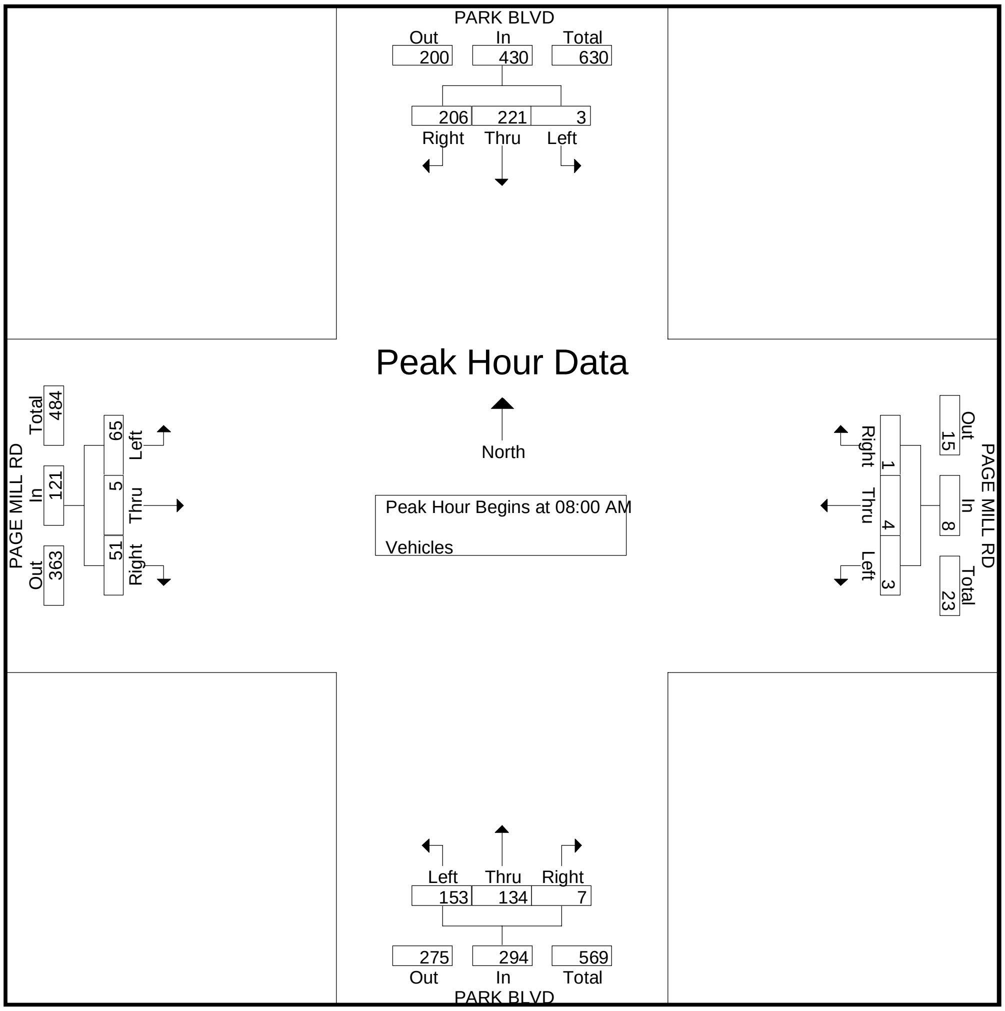
File Name : 3AM FINAL
Site Code : 00000003
Start Date : 9/27/2016
Page No : 2



Traffic Data Service

San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name : 2AM FINAL
Site Code : 00000002
Start Date : 9/27/2016
Page No : 1

Groups Printed- Vehicles

	PARK BLVD Southbound					SHERMAN AVE Westbound					PARK BLVD Northbound					SHERMAN AVE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	1	13	0	1	15	0	0	0	3	3	1	7	3	0	11	4	1	0	4	9	38
07:15 AM	1	16	0	0	17	0	0	1	5	6	2	13	4	0	19	8	0	3	1	12	54
07:30 AM	1	20	1	1	23	1	0	1	10	12	1	17	7	1	26	9	0	3	5	17	78
07:45 AM	0	32	0	2	34	1	0	3	2	6	1	22	7	0	30	8	0	1	4	13	83
Total	3	81	1	4	89	2	0	5	20	27	5	59	21	1	86	29	1	7	14	51	253
08:00 AM	2	43	0	1	46	2	0	1	2	5	1	33	4	1	39	3	0	1	2	6	96
08:15 AM	2	35	2	0	39	2	1	1	4	8	1	24	8	0	33	9	0	4	0	13	93
08:30 AM	0	36	0	1	37	4	0	2	5	11	1	35	13	1	50	11	0	1	4	16	114
08:45 AM	0	37	2	0	39	0	0	2	3	5	0	42	9	1	52	11	0	1	3	15	111
Total	4	151	4	2	161	8	1	6	14	29	3	134	34	3	174	34	0	7	9	50	414
Grand Total	7	232	5	6	250	10	1	11	34	56	8	193	55	4	260	63	1	14	23	101	667
Apprch %	2.8	92.8	2	2.4		17.9	1.8	19.6	60.7		3.1	74.2	21.2	1.5		62.4	1	13.9	22.8		
Total %	1	34.8	0.7	0.9	37.5	1.5	0.1	1.6	5.1	8.4	1.2	28.9	8.2	0.6	39	9.4	0.1	2.1	3.4	15.1	

	PARK BLVD Southbound				SHERMAN AVE Westbound				PARK BLVD Northbound				SHERMAN AVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	**2**	**43**	0	**45**	2	0	1	3	**1**	33	4	38	3	0	1	4	90
08:15 AM	2	35	**2**	39	2	**1**	1	4	1	24	8	33	9	0	**4**	**13**	89
08:30 AM	0	36	0	36	**4**	0	**2**	**6**	1	35	**13**	49	**11**	0	1	12	103
08:45 AM	0	37	2	39	0	0	2	2	0	**42**	9	**51**	11	0	1	12	**104**
Total Volume	4	151	4	159	8	1	6	15	3	134	34	171	34	0	7	41	386
% App. Total	2.5	95	2.5		53.3	6.7	40		1.8	78.4	19.9		82.9	0	17.1		
PHF	.500	.878	.500	.883	.500	.250	.750	.625	.750	.798	.654	.838	.773	.000	.438	.788	.928

Traffic Data Service

San Jose, CA
(408) 622-4787
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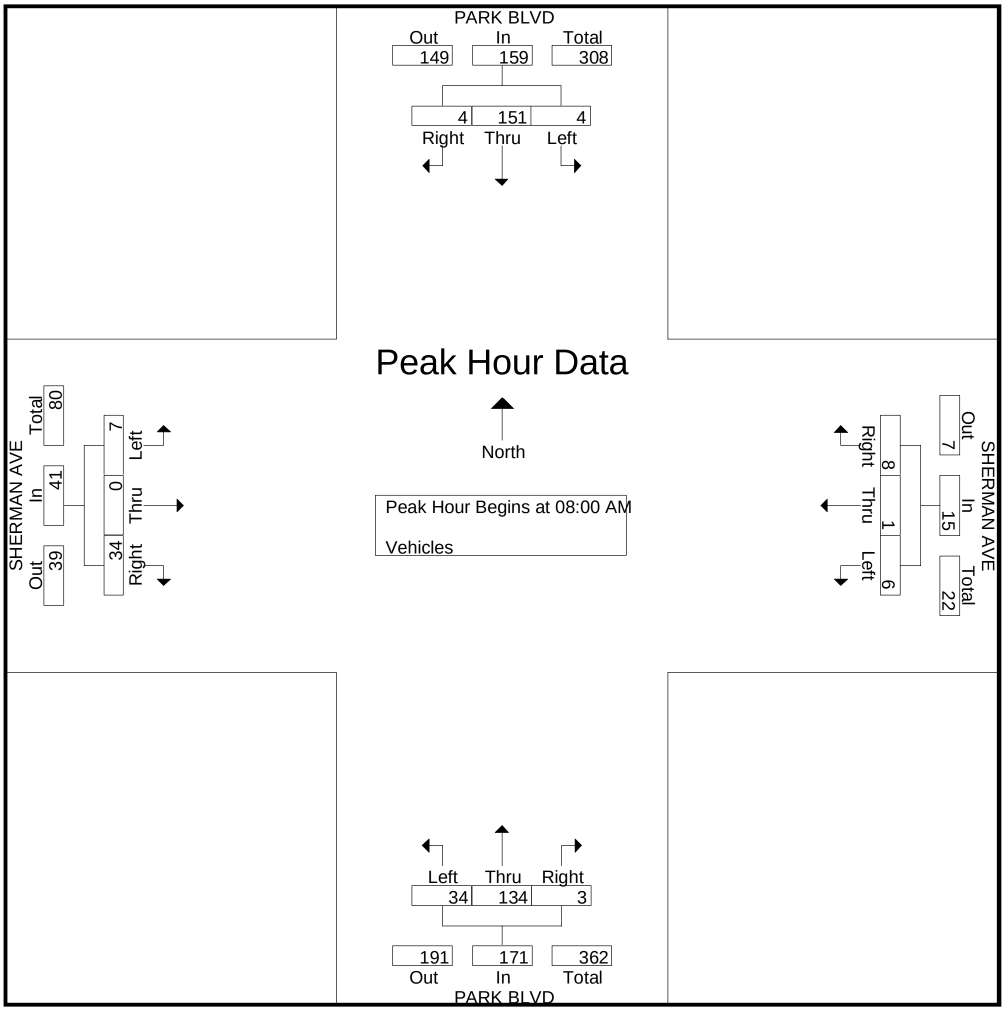
File Name : 2AM FINAL
Site Code : 00000002
Start Date : 9/27/2016
Page No : 2



(303) 216-2439
www.alltrafficdata.net

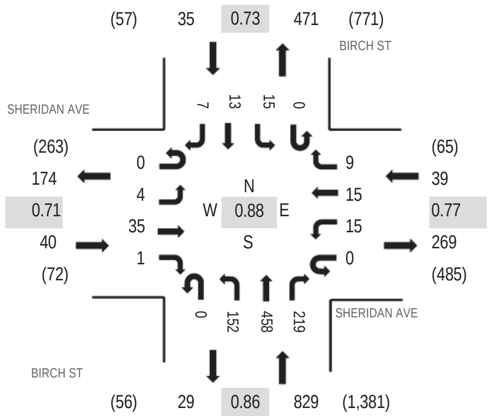
Location: 1 BIRCH ST & SHERIDAN AVE AM

Date and Start Time: Thursday, March 23, 2017

Peak Hour: 07:45 AM - 08:45 AM

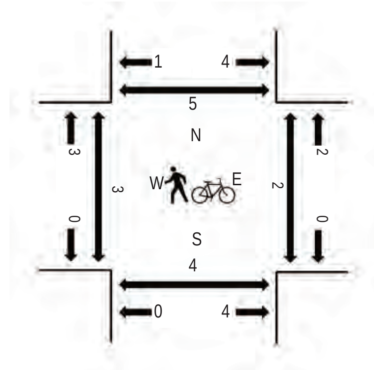
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	SHERIDAN AVE Eastbound U-Turn	Left	Thru	Right	SHERIDAN AVE Westbound U-Turn	Left	Thru	Right	BIRCH ST Northbound U-Turn	Left	Thru	Right	BIRCH ST Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour	Pedestrain Crossings West	East	South	North
7:00 AM	0	0	4	0	0	0	0	2	0	8	43	31	0	1	1	0	90	654	1	1	0	2
7:15 AM	0	2	6	0	0	5	0	1	0	14	57	34	0	5	1	0	125	784	1	1	0	1
7:30 AM	0	1	9	1	0	4	1	2	0	25	83	37	0	1	6	2	172	891	0	2	0	0
7:45 AM	0	1	8	0	0	5	3	2	0	63	132	45	0	3	2	3	267	943	1	0	1	1
8:00 AM	0	0	3	0	0	2	2	2	0	41	109	55	0	1	4	1	220	921	1	0	0	3
8:15 AM	0	2	11	1	0	4	5	4	0	28	108	60	0	5	3	1	232		1	0	1	1
8:30 AM	0	1	13	0	0	4	5	1	0	20	109	59	0	6	4	2	224		0	2	0	0
8:45 AM	0	1	7	1	0	4	4	3	0	35	105	80	0	1	4	0	245		0	1	1	3

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound U-Turn	Left	Thru	Right	Westbound U-Turn	Left	Thru	Right	Northbound U-Turn	Left	Thru	Right	Southbound U-Turn	Left	Thru	Right	Total
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
Lights	0	4	35	1	0	14	14	9	0	150	451	216	0	15	12	7	928
Mediums	0	0	0	0	0	1	1	0	0	2	7	2	0	0	1	0	14
Total	0	4	35	1	0	15	15	9	0	152	458	219	0	15	13	7	943

Traffic Data Service

San Jose, CA

(408) 622-4787

tdsbay@cs.com

File Name : 6AM FINAL
Site Code : 00000006
Start Date : 9/27/2016
Page No : 1

Groups Printed- Vehicles

	BIRCH ST Southbound					GRANT AVE Westbound					BIRCH ST Northbound					GRANT AVE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	2	4	1	1	8	0	0	0	1	1	6	47	3	2	58	2	4	2	0	8	75
07:15 AM	0	0	1	2	3	0	0	0	5	5	5	49	3	0	57	0	7	6	1	14	79
07:30 AM	1	3	0	0	4	0	0	0	4	4	7	60	4	0	71	2	7	2	0	11	90
07:45 AM	0	4	1	0	5	0	0	0	4	4	6	82	16	1	105	0	9	5	1	15	129
Total	3	11	3	3	20	0	0	0	14	14	24	238	26	3	291	4	27	15	2	48	373
08:00 AM	3	6	2	0	11	0	0	0	3	3	8	113	8	0	129	4	8	6	2	20	163
08:15 AM	1	5	1	0	7	0	0	0	1	1	9	105	9	0	123	1	8	5	5	19	150
08:30 AM	6	8	8	0	22	0	0	0	1	1	8	105	7	1	121	1	12	12	1	26	170
08:45 AM	3	8	4	0	15	0	0	0	5	5	7	94	15	3	119	5	7	8	3	23	162
Total	13	27	15	0	55	0	0	0	10	10	32	417	39	4	492	11	35	31	11	88	645
Grand Total	16	38	18	3	75	0	0	0	24	24	56	655	65	7	783	15	62	46	13	136	1018
Apprch %	21.3	50.7	24	4		0	0	0	100		7.2	83.7	8.3	0.9		11	45.6	33.8	9.6		
Total %	1.6	3.7	1.8	0.3	7.4	0	0	0	2.4	2.4	5.5	64.3	6.4	0.7	76.9	1.5	6.1	4.5	1.3	13.4	

	BIRCH ST Southbound				GRANT AVE Westbound				BIRCH ST Northbound				GRANT AVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	3	6	2	11	0	0	0	0	8	**113**	8	**129**	4	8	6	18	158
08:15 AM	1	5	1	7	0	0	0	0	**9**	105	9	123	1	8	5	14	144
08:30 AM	**6**	**8**	**8**	**22**	0	0	0	0	8	105	7	120	1	**12**	**12**	**25**	**167**
08:45 AM	3	8	4	15	0	0	0	0	7	94	**15**	116	**5**	7	8	20	151
Total Volume	13	27	15	55	0	0	0	0	32	417	39	488	11	35	31	77	620
% App. Total	23.6	49.1	27.3		0	0	0		6.6	85.5	8		14.3	45.5	40.3		
PHF	.542	.844	.469	.625	.000	.000	.000	.000	.889	.923	.650	.946	.550	.729	.646	.770	.928

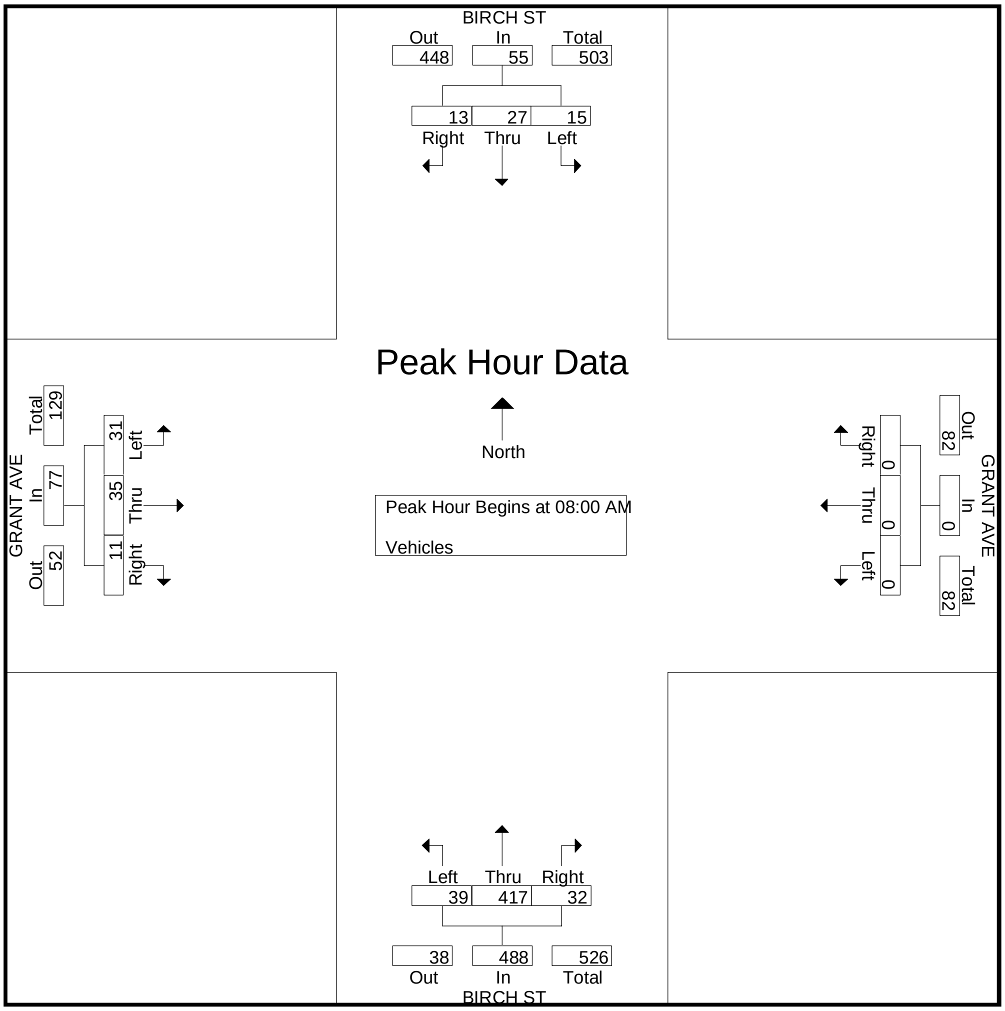
Traffic Data Service

San Jose, CA

(408) 622-4787

tdsbay@cs.com

File Name : 6AM FINAL
Site Code : 00000006
Start Date : 9/27/2016
Page No : 2

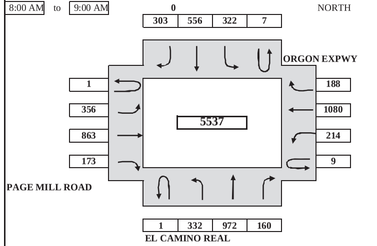


B.A.Y.M.E.T.R.I.C.S.

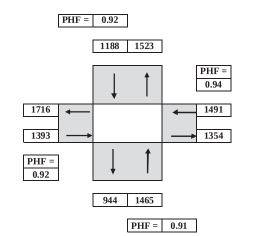
INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN PALO ALTO	SURVEY DATE: 10/4/2016	DAY: TUESDAY	
N-S APPROACH: EL CAMINO REAL	SURVEY TIME: 7:00 AM	TO 9:00 AM	
E-W APPROACH: PAGE MILL ROAD - ORGON EXPWY	JURISDICTION: PALO ALTO	FILE: 3610078	

PEAK HOUR 8:00 AM to 9:00 AM



ARRIVAL / DEPARTURE VOLUMES



TIME From		PERIOD To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
7:00 AM	to	7:15 AM	0	55	189	32	0	34	60	36	0	62	119	28	1	56	230	66	968
7:15 AM	to	7:30 AM	1	106	325	68	0	63	139	71	0	126	245	52	2	94	426	113	1831
7:30 AM	to	7:45 AM	2	200	646	124	0	108	236	121	0	217	429	97	8	174	706	183	3251
7:45 AM	to	8:00 AM	2	262	877	166	0	179	380	187	0	298	590	131	10	229	913	228	4452
8:00 AM	to	8:15 AM	2	361	1111	212	0	278	537	248	0	393	821	185	11	288	1196	283	5926
8:15 AM	to	8:30 AM	2	432	1315	245	3	357	656	303	1	479	1037	221	14	339	1474	328	7206
8:30 AM	to	8:45 AM	2	509	1597	289	4	432	789	386	1	554	1243	260	16	401	1757	376	8616
8:45 AM	to	9:00 AM	3	594	1849	326	7	501	936	490	1	654	1453	304	19	443	1993	416	9989
TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	55	189	32	0	34	60	36	0	62	119	28	1	56	230	66	968
7:15 AM	to	7:30 AM	1	51	136	36	0	29	79	35	0	64	126	24	1	38	196	47	863
7:30 AM	to	7:45 AM	1	94	321	56	0	45	97	50	0	91	184	45	6	80	280	70	1420
7:45 AM	to	8:00 AM	0	62	231	42	0	71	144	66	0	81	161	34	2	55	207	45	1201
8:00 AM	to	8:15 AM	0	99	234	46	0	99	157	61	0	95	231	54	1	59	283	55	1474
8:15 AM	to	8:30 AM	0	71	204	33	3	79	119	55	1	86	216	36	3	51	278	45	1280
8:30 AM	to	8:45 AM	0	77	282	44	1	75	133	83	0	75	206	39	2	62	283	48	1410
8:45 AM	to	9:00 AM	1	85	252	37	3	69	147	104	0	100	210	44	3	42	236	40	1373
HOURLY TOTALS																			
7:00 AM	to	8:00 AM	2	262	877	166	0	179	380	187	0	298	590	131	10	229	913	228	4452
7:15 AM	to	8:15 AM	2	306	922	180	0	244	477	212	0	331	702	157	10	232	966	217	4958
7:30 AM	to	8:30 AM	1	326	990	177	3	294	517	232	1	353	792	169	12	245	1048	215	5375
7:45 AM	to	8:45 AM	0	309	951	165	4	324	553	265	1	337	814	163	8	227	1051	193	5365
8:00 AM	to	9:00 AM	1	332	972	160	7	322	556	303	1	356	863	173	9	214	1080	188	5537

PEAK HOUR SUMMARY

8:00 AM to 9:00 AM	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	TOTAL
VOLUME	1	332	972	160	7	322	556	303	1	356	863	173	9	214	1080	188	5537
PHF BY MOVEMENT	0.25	0.84	0.86	0.87	0.58	0.81	0.89	0.73	0.25	0.89	0.93	0.80	0.75	0.86	0.95	0.85	OVERALL
PHF BY APPROACH	0.91				0.92				0.92				0.94				0.94
BICYCLE	3				2				5				8				18
PEDESTRIAN BY DIR:	46				12				8				26				92
	N-LEG				S-LEG				E-LEG				W-LEG				
PEDESTRIAN BY LEG:	23				11				33				25				92

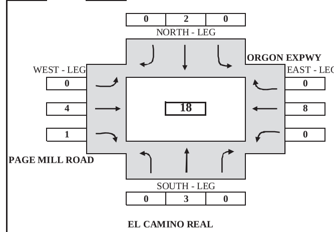
TEL: (510) 232 - 1271 EMAIL: BAYMETRICS@GMAIL.COM

B.A.Y.M.E.T.R.I.C.S.

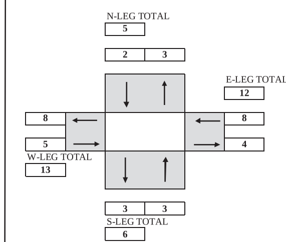
BICYCLE MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN PALO ALTO	SURVEY DATE: 10/4/2016	DAY: TUESDAY	
N-S APPROACI EL CAMINO REAL	SURVEY TIME: 7:00 AM	TO 9:00 AM	
E-W APPROAC PAGE MILL ROAD	JURISDICTION PALO ALTO	FILE: 3610078	

PEAK HOUR 8:00 AM TO 9:00 AM



ARRIVAL / DEPARTURE VOLUMES



TIME From		PERIOD To	NB LEFT	NB THRU	NB RIGHT	SB LEFT	SB THRU	SB RIGHT	EB LEFT	EB THRU	EB RIGHT	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA															
7:00 AM	to	7:15 AM	0	1	0	0	0	1	0	0	0	0	0	0	2
7:15 AM	to	7:30 AM	0	1	0	0	0	1	0	2	0	0	1	0	5
7:30 AM	to	7:45 AM	0	1	0	0	1	1	0	3	0	0	1	0	7
7:45 AM	to	8:00 AM	0	4	0	0	1	1	0	3	0	0	1	0	10
8:00 AM	to	8:15 AM	0	5	0	0	1	1	0	3	1	0	2	0	13
8:15 AM	to	8:30 AM	0	5	0	0	3	1	0	4	1	0	8	0	22
8:30 AM	to	8:45 AM	0	6	0	0	3	1	0	6	1	0	8	0	25
8:45 AM	to	9:00 AM	0	7	0	0	3	1	0	7	1	0	9	0	28
TOTAL BY PERIOD															
7:00 AM	to	7:15 AM	0	1	0	0	0	1	0	0	0	0	0	0	2
7:15 AM	to	7:30 AM	0	0	0	0	0	0	0	2	0	0	1	0	3
7:30 AM	to	7:45 AM	0	0	0	0	1	0	0	1	0	0	0	0	2
7:45 AM	to	8:00 AM	0	3	0	0	0	0	0	0	0	0	0	0	3
8:00 AM	to	8:15 AM	0	1	0	0	0	0	0	0	1	0	1	0	3
8:15 AM	to	8:30 AM	0	0	0	0	2	0	0	1	0	0	6	0	9
8:30 AM	to	8:45 AM	0	1	0	0	0	0	0	2	0	0	0	0	3
8:45 AM	to	9:00 AM	0	1	0	0	0	0	0	1	0	0	1	0	3
HOURLY TOTALS															
7:00 AM	to	8:00 AM	0	4	0	0	1	1	0	3	0	0	1	0	10
7:15 AM	to	8:15 AM	0	4	0	0	1	0	0	3	1	0	2	0	11
7:30 AM	to	8:30 AM	0	4	0	0	3	0	0	2	1	0	7	0	17
7:45 AM	to	8:45 AM	0	5	0	0	2	0	0	3	1	0	7	0	18
8:00 AM	to	9:00 AM	0	3	0	0	2	0	0	4	1	0	8	0	18

TEL: (510) 232 - 1271 EMAIL: BAYMETRICS@GMAIL.CON

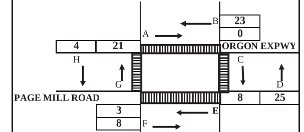
8:00 AM to 9:00 AM					
VOLUME BY APPROACH	NBT	SBT	EBT	WBT	TOTAL
BICYCLE	3	2	5	8	18

B.A.Y.M.E.T.R.I.C.S.

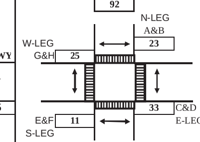
PEDESTRIAN MOVEMENT SUMMARY

PROJECT: TRAFFIC COUNTS IN PALO ALTO		SURVEY DATE: 10/4/2016	
N-S APPROACH EL CAMINO REAL		DAY: TUESDAY	
E-W APPROACI PAGE MILL ROAD		JURISDICTION PALO ALTO	
SURVEY PERIO 7:00 AM	TO 9:00 AM	FILE: 3610078	

PEAK HOUR 08:00 AM TO 09:00 AM



PEAK HOUR
TOTAL PEDESTRIAN VOLUMES
92



LEGEND: CROSSWALK, SIDEWALK, STOP CONTROL LINE

EL CAMINO REAL

BY LEG:			BY DIRECTION:	
N-LEG	(A&B)	23	NB(D+G)	46
S-LEG	(E&F)	11	SB(C+H)	12
E-LEG	(C&D)	33	EB(A+F)	8
W-LEG	(G&H)	25	WB(B+E)	26

TIME From		PERIOD To	NORTH X-WALK A	NORTH X-WALK B	EAST X-WALK C	EAST X-WALK D	SOUTH X-WALK E	SOUTH X-WALK F	WEST X-WALK G	WEST X-WALK H	TOTAL
SURVEY DATA											
07:00 AM	---	07:15 AM	0	3	2	0	0	1	2	0	8
07:15 AM	---	07:30 AM	2	5	5	1	0	4	2	1	20
07:30 AM	---	07:45 AM	3	6	5	6	0	4	9	1	34
07:45 AM	---	08:00 AM	5	11	7	6	0	6	10	1	46
08:00 AM	---	08:15 AM	5	13	8	13	2	7	10	1	59
08:15 AM	---	08:30 AM	5	24	11	21	2	8	12	2	85
08:30 AM	---	08:45 AM	5	25	11	23	2	11	19	2	98
08:45 AM	---	09:00 AM	5	34	15	31	3	14	31	5	138
TOTAL BY PERIOD											
07:00 AM	---	07:15 AM	0	3	2	0	0	1	2	0	8
07:15 AM	---	07:30 AM	2	2	3	1	0	3	0	1	12
07:30 AM	---	07:45 AM	1	1	0	5	0	0	7	0	14
07:45 AM	---	08:00 AM	2	5	2	0	0	2	1	0	12
08:00 AM	---	08:15 AM	0	2	1	7	2	1	0	0	13
08:15 AM	---	08:30 AM	0	11	3	8	0	1	2	1	26
08:30 AM	---	08:45 AM	0	1	0	2	0	3	7	0	13
08:45 AM	---	09:00 AM	0	9	4	8	1	3	12	3	40
HOURLY TOTALS											
07:00 AM	---	08:00 AM	5	11	7	6	0	6	10	1	46
07:15 AM	---	08:15 AM	5	10	6	13	2	6	8	1	51
07:30 AM	---	08:30 AM	3	19	6	20	2	4	10	1	65
07:45 AM	---	08:45 AM	2	19	6	17	2	7	10	1	64
08:00 AM	---	09:00 AM	0	23	8	25	3	8	21	4	92

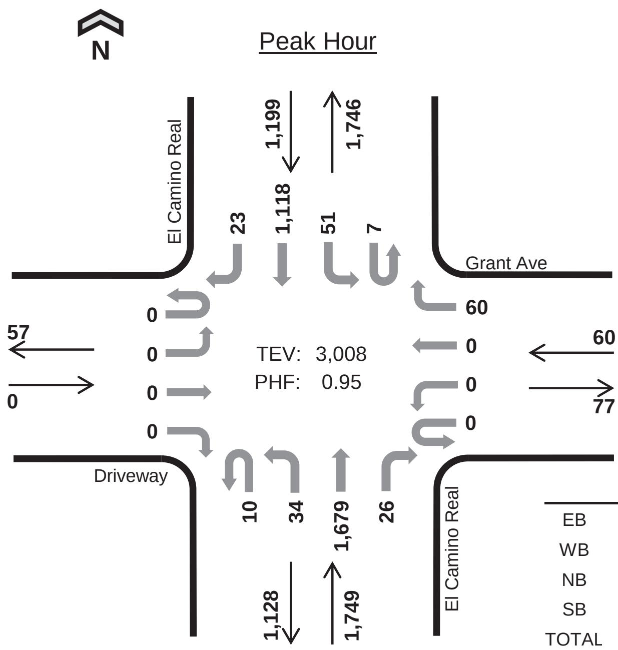
Tel : (510) 232-1271 EMAIL: BAYMETRICS@GMAIL.COM

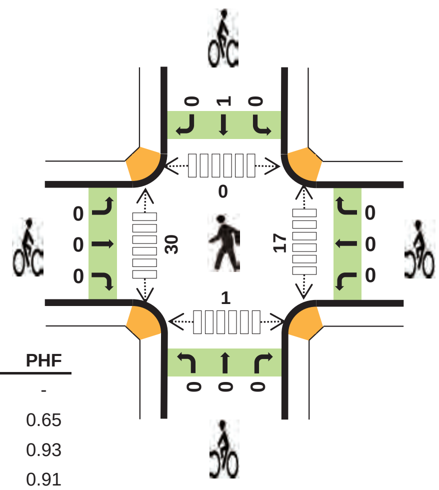
8:00 AM to 9:00 AM					
VOLUME BY DIRECTION	NB	SB	EB	WB	TOTAL
PEDESTRIAN	46	12	8	26	92
VOLUME BY LEG	N-LEG	S-LEG	E-LEG	W-LEG	TOTAL
PEDESTRIAN	23	11	33	25	92

El Camino Real
Grant Ave

Date: 03/08/2016
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM

Peak Hour





	HV %:	PHF
EB	-	-
WB	1.7%	0.65
NB	3.6%	0.93
SB	5.3%	0.91
TOTAL	4.2%	0.95

Two-Hour Count Summaries

Interval Start	Driveway Eastbound UT	LT	TH	RT	Grant Ave Westbound UT	LT	TH	RT	El Camino Real Northbound UT	LT	TH	RT	El Camino Real Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
7:00 AM	0	0	0	0	0	0	0	5	3	3	260	3	1	2	144	2	423	0
7:15 AM	0	0	0	0	0	0	0	6	2	3	310	6	1	4	154	0	486	0
7:30 AM	0	0	0	0	0	0	0	5	4	3	358	1	2	9	248	2	632	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**23**	**1**	**3**	**461**	**7**	**0**	**3**	**237**	**4**	**739**	2,280
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**5**	**8**	**405**	**7**	**1**	**19**	**307**	**2**	**774**	2,631
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**16**	**433**	**3**	**3**	**15**	**300**	**9**	**788**	2,933
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**4**	**7**	**380**	**9**	**3**	**14**	**274**	**8**	**707**	**3,008**
8:45 AM	0	0	0	0	0	1	0	10	0	12	385	8	1	9	264	8	698	2,967
Count Total	0	0	0	0	0	1	0	86	19	55	2,992	44	12	75	1,928	35	5,247	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**60**	**10**	**34**	**1,679**	**26**	**7**	**51**	**1,118**	**23**	**3,008**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**62**	**0**	**0**	**0**	**63**	**0**	**127**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2%**	**0%**	**3%**	**4%**	**0%**	**0%**	**0%**	**6%**	**0%**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
7:00 AM	0	0	11	10	*21*	0	0	2	0	*2*	3	3	0	0	*6*
7:15 AM	0	0	18	8	*26*	0	0	0	0	*0*	6	9	0	0	*15*
7:30 AM	0	0	11	11	*22*	0	0	0	0	*0*	5	13	1	0	*19*
7:45 AM	**0**	**0**	**11**	**15**	***26***	**0**	**0**	**0**	**0**	***0***	**8**	**11**	**0**	**0**	*19*
8:00 AM	**0**	**1**	**16**	**13**	***30***	**0**	**0**	**0**	**0**	***0***	**3**	**10**	**0**	**0**	*13*
8:15 AM	**0**	**0**	**16**	**21**	***37***	**0**	**0**	**0**	**1**	***1***	**4**	**1**	**0**	**0**	*5*
8:30 AM	**0**	**0**	**20**	**14**	***34***	**0**	**0**	**0**	**0**	***0***	**2**	**8**	**0**	**1**	***11***
8:45 AM	0	0	9	14	*23*	0	0	0	1	*1*	4	11	1	1	*17*
Count Total	0	1	112	106	*219*	0	0	2	2	*4*	35	66	2	2	*105*
Peak Hour	**0**	**1**	**63**	**63**	***127***	**0**	**0**	**0**	**1**	***1***	**17**	**30**	**0**	**1**	***48***

Deon Fouche: 415 - 757 - 7714
deon.fouche@idaxdata.com

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Driveway				Grant Ave				El Camino Real				El Camino Real				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	11	0	0	1	9	0	21	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	18	0	0	0	8	0	26	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	11	0	0	1	10	0	22	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**0**	**15**	**0**	**26**	95
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**16**	**0**	**0**	**0**	**13**	**0**	**30**	104
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**15**	**0**	**0**	**0**	**21**	**0**	**37**	115
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**20**	**0**	**0**	**0**	**14**	**0**	**34**	**127**
8:45 AM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	14	0	23	124
Count Total	0	0	0	0	0	0	0	1	0	1	111	0	0	2	104	0	219	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**62**	**0**	**0**	**0**	**63**	**0**	**127**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Driveway			Grant Ave			El Camino Real			El Camino Real			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	2	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	1
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
8:45 AM	0	0	0	0	0	0	0	0	0	0	1	0	1	2
Count Total	0	0	0	0	0	0	1	1	0	0	2	0	4	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Traffic Data Service

San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name : 13AM FINAL
Site Code : 00000013
Start Date : 9/27/2016
Page No : 1

Groups Printed- Vehicles

	EL CAMINO REAL Southbound					CALIFORNIA AVE Westbound					EL CAMINO REAL Northbound					CALIFORNIA AVE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	13	115	7	6	141	6	9	7	1	23	15	204	15	6	240	6	0	3	1	10	414
07:15 AM	23	136	15	3	177	4	4	4	1	13	13	249	16	12	290	4	1	1	1	7	487
07:30 AM	20	194	12	12	238	9	13	13	3	38	14	282	12	21	329	13	5	11	4	33	638
07:45 AM	20	224	6	3	253	16	16	9	0	41	14	346	14	23	397	15	8	5	3	31	722
Total	76	669	40	24	809	35	42	33	5	115	56	1081	57	62	1256	38	14	20	9	81	2261
08:00 AM	28	248	13	11	300	22	18	11	0	51	15	452	21	10	498	7	5	12	4	28	877
08:15 AM	40	276	14	11	341	8	18	21	1	48	13	375	22	16	426	15	9	6	6	36	851
08:30 AM	33	225	14	4	276	14	15	13	6	48	13	346	30	15	404	19	8	8	4	39	767
08:45 AM	43	274	19	13	349	21	23	15	3	62	13	340	27	27	407	12	5	7	7	31	849
Total	144	1023	60	39	1266	65	74	60	10	209	54	1513	100	68	1735	53	27	33	21	134	3344
Grand Total	220	1692	100	63	2075	100	116	93	15	324	110	2594	157	130	2991	91	41	53	30	215	5605
Apprch %	10.6	81.5	4.8	3		30.9	35.8	28.7	4.6		3.7	86.7	5.2	4.3		42.3	19.1	24.7	14		
Total %	3.9	30.2	1.8	1.1	37	1.8	2.1	1.7	0.3	5.8	2	46.3	2.8	2.3	53.4	1.6	0.7	0.9	0.5	3.8	

	EL CAMINO REAL Southbound				CALIFORNIA AVE Westbound				EL CAMINO REAL Northbound				CALIFORNIA AVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	28	248	13	289	**22**	18	11	51	**15**	**452**	21	**488**	7	5	**12**	24	**852**
08:15 AM	40	**276**	14	330	8	18	**21**	47	13	375	22	410	15	**9**	6	30	817
08:30 AM	33	225	14	272	14	15	13	42	13	346	**30**	389	**19**	8	8	**35**	738
08:45 AM	**43**	274	**19**	**336**	21	**23**	15	**59**	13	340	27	380	12	5	7	24	799
Total Volume	144	1023	60	1227	65	74	60	199	54	1513	100	1667	53	27	33	113	3206
% App. Total	11.7	83.4	4.9		32.7	37.2	30.2		3.2	90.8	6		46.9	23.9	29.2		
PHF	.837	.927	.789	.913	.739	.804	.714	.843	.900	.837	.833	.854	.697	.750	.688	.807	.941

Traffic Data Service

San Jose, CA
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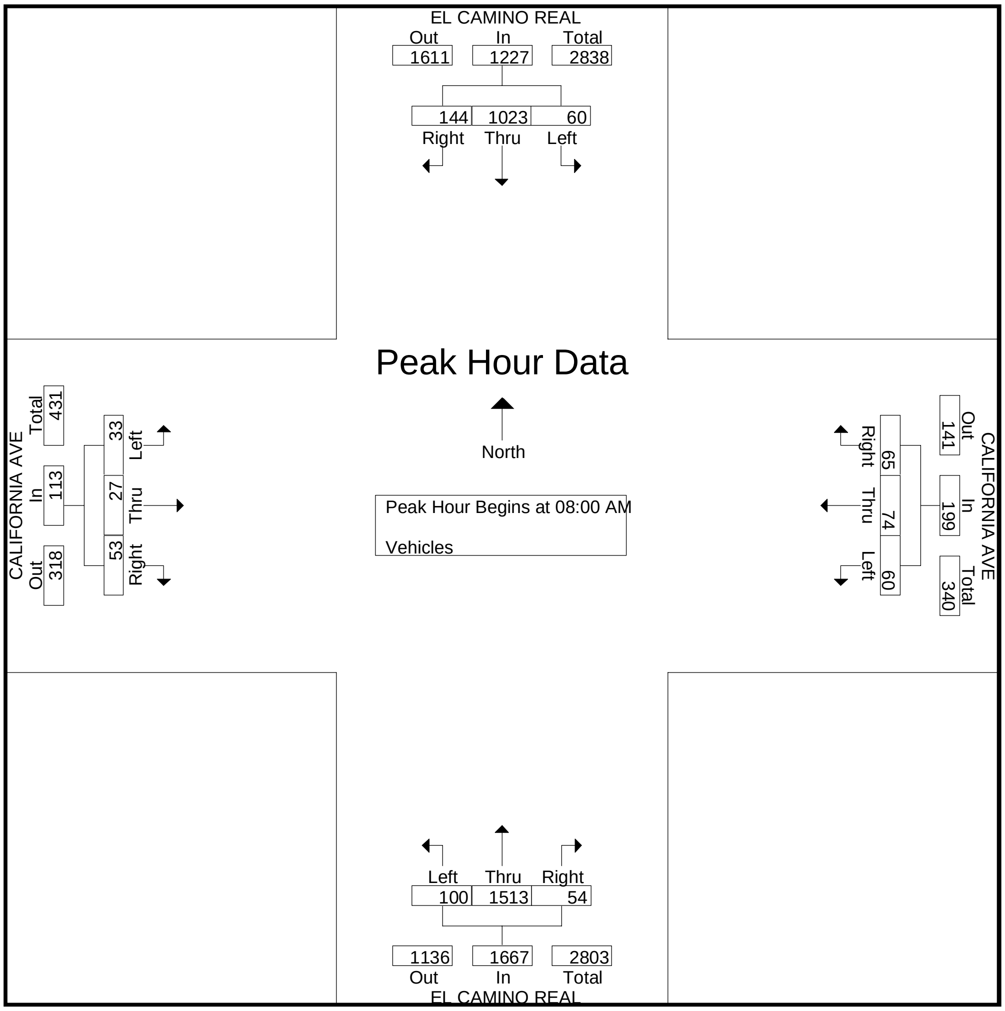
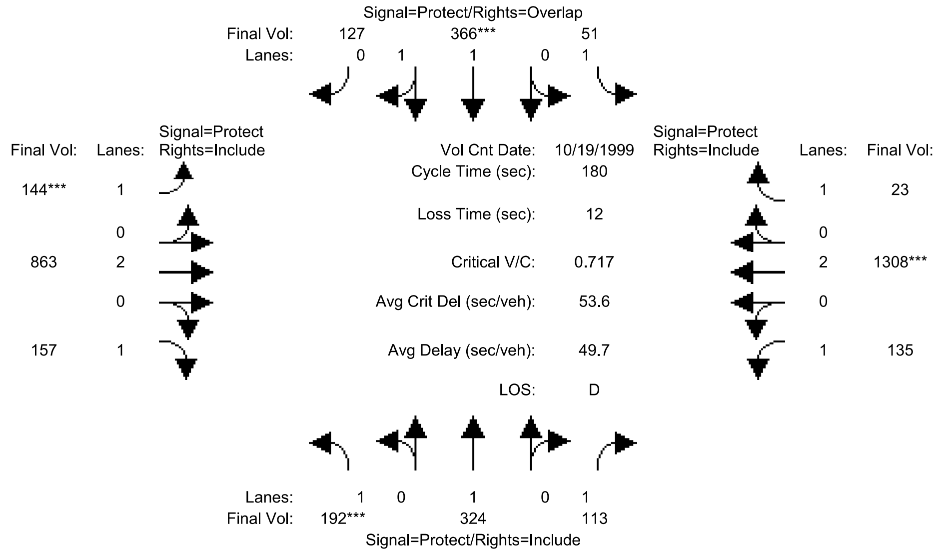
File Name : 13AM FINAL
Site Code : 00000013
Start Date : 9/27/2016
Page No : 2



SD16-0223
Palo Alto PSB TIA
Existing AM

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD



Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	7	10	10	7	65	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module: >> Count Date: 19 Oct 1999 << 7:00-9:00												
Base Vol:	192	324	113	51	366	127	144	863	157	135	1308	23
Growth 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
Initial Bse:	192	324	113	51	366	127	144	863	157	135	1308	23
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	192	324	113	51	366	127	144	863	157	135	1308	23
User 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
PHF 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
PHF Volume:	192	324	113	51	366	127	144	863	157	135	1308	23
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	192	324	113	51	366	127	144	863	157	135	1308	23
PCE 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
MLF 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
FinalVolume:	192	324	113	51	366	127	144	863	157	135	1308	23
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.47	0.53	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	2746	953	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.11	0.17	0.06	0.03	0.13	0.13	0.08	0.23	0.09	0.08	0.34	0.01
Crit Moves:	****				****		****				****	
Green Time:	27.5	46.0	46.0	15.0	33.4	54.1	20.6	79.9	79.9	27.1	86.4	86.4
Volume/Cap:	0.72	0.67	0.25	0.35	0.72	0.44	0.72	0.51	0.20	0.51	0.72	0.03
Delay/Veh:	81.5	63.7	53.6	79.4	72.5	51.1	88.6	36.3	30.7	72.0	38.5	24.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	81.5	63.7	53.6	79.4	72.5	51.1	88.6	36.3	30.7	72.0	38.5	24.7
LOS by Move:	F	E	D-	E-	E	D-	F	D+	C	E	D+	C
HCM2k95thQ:	22	29	10	6	25	20	18	29	11	15	46	1

Note: Queue reported is the number of cars per lane.

Traffic Data Service

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File Name : 3PM FINAL
Site Code : 00000003
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Groups Printed- Vehicles

	PARK BLVD Southbound					PAGE MILL RD Westbound					PARK BLVD Northbound					PAGE MILL RD Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	72	29	0	9	110	0	5	0	34	39	1	21	26	23	71	5	1	13	8	27	247
04:15 PM	71	28	0	0	99	0	3	0	4	7	0	22	29	6	57	3	0	7	10	20	183
04:30 PM	80	35	1	0	116	0	1	0	10	11	0	22	25	7	54	1	0	6	4	11	192
04:45 PM	75	41	0	2	118	1	0	0	13	14	1	20	38	7	66	4	0	10	2	16	214
Total	298	133	1	11	443	1	9	0	61	71	2	85	118	43	248	13	1	36	24	74	836
05:00 PM	101	60	0	5	166	2	0	2	89	93	0	23	25	84	132	1	0	9	4	14	405
05:15 PM	90	57	0	2	149	0	0	2	15	17	0	30	23	9	62	6	0	6	5	17	245
05:30 PM	86	41	0	1	128	0	2	1	30	33	0	33	28	20	81	2	1	9	5	17	259
05:45 PM	95	56	0	2	153	3	2	0	18	23	0	34	28	15	77	12	2	8	4	26	279
Total	372	214	0	10	596	5	4	5	152	166	0	120	104	128	352	21	3	32	18	74	1188
Grand Total	670	347	1	21	1039	6	13	5	213	237	2	205	222	171	600	34	4	68	42	148	2024
Apprch %	64.5	33.4	0.1	2		2.5	5.5	2.1	89.9		0.3	34.2	37	28.5		23	2.7	45.9	28.4		
Total %	33.1	17.1	0	1	51.3	0.3	0.6	0.2	10.5	11.7	0.1	10.1	11	8.4	29.6	1.7	0.2	3.4	2.1	7.3	

	PARK BLVD Southbound				PAGE MILL RD Westbound				PARK BLVD Northbound				PAGE MILL RD Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**101**	**60**	0	**161**	2	0	**2**	4	0	23	25	48	1	0	**9**	10	223
05:15 PM	90	57	0	147	0	0	2	2	0	30	23	53	6	0	6	12	214
05:30 PM	86	41	0	127	0	**2**	1	3	0	33	**28**	61	2	1	9	12	203
05:45 PM	95	56	0	151	**3**	2	0	**5**	0	**34**	28	**62**	**12**	**2**	8	**22**	**240**
Total Volume	372	214	0	586	5	4	5	14	0	120	104	224	21	3	32	56	880
% App. Total	63.5	36.5	0		35.7	28.6	35.7		0	53.6	46.4		37.5	5.4	57.1		
PHF	.921	.892	.000	.910	.417	.500	.625	.700	.000	.882	.929	.903	.438	.375	.889	.636	.917

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File Name : 3PM FINAL
Site Code : 00000003
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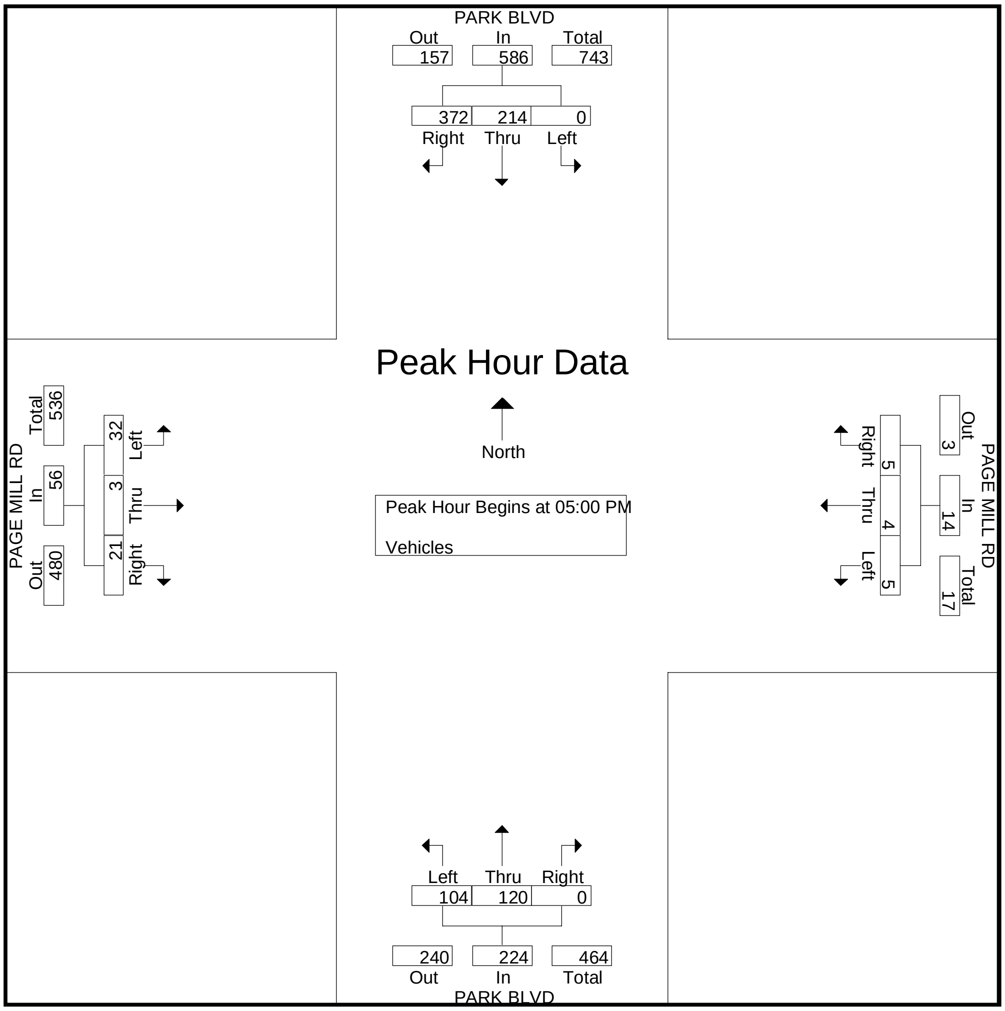

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File Name : 2PM FINAL
Site Code : 00000002
Start Date : 9/27/2016
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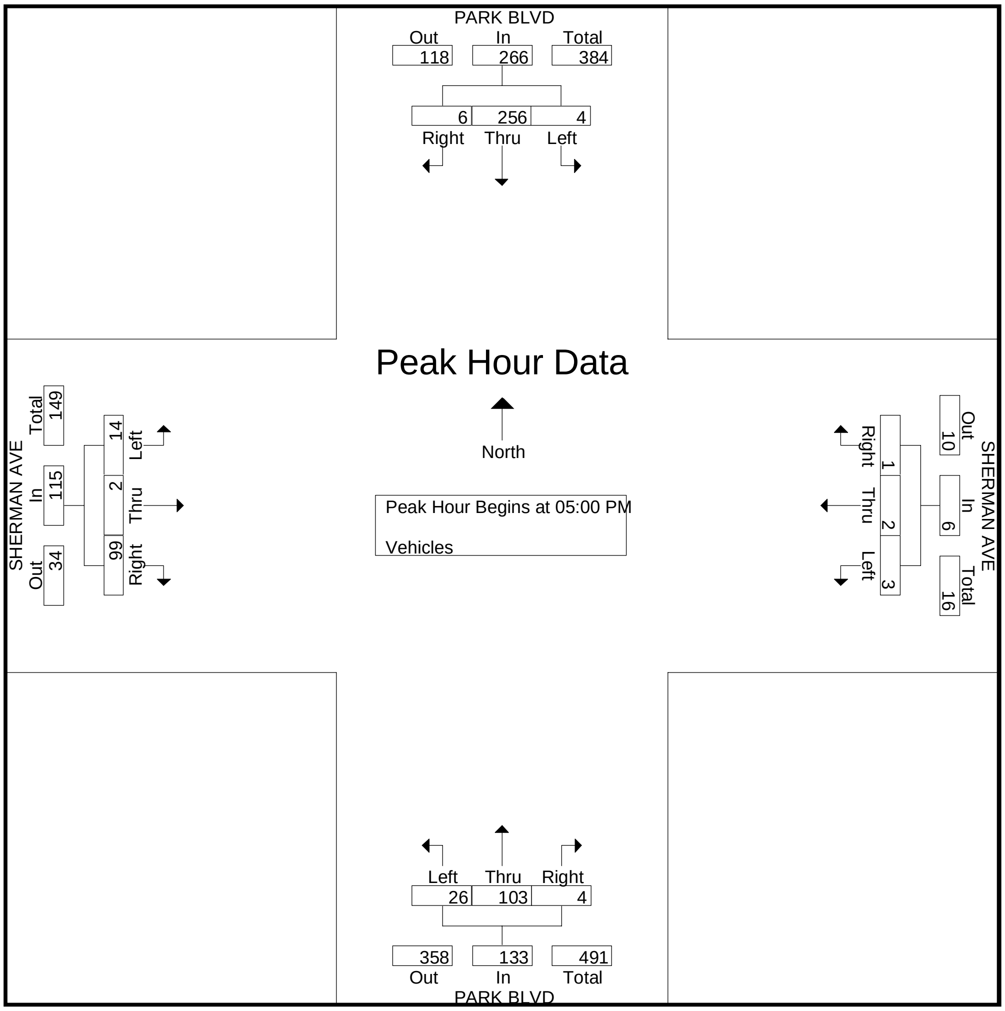

Traffic Data Service

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File Name : 2PM FINAL
Site Code : 00000002
Start Date : 9/27/2016
Page No : 1

Groups Printed- Vehicles

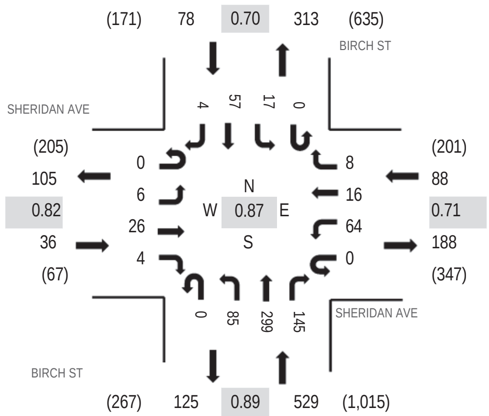
	PARK BLVD Southbound					SHERMAN AVE Westbound					PARK BLVD Northbound					SHERMAN AVE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	2	52	3	1	58	0	3	3	6	12	1	22	4	2	29	12	0	1	8	21	120
04:15 PM	2	47	0	1	50	2	1	2	1	6	2	24	3	1	30	17	0	1	10	28	114
04:30 PM	0	58	0	0	58	0	0	2	0	2	0	17	7	0	24	15	0	3	4	22	106
04:45 PM	0	50	0	1	51	1	1	2	5	9	0	21	5	0	26	13	0	1	2	16	102
Total	4	207	3	3	217	3	5	9	12	29	3	84	19	3	109	57	0	6	24	87	442
05:00 PM	1	65	1	5	72	0	1	0	5	6	2	36	8	2	48	29	0	4	8	41	167
05:15 PM	2	67	1	0	70	0	0	2	9	11	1	15	4	0	20	24	0	5	8	37	138
05:30 PM	3	56	0	0	59	1	1	1	6	9	0	24	6	1	31	22	2	4	16	44	143
05:45 PM	0	68	2	1	71	0	0	0	9	9	1	28	8	1	38	24	0	1	3	28	146
Total	6	256	4	6	272	1	2	3	29	35	4	103	26	4	137	99	2	14	35	150	594
Grand Total	10	463	7	9	489	4	7	12	41	64	7	187	45	7	246	156	2	20	59	237	1036
Apprch %	2	94.7	1.4	1.8		6.2	10.9	18.8	64.1		2.8	76	18.3	2.8		65.8	0.8	8.4	24.9		
Total %	1	44.7	0.7	0.9	47.2	0.4	0.7	1.2	4	6.2	0.7	18.1	4.3	0.7	23.7	15.1	0.2	1.9	5.7	22.9	

	PARK BLVD Southbound				SHERMAN AVE Westbound				PARK BLVD Northbound				SHERMAN AVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	1	65	1	67	0	**1**	0	1	**2**	**36**	**8**	**46**	**29**	0	4	**33**	**147**
05:15 PM	2	67	1	**70**	0	0	**2**	2	1	15	4	20	24	0	**5**	29	121
05:30 PM	**3**	56	0	59	**1**	1	1	**3**	0	24	6	30	22	**2**	4	28	120
05:45 PM	0	**68**	**2**	70	0	0	0	0	1	28	8	37	24	0	1	25	132
Total Volume	6	256	4	266	1	2	3	6	4	103	26	133	99	2	14	115	520
% App. Total	2.3	96.2	1.5		16.7	33.3	50		3	77.4	19.5		86.1	1.7	12.2		
PHF	.500	.941	.500	.950	.250	.500	.375	.500	.500	.715	.813	.723	.853	.250	.700	.871	.884

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

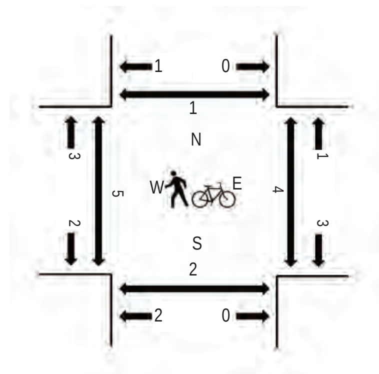
Location: 2 BIRCH ST & SHERIDAN AVE PM
Date and Start Time: Tuesday, April 25, 2017
Peak Hour: 05:30 PM - 06:30 PM
Peak 15-Minutes: 06:00 PM - 06:15 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	SHERIDAN AVE Eastbound U-Turn	Left	Thru	Right	SHERIDAN AVE Westbound U-Turn	Left	Thru	Right	BIRCH ST Northbound U-Turn	Left	Thru	Right	BIRCH ST Southbound U-Turn	Left	Thru	Right	Total	Rolling Hour	Pedestrain Crossings West	East	South	North
4:30 PM	0	1	7	1	0	10	7	1	0	14	83	24	0	2	13	1	164	723	1	0	0	4
4:45 PM	0	2	6	0	0	12	8	1	0	18	84	32	0	7	24	2	196	710	1	0	0	4
5:00 PM	0	1	4	1	0	30	9	4	0	14	75	34	0	7	19	0	198	697	0	0	0	0
5:15 PM	0	0	7	1	0	15	9	7	0	18	63	27	0	2	16	0	165	710	0	0	0	0
5:30 PM	0	2	6	1	0	17	1	2	0	19	56	33	0	4	10	0	151	731	0	1	2	0
5:45 PM	0	0	8	0	0	16	8	4	0	16	75	34	0	7	13	2	183		2	1	0	0
6:00 PM	0	0	6	2	0	19	5	1	0	16	91	42	0	3	24	2	211		1	0	0	0
6:15 PM	0	4	6	1	0	12	2	1	0	34	77	36	0	3	10	0	186		2	2	0	1

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound U-Turn	Left	Thru	Right	Westbound U-Turn	Left	Thru	Right	Northbound U-Turn	Left	Thru	Right	Southbound U-Turn	Left	Thru	Right	Total
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	6	24	4	0	64	16	8	0	85	299	145	0	17	56	4	728
Mediums	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	3
Total	0	6	26	4	0	64	16	8	0	85	299	145	0	17	57	4	731

Traffic Data Service
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File Name : 6PM FINAL
Site Code : 00000006
Start Date : 9/27/2016
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Groups Printed- Vehicles

	BIRCH ST Southbound					GRANT AVE Westbound					BIRCH ST Northbound					GRANT AVE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	5	16	2	0	23	0	0	0	2	2	6	76	2	1	85	3	4	7	1	15	125
04:15 PM	7	16	3	2	28	0	0	0	3	3	9	56	4	3	72	1	7	0	2	10	113
04:30 PM	1	12	1	2	16	0	0	0	2	2	2	57	4	0	63	5	11	4	2	22	103
04:45 PM	2	22	2	0	26	0	0	0	2	2	4	88	3	1	96	1	11	11	2	25	149
Total	15	66	8	4	93	0	0	0	9	9	21	277	13	5	316	10	33	22	7	72	490
05:00 PM	1	16	2	0	19	0	0	0	6	6	5	56	4	1	66	2	10	5	1	18	109
05:15 PM	0	19	1	0	20	0	0	0	3	3	2	53	6	0	61	5	9	3	3	20	104
05:30 PM	1	19	3	1	24	0	0	0	7	7	2	81	6	0	89	2	6	2	5	15	135
05:45 PM	1	19	3	1	24	0	0	0	2	2	6	66	7	0	79	4	6	1	2	13	118
Total	3	73	9	2	87	0	0	0	18	18	15	256	23	1	295	13	31	11	11	66	466
Grand Total	18	139	17	6	180	0	0	0	27	27	36	533	36	6	611	23	64	33	18	138	956
Apprch %	10	77.2	9.4	3.3		0	0	0	100		5.9	87.2	5.9	1		16.7	46.4	23.9	13		
Total %	1.9	14.5	1.8	0.6	18.8	0	0	0	2.8	2.8	3.8	55.8	3.8	0.6	63.9	2.4	6.7	3.5	1.9	14.4	

	BIRCH ST Southbound				GRANT AVE Westbound				BIRCH ST Northbound				GRANT AVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	5	16	2	23	0	0	0	0	6	76	2	84	3	4	7	14	121
04:15 PM	**7**	16	**3**	**26**	0	0	0	0	**9**	56	**4**	69	1	7	0	8	103
04:30 PM	1	12	1	14	0	0	0	0	2	57	4	63	**5**	**11**	4	20	97
04:45 PM	2	**22**	2	26	0	0	0	0	4	**88**	3	**95**	1	11	**11**	**23**	**144**
Total Volume	15	66	8	89	0	0	0	0	21	277	13	311	10	33	22	65	465
% App. Total	16.9	74.2	9		0	0	0		6.8	89.1	4.2		15.4	50.8	33.8		
PHF	.536	.750	.667	.856	.000	.000	.000	.000	.583	.787	.813	.818	.500	.750	.500	.707	.807

Traffic Data Service

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File Name : 6PM FINAL
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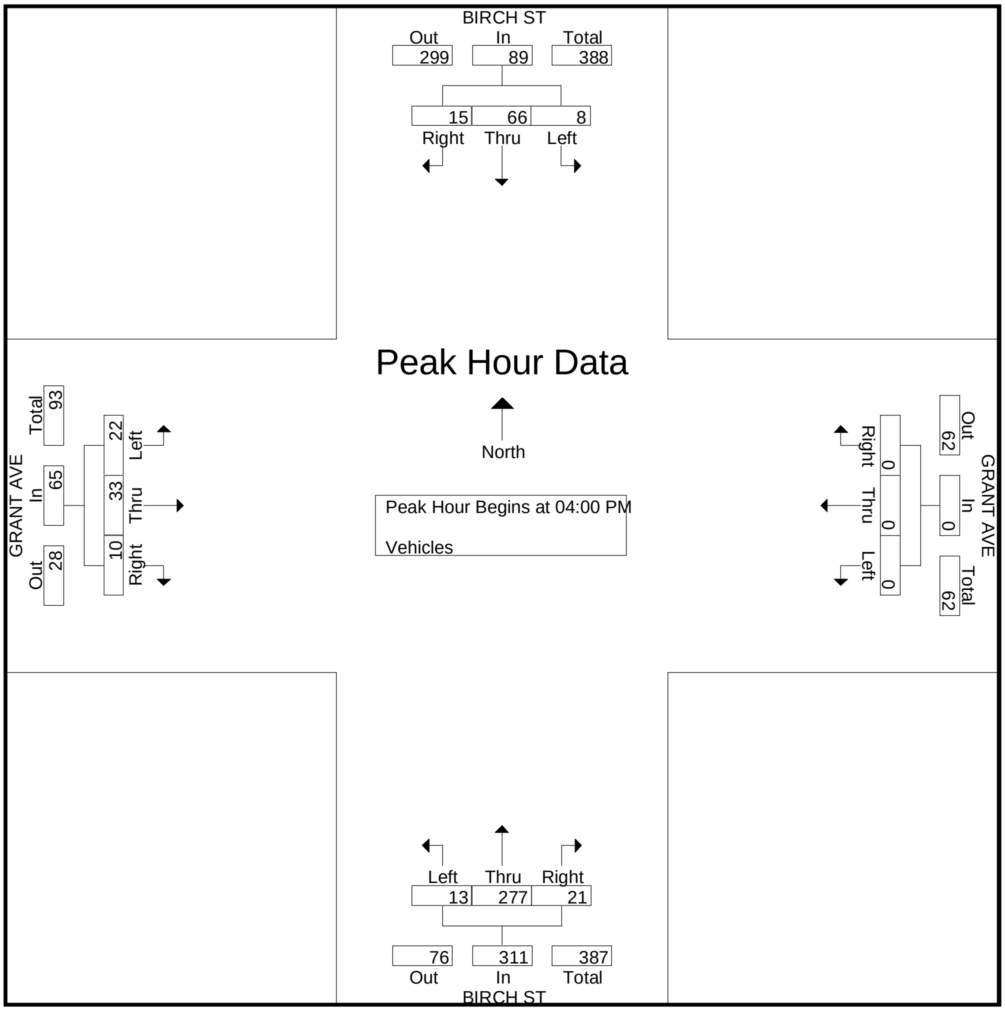


Vistro File: C:\...\VTA_2019_Existing_PM_V2020_PTV_staff_05152020.vistro

Scenario: Base Scenario

Report File: C:\...\Page Mill & ECR Volume.pdf

11/16/2020

Turning Movement Volume: Summary

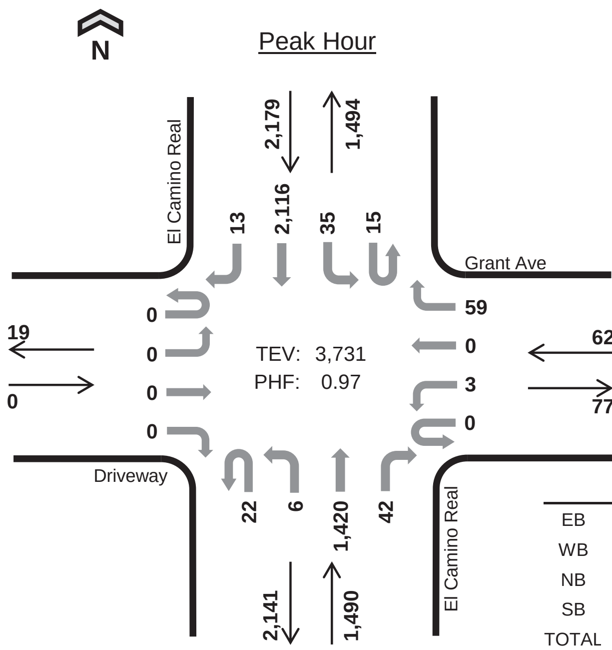
ID	Intersection Name	Northbound				Southbound				Eastbound			
		U-T	Left	Thru	Right	U-T	Left	Thru	Right	U-T	Left	Thru	Right
1104	El Camino Real (Rte. 82) & Page Mill Rd./Oregon Expwy.	2	305	1130	232	12	365	829	119	8	434	1273	248

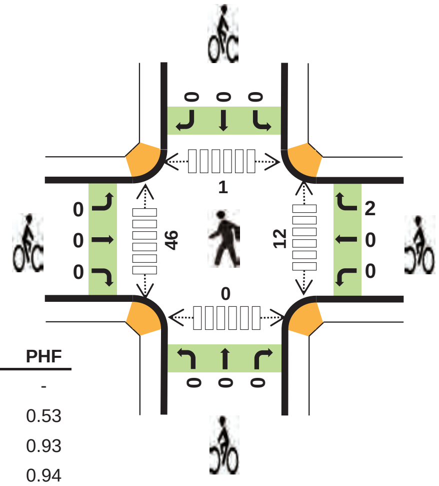
Westbound				Total Volume
U-T	Left	Thru	Right	
14	222	736	265	6194

El Camino Real
Grant Ave

Peak Hour

Date: 03/08/2016
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 5:00 PM to 6:00 PM





	HV %:	PHF
EB	-	-
WB	0.0%	0.53
NB	1.7%	0.93
SB	1.1%	0.94
TOTAL	1.3%	0.97

Two-Hour Count Summaries

Interval Start	Driveway Eastbound UT	LT	TH	RT	Grant Ave Westbound UT	LT	TH	RT	El Camino Real Northbound UT	LT	TH	RT	El Camino Real Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	1	0	9	5	5	315	11	1	8	435	4	794	0
4:15 PM	0	0	0	0	0	0	0	13	5	5	315	9	5	11	449	4	816	0
4:30 PM	0	0	0	0	0	0	0	12	1	4	330	10	2	11	498	11	879	0
4:45 PM	0	0	0	0	0	0	0	9	2	6	339	19	4	12	471	3	865	3,354
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**10**	**5**	**2**	**343**	**11**	**4**	**8**	**523**	**2**	**908**	3,468
5:15 PM	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**11**	**8**	**2**	**342**	**10**	**5**	**12**	**554**	**6**	**951**	3,603
5:30 PM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**27**	**6**	**0**	**354**	**7**	**4**	**5**	**552**	**3**	**960**	3,684
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**3**	**2**	**381**	**14**	**2**	**10**	**487**	**2**	**912**	**3,731**
Count Total	0	0	0	0	0	4	0	102	35	26	2,719	91	27	77	3,969	35	7,085	0
Peak Hour All	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**59**	**22**	**6**	**1,420**	**42**	**15**	**35**	**2,116**	**13**	**3,731**	**0**
Peak Hour HV	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**25**	**0**	**0**	**0**	**23**	**0**	**48**	**0**
Peak Hour HV%	**-**	**-**	**-**	**-**	**-**	**0%**	**-**	**0%**	**0%**	**0%**	**2%**	**0%**	**0%**	**0%**	**1%**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	0	0	8	7	*15*	0	0	0	0	*0*	5	22	0	0	*27*
4:15 PM	0	0	9	9	*18*	0	0	0	1	*1*	6	17	0	0	*23*
4:30 PM	0	0	4	10	*14*	0	0	0	0	*0*	3	17	0	0	*20*
4:45 PM	0	0	8	6	*14*	0	0	0	0	*0*	5	19	1	0	*25*
5:00 PM	**0**	**0**	**4**	**6**	***10***	**0**	**0**	**0**	**0**	***0***	**4**	**9**	**1**	**0**	*14*
5:15 PM	**0**	**0**	**9**	**4**	***13***	**0**	**2**	**0**	**0**	***2***	**4**	**19**	**0**	**0**	*23*
5:30 PM	**0**	**0**	**5**	**7**	***12***	**0**	**0**	**0**	**0**	***0***	**1**	**8**	**0**	**0**	*9*
5:45 PM	**0**	**0**	**7**	**6**	***13***	**0**	**0**	**0**	**0**	***0***	**3**	**10**	**0**	**0**	***13***
Count Total	0	0	54	55	*109*	0	2	0	1	*3*	31	121	2	0	*154*
Peak Hour	**0**	**0**	**25**	**23**	***48***	**0**	**2**	**0**	**0**	***2***	**12**	**46**	**1**	**0**	***59***

Deon Fouche: 415 - 757 - 7714

deon.fouche@idaxdata.com

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Driveway Eastbound UT	LT	TH	RT	Grant Ave Westbound UT	LT	TH	RT	El Camino Real Northbound UT	LT	TH	RT	El Camino Real Southbound UT	LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	0	0	0	0	0	8	0	0	0	7	0	15	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	9	0	18	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	10	0	14	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	7	1	0	1	5	0	14	61
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**6**	**0**	**10**	56
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**4**	**0**	**13**	51
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**7**	**0**	**12**	49
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**6**	**0**	**13**	**48**
Count Total	0	0	0	0	0	0	0	0	0	0	53	1	0	1	54	0	109	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**25**	**0**	**0**	**0**	**23**	**0**	**48**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Driveway Eastbound LT	TH	RT	Grant Ave Westbound LT	TH	RT	El Camino Real Northbound LT	TH	RT	El Camino Real Southbound LT	TH	RT	15-min Total	Rolling One Hour
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:15 PM	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	2
5:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	2
5:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**
Count Total	0	0	0	0	0	2	0	0	0	0	1	0	3	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Deon Fouche: 415 - 757 - 7714 deon.fouche@idaxdata.com

Traffic Data Service

San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name : 13PM FINAL
Site Code : 00000013
Start Date : 9/27/2016
Page No : 1

Groups Printed- Vehicles

	EL CAMINO REAL Southbound					CALIFORNIA AVE Westbound					EL CAMINO REAL Northbound					CALIFORNIA AVE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	10	341	1	12	364	21	11	23	1	56	18	312	23	17	370	30	8	15	12	65	855
04:15 PM	9	425	0	16	450	22	6	18	6	52	20	288	19	18	345	28	11	20	7	66	913
04:30 PM	18	441	2	15	476	10	10	26	2	48	23	283	27	17	350	34	11	17	4	66	940
04:45 PM	9	452	1	9	471	28	8	15	5	56	18	302	17	21	358	35	18	25	8	86	971
Total	46	1659	4	52	1761	81	35	82	14	212	79	1185	86	73	1423	127	48	77	31	283	3679
05:00 PM	14	424	23	10	471	17	5	24	3	49	22	289	24	21	356	43	20	23	5	91	967
05:15 PM	12	482	15	16	525	23	12	19	2	56	20	274	12	21	327	41	19	29	6	95	1003
05:30 PM	13	399	19	19	450	13	4	20	5	42	25	329	17	25	396	26	19	38	7	90	978
05:45 PM	12	407	17	15	451	14	10	22	2	48	18	349	16	32	415	20	15	32	3	70	984
Total	51	1712	74	60	1897	67	31	85	12	195	85	1241	69	99	1494	130	73	122	21	346	3932
Grand Total	97	3371	78	112	3658	148	66	167	26	407	164	2426	155	172	2917	257	121	199	52	629	7611
Apprch %	2.7	92.2	2.1	3.1		36.4	16.2	41	6.4		5.6	83.2	5.3	5.9		40.9	19.2	31.6	8.3		
Total %	1.3	44.3	1	1.5	48.1	1.9	0.9	2.2	0.3	5.3	2.2	31.9	2	2.3	38.3	3.4	1.6	2.6	0.7	8.3	

	EL CAMINO REAL Southbound				CALIFORNIA AVE Westbound				EL CAMINO REAL Northbound				CALIFORNIA AVE Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	**14**	424	**23**	461	17	5	**24**	46	22	289	**24**	335	**43**	**20**	23	86	928
05:15 PM	12	**482**	15	**509**	**23**	**12**	19	**54**	20	274	12	306	41	19	29	**89**	**958**
05:30 PM	13	399	19	431	13	4	20	37	**25**	329	17	371	26	19	**38**	83	922
05:45 PM	12	407	17	436	14	10	22	46	18	**349**	16	**383**	20	15	32	67	932
Total Volume	51	1712	74	1837	67	31	85	183	85	1241	69	1395	130	73	122	325	3740
% App. Total	2.8	93.2	4		36.6	16.9	46.4		6.1	89	4.9		40	22.5	37.5		
PHF	.911	.888	.804	.902	.728	.646	.885	.847	.850	.889	.719	.911	.756	.913	.803	.913	.976

Traffic Data Service

San Jose, CA
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File Name : 13PM FINAL
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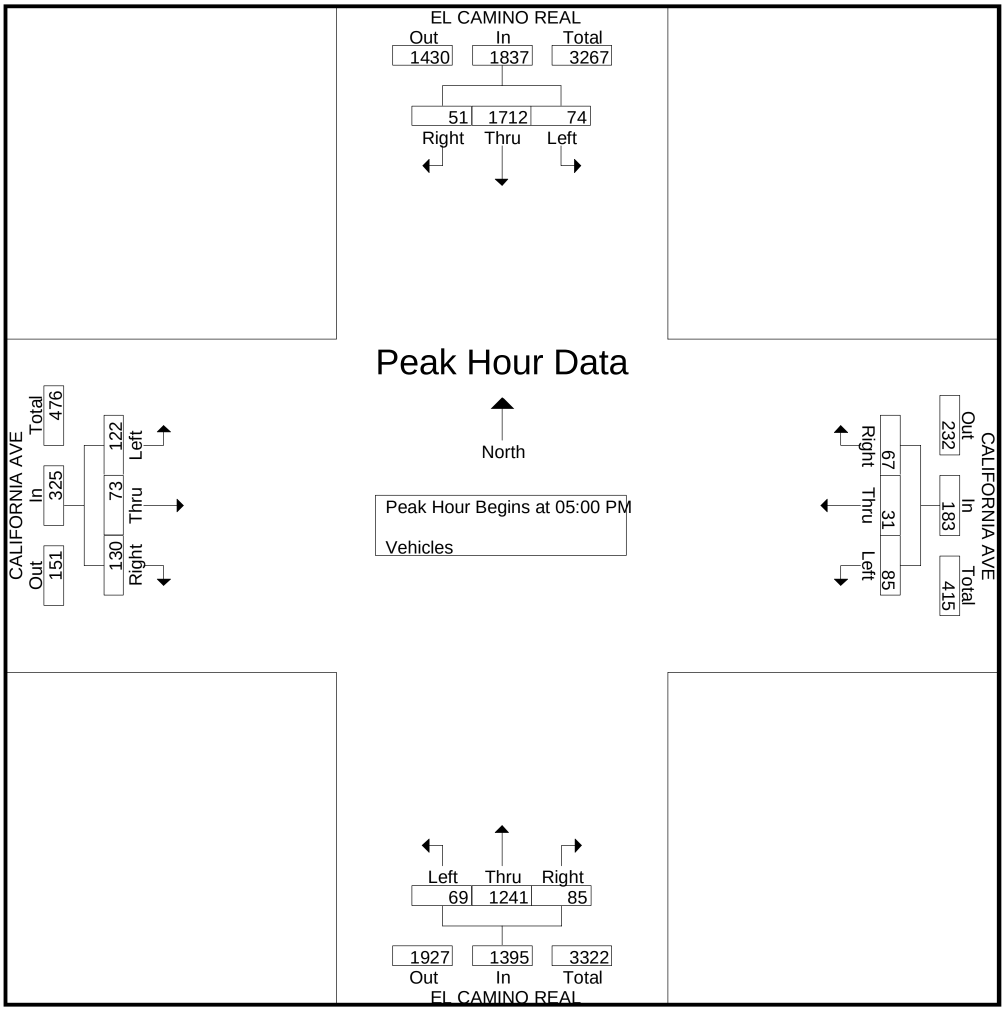
Page No : 2



Oregon Expressway & Middlefield Rd - Intersection Volume Counts

Peak Period	Middlefield Rd			Middlefield Rd			Oregon Expressway			Oregon Expressway		
	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
PM	192	419	137	52	464	88	136	1110	223	207	1041	36

Notes

* Count date on November 1, 2018 from 5:15-6:15 PM

APPENDIX B

Existing Conditions

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

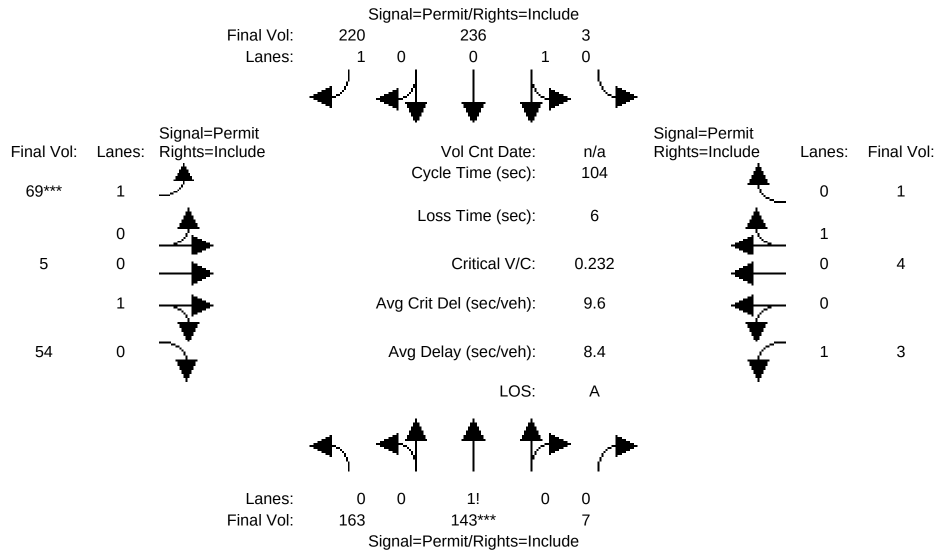
Summary Scenario Comparison Report (With Average Critical Delay)
Future Volume Alternative

		Existing AM				Existing + Project AM				Existing PM						Existing + Project PM			
Intersection		LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Crit V/C Change	Avg Crit Del (sec)	Avg Crit Del Change	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)
#1	Park Blvd/ Page Mill Rd	A	8.4	0.232	9.6	A	9.5	0.246	11.5	A	4.8	0.261	+ 0.015	5.0	- 6.5	A	5.6	0.281	6.6
#2	Park Blvd /Sherman Ave	B	2.2	0.041	2.2	B	2.2	0.041	2.2	B	3.0	0.138	+ 0.097	3.0	+ 0.9	B	3.0	0.139	3.0
#3	Birch St/ Sheridan Ave	D	3.6	0.192	3.6	D	4.5	0.214	4.5	C	4.2	0.208	- 0.006	4.2	- 0.3	C	4.5	0.240	4.5
#4	Birch St/ Grant Ave	B	12.2	0.606	12.2	B	13.0	0.640	13.0	A	9.1	0.385	- 0.254	9.1	- 3.9	A	9.2	0.400	9.2
#5	El Camino Real/ Page Mill Rd/ Oregon Expwy	D	50.3	0.897	55.6	D-	51.0	0.908	56.7	D	47.3	0.824	- 0.083	51.4	- 5.3	D	47.5	0.832	51.9
#6	El Camino Real/ Grant Ave	C	0.8	0.182	0.8	C	0.8	0.182	0.8	C	0.6	0.132	- 0.050	0.6	- 0.2	C	0.6	0.132	0.6
#7	El Camino Real/ California Ave	C+	22.0	0.456	19.0	C+	22.2	0.461	19.4	C	29.1	0.599	+ 0.138	29.2	+ 9.8	C	29.3	0.599	29.2
#8	Middlefield Rd/ Oregon Expwy	D	44.7	0.777	48.6	D	45.1	0.786	49.3	D	46.4	0.742	- 0.044	47.9	- 1.4	D	46.6	0.743	47.9
#9	Park Blvd/ Access#1	A	0.0	0.000	0.0	A	1.5	0.063	1.5	A	0.0	0.000	- 0.063	0.0	- 1.5	B	0.7	0.034	0.7

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #1: Park Blvd/ Page Mill Rd



Street Name:	Park Blvd						Page Mill Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	163	143	7	3	236	220	69	5	54	3	4	1
Growth 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
Initial Bse:	163	143	7	3	236	220	69	5	54	3	4	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	163	143	7	3	236	220	69	5	54	3	4	1
User 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
PHF 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
PHF Volume:	163	143	7	3	236	220	69	5	54	3	4	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	163	143	7	3	236	220	69	5	54	3	4	1
PCE 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
MLF 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
FinalVolume:	163	143	7	3	236	220	69	5	54	3	4	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.52	0.46	0.02	0.01	0.99	1.00	1.00	0.08	0.92	1.00	0.80	0.20
Final Sat.:	911	800	39	23	1777	1750	1750	153	1647	1750	1440	360
Capacity Analysis Module:												
Vol/Sat:	0.18	0.18	0.18	0.13	0.13	0.13	0.04	0.03	0.03	0.00	0.00	0.00
Crit Moves:		****					****					
Green Time:	80.3	80.3	80.3	80.3	80.3	80.3	17.7	17.7	17.7	17.7	17.7	17.7
Volume/Cap:	0.23	0.23	0.23	0.17	0.17	0.16	0.23	0.19	0.19	0.01	0.02	0.02
Delay/Veh:	3.4	3.4	3.4	3.2	3.2	3.1	37.7	37.3	37.3	35.9	35.9	35.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	3.4	3.4	3.4	3.2	3.2	3.1	37.7	37.3	37.3	35.9	35.9	35.9
LOS by Move:	A	A	A	A	A	A	D+	D+	D+	D+	D+	D+
HCM2kAvgQ:	76	76	76	53	53	50	54	45	45	2	4	4

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing + Project AM

Intersection #1: Park Blvd/ Page Mill Rd

Signal=Permit/Rights=Include
Final Vol: 254 236 3
Lanes: 1 0 0 1 0

Signal=Permit Rights=Include (West side)
Final Vol: Lanes:
93*** 1
0
5 0
1
54 0

Vol Cnt Date: n/a
Cycle Time (sec): 104
Loss Time (sec): 6
Critical V/C: 0.246
Avg Crit Del (sec/veh): 11.5
Avg Delay (sec/veh): 9.5
LOS: A

Signal=Permit Rights=Include
Lanes: Final Vol:
0 1
1
0 4
0
1 3

Lanes: 0 0 1! 0 0
Final Vol: 163 143*** 7
Signal=Permit/Rights=Include

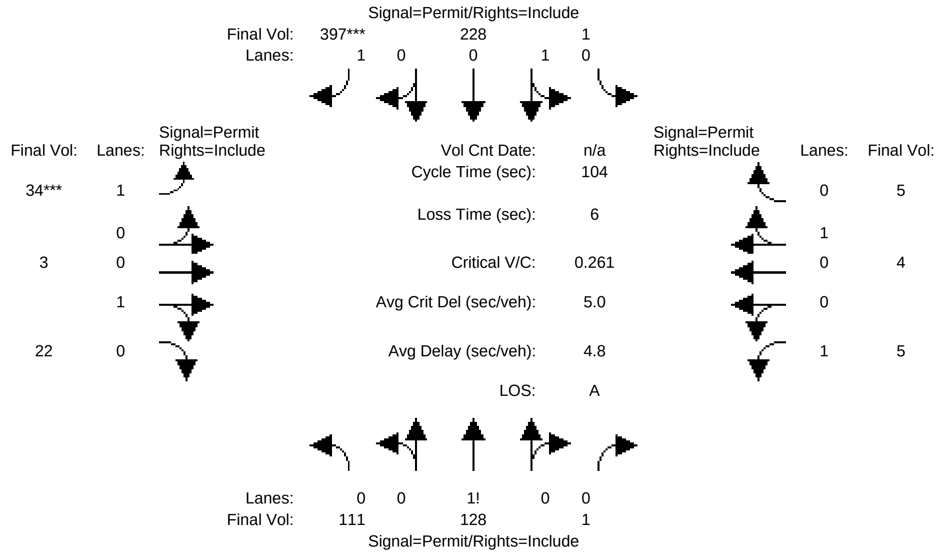
Street Name:	Park Blvd						Page Mill Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	163	143	7	3	236	220	69	5	54	3	4	1
Growth 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
Initial Bse:	163	143	7	3	236	220	69	5	54	3	4	1
Added Vol:	0	0	0	0	0	34	24	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	163	143	7	3	236	254	93	5	54	3	4	1
User 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
PHF 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
PHF Volume:	163	143	7	3	236	254	93	5	54	3	4	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	163	143	7	3	236	254	93	5	54	3	4	1
PCE 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
MLF 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
FinalVolume:	163	143	7	3	236	254	93	5	54	3	4	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.52	0.46	0.02	0.01	0.99	1.00	1.00	0.08	0.92	1.00	0.80	0.20
Final Sat.:	911	800	39	23	1777	1750	1750	153	1647	1750	1440	360
Capacity Analysis Module:												
Vol/Sat:	0.18	0.18	0.18	0.13	0.13	0.15	0.05	0.03	0.03	0.00	0.00	0.00
Crit Moves:		****					****					
Green Time:	75.6	75.6	75.6	75.6	75.6	75.6	22.4	22.4	22.4	22.4	22.4	22.4
Volume/Cap:	0.25	0.25	0.25	0.18	0.18	0.20	0.25	0.15	0.15	0.01	0.01	0.01
Delay/Veh:	4.8	4.8	4.8	4.6	4.6	4.6	34.1	33.2	33.2	32.0	32.1	32.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	4.8	4.8	4.8	4.6	4.6	4.6	34.1	33.2	33.2	32.0	32.1	32.1
LOS by Move:	A	A	A	A	A	A	C-	C-	C-	C-	C-	C-
HCM2kAvgQ:	90	90	90	63	63	70	68	41	41	2	3	3

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #1: Park Blvd/ Page Mill Rd



Street Name:	Park Blvd						Page Mill Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	111	128	1	1	228	397	34	3	22	5	4	5
Growth 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
Initial Bse:	111	128	1	1	228	397	34	3	22	5	4	5
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	128	1	1	228	397	34	3	22	5	4	5
User 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
PHF 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
PHF Volume:	111	128	1	1	228	397	34	3	22	5	4	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	111	128	1	1	228	397	34	3	22	5	4	5
PCE 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
MLF 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
FinalVolume:	111	128	1	1	228	397	34	3	22	5	4	5
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.46	0.53	0.01	0.01	0.99	1.00	1.00	0.12	0.88	1.00	0.44	0.56
Final Sat.:	809	933	7	8	1792	1750	1750	216	1584	1750	800	1000
Capacity Analysis Module:												
Vol/Sat:	0.14	0.14	0.14	0.13	0.13	0.23	0.02	0.01	0.01	0.00	0.01	0.01
Crit Moves:						****	****					
Green Time:	88.0	88.0	88.0	88.0	88.0	88.0	10.0	10.0	10.0	10.0	10.0	10.0
Volume/Cap:	0.16	0.16	0.16	0.15	0.15	0.27	0.20	0.14	0.14	0.03	0.05	0.05
Delay/Veh:	1.5	1.5	1.5	1.5	1.5	1.7	43.9	43.5	43.5	42.7	42.8	42.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.5	1.5	1.5	1.5	1.5	1.7	43.9	43.5	43.5	42.7	42.8	42.8
LOS by Move:	A	A	A	A	A	A	D	D	D	D	D	D
HCM2kAvgQ:	38	38	38	35	35	71	31	22	22	4	8	8

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing + Project PM

Intersection #1: Park Blvd/ Page Mill Rd

Signal=Permit/Rights=Include
Final Vol: 412*** 228 1
Lanes: 1 0 0 1 0

Signal=Permit Rights=Include (Eastbound)
Final Vol: 52*** / 3 / 22
Lanes: 1 / 0 / 0 / 1 / 0

Vol Cnt Date: n/a
Cycle Time (sec): 104
Loss Time (sec): 6
Critical V/C: 0.281
Avg Crit Del (sec/veh): 6.6
Avg Delay (sec/veh): 5.6
LOS: A

Signal=Permit Rights=Include (Westbound)
Lanes: 0 / 1 / 0 / 0 / 1
Final Vol: 5 / 4 / 5

Lanes: 0 0 1! 0 0
Final Vol: 111 128 1
Signal=Permit/Rights=Include

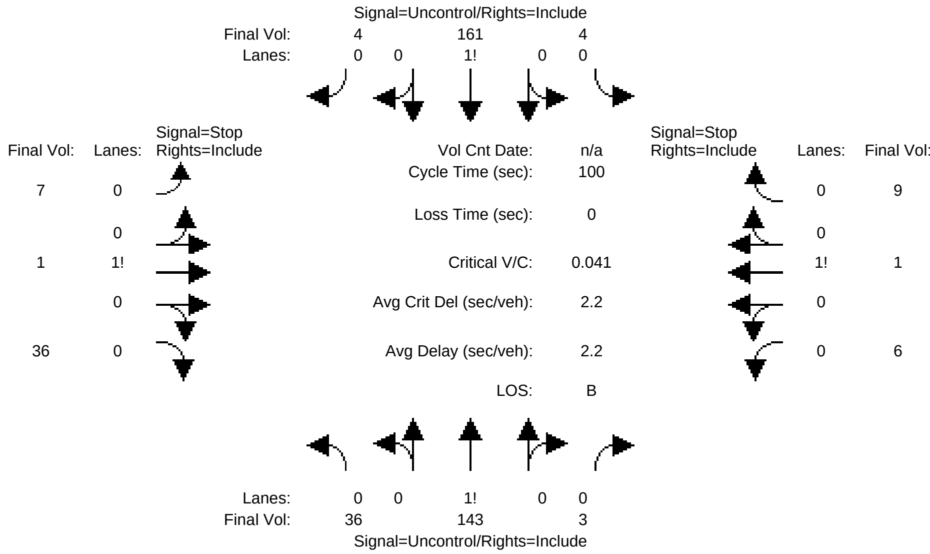
Street Name:	Park Blvd						Page Mill Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	111	128	1	1	228	397	34	3	22	5	4	5
Growth 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
Initial Bse:	111	128	1	1	228	397	34	3	22	5	4	5
Added Vol:	0	0	0	0	0	15	18	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	128	1	1	228	412	52	3	22	5	4	5
User 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
PHF 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
PHF Volume:	111	128	1	1	228	412	52	3	22	5	4	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	111	128	1	1	228	412	52	3	22	5	4	5
PCE 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
MLF 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
FinalVolume:	111	128	1	1	228	412	52	3	22	5	4	5
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.46	0.53	0.01	0.01	0.99	1.00	1.00	0.12	0.88	1.00	0.44	0.56
Final Sat.:	809	933	7	8	1792	1750	1750	216	1584	1750	800	1000
Capacity Analysis Module:												
Vol/Sat:	0.14	0.14	0.14	0.13	0.13	0.24	0.03	0.01	0.01	0.00	0.01	0.01
Crit Moves:						****	****					
Green Time:	87.0	87.0	87.0	87.0	87.0	87.0	11.0	11.0	11.0	11.0	11.0	11.0
Volume/Cap:	0.16	0.16	0.16	0.15	0.15	0.28	0.28	0.13	0.13	0.03	0.05	0.05
Delay/Veh:	1.7	1.7	1.7	1.6	1.6	1.9	43.7	42.5	42.5	41.8	41.9	41.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.7	1.7	1.7	1.6	1.6	1.9	43.7	42.5	42.5	41.8	41.9	41.9
LOS by Move:	A	A	A	A	A	A	D	D	D	D	D	D
HCM2kAvgQ:	41	41	41	37	37	79	47	21	21	4	7	7

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #2: Park Blvd /Sherman Ave

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Street Name:              Park Blvd                    Park Blvd /Sherman Ave
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      36  143      3     4  161      4     7    1     36     6    1      9
Growth 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
Initial Bse:   36  143      3     4  161      4     7    1     36     6    1      9
Added Vol:      0    0      0     0    0      0     0    0      0     0    0      0
PasserByVol:    0    0      0     0    0      0     0    0      0     0    0      0
Initial Fut:   36  143      3     4  161      4     7    1     36     6    1      9
User 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
PHF 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
PHF Volume:    36  143      3     4  161      4     7    1     36     6    1      9
Reduct Vol:     0    0      0     0    0      0     0    0      0     0    0      0
FinalVolume:   36  143      3     4  161      4     7    1     36     6    1      9
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  165 xxxx xxxxx   146 xxxx xxxxx   393  389   163   406  390   145
Potent Cap.: 1426 xxxx xxxxx  1448 xxxx xxxxx   571  549   887   559  549   908
Move Cap.:   1426 xxxx xxxxx  1448 xxxx xxxxx   552  534   887   524  533   908
Volume/Cap:  0.03 xxxx  xxxx  0.00 xxxx  xxxx  0.01 0.00  0.04  0.01 0.00  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    1.9 xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.6 xxxx xxxxx   7.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  798 xxxxx  xxxx  688 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.2 xxxxx xxxxx  0.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  9.8 xxxxx xxxxx 10.4 xxxxx
Shared LOS:     *    *     *     *    *     *     *    A     *     *    B     *
ApproachDel:     xxxxxx            xxxxxx             9.8              10.4
ApproachLOS:         *                 *                A                 B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   36  143     3     4  161     4     7    1    36     6    1     9
ApproachDel:    xxxxxx           xxxxxx              9.8              10.4
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=44]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=411]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=16]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=411]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   36  143     3     4  161     4     7    1    36     6    1     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            351
Minor Approach Volume:          44
Minor Approach Volume Threshold: 499
--------------------------------------------------------------------------------
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
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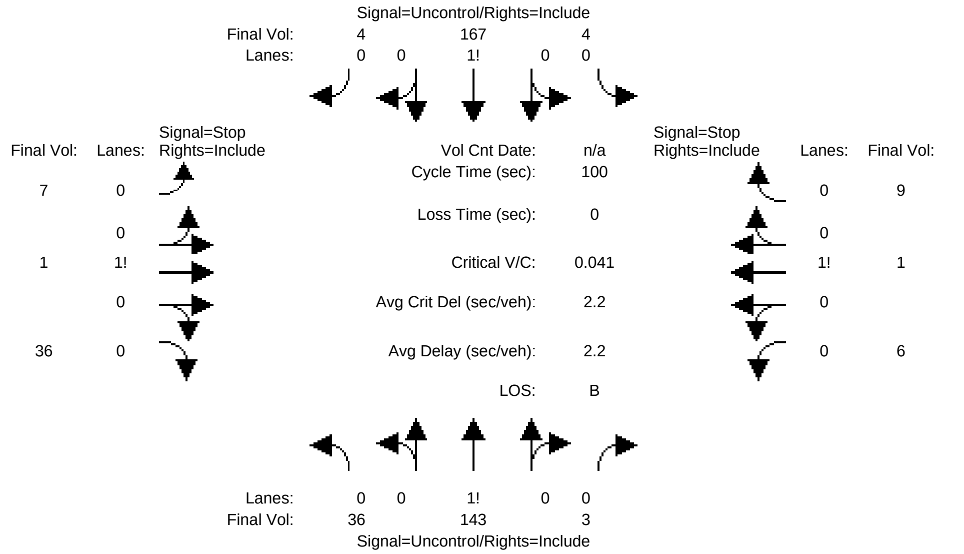
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing + Project AM

Intersection #2: Park Blvd /Sherman Ave



Street Name:		Park Blvd						Park Blvd /Sherman Ave				
Approach:		North Bound			South Bound			East Bound			West Bound	
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	36	143	3	4	161	4	7	1	36	6	1	9
Growth 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
Initial Bse:	36	143	3	4	161	4	7	1	36	6	1	9
Added Vol:	0	0	0	0	6	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	36	143	3	4	167	4	7	1	36	6	1	9
User 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
PHF 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
PHF Volume:	36	143	3	4	167	4	7	1	36	6	1	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	36	143	3	4	167	4	7	1	36	6	1	9
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	171	xxxx	xxxxx	146	xxxx	xxxxx	399	395	169	412	396	145
Potent Cap.:	1418	xxxx	xxxxx	1448	xxxx	xxxxx	565	545	880	554	545	908
Move Cap.:	1418	xxxx	xxxxx	1448	xxxx	xxxxx	547	529	880	519	529	908
Volume/Cap:	0.03	xxxx	xxxx	0.00	xxxx	xxxx	0.01	0.00	0.04	0.01	0.00	0.01
Level Of Service Module:												
2Way95thQ:	2.0	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.6	xxxx	xxxxx	7.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	791	xxxxx	xxxx	685	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.2	xxxxx	xxxxx	0.1	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	9.8	xxxxx	xxxxx	10.4	xxxxx
Shared LOS:	*	*	*	*	*	*	*	A	*	*	B	*
ApproachDel:		xxxxxx			xxxxxx			9.8			10.4	
ApproachLOS:		*			*			A			B	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

****

Intersection #2 Park Blvd /Sherman Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met


```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   36  143     3     4  167     4     7    1    36     6    1     9
ApproachDel:    xxxxxx           xxxxxx               9.8              10.4
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=44]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=417]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=16]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=417]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   36  143     3     4  167     4     7    1    36     6    1     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             357
Minor Approach Volume:           44
Minor Approach Volume Threshold: 494
--------------------------------------------------------------------------------
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #2: Park Blvd /Sherman Ave

Signal=Uncontrol/Rights=Include
Final Vol: 6 273 4
Lanes: 0 0 1! 0 0

Signal=Stop Rights=Include (Westbound approach on left): Final Vol: 15, 2, 106; Lanes: 0, 0, 1!, 0, 0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.138
Avg Crit Del (sec/veh): 3.0
Avg Delay (sec/veh): 3.0
LOS: B

Signal=Stop Rights=Include: Lanes: 0, 0, 1!, 0, 0; Final Vol: 1, 2, 3

Lanes: 0 0 1! 0 0
Final Vol: 28 110 4
Signal=Uncontrol/Rights=Include

Street Name:	Park Blvd						Park Blvd /Sherman Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	28	110	4	4	273	6	15	2	106	3	2	1
Growth 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
Initial Bse:	28	110	4	4	273	6	15	2	106	3	2	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	28	110	4	4	273	6	15	2	106	3	2	1
User 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
PHF 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
PHF Volume:	28	110	4	4	273	6	15	2	106	3	2	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	28	110	4	4	273	6	15	2	106	3	2	1
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	279	xxxx	xxxxx	114	xxxx	xxxxx	454	454	276	506	455	112
Potent Cap.:	1295	xxxx	xxxxx	1488	xxxx	xxxxx	520	505	768	480	504	947
Move Cap.:	1295	xxxx	xxxxx	1488	xxxx	xxxxx	508	492	768	405	492	947
Volume/Cap:	0.02	xxxx	xxxx	0.00	xxxx	xxxx	0.03	0.00	0.14	0.01	0.00	0.00
Level Of Service Module:												
2Way95thQ:	1.7	xxxx	xxxxx	0.2	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.8	xxxx	xxxxx	7.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	716	xxxxx	xxxx	479	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.6	xxxxx	xxxxx	0.0	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	11.1	xxxxx	xxxxx	12.6	xxxxx
Shared LOS:	*	*	*	*	*	*	*	B	*	*	B	*
ApproachDel:		xxxxxx			xxxxxx			11.1			12.6	
ApproachLOS:		*			*			B			B	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

Intersection #2 Park Blvd /Sherman Ave

Future Volume Alternative: Peak Hour Warrant NOT Met

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
Initial Vol:   28  110     4     4  273     6    15    2   106     3    2     1
ApproachDel:    xxxxxx           xxxxxx             11.1             12.6
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=123]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=554]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=6]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=554]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
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signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
Initial Vol:   28  110     4     4  273     6    15    2   106     3    2     1
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            425
Minor Approach Volume:          123
Minor Approach Volume Threshold: 448
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing + Project PM

Intersection #2: Park Blvd /Sherman Ave

```
                         Signal=Uncontrol/Rights=Include
                Final Vol:    6        278       4
                    Lanes:    0    0    1!    0    0

            Signal=Stop                              Signal=Stop
Final Vol: Lanes: Rights=Include   Vol Cnt Date:     n/a    Rights=Include   Lanes:  Final Vol:
                                   Cycle Time (sec): 100
   15       0                                                                  0        1
                                   Loss Time (sec):  0
            0                                                                  0
    2       1!                     Critical V/C:     0.139                     1!       2
            0                      Avg Crit Del (sec/veh): 3.0                 0
  106       0                      Avg Delay (sec/veh):    3.0                 0        3
                                   LOS:              B

                    Lanes:    0    0    1!    0    0
                Final Vol:   28        110       4
                         Signal=Uncontrol/Rights=Include
```

```
Street Name:                Park Blvd                        Park Blvd /Sherman Ave
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      28  110     4     4  273     6    15    2   106     3    2     1
Growth 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
Initial Bse:   28  110     4     4  273     6    15    2   106     3    2     1
Added Vol:      0    0     0     0    5     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   28  110     4     4  278     6    15    2   106     3    2     1
User 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
PHF 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
PHF Volume:    28  110     4     4  278     6    15    2   106     3    2     1
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   28  110     4     4  278     6    15    2   106     3    2     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  284 xxxx xxxxx   114 xxxx xxxxx   459  459   281   511  460   112
Potent Cap.: 1290 xxxx xxxxx  1488 xxxx xxxxx   516  502   763   476  501   947
Move Cap.:   1290 xxxx xxxxx  1488 xxxx xxxxx   504  489   763   401  489   947
Volume/Cap:  0.02 xxxx  xxxx  0.00 xxxx  xxxx  0.03 0.00  0.14  0.01 0.00  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    1.7 xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.9 xxxx xxxxx   7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  712 xxxxx  xxxx  475 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.6 xxxxx xxxxx  0.0 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 11.1 xxxxx xxxxx 12.7 xxxxx
Shared LOS:     *    *     *     *    *     *     *    B     *     *    B     *
ApproachDel:     xxxxxx           xxxxxx              11.1              12.7
ApproachLOS:         *                *                  B                 B
Note: Queue reported is the distance per lane in feet.
                      Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   28  110     4     4  278     6    15    2   106     3    2     1
ApproachDel:    xxxxxx           xxxxxx              11.1             12.7
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=123]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=559]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=6]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=559]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   28  110     4     4  278     6    15    2   106     3    2     1
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            430
Minor Approach Volume:          123
Minor Approach Volume Threshold: 444
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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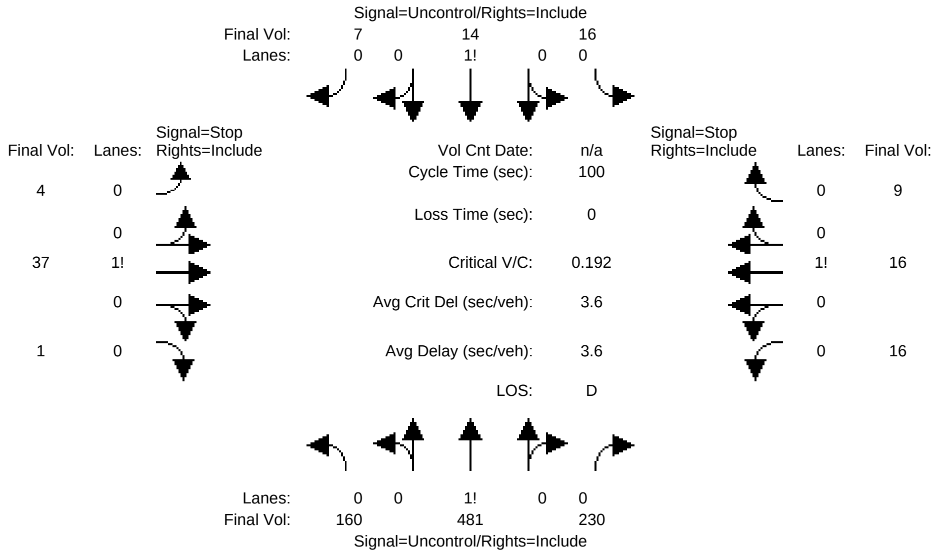
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```


231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #3: Birch St/ Sheridan Ave



Street Name:	Birch St						Sheridan Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	160	481	230	16	14	7	4	37	1	16	16	9
Growth 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
Initial Bse:	160	481	230	16	14	7	4	37	1	16	16	9
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	160	481	230	16	14	7	4	37	1	16	16	9
User 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
PHF 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
PHF Volume:	160	481	230	16	14	7	4	37	1	16	16	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	160	481	230	16	14	7	4	37	1	16	16	9
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	21	xxxx	xxxxx	711	xxxx	xxxxx	978	1081	18	985	969	596
Potent Cap.:	1608	xxxx	xxxxx	898	xxxx	xxxxx	232	220	1067	229	256	507
Move Cap.:	1608	xxxx	xxxxx	898	xxxx	xxxxx	195	192	1067	177	224	507
Volume/Cap:	0.10	xxxx	xxxx	0.02	xxxx	xxxx	0.02	0.19	0.00	0.09	0.07	0.02
Level Of Service Module:												
2Way95thQ:	8.3	xxxx	xxxxx	1.4	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.5	xxxx	xxxxx	9.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	196	xxxxx	xxxx	228	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.8	xxxxx	xxxxx	0.6	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	28.3	xxxxx	xxxxx	24.2	xxxxx
Shared LOS:	*	*	*	*	*	*	*	D	*	*	C	*
ApproachDel:		xxxxxx			xxxxxx			28.3			24.2	
ApproachLOS:		*			*			D			C	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

****

Intersection #3 Birch St/ Sheridan Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met


```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:  160  481   230    16   14     7     4   37     1    16   16     9
ApproachDel:    xxxxxx           xxxxxx              28.3             24.2
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=42]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=991]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=41]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=991]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:  160  481   230    16   14     7     4   37     1    16   16     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             908
Minor Approach Volume:           42
Minor Approach Volume Threshold: 245
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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a traffic signal in the future.  Intersections that exceed this warrant
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signal warrant (such as the 4-hour or 8-hour warrants).

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jurisdiction.  Consideration of the other signal warrants, which is beyond
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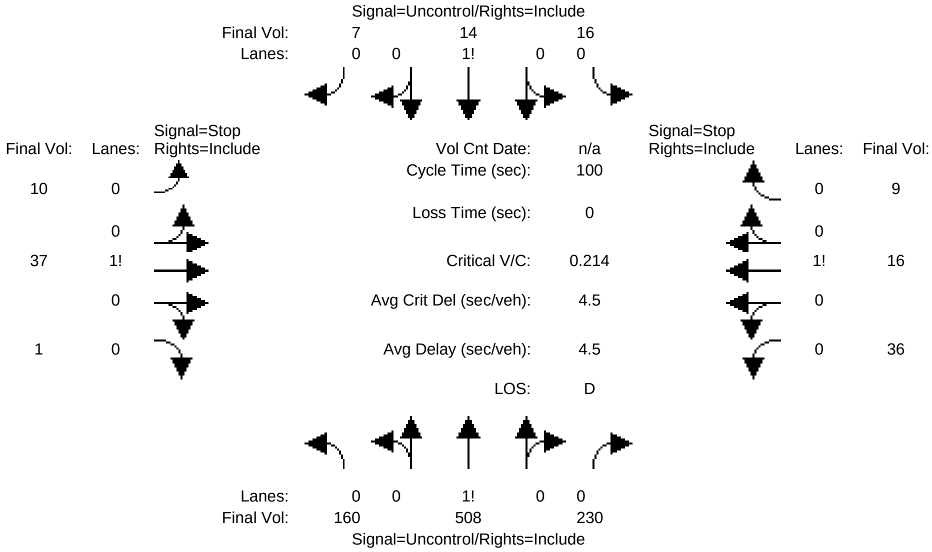
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing + Project AM

Intersection #3: Birch St/ Sheridan Ave




```
Street Name:                Birch St                          Sheridan Ave
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     160  481   230    16   14     7     4   37     1    16   16     9
Growth 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
Initial Bse:  160  481   230    16   14     7     4   37     1    16   16     9
Added Vol:      0   27     0     0    0     0     6    0     0    20    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  160  508   230    16   14     7    10   37     1    36   16     9
User 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
PHF 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
PHF Volume:   160  508   230    16   14     7    10   37     1    36   16     9
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:  160  508   230    16   14     7    10   37     1    36   16     9
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   21 xxxx xxxxx   738 xxxx xxxxx  1005 1108    18  1012  996   623
Potent Cap.: 1608 xxxx xxxxx   877 xxxx xxxxx   222  212  1067   220  246   490
Move Cap.:   1608 xxxx xxxxx   877 xxxx xxxxx   186  185  1067   169  215   490
Volume/Cap:  0.10 xxxx  xxxx  0.02 xxxx  xxxx  0.05 0.20  0.00  0.21 0.07  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    8.3 xxxx xxxxx   1.4 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.5 xxxx xxxxx   9.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  189 xxxxx  xxxx  199 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.0 xxxxx xxxxx  1.2 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 30.5 xxxxx xxxxx 30.9 xxxxx
Shared LOS:     *    *     *     *    *     *     *    D     *     *    D     *
ApproachDel:     xxxxxx            xxxxxx             30.5              30.9
ApproachLOS:          *                 *                D                 D
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:  160  508   230    16   14     7    10   37     1    36   16     9
ApproachDel:    xxxxxx           xxxxxx              30.5             30.9
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=48]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1044]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=61]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1044]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
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signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:  160  508   230    16   14     7    10   37     1    36   16     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            935
Minor Approach Volume:          61
Minor Approach Volume Threshold: 237
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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jurisdiction.  Consideration of the other signal warrants, which is beyond
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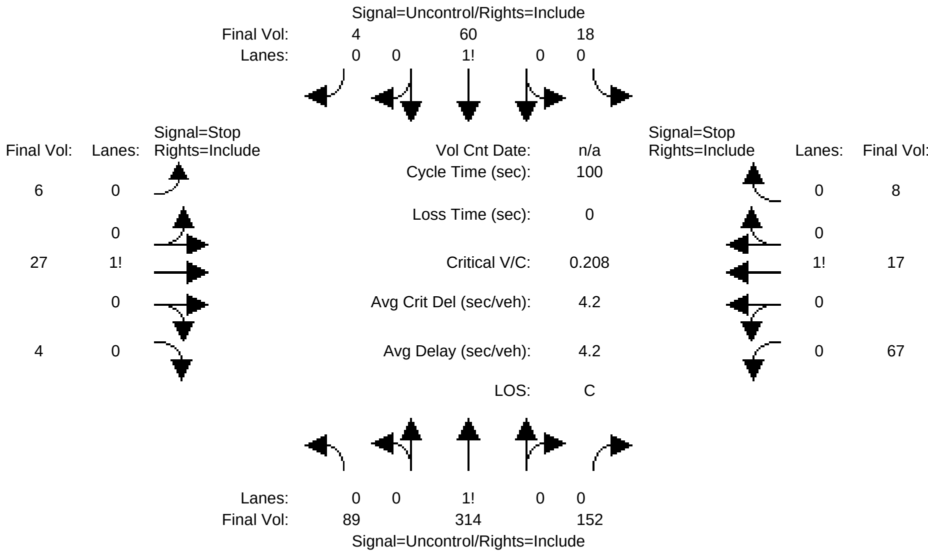
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #3: Birch St/ Sheridan Ave



Street Name:	Birch St						Sheridan Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	89	314	152	18	60	4	6	27	4	67	17	8
Growth 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
Initial Bse:	89	314	152	18	60	4	6	27	4	67	17	8
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	89	314	152	18	60	4	6	27	4	67	17	8
User 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
PHF 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
PHF Volume:	89	314	152	18	60	4	6	27	4	67	17	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	89	314	152	18	60	4	6	27	4	67	17	8
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	64	xxxx	xxxxx	466	xxxx	xxxxx	679	742	62	682	668	390
Potent Cap.:	1551	xxxx	xxxxx	1106	xxxx	xxxxx	369	346	1009	367	382	663
Move Cap.:	1551	xxxx	xxxxx	1106	xxxx	xxxxx	331	320	1009	322	353	663
Volume/Cap:	0.06	xxxx	xxxx	0.02	xxxx	xxxx	0.02	0.08	0.00	0.21	0.05	0.01
Level Of Service Module:												
2Way95thQ:	4.6	xxxx	xxxxx	1.2	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.5	xxxx	xxxxx	8.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	347	xxxxx	xxxx	343	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.4	xxxxx	xxxxx	1.1	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	16.6	xxxxx	xxxxx	19.3	xxxxx
Shared LOS:	*	*	*	*	*	*	*	C	*	*	C	*
ApproachDel:		xxxxxx			xxxxxx			16.6			19.3	
ApproachLOS:		*			*			C			C	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

Intersection #3 Birch St/ Sheridan Ave

Future Volume Alternative: Peak Hour Warrant NOT Met


```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   89  314   152    18   60     4     6   27     4    67   17     8
ApproachDel:    xxxxxx           xxxxxx              16.6             19.3
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=37]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=766]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=92]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=766]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

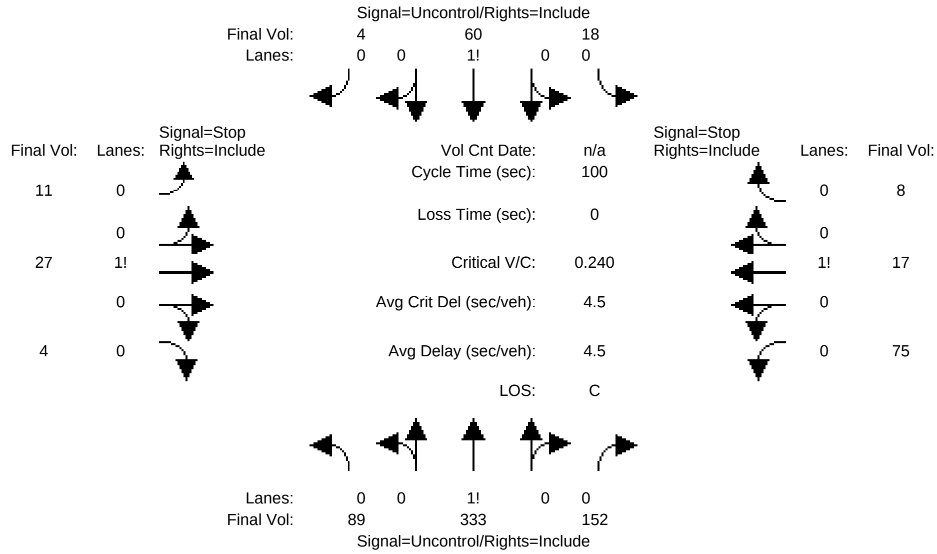
The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   89  314   152    18   60     4     6   27     4    67   17     8
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            637
Minor Approach Volume:          92
Minor Approach Volume Threshold: 340
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing + Project PM

Intersection #3: Birch St/ Sheridan Ave



Street Name:	Birch St						Sheridan Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	89	314	152	18	60	4	6	27	4	67	17	8
Growth 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
Initial Bse:	89	314	152	18	60	4	6	27	4	67	17	8
Added Vol:	0	19	0	0	0	0	5	0	0	8	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	89	333	152	18	60	4	11	27	4	75	17	8
User 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
PHF 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
PHF Volume:	89	333	152	18	60	4	11	27	4	75	17	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	89	333	152	18	60	4	11	27	4	75	17	8
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	64	xxxx	xxxxx	485	xxxx	xxxxx	698	761	62	701	687	409
Potent Cap.:	1551	xxxx	xxxxx	1088	xxxx	xxxxx	358	337	1009	356	372	647
Move Cap.:	1551	xxxx	xxxxx	1088	xxxx	xxxxx	321	312	1009	312	344	647
Volume/Cap:	0.06	xxxx	xxxx	0.02	xxxx	xxxx	0.03	0.09	0.00	0.24	0.05	0.01
Level Of Service Module:												
2Way95thQ:	4.6	xxxx	xxxxx	1.3	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.5	xxxx	xxxxx	8.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	336	xxxxx	xxxx	331	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.4	xxxxx	xxxxx	1.2	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	17.2	xxxxx	xxxxx	20.5	xxxxx
Shared LOS:	*	*	*	*	*	*	*	C	*	*	C	*
ApproachDel:		xxxxxx			xxxxxx			17.2			20.5	
ApproachLOS:		*			*			C			C	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

****

Intersection #3 Birch St/ Sheridan Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met


```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   89  333   152    18   60     4    11   27     4    75   17     8
ApproachDel:    xxxxxx           xxxxxx              17.2             20.5
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=42]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=798]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.6]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=100]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=798]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   89  333   152    18   60     4    11   27     4    75   17     8
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             656
Minor Approach Volume:           100
Minor Approach Volume Threshold: 332
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```


231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM

Intersection #4: Birch St/ Grant Ave

Signal=Stop/Rights=Include
Final Vol: 14 29*** 16
Lanes: 0 0 1! 0 0

Final Vol:	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Final Vol:
			Vol Cnt Date:	n/a			
33	0		Cycle Time (sec):	100		0	0
	0		Loss Time (sec):	0		0	
37***	1!		Critical V/C:	0.606		0	0
	0		Avg Crit Del (sec/veh):	12.2		0	
12	0		Avg Delay (sec/veh):	12.2		0	0
			LOS:	B			

Lanes: 0 0 1! 0 0
Final Vol: 42 445 34***
Signal=Stop/Rights=Include

Street Name:	Birch St						Grant Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	42	445	34	16	29	14	33	37	12	0	0	0
Growth 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
Initial Bse:	42	445	34	16	29	14	33	37	12	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	42	445	34	16	29	14	33	37	12	0	0	0
User 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
PHF 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
PHF Volume:	42	445	34	16	29	14	33	37	12	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	42	445	34	16	29	14	33	37	12	0	0	0
PCE 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
MLF 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
FinalVolume:	42	445	34	16	29	14	33	37	12	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.08	0.85	0.07	0.27	0.49	0.24	0.40	0.45	0.15	0.00	0.00	0.00
Final Sat.:	69	735	56	208	378	182	261	293	95	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.61	0.61	0.61	0.08	0.08	0.08	0.13	0.13	0.13	xxxx	xxxx	xxxx
Crit Moves:			****		****			****				
Delay/Veh:	13.2	13.2	13.2	7.9	7.9	7.9	8.7	8.7	8.7	0.0	0.0	0.0
Delay 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
AdjDel/Veh:	13.2	13.2	13.2	7.9	7.9	7.9	8.7	8.7	8.7	0.0	0.0	0.0
LOS by Move:	B	B	B	A	A	A	A	A	A	*	*	*
ApproachDel:		13.2			7.9			8.7			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		13.2			7.9			8.7			xxxxxx	
LOS by Appr:		B			A			A			*	
AllWayAvgQ:	36.1	36.1	36.1	1.9	1.9	1.9	3.0	3.0	3.0	0.0	0.0	0.0

Note: Queue reported is the distance per lane in feet.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #4 Birch St/ Grant Ave


```
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   42  445    34    16   29    14    33   37    12     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             580
Minor Approach Volume:           82
Minor Approach Volume Threshold: 365
--------------------------------------------------------------------------------
```

SIGNAL WARRANT DISCLAIMER
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231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing + Project AM

Intersection #4: Birch St/ Grant Ave

Signal=Stop/Rights=Include
Final Vol: 14 29*** 16
Lanes: 0 0 1! 0 0

Westbound approach (left of diagram): Signal=Stop, Rights=Include
Final Vol: 33, 37***, 12
Lanes: 0, 0, 1!, 0, 0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.640
Avg Crit Del (sec/veh): 13.0
Avg Delay (sec/veh): 13.0
LOS: B

Signal=Stop Rights=Include Lanes: Final Vol:
Lanes: 0, 0, 0, 0, 0
Final Vol: 0, 0, 0

Lanes: 0 0 1! 0 0
Final Vol: 66 449*** 34
Signal=Stop/Rights=Include

Street Name:	Birch St						Grant Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	42	445	34	16	29	14	33	37	12	0	0	0
Growth 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
Initial Bse:	42	445	34	16	29	14	33	37	12	0	0	0
Added Vol:	24	4	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	66	449	34	16	29	14	33	37	12	0	0	0
User 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
PHF 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
PHF Volume:	66	449	34	16	29	14	33	37	12	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	66	449	34	16	29	14	33	37	12	0	0	0
PCE 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
MLF 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
FinalVolume:	66	449	34	16	29	14	33	37	12	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.12	0.82	0.06	0.27	0.49	0.24	0.40	0.45	0.15	0.00	0.00	0.00
Final Sat.:	103	702	53	207	375	181	258	289	94	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.64	0.64	0.64	0.08	0.08	0.08	0.13	0.13	0.13	xxxx	xxxx	xxxx
Crit Moves:		****			****			****				
Delay/Veh:	14.1	14.1	14.1	7.9	7.9	7.9	8.8	8.8	8.8	0.0	0.0	0.0
Delay 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
AdjDel/Veh:	14.1	14.1	14.1	7.9	7.9	7.9	8.8	8.8	8.8	0.0	0.0	0.0
LOS by Move:	B	B	B	A	A	A	A	A	A	*	*	*
ApproachDel:		14.1			7.9			8.8			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		14.1			7.9			8.8			xxxxxx	
LOS by Appr:		B			A			A			*	
AllWayAvgQ:	41.5	41.5	41.5	1.9	1.9	1.9	3.0	3.0	3.0	0.0	0.0	0.0

Note: Queue reported is the distance per lane in feet.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #4 Birch St/ Grant Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound	South Bound	East Bound	West Bound
Movement:	L - T - R	L - T - R	L - T - R	L - T - R
Control:	Stop Sign	Stop Sign	Stop Sign	Stop Sign
Lanes:	0 0 1! 0 0	0 0 1! 0 0	0 0 1! 0 0	0 0 0 0 0
Initial Vol:	66 449 34	16 29 14	33 37 12	0 0 0

Major Street Volume: 608
Minor Approach Volume: 82
Minor Approach Volume Threshold: 352

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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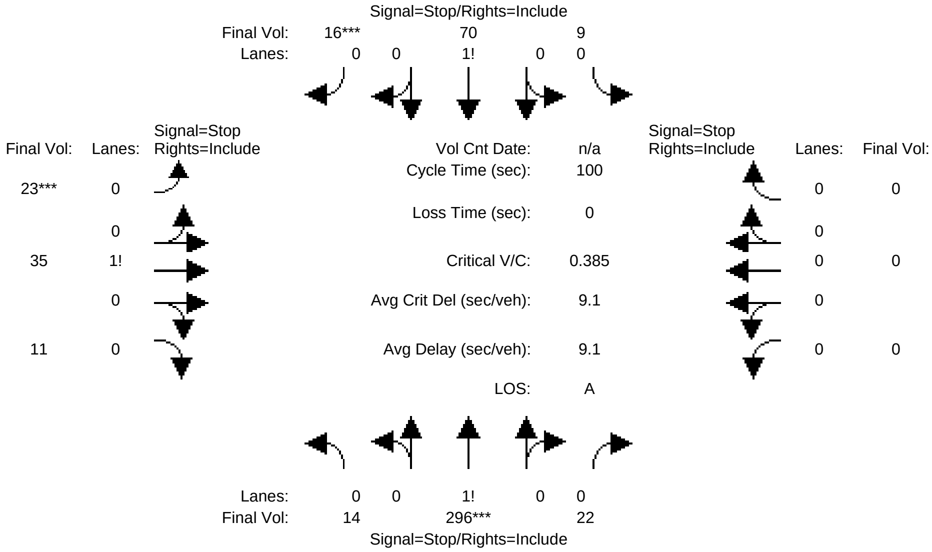
231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing PM

Intersection #4: Birch St/ Grant Ave



Street Name:	Birch St						Grant Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	14	296	22	9	70	16	23	35	11	0	0	0
Growth 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
Initial Bse:	14	296	22	9	70	16	23	35	11	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	14	296	22	9	70	16	23	35	11	0	0	0
User 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
PHF 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
PHF Volume:	14	296	22	9	70	16	23	35	11	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	14	296	22	9	70	16	23	35	11	0	0	0
PCE 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
MLF 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
FinalVolume:	14	296	22	9	70	16	23	35	11	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.04	0.89	0.07	0.09	0.74	0.17	0.33	0.51	0.16	0.00	0.00	0.00
Final Sat.:	36	768	57	77	601	137	236	359	113	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.39	0.39	0.39	0.12	0.12	0.12	0.10	0.10	0.10	xxxx	xxxx	xxxx
Crit Moves:		****				****	****					
Delay/Veh:	9.6	9.6	9.6	7.8	7.8	7.8	8.2	8.2	8.2	0.0	0.0	0.0
Delay 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
AdjDel/Veh:	9.6	9.6	9.6	7.8	7.8	7.8	8.2	8.2	8.2	0.0	0.0	0.0
LOS by Move:	A	A	A	A	A	A	A	A	A	*	*	*
ApproachDel:		9.6			7.8			8.2			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		9.6			7.8			8.2			xxxxxx	
LOS by Appr:		A			A			A			*	
AllWayAvgQ:	15.1	15.1	15.1	3.1	3.1	3.1	2.3	2.3	2.3	0.0	0.0	0.0

Note: Queue reported is the distance per lane in feet.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #4 Birch St/ Grant Ave

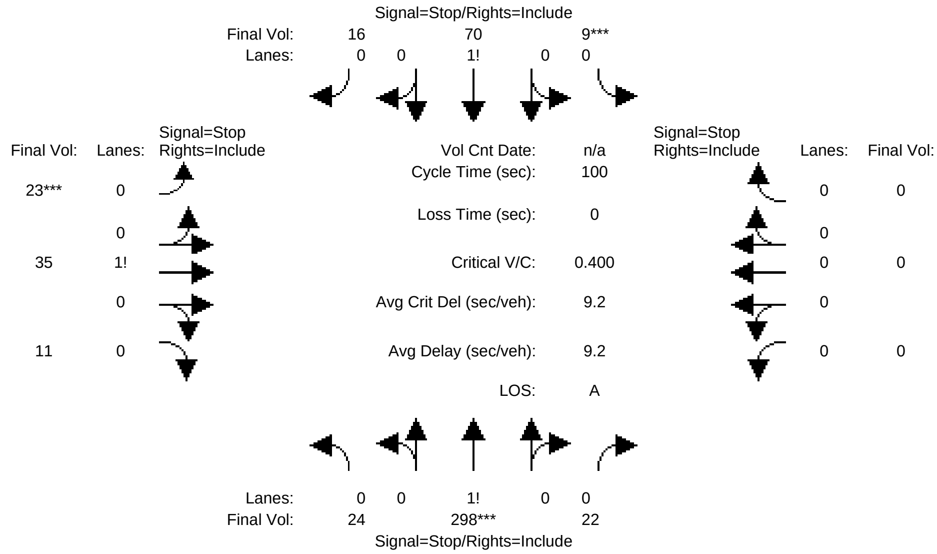

```
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   14  296    22     9   70    16    23   35    11     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            427
Minor Approach Volume:          69
Minor Approach Volume Threshold: 446
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing + Project PM

Intersection #4: Birch St/ Grant Ave



Street Name:		Birch St						Grant Ave				
Approach:		North Bound			South Bound			East Bound			West Bound	
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	14	296	22	9	70	16	23	35	11	0	0	0
Growth 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
Initial Bse:	14	296	22	9	70	16	23	35	11	0	0	0
Added Vol:	10	2	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	24	298	22	9	70	16	23	35	11	0	0	0
User 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
PHF 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
PHF Volume:	24	298	22	9	70	16	23	35	11	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	24	298	22	9	70	16	23	35	11	0	0	0
PCE 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
MLF 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
FinalVolume:	24	298	22	9	70	16	23	35	11	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.07	0.87	0.06	0.09	0.74	0.17	0.33	0.51	0.16	0.00	0.00	0.00
Final Sat.:	60	745	55	77	599	137	234	357	112	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.40	0.40	0.40	0.12	0.12	0.12	0.10	0.10	0.10	xxxx	xxxx	xxxx
Crit Moves:		****		****			****					
Delay/Veh:	9.8	9.8	9.8	7.9	7.9	7.9	8.2	8.2	8.2	0.0	0.0	0.0
Delay 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
AdjDel/Veh:	9.8	9.8	9.8	7.9	7.9	7.9	8.2	8.2	8.2	0.0	0.0	0.0
LOS by Move:	A	A	A	A	A	A	A	A	A	*	*	*
ApproachDel:		9.8			7.9			8.2			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		9.8			7.9			8.2			xxxxxx	
LOS by Appr:		A			A			A			*	
AllWayAvgQ:	16.0	16.0	16.0	3.1	3.1	3.1	2.3	2.3	2.3	0.0	0.0	0.0

Note: Queue reported is the distance per lane in feet.

Peak Hour Volume Signal Warrant Report [Urban]

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Intersection #4 Birch St/ Grant Ave

****

```
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   24  298    22     9   70    16    23   35    11     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            439
Minor Approach Volume:          69
Minor Approach Volume Threshold: 439
--------------------------------------------------------------------------------
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SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy

Signal=Protect/Rights=Include
Final Vol: 323 594 351***
Lanes: 1 0 3 0 2

Signal=Protect Rights=Include (Eastbound)
Final Vol: Lanes:
381*** 2
0
921 2
0
185 1

Vol Cnt Date: n/a
Cycle Time (sec): 130
Loss Time (sec): 12
Critical V/C: 0.897
Avg Crit Del (sec/veh): 55.6
Avg Delay (sec/veh): 50.3
LOS: D

Signal=Protect Rights=Include (Westbound)
Lanes: Final Vol:
0 201
1
1 1153***
0
2 238

Lanes: 2 0 2 1 0
Final Vol: 355 1038*** 171
Signal=Protect/Rights=Include

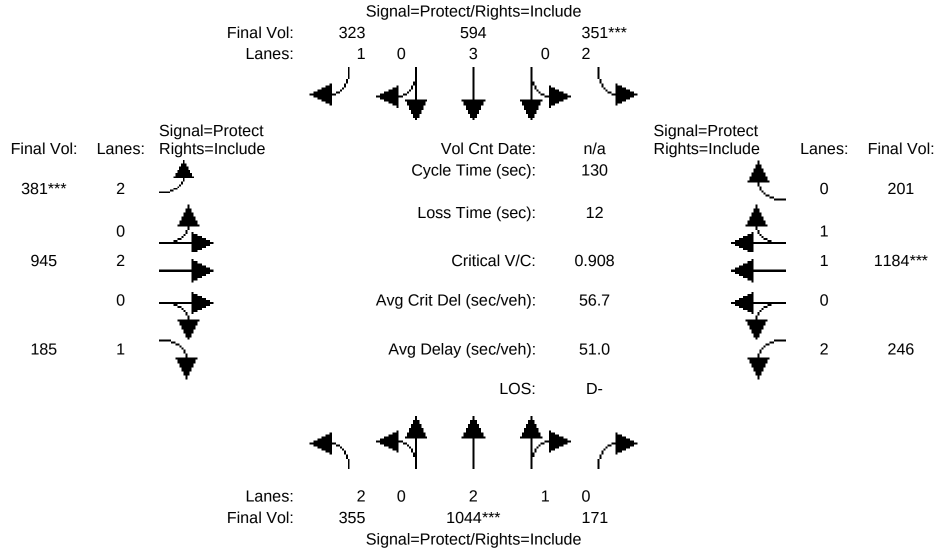
Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	355	1038	171	351	594	323	381	921	185	238	1153	201
Growth 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
Initial Bse:	355	1038	171	351	594	323	381	921	185	238	1153	201
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	355	1038	171	351	594	323	381	921	185	238	1153	201
User 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
PHF 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
PHF Volume:	355	1038	171	351	594	323	381	921	185	238	1153	201
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	355	1038	171	351	594	323	381	921	185	238	1153	201
PCE 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
MLF 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
FinalVolume:	355	1038	171	351	594	323	381	921	185	238	1153	201
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	0.98	0.95
Lanes:	2.00	2.56	0.44	2.00	3.00	1.00	2.00	2.00	1.00	2.00	1.69	0.31
Final Sat.:	3150	4807	792	3150	5700	1750	3150	3800	1750	3150	3150	549
Capacity Analysis Module:												
Vol/Sat:	0.11	0.22	0.22	0.11	0.10	0.18	0.12	0.24	0.11	0.08	0.37	0.37
Crit Moves:		****		****			****				****	
Green Time:	18.0	31.3	31.3	16.1	29.5	29.5	17.5	53.8	53.8	16.8	53.0	53.0
Volume/Cap:	0.81	0.90	0.90	0.90	0.46	0.81	0.90	0.59	0.26	0.59	0.90	0.90
Delay/Veh:	65.6	56.1	56.1	78.6	43.7	59.9	76.5	30.1	25.2	55.6	43.4	43.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	65.6	56.1	56.1	78.6	43.7	59.9	76.5	30.1	25.2	55.6	43.4	43.4
LOS by Move:	E	E+	E+	E-	D	E+	E-	C	C	E+	D	D
HCM2kAvgQ:	262	479	479	285	175	383	303	356	127	154	726	726

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing + Project AM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy



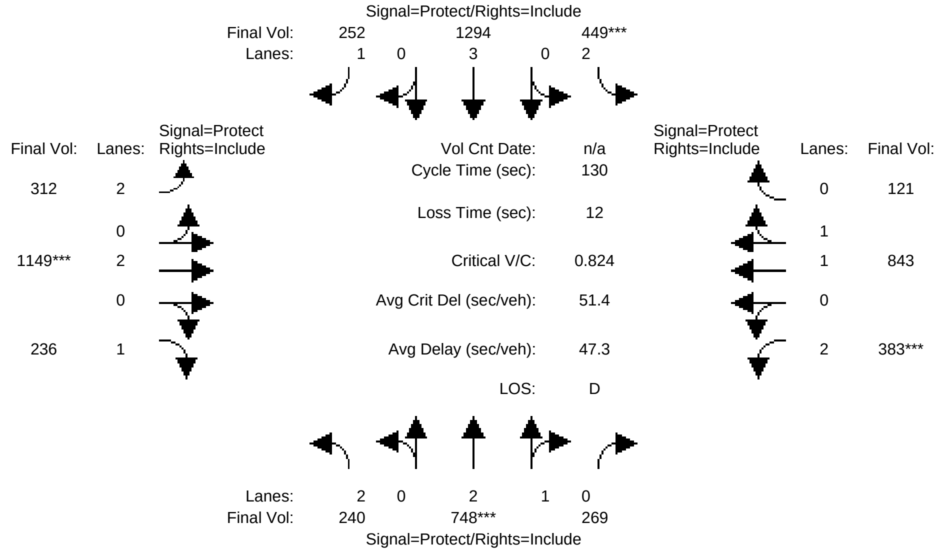
Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	355	1038	171	351	594	323	381	921	185	238	1153	201
Growth 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
Initial Bse:	355	1038	171	351	594	323	381	921	185	238	1153	201
Added Vol:	0	6	0	0	0	0	0	24	0	8	31	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	355	1044	171	351	594	323	381	945	185	246	1184	201
User 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
PHF 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
PHF Volume:	355	1044	171	351	594	323	381	945	185	246	1184	201
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	355	1044	171	351	594	323	381	945	185	246	1184	201
PCE 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
MLF 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
FinalVolume:	355	1044	171	351	594	323	381	945	185	246	1184	201
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	0.98	0.95
Lanes:	2.00	2.56	0.44	2.00	3.00	1.00	2.00	2.00	1.00	2.00	1.70	0.30
Final Sat.:	3150	4811	788	3150	5700	1750	3150	3800	1750	3150	3163	537
Capacity Analysis Module:												
Vol/Sat:	0.11	0.22	0.22	0.11	0.10	0.18	0.12	0.25	0.11	0.08	0.37	0.37
Crit Moves:		****		****			****				****	
Green Time:	17.8	31.1	31.1	16.0	29.2	29.2	17.3	54.0	54.0	17.0	53.6	53.6
Volume/Cap:	0.82	0.91	0.91	0.91	0.46	0.82	0.91	0.60	0.25	0.60	0.91	0.91
Delay/Veh:	66.4	57.3	57.3	80.8	43.9	60.9	78.6	30.2	25.0	55.8	44.1	44.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	66.4	57.3	57.3	80.8	43.9	60.9	78.6	30.2	25.0	55.8	44.1	44.1
LOS by Move:	E	E+	E+	F	D	E	E-	C	C	E+	D	D
HCM2kAvgQ:	264	487	487	288	176	386	307	368	127	160	751	751

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy



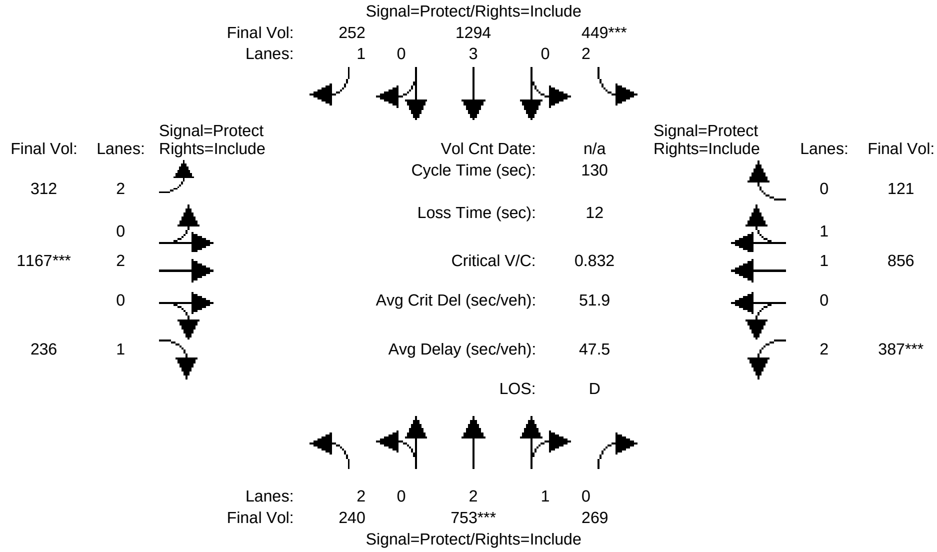
Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	240	748	269	449	1294	252	312	1149	236	383	843	121
Growth 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
Initial Bse:	240	748	269	449	1294	252	312	1149	236	383	843	121
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	240	748	269	449	1294	252	312	1149	236	383	843	121
User 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
PHF 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
PHF Volume:	240	748	269	449	1294	252	312	1149	236	383	843	121
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	240	748	269	449	1294	252	312	1149	236	383	843	121
PCE 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
MLF 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
FinalVolume:	240	748	269	449	1294	252	312	1149	236	383	843	121
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	1.00	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	0.98	0.95
Lanes:	2.00	2.18	0.82	2.00	3.00	1.00	2.00	2.00	1.00	2.00	1.74	0.26
Final Sat.:	3150	4117	1481	3150	5700	1750	3150	3800	1750	3150	3235	464
Capacity Analysis Module:												
Vol/Sat:	0.08	0.18	0.18	0.14	0.23	0.14	0.10	0.30	0.13	0.12	0.26	0.26
Crit Moves:		****		****				****		****		
Green Time:	12.8	28.7	28.7	22.5	38.3	38.3	18.4	47.7	47.7	19.2	48.4	48.4
Volume/Cap:	0.77	0.82	0.82	0.82	0.77	0.49	0.70	0.82	0.37	0.82	0.70	0.70
Delay/Veh:	68.3	52.9	52.9	61.8	44.1	38.5	58.0	41.5	30.5	65.2	36.2	36.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	68.3	52.9	52.9	61.8	44.1	38.5	58.0	41.5	30.5	65.2	36.2	36.2
LOS by Move:	E	D-	D-	E	D	D+	E+	D	C	E	D+	D+
HCM2kAvgQ:	186	382	382	317	427	227	211	565	184	280	433	433

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing + Project PM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy



Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	240	748	269	449	1294	252	312	1149	236	383	843	121
Growth 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
Initial Bse:	240	748	269	449	1294	252	312	1149	236	383	843	121
Added Vol:	0	5	0	0	0	0	0	18	0	4	13	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	240	753	269	449	1294	252	312	1167	236	387	856	121
User 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
PHF 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
PHF Volume:	240	753	269	449	1294	252	312	1167	236	387	856	121
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	240	753	269	449	1294	252	312	1167	236	387	856	121
PCE 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
MLF 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
FinalVolume:	240	753	269	449	1294	252	312	1167	236	387	856	121
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	0.98	0.95
Lanes:	2.00	2.18	0.82	2.00	3.00	1.00	2.00	2.00	1.00	2.00	1.75	0.25
Final Sat.:	3150	4124	1473	3150	5700	1750	3150	3800	1750	3150	3241	458
Capacity Analysis Module:												
Vol/Sat:	0.08	0.18	0.18	0.14	0.23	0.14	0.10	0.31	0.13	0.12	0.26	0.26
Crit Moves:		****		****				****		****		
Green Time:	12.8	28.5	28.5	22.3	38.0	38.0	18.3	48.0	48.0	19.2	48.9	48.9
Volume/Cap:	0.78	0.83	0.83	0.83	0.78	0.49	0.70	0.83	0.37	0.83	0.70	0.70
Delay/Veh:	68.9	53.4	53.4	62.6	44.4	38.7	58.3	41.7	30.3	65.9	36.0	36.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	68.9	53.4	53.4	62.6	44.4	38.7	58.3	41.7	30.3	65.9	36.0	36.0
LOS by Move:	E	D-	D-	E	D	D+	E+	D	C	E	D+	D+
HCM2kAvgQ:	187	387	387	319	429	228	211	577	183	285	439	439

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #6: El Camino Real/ Grant Ave

Signal=Uncontrol/Rights=Include
Final Vol: 25 1194 62
Lanes: 0 1 2 0 1

Final Vol:	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Final Vol:
			Vol Cnt Date:	n/a			
0	0		Cycle Time (sec):	100		1	64
	0		Loss Time (sec):	0		0	
0	0		Critical V/C:	0.182		0	0
	0		Avg Crit Del (sec/veh):	0.8		0	
0	1		Avg Delay (sec/veh):	0.8		0	0
			LOS:	C			

Lanes: 1 0 2 1 0
Final Vol: 47 1792 28
Signal=Uncontrol/Rights=Include

Street Name:	El Camino Real						Grant Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	47	1792	28	62	1194	25	0	0	0	0	0	64
Growth 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
Initial Bse:	47	1792	28	62	1194	25	0	0	0	0	0	64
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	47	1792	28	62	1194	25	0	0	0	0	0	64
User 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
PHF 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
PHF Volume:	47	1792	28	62	1194	25	0	0	0	0	0	64
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	47	1792	28	62	1194	25	0	0	0	0	0	64
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	6.9	xxxxx	xxxx	6.9
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	3.3	xxxxx	xxxx	3.3
Capacity Module:												
Cnflict Vol:	1219	xxxx	xxxxx	1820	xxxx	xxxxx	xxxx	xxxx	411	xxxx	xxxx	611
Potent Cap.:	579	xxxx	xxxxx	341	xxxx	xxxxx	xxxx	xxxx	596	xxxx	xxxx	442
Move Cap.:	579	xxxx	xxxxx	341	xxxx	xxxxx	xxxx	xxxx	596	xxxx	xxxx	442
Volume/Cap:	0.08	xxxx	xxxx	0.18	xxxx	xxxx	xxxx	xxxx	0.00	xxxx	xxxx	0.14
Level Of Service Module:												
2Way95thQ:	6.6	xxxx	xxxxx	16.3	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	12.6
Control Del:	11.8	xxxx	xxxxx	17.9	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	14.5
LOS by Move:	B	*	*	C	*	*	*	*	*	*	*	B
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		xxxxxx			xxxxxx			xxxxxx			14.5	
ApproachLOS:		*			*			*			B	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

****

Intersection #6 El Camino Real/ Grant Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L - T - R      L - T - R      L - T - R      L - T - R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled     Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   47 1792    28    62 1194    25     0    0     0     0    0    64
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             14.5
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=64]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3212]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
```

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

```
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L - T - R      L - T - R      L - T - R      L - T - R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled     Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   47 1792    28    62 1194    25     0    0     0     0    0    64
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            3148
Minor Approach Volume:          64
Minor Approach Volume Threshold: -110 [less than minimum of 100]
--------------------------------------------------------------------------------
```

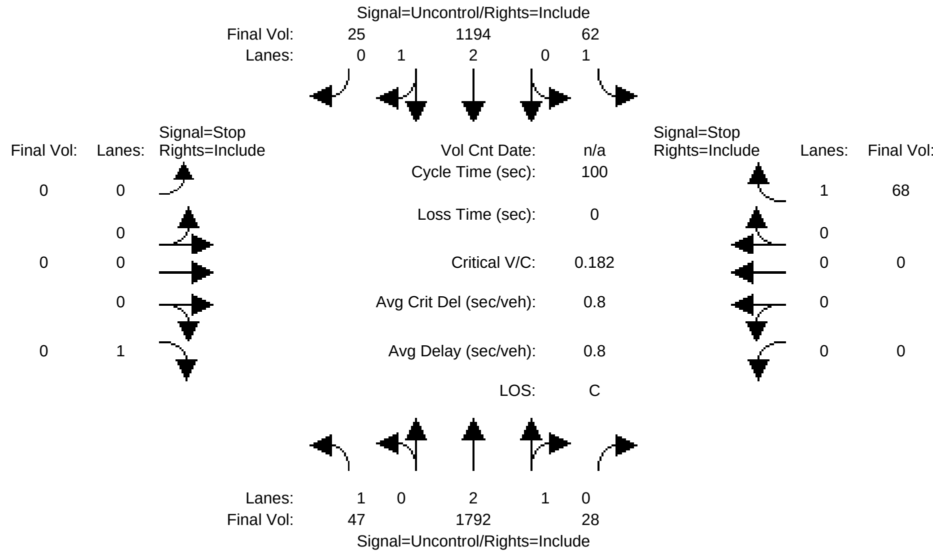
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing + Project AM

Intersection #6: El Camino Real/ Grant Ave




```
Street Name:          El Camino Real                      Grant Ave
Approach:      North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      47 1792    28    62 1194    25     0     0     0     0     0    64
Growth 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
Initial Bse:   47 1792    28    62 1194    25     0     0     0     0     0    64
Added Vol:      0    0     0     0    0     0     0     0     0     0     0     4
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:   47 1792    28    62 1194    25     0     0     0     0     0    68
User 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
PHF 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
PHF Volume:    47 1792    28    62 1194    25     0     0     0     0     0    68
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:   47 1792    28    62 1194    25     0     0     0     0     0    68
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1219 xxxx xxxxx  1820 xxxx xxxxx  xxxx xxxx   411  xxxx xxxx   611
Potent Cap.:  579 xxxx xxxxx   341 xxxx xxxxx  xxxx xxxx   596  xxxx xxxx   442
Move Cap.:    579 xxxx xxxxx   341 xxxx xxxxx  xxxx xxxx   596  xxxx xxxx   442
Volume/Cap:  0.08 xxxx  xxxx  0.18 xxxx  xxxx  xxxx xxxx  0.00  xxxx xxxx  0.15
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    6.6 xxxx xxxxx  16.3 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  13.5
Control Del: 11.8 xxxx xxxxx  17.9 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  14.6
LOS by Move:    B    *     *     C    *     *     *     *     *     *     *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *     *     *     *     *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx            14.6
ApproachLOS:        *                 *                 *                 B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   47 1792    28    62 1194    25     0    0     0     0    0    68
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            14.6
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=68]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3216]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

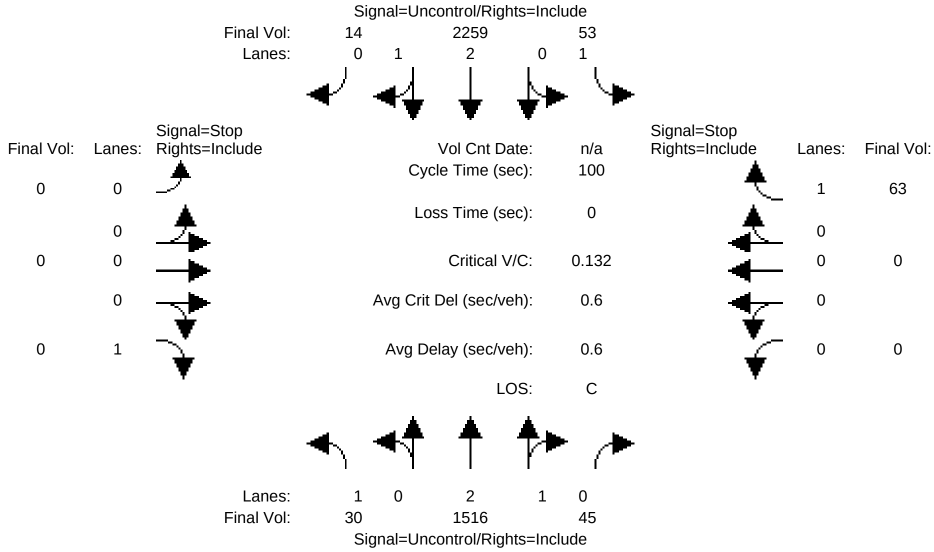
The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   47 1792    28    62 1194    25     0    0     0     0    0    68
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            3148
Minor Approach Volume:          68
Minor Approach Volume Threshold: -110 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #6: El Camino Real/ Grant Ave




```
Street Name:          El Camino Real                     Grant Ave
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       30 1516    45    53 2259    14     0    0     0     0    0    63
Growth 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
Initial Bse:    30 1516    45    53 2259    14     0    0     0     0    0    63
Added Vol:       0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    30 1516    45    53 2259    14     0    0     0     0    0    63
User 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
PHF 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
PHF Volume:     30 1516    45    53 2259    14     0    0     0     0    0    63
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    30 1516    45    53 2259    14     0    0     0     0    0    63
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:   4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx   6.9
FollowUpTim:   2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 2273 xxxx xxxxx  1561 xxxx xxxxx  xxxx xxxx   760  xxxx xxxx   528
Potent Cap.:   227 xxxx xxxxx   429 xxxx xxxxx  xxxx xxxx   353  xxxx xxxx   500
Move Cap.:     227 xxxx xxxxx   429 xxxx xxxxx  xxxx xxxx   353  xxxx xxxx   500
Volume/Cap:   0.13 xxxx  xxxx  0.12 xxxx  xxxx  xxxx xxxx  0.00  xxxx xxxx  0.13
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2WayQ95thQ:   11.2 xxxx xxxxx  10.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  10.7
Control Del: 23.2 xxxx xxxxx  14.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  13.2
LOS by Move:    C    *     *     B    *     *     *    *     *     *    *     B
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:      xxxxxx           xxxxxx           xxxxxx             13.2
ApproachLOS:           *                *                *                B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   30 1516    45    53 2259    14     0    0     0     0    0    63
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             13.2
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=63]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3980]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

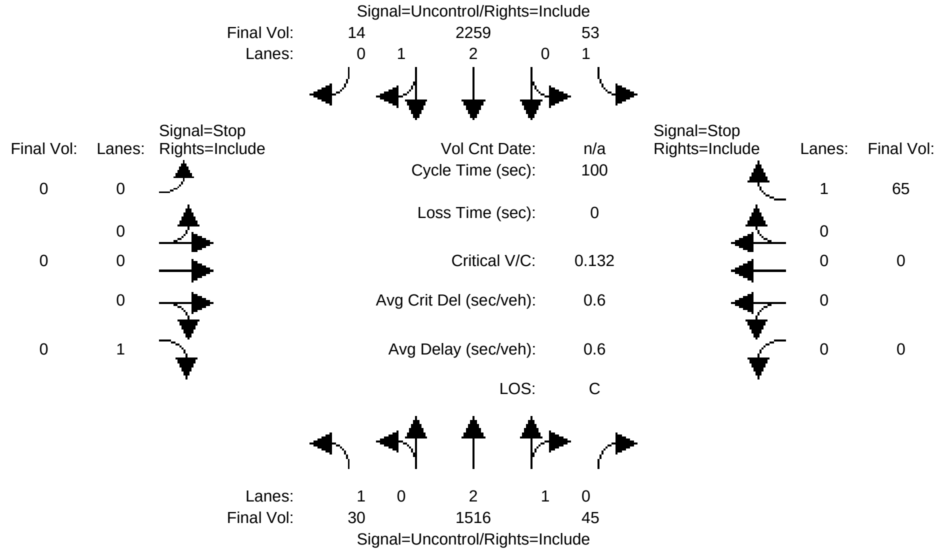
The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   30 1516    45    53 2259    14     0    0     0     0    0    63
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             3917
Minor Approach Volume:           63
Minor Approach Volume Threshold: -186 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing + Project PM

Intersection #6: El Camino Real/ Grant Ave




```
Street Name:          El Camino Real                     Grant Ave
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      30 1516    45    53 2259    14     0    0     0     0    0    63
Growth 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
Initial Bse:   30 1516    45    53 2259    14     0    0     0     0    0    63
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     2
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   30 1516    45    53 2259    14     0    0     0     0    0    65
User 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
PHF 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
PHF Volume:    30 1516    45    53 2259    14     0    0     0     0    0    65
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   30 1516    45    53 2259    14     0    0     0     0    0    65
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 2273 xxxx xxxxx  1561 xxxx xxxxx  xxxx xxxx   760  xxxx xxxx   528
Potent Cap.:  227 xxxx xxxxx   429 xxxx xxxxx  xxxx xxxx   353  xxxx xxxx   500
Move Cap.:    227 xxxx xxxxx   429 xxxx xxxxx  xxxx xxxx   353  xxxx xxxx   500
Volume/Cap:  0.13 xxxx  xxxx  0.12 xxxx  xxxx  xxxx xxxx  0.00  xxxx xxxx  0.13
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   11.2 xxxx xxxxx  10.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  11.1
Control Del: 23.2 xxxx xxxxx  14.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  13.3
LOS by Move:    C    *     *     B    *     *     *    *     *     *    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx              13.3
ApproachLOS:          *                 *                 *                 B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   30 1516    45    53 2259    14     0    0     0     0    0    65
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             13.3
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=65]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3982]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

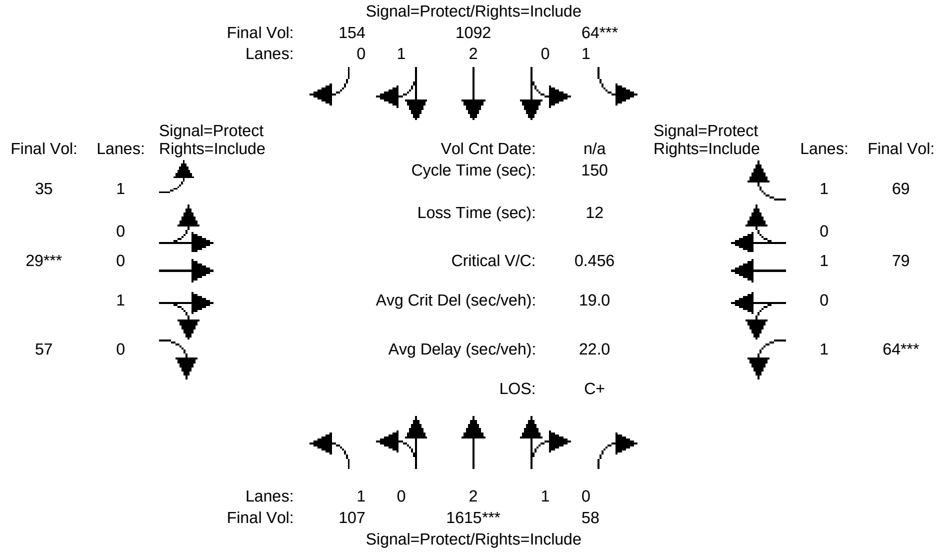
The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   30 1516    45    53 2259    14     0    0     0     0    0    65
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             3917
Minor Approach Volume:           65
Minor Approach Volume Threshold: -186 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #7: El Camino Real/ California Ave



Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	107	1615	58	64	1092	154	35	29	57	64	79	69
Growth 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
Initial Bse:	107	1615	58	64	1092	154	35	29	57	64	79	69
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	107	1615	58	64	1092	154	35	29	57	64	79	69
User 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
PHF 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
PHF Volume:	107	1615	58	64	1092	154	35	29	57	64	79	69
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	107	1615	58	64	1092	154	35	29	57	64	79	69
PCE 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
MLF 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
FinalVolume:	107	1615	58	64	1092	154	35	29	57	64	79	69
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.99	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.89	0.11	1.00	2.62	0.38	1.00	0.34	0.66	1.00	1.00	1.00
Final Sat.:	1750	5406	194	1750	4907	692	1750	607	1193	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.06	0.30	0.30	0.04	0.22	0.22	0.02	0.05	0.05	0.04	0.04	0.04
Crit Moves:		****		****				****		****		
Green Time:	23.8	98.2	98.2	12.0	86.5	86.5	11.4	15.7	15.7	12.0	16.3	16.3
Volume/Cap:	0.39	0.46	0.46	0.46	0.39	0.39	0.26	0.46	0.46	0.46	0.38	0.36
Delay/Veh:	57.5	12.8	12.8	68.2	17.4	17.4	66.4	64.9	64.9	68.2	63.3	63.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	57.5	12.8	12.8	68.2	17.4	17.4	66.4	64.9	64.9	68.2	63.3	63.2
LOS by Move:	E+	B	B	E	B	B	E	E	E	E	E	E
HCM2kAvgQ:	124	312	312	89	255	255	46	109	109	89	91	86

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing + Project AM

Intersection #7: El Camino Real/ California Ave

Signal=Protect/Rights=Include
Final Vol: 154 1092 70***
Lanes: 0 1 2 0 1

Signal=Protect
Rights=Include

Final Vol:	Lanes:
35	1
	0
29***	0
	1
57	0

Vol Cnt Date:	n/a
Cycle Time (sec):	150
Loss Time (sec):	12
Critical V/C:	0.461
Avg Crit Del (sec/veh):	19.4
Avg Delay (sec/veh):	22.2
LOS:	C+

Signal=Protect
Rights=Include

Lanes:	Final Vol:
1	73
0	
1	79
0	
1	64***

Lanes: 1 0 2 1 0
Final Vol: 107 1619*** 58
Signal=Protect/Rights=Include

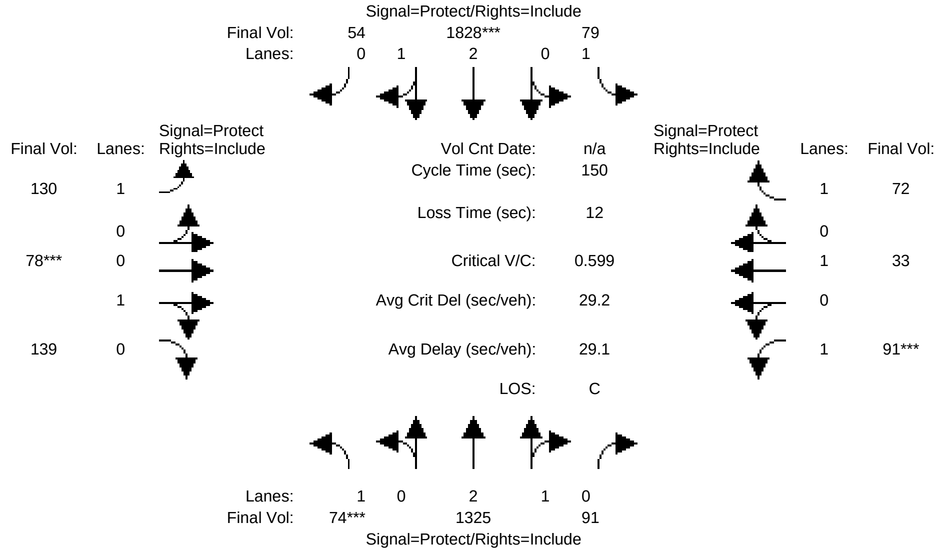
Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	107	1615	58	64	1092	154	35	29	57	64	79	69
Growth 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
Initial Bse:	107	1615	58	64	1092	154	35	29	57	64	79	69
Added Vol:	0	4	0	6	0	0	0	0	0	0	0	4
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	107	1619	58	70	1092	154	35	29	57	64	79	73
User 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
PHF 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
PHF Volume:	107	1619	58	70	1092	154	35	29	57	64	79	73
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	107	1619	58	70	1092	154	35	29	57	64	79	73
PCE 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
MLF 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
FinalVolume:	107	1619	58	70	1092	154	35	29	57	64	79	73
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.99	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.89	0.11	1.00	2.62	0.38	1.00	0.34	0.66	1.00	1.00	1.00
Final Sat.:	1750	5406	194	1750	4907	692	1750	607	1193	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.06	0.30	0.30	0.04	0.22	0.22	0.02	0.05	0.05	0.04	0.04	0.04
Crit Moves:		****		****				****		****		
Green Time:	23.8	97.5	97.5	13.0	86.7	86.7	11.3	15.6	15.6	11.9	16.2	16.2
Volume/Cap:	0.38	0.46	0.46	0.46	0.38	0.38	0.27	0.46	0.46	0.46	0.39	0.39
Delay/Veh:	57.4	13.2	13.2	67.4	17.2	17.2	66.5	65.1	65.1	68.4	63.5	63.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	57.4	13.2	13.2	67.4	17.2	17.2	66.5	65.1	65.1	68.4	63.5	63.6
LOS by Move:	E+	B	B	E	B	B	E	E	E	E	E	E
HCM2kAvgQ:	124	317	317	95	255	255	46	109	109	89	92	92

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #7: El Camino Real/ California Ave



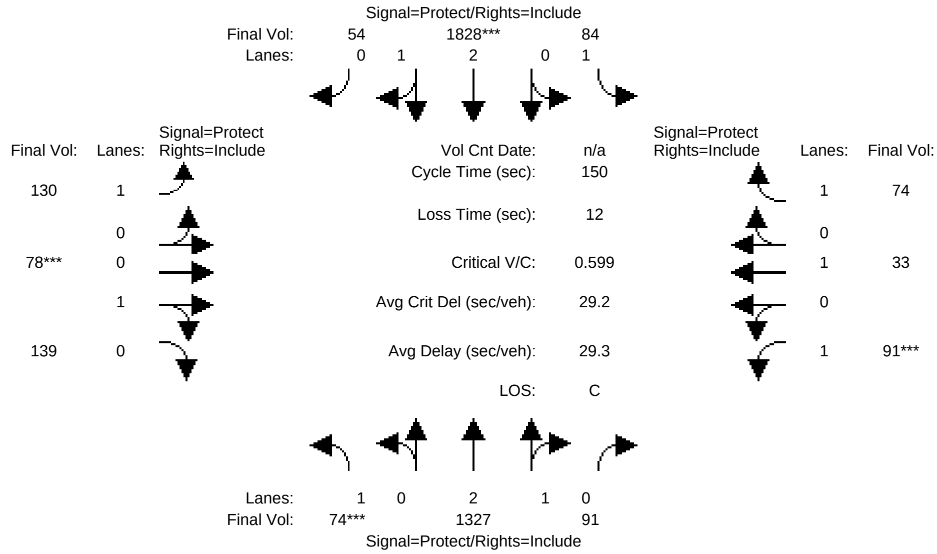
Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	74	1325	91	79	1828	54	130	78	139	91	33	72
Growth 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
Initial Bse:	74	1325	91	79	1828	54	130	78	139	91	33	72
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	74	1325	91	79	1828	54	130	78	139	91	33	72
User 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
PHF 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
PHF Volume:	74	1325	91	79	1828	54	130	78	139	91	33	72
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	74	1325	91	79	1828	54	130	78	139	91	33	72
PCE 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
MLF 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
FinalVolume:	74	1325	91	79	1828	54	130	78	139	91	33	72
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.98	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.80	0.20	1.00	2.91	0.09	1.00	0.36	0.64	1.00	1.00	1.00
Final Sat.:	1750	5240	360	1750	5439	161	1750	647	1153	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.04	0.25	0.25	0.05	0.34	0.34	0.07	0.12	0.12	0.05	0.02	0.04
Crit Moves:	****				****			****		****		
Green Time:	10.6	80.0	80.0	14.8	84.2	84.2	22.8	30.2	30.2	13.0	20.4	20.4
Volume/Cap:	0.60	0.47	0.47	0.46	0.60	0.60	0.49	0.60	0.60	0.60	0.13	0.30
Delay/Veh:	75.5	22.0	22.0	65.8	22.1	22.1	59.7	57.2	57.2	72.4	57.2	59.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	75.5	22.0	22.0	65.8	22.1	22.1	59.7	57.2	57.2	72.4	57.2	59.1
LOS by Move:	E-	C+	C+	E	C+	C+	E+	E+	E+	E	E+	E+
HCM2kAvgQ:	113	335	335	104	476	476	158	251	251	131	34	84

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing + Project PM

Intersection #7: El Camino Real/ California Ave



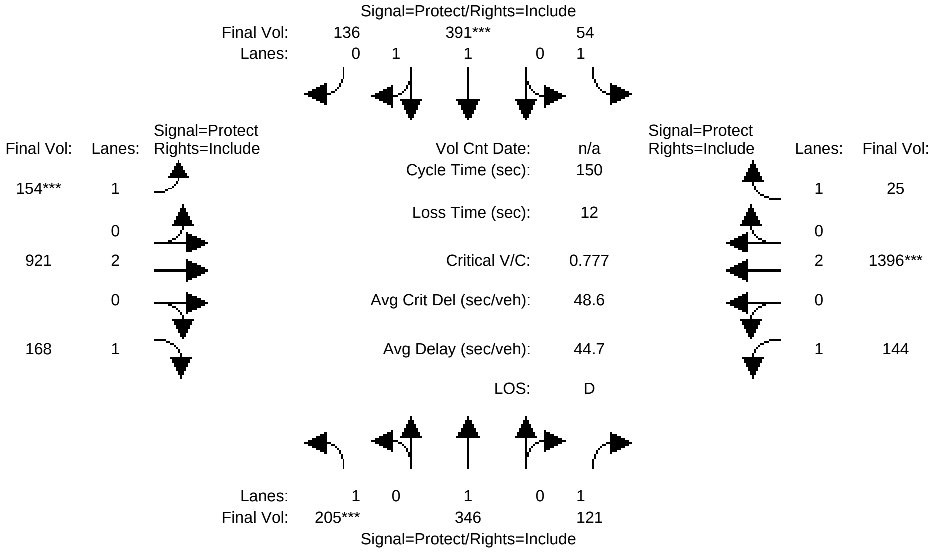
Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	74	1325	91	79	1828	54	130	78	139	91	33	72
Growth 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
Initial Bse:	74	1325	91	79	1828	54	130	78	139	91	33	72
Added Vol:	0	2	0	5	0	0	0	0	0	0	0	2
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	74	1327	91	84	1828	54	130	78	139	91	33	74
User 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
PHF 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
PHF Volume:	74	1327	91	84	1828	54	130	78	139	91	33	74
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	74	1327	91	84	1828	54	130	78	139	91	33	74
PCE 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
MLF 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
FinalVolume:	74	1327	91	84	1828	54	130	78	139	91	33	74
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.98	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.80	0.20	1.00	2.91	0.09	1.00	0.36	0.64	1.00	1.00	1.00
Final Sat.:	1750	5240	359	1750	5439	161	1750	647	1153	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.04	0.25	0.25	0.05	0.34	0.34	0.07	0.12	0.12	0.05	0.02	0.04
Crit Moves:	****				****			****		****		
Green Time:	10.6	79.7	79.7	15.1	84.2	84.2	22.8	30.2	30.2	13.0	20.4	20.4
Volume/Cap:	0.60	0.48	0.48	0.48	0.60	0.60	0.49	0.60	0.60	0.60	0.13	0.31
Delay/Veh:	75.5	22.2	22.2	65.7	22.1	22.1	59.7	57.2	57.2	72.4	57.2	59.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	75.5	22.2	22.2	65.7	22.1	22.1	59.7	57.2	57.2	72.4	57.2	59.2
LOS by Move:	E-	C+	C+	E	C+	C+	E+	E+	E+	E	E+	E+
HCM2kAvgQ:	113	337	337	111	476	476	158	251	251	131	34	87

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing AM

Intersection #8: Middlefield Rd/ Oregon Expwy



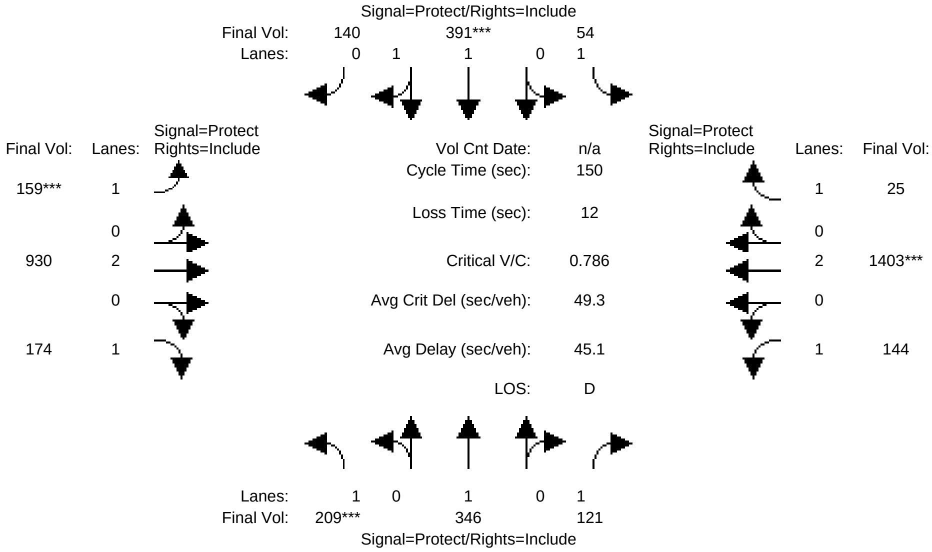
Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	205	346	121	54	391	136	154	921	168	144	1396	25
Growth 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
Initial Bse:	205	346	121	54	391	136	154	921	168	144	1396	25
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	205	346	121	54	391	136	154	921	168	144	1396	25
User 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
PHF 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
PHF Volume:	205	346	121	54	391	136	154	921	168	144	1396	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	205	346	121	54	391	136	154	921	168	144	1396	25
PCE 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
MLF 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
FinalVolume:	205	346	121	54	391	136	154	921	168	144	1396	25
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.47	0.53	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	2744	955	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.12	0.18	0.07	0.03	0.14	0.14	0.09	0.24	0.10	0.08	0.37	0.01
Crit Moves:	****				****		****				****	
Green Time:	22.6	39.9	39.9	10.2	27.5	27.5	17.0	65.6	65.6	22.3	70.9	70.9
Volume/Cap:	0.78	0.68	0.26	0.45	0.78	0.78	0.78	0.55	0.22	0.55	0.78	0.03
Delay/Veh:	74.9	53.3	43.7	69.9	64.0	64.0	82.1	31.7	26.4	61.9	35.2	21.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	74.9	53.3	43.7	69.9	64.0	64.0	82.1	31.7	26.4	61.9	35.2	21.2
LOS by Move:	E	D-	D	E	E	E	F	C	C	E	D+	C+
HCM2kAvgQ:	289	373	117	78	337	337	231	386	125	180	684	16

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing + Project AM

Intersection #8: Middlefield Rd/ Oregon Expwy



Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	205	346	121	54	391	136	154	921	168	144	1396	25
Growth 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
Initial Bse:	205	346	121	54	391	136	154	921	168	144	1396	25
Added Vol:	4	0	0	0	0	4	5	9	6	0	7	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	209	346	121	54	391	140	159	930	174	144	1403	25
User 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
PHF 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
PHF Volume:	209	346	121	54	391	140	159	930	174	144	1403	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	209	346	121	54	391	140	159	930	174	144	1403	25
PCE 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
MLF 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
FinalVolume:	209	346	121	54	391	140	159	930	174	144	1403	25
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.46	0.54	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	2724	975	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.12	0.18	0.07	0.03	0.14	0.14	0.09	0.24	0.10	0.08	0.37	0.01
Crit Moves:	****				****		****				****	
Green Time:	22.8	40.0	40.0	10.2	27.4	27.4	17.3	65.7	65.7	22.1	70.5	70.5
Volume/Cap:	0.79	0.68	0.26	0.45	0.79	0.79	0.79	0.56	0.23	0.56	0.79	0.03
Delay/Veh:	75.5	53.2	43.7	69.9	64.6	64.6	82.7	31.8	26.4	62.2	35.8	21.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	75.5	53.2	43.7	69.9	64.6	64.6	82.7	31.8	26.4	62.2	35.8	21.4
LOS by Move:	E-	D-	D	E	E	E	F	C	C	E	D+	C+
HCM2kAvgQ:	296	372	117	78	342	342	239	391	130	181	695	16

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing PM

Intersection #8: Middlefield Rd/ Oregon Expwy

Signal=Protect/Rights=Include
Final Vol: 91 480 54***
Lanes: 0 1 1 0 1

Signal=Protect Rights=Include (West approach)
Final Vol: 141, Lanes: 1
Lanes: 0
Final Vol: 1147***, Lanes: 2
Lanes: 0
Final Vol: 231, Lanes: 1

Vol Cnt Date: n/a
Cycle Time (sec): 150
Loss Time (sec): 12
Critical V/C: 0.742
Avg Crit Del (sec/veh): 47.9
Avg Delay (sec/veh): 46.4
LOS: D

Signal=Protect Rights=Include (East approach)
Lanes: 1, Final Vol: 37
Lanes: 0
Lanes: 2, Final Vol: 1076
Lanes: 0
Lanes: 1, Final Vol: 214***

Lanes: 1 0 1 0 1
Final Vol: 198 433*** 142
Signal=Protect/Rights=Include

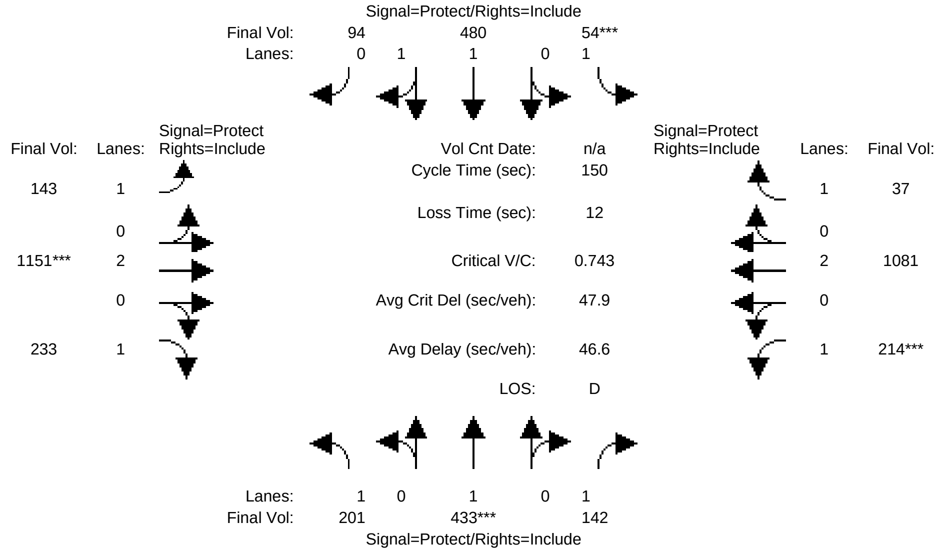
Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	198	433	142	54	480	91	141	1147	231	214	1076	37
Growth 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
Initial Bse:	198	433	142	54	480	91	141	1147	231	214	1076	37
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	198	433	142	54	480	91	141	1147	231	214	1076	37
User 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
PHF 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
PHF Volume:	198	433	142	54	480	91	141	1147	231	214	1076	37
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	198	433	142	54	480	91	141	1147	231	214	1076	37
PCE 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
MLF 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
FinalVolume:	198	433	142	54	480	91	141	1147	231	214	1076	37
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.67	0.33	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	3110	590	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.11	0.23	0.08	0.03	0.15	0.15	0.08	0.30	0.13	0.12	0.28	0.02
Crit Moves:		****		****				****		****		
Green Time:	22.3	45.8	45.8	7.0	30.5	30.5	18.9	60.6	60.6	24.6	66.3	66.3
Volume/Cap:	0.76	0.75	0.27	0.66	0.76	0.76	0.64	0.75	0.33	0.75	0.64	0.05
Delay/Veh:	73.5	52.2	39.7	88.7	60.9	60.9	68.6	40.2	30.9	70.0	33.4	23.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	73.5	52.2	39.7	88.7	60.9	60.9	68.6	40.2	30.9	70.0	33.4	23.9
LOS by Move:	E	D-	D	F	E	E	E	D	C	E	C-	C
HCM2kAvgQ:	276	470	130	96	353	353	190	576	191	290	479	25

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Existing + Project PM

Intersection #8: Middlefield Rd/ Oregon Expwy



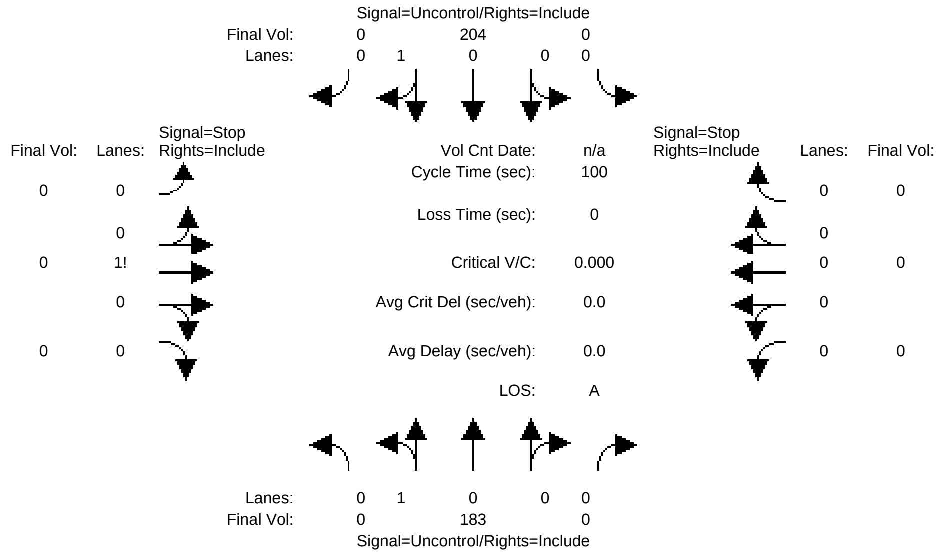
Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	198	433	142	54	480	91	141	1147	231	214	1076	37
Growth 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
Initial Bse:	198	433	142	54	480	91	141	1147	231	214	1076	37
Added Vol:	3	0	0	0	0	3	2	4	2	0	5	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	201	433	142	54	480	94	143	1151	233	214	1081	37
User 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
PHF 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
PHF Volume:	201	433	142	54	480	94	143	1151	233	214	1081	37
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	201	433	142	54	480	94	143	1151	233	214	1081	37
PCE 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
MLF 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
FinalVolume:	201	433	142	54	480	94	143	1151	233	214	1081	37
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.66	0.34	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	3094	606	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.11	0.23	0.08	0.03	0.16	0.16	0.08	0.30	0.13	0.12	0.28	0.02
Crit Moves:		****		****				****		****		
Green Time:	22.4	45.7	45.7	7.0	30.3	30.3	19.0	60.8	60.8	24.5	66.3	66.3
Volume/Cap:	0.77	0.75	0.27	0.66	0.77	0.77	0.64	0.75	0.33	0.75	0.64	0.05
Delay/Veh:	74.2	52.3	39.7	88.7	61.4	61.4	68.6	40.1	30.9	70.2	33.5	23.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	74.2	52.3	39.7	88.7	61.4	61.4	68.6	40.1	30.9	70.2	33.5	23.9
LOS by Move:	E	D-	D	F	E	E	E	D	C	E	C-	C
HCM2kAvgQ:	282	471	131	96	357	357	193	578	193	290	483	25

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

Intersection #9: Park Blvd/ Access#1




```
Street Name:                Park Blvd                         Access#1
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  183     0     0  204     0     0     0     0     0     0     0
Growth 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
Initial Bse:    0  183     0     0  204     0     0     0     0     0     0     0
Added Vol:      0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0  183     0     0  204     0     0     0     0     0     0     0
User 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
PHF 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
PHF Volume:     0  183     0     0  204     0     0     0     0     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0  183     0     0  204     0     0     0     0     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx   387  387   204  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   620  551   842  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   620  551   842  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.00 0.00  0.00  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx            xxxxxx
ApproachLOS:          *                 *                 *                 *
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    0  183     0     0  204     0     0    0     0     0    0     0
ApproachDel:    xxxxxx           xxxxxx           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    0  183     0     0  204     0     0    0     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            387
Minor Approach Volume:          0
Minor Approach Volume Threshold: 473
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```


231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing + Project AM

Intersection #9: Park Blvd/ Access#1

```
                              Signal=Uncontrol/Rights=Include
                  Final Vol:    6        204        0
                     Lanes:     0    1    0    0    0

                     Signal=Stop                              Signal=Stop
Final Vol:  Lanes:   Rights=Include      Vol Cnt Date:    n/a  Rights=Include   Lanes:  Final Vol:
                                         Cycle Time (sec): 100
    0         0                                                                    0        0
                                         Loss Time (sec):   0
              0                                                                    0
    0         1!                         Critical V/C:     0.063                   0        0
              0                          Avg Crit Del (sec/veh): 1.5               0
   53         0                          Avg Delay (sec/veh):    1.5               0        0
                                         LOS:               A

                     Lanes:     0    1    0    0    0
                  Final Vol:   24        183        0
                              Signal=Uncontrol/Rights=Include
```

```
Street Name:              Park Blvd                          Access#1
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  183     0     0  204     0     0     0     0     0     0     0
Growth 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
Initial Bse:    0  183     0     0  204     0     0     0     0     0     0     0
Added Vol:     24    0     0     0    0     6     0     0    53     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:   24  183     0     0  204     6     0     0    53     0     0     0
User 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
PHF 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
PHF Volume:    24  183     0     0  204     6     0     0    53     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:   24  183     0     0  204     6     0     0    53     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  210 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   207  xxxx xxxx xxxxx
Potent Cap.: 1373 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   839  xxxx xxxx xxxxx
Move Cap.:   1373 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   839  xxxx xxxx xxxxx
Volume/Cap:  0.02 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.06  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    1.3 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   5.0  xxxx xxxx xxxxx
Control Del:  7.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   9.6 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     *    *     A     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:  0.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:  7.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             9.6            xxxxxx
ApproachLOS:        *                *                A                *
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  1   0  0  0  0  0
Initial Vol:   24  183     0     0  204     6     0     0    53     0     0     0
ApproachDel:    xxxxxx           xxxxxx              9.6             xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=53]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=470]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  1   0  0  0  0  0
Initial Vol:   24  183     0     0  204     6     0     0    53     0     0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            417
Minor Approach Volume:          53
Minor Approach Volume Threshold: 453
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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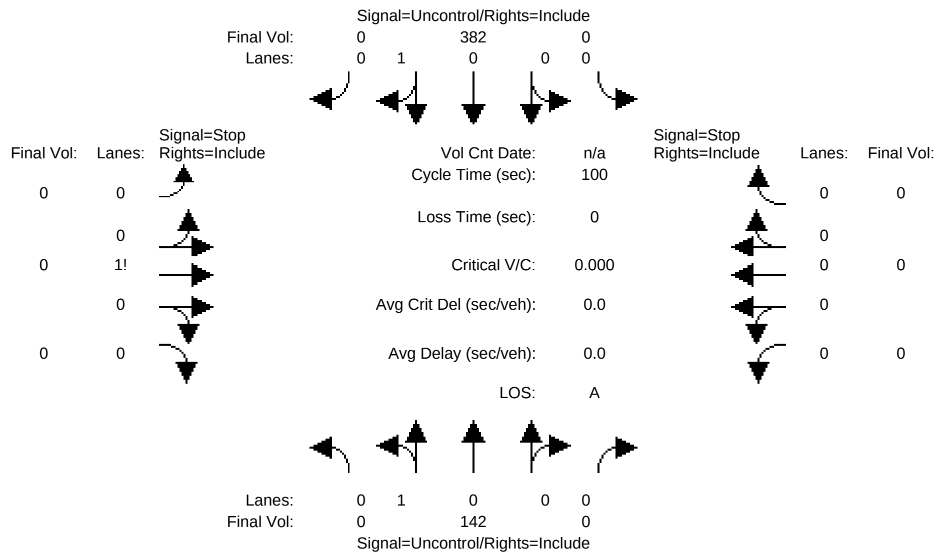
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing PM

Intersection #9: Park Blvd/ Access#1




```
Street Name:              Park Blvd                          Access#1
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  142     0     0  382     0     0     0     0     0     0     0
Growth 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
Initial Bse:    0  142     0     0  382     0     0     0     0     0     0     0
Added Vol:      0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0  142     0     0  382     0     0     0     0     0     0     0
User 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
PHF 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
PHF Volume:     0  142     0     0  382     0     0     0     0     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0  142     0     0  382     0     0     0     0     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx   524  524   382  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   517  461   670  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   517  461   670  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.00 0.00  0.00  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:          *                *                *                *
Note: Queue reported is the distance per lane in feet.
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    0  142     0     0  382     0     0    0     0     0    0     0
ApproachDel:    xxxxxx           xxxxxx           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    0  142     0     0  382     0     0    0     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            524
Minor Approach Volume:          0
Minor Approach Volume Threshold: 392
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing + Project PM

Intersection #9: Park Blvd/ Access#1

```
                    Signal=Uncontrol/Rights=Include
       Final Vol:   5          382         0
           Lanes:   0    1      0     0    0

Signal=Stop                                              Signal=Stop
Final Vol:  Lanes:  Rights=Include    Vol Cnt Date:      n/a    Rights=Include   Lanes:  Final Vol:
                                      Cycle Time (sec):  100
   0          0                                                                   0         0
                                      Loss Time (sec):     0
              0                                                                   0
   0          1!                      Critical V/C:      0.034                    0         0
              0                       Avg Crit Del (sec/veh):  0.7                0
  23          0                       Avg Delay (sec/veh):     0.7                0         0
                                      LOS:               B

           Lanes:   0    1      0     0    0
       Final Vol:  18          142         0
                    Signal=Uncontrol/Rights=Include
```

```
Street Name:                Park Blvd                           Access#1
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  142     0      0  382     0      0     0     0      0     0     0
Growth 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
Initial Bse:    0  142     0      0  382     0      0     0     0      0     0     0
Added Vol:     18    0     0      0    0     5      0     0    23      0     0     0
PasserByVol:    0    0     0      0    0     0      0     0     0      0     0     0
Initial Fut:   18  142     0      0  382     5      0     0    23      0     0     0
User 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
PHF 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
PHF Volume:    18  142     0      0  382     5      0     0    23      0     0     0
Reduct Vol:     0    0     0      0    0     0      0     0     0      0     0     0
FinalVolume:   18  142     0      0  382     5      0     0    23      0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  387 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   385  xxxx xxxx xxxxx
Potent Cap.: 1183 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   668  xxxx xxxx xxxxx
Move Cap.:   1183 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   668  xxxx xxxx xxxxx
Volume/Cap:  0.02 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.03  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    1.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   2.7  xxxx xxxx xxxxx
Control Del:  8.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  10.6 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:  0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:  8.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx              10.6            xxxxxx
ApproachLOS:          *                 *                 B                 *
Note: Queue reported is the distance per lane in feet.
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:       0  1  0  0  0   0  0  0  1  0   0  0  0  0  1   0  0  0  0  0
Initial Vol:  18  142    0     0  382    5     0    0    23     0    0     0
ApproachDel:   xxxxxx           xxxxxx            10.6           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=23]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=570]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:       0  1  0  0  0   0  0  0  1  0   0  0  0  0  1   0  0  0  0  0
Initial Vol:  18  142    0     0  382    5     0    0    23     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            547
Minor Approach Volume:          23
Minor Approach Volume Threshold: 380
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

APPENDIX C

Approved Projects Trips

Approved Project Trips

AM

Int #	Location	NB			SB			EB			WB		
		L	T	R	L	T	R	L	T	R	L	T	R
1	Park Boulevard / Page Mill Rd	0	0	0	0	0	14	2	0	0	0	0	0
2	Park Boulevard / Sherman Ave	12	0	0	0	0	11	5	0	17	0	0	0
3	Birch St / Sheridan Ave	0	20	0	0	11	0	0	7	0	0	0	0
4	Birch St / Grant Ave	0	20	0	2	11	0	0	0	0	0	0	0
5	El Camino Real / Oregon Expressway/Page Mill Rd (CMP)	0	8	0	8	1	1	3	2	0	8	9	2
6	El Camino Real / Grant Ave	2	7	0	0	2	0	0	0	0	0	0	0
7	El Camino Real / California Ave	0	0	0	6	0	0	0	0	0	6	0	6
8	Middlefield Rd / Oregon Expressway (CMP)	3	0	0	0	0	3	3	7	3	0	7	0
9	Park Boulevard / Project Driveway	0	12	0	0	14	0	0	0	0	0	0	0

PM

Int #	Location	NB			SB			EB			WB		
		L	T	R	L	T	R	L	T	R	L	T	R
1	Park Boulevard / Page Mill Rd	0	0	0	0	0	18	2	0	0	0	0	0
2	Park Boulevard / Sherman Ave	19	0	0	0	0	17	18	0	33	0	0	0
3	Birch St / Sheridan Ave	0	26	0	0	14	0	0	4	0	0	0	0
4	Birch St / Grant Ave	0	26	0	2	14	0	0	0	0	0	0	0
5	El Camino Real / Oregon Expressway/Page Mill Rd (CMP)	0	11	0	15	0	1	9	2	0	11	7	7
6	El Camino Real / Grant Ave	1	4	0	0	7	0	0	0	0	0	0	0
7	El Camino Real / California Ave	0	0	0	7	0	0	0	0	0	8	0	7
8	Middlefield Rd / Oregon Expressway (CMP)	4	0	0	0	0	3	3	10	4	0	9	0
9	Park Boulevard / Project Driveway	0	19	0	0	18	0	0	0	0	0	0	0

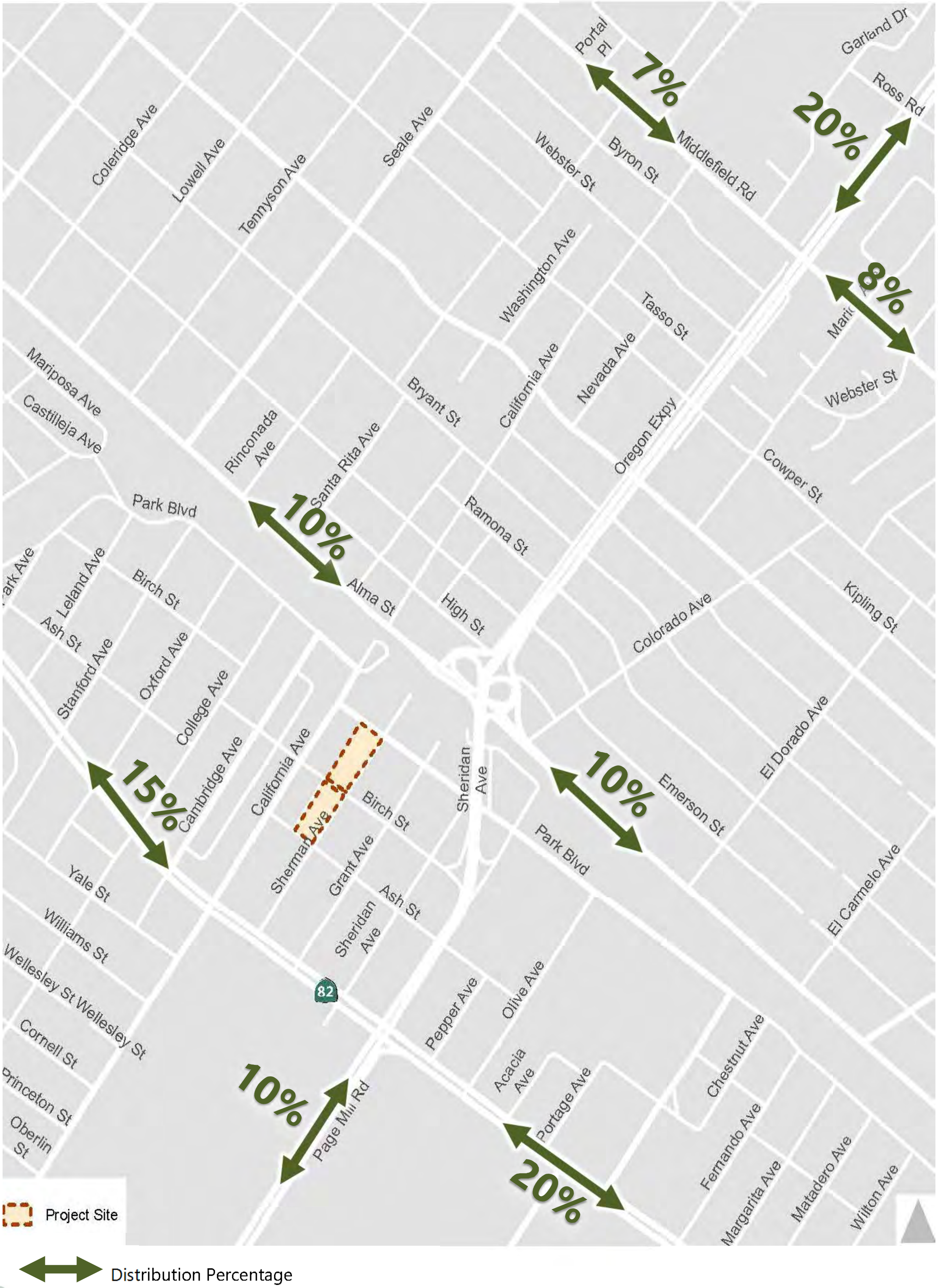
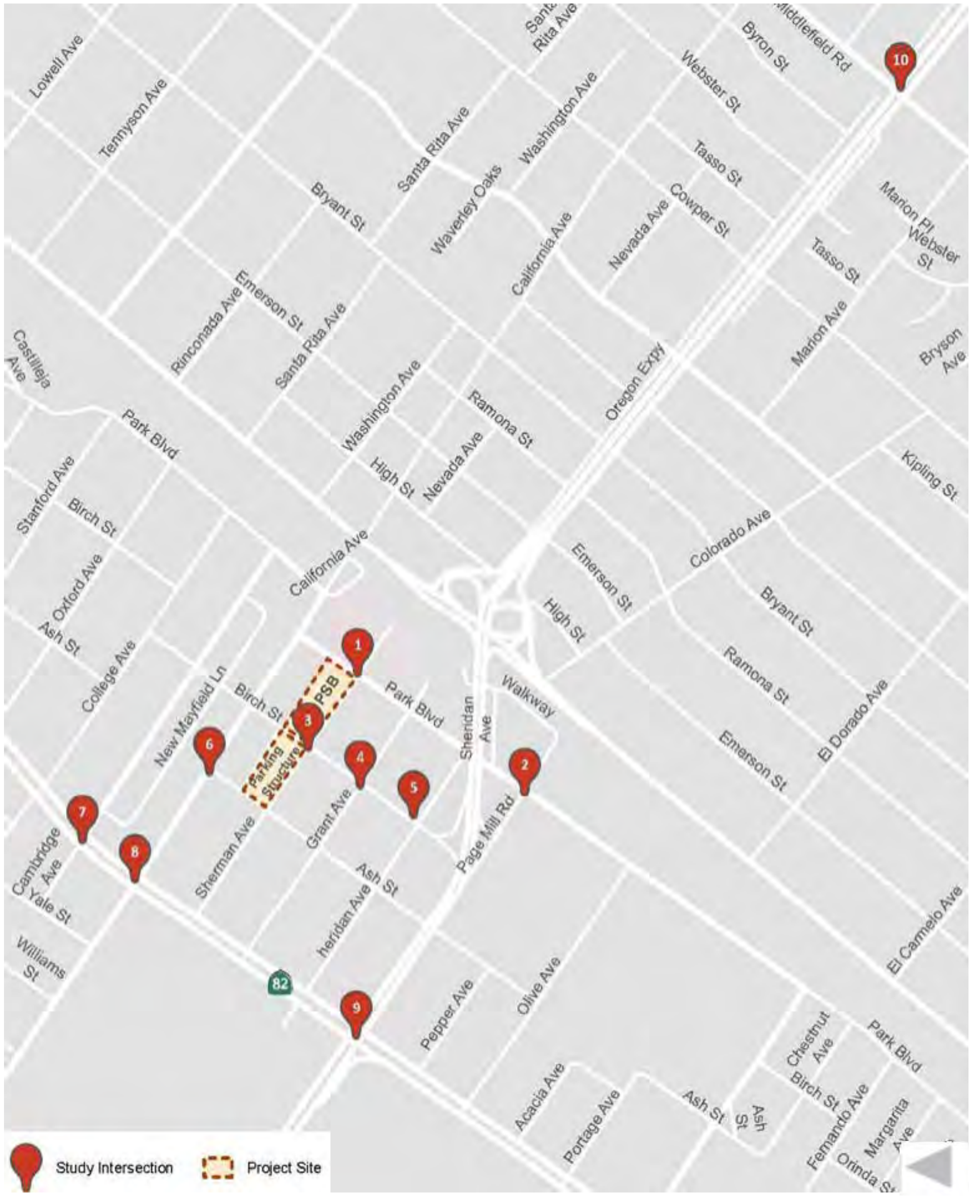


Figure 6

Project Trip Distribution



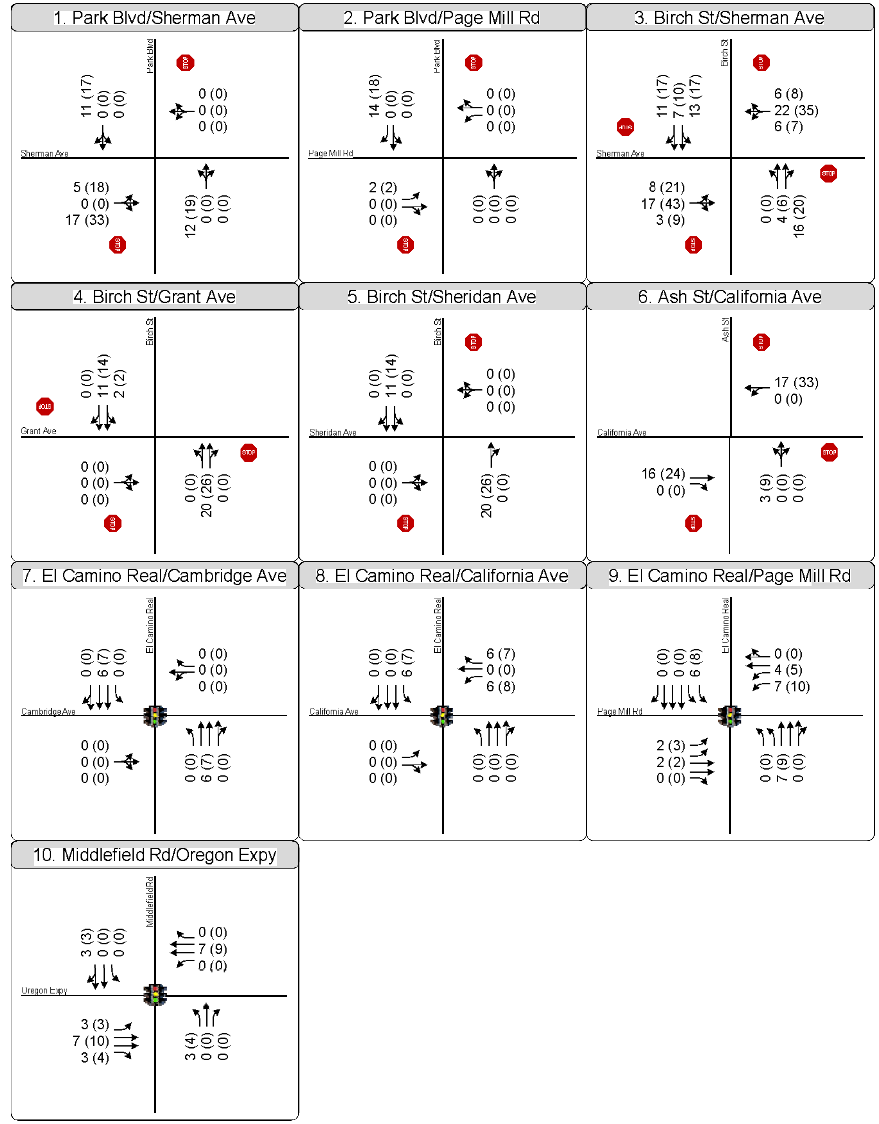


Figure 7

Traffic Volumes and Lane Configurations

Project Trip Assignment - AM & PM Peak Hours

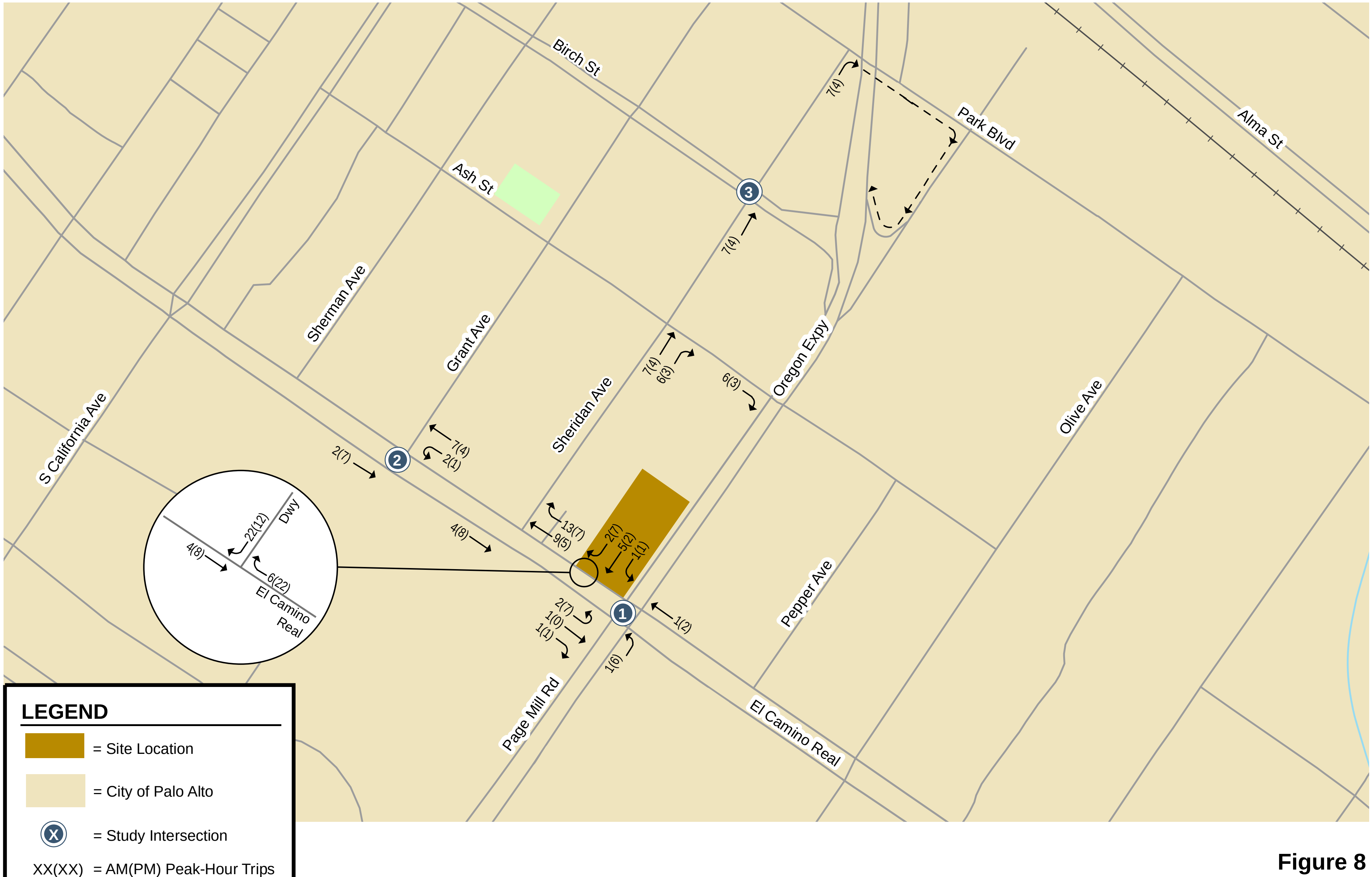
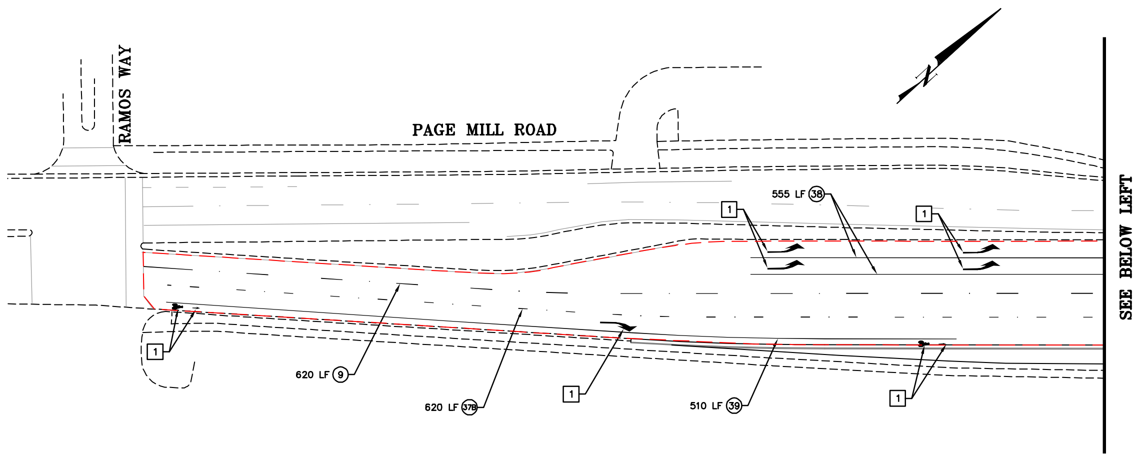


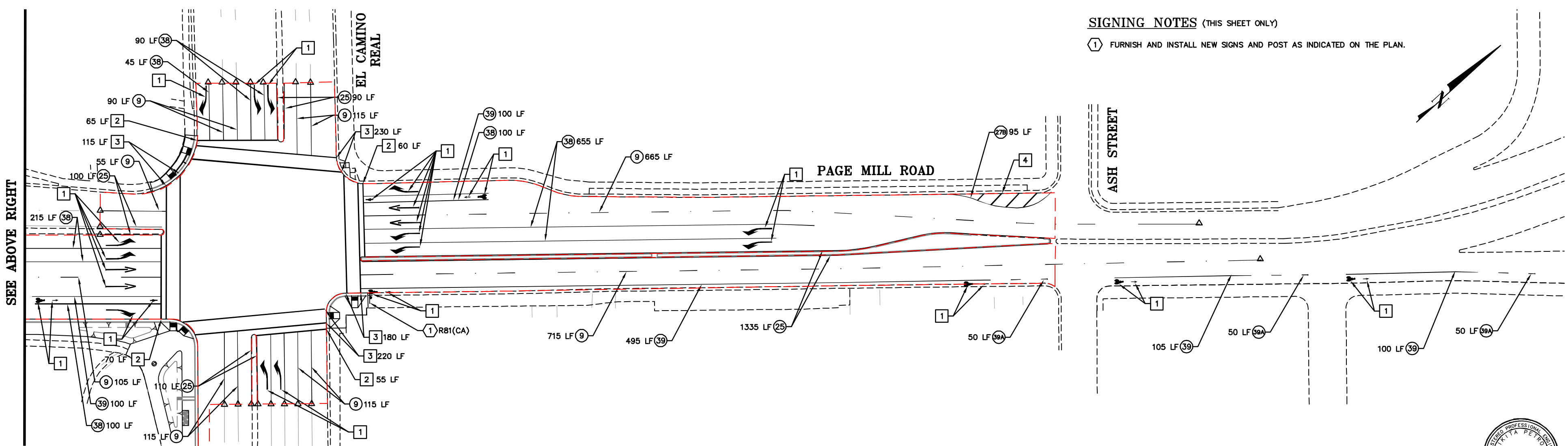
Figure 8
Project Trip Assignment

Hexagon

APPENDIX D

New Striping Plan for El Camino Real/Page Mill Road Intersection





GENERAL NOTES (THIS SHEET ONLY)

1. ALL SIGN CODES REFER TO THE LATEST 2014 CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CAMUTCD) UNLESS OTHERWISE NOTED.
2. ALL EXISTING STRIPING AND PAVEMENT MARKINGS CONFLICTING WITH THE NEW STRIPING SHALL BE REMOVED BY GRINDING.
3. ALL EXISTING SIGNS TO REMAIN UNLESS OTHERWISE NOTED.
4. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES AND OTHER ITEMS AFFECTED BY THESE IMPROVEMENTS PRIOR TO CONSTRUCTION AND CONTACT THE CITY IF CONFLICT ARISES.
5. ALL EXISTING STRIPING WITHIN SLURRY SEAL LIMITS SHALL BE REMOVED BY GRINDING PRIOR TO SLURRY SEAL OPERATION.

STRIPING LEGEND

- PROPOSED MARKING PER CALTRANS STANDARD DETAILS
- EXISTING MARKING TO REMAIN
- EXISTING MARKING TO BE REMOVED BY GRINDING
- PROPOSED STRIPING
- EXISTING STRIPING TO REMAIN
- △ CONFORM TO EXISTING STRIPING
- SLURRY SEAL LIMITS

STRIPING NOTES (FOR SHEETS SS-01 TO SS-02)

- (XX) INSTALL STRIPING DETAIL NUMBER "XX" PER CALTRANS STANDARD PLANS A20A, A20B, A20D, AND A24A.
- [1] INSTALL CALTRANS STANDARD PAVEMENT LEGEND (SKID RESISTANT THERMOPLASTIC).
- [2] INSTALL 12" WIDE WHITE LINE (THERMOPLASTIC) PER LENGTH AS INDICATED ON PLANS.
- [3] INSTALL 12" WHITE CROSSWALK, 11' APART ON CENTER.
- [4] INSTALL 8" WIDE MARKING AT 8' SPACING.

SIGNING NOTES (THIS SHEET ONLY)

- (1) FURNISH AND INSTALL NEW SIGNS AND POST AS INDICATED ON THE PLAN.

65% DESIGN
FOR REVIEW ONLY
SEPTEMBER 2020

811 Know what's below. Call before you dig.

GRAPHIC SCALE
40 0 20 40 80
(IN FEET)
1 inch = 40 ft.

REGISTERED PROFESSIONAL ENGINEER NIKITA PETROV No. 80570 EXP. 03/31/21 CIVIL STATE OF CALIFORNIA

Kimley»Horn

NO.	REVISIONS	BY	DATE	APP'D
1				

THE COUNTY OF SANTA CLARA 1850

COUNTY OF SANTA CLARA ROADS AND AIRPORTS DEPARTMENT

AP	09-2020
DESIGNED	DATE
HW, CW	09-2020
DRAWN	DATE
NP	09-2020
CHECKED	DATE

SUBMITTED:
NORA CHUNG
ASSOCIATE CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER NORA CHUNG No 61173 Exp. 06-30-21 CIVIL STATE OF CALIFORNIA

APPROVED:
JAMIL SALAS
SENIOR CIVIL ENGINEER

REGISTERED PROFESSIONAL ENGINEER JAMIL S SALAS No C74528 Exp. 12-31-21 CIVIL STATE OF CALIFORNIA

INTERSECTION IMPROVEMENTS AT PAGE MILL ROAD AND EL CAMINO REAL

STRIPING PLAN

WORK ORDER No. | ADVERTISEMENT DATE: | CONTRACT No. | FILE No.

DRAWING No. PR-01

SHT No. 12 OF 24

Scale AS SHOWN

APPENDIX E

Background Conditions

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

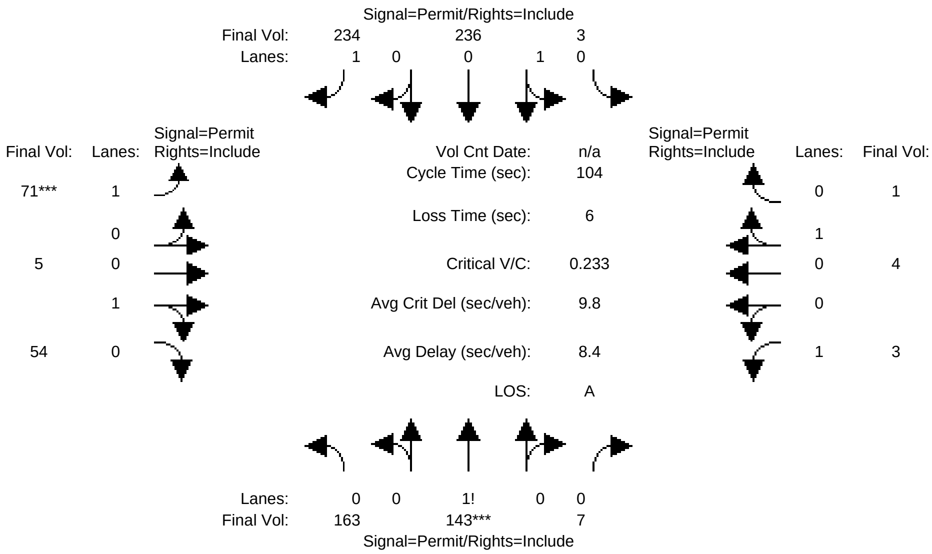
Summary Scenario Comparison Report (With Average Critical Delay)
Future Volume Alternative

		Background AM				Background + Project AM				Background PM						Background + Project PM			
Intersection		LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Crit V/C Change	Avg Crit Del (sec)	Avg Crit Del Change	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)
#1	Park Blvd/ Page Mill Rd	A	8.4	0.233	9.8	A	9.5	0.247	11.7	A	4.9	0.273	+ 0.026	5.1	- 6.6	A	5.7	0.294	6.6
#2	Park Blvd /Sherman Ave	B	2.7	0.060	2.7	B	2.7	0.061	2.7	B	4.1	0.183	+ 0.122	4.1	+ 1.4	B	4.1	0.184	4.1
#3	Birch St/ Sheridan Ave	D	3.8	0.239	3.8	D	4.9	0.248	4.9	C	4.3	0.225	- 0.023	4.3	- 0.6	C	4.6	0.260	4.6
#4	Birch St/ Grant Ave	B	12.7	0.632	12.7	B	13.6	0.666	13.6	A	9.4	0.418	- 0.249	9.4	- 4.2	A	9.5	0.432	9.5
#5	El Camino Real/ Page Mill Rd/ Oregon Expwy	D	46.8	0.836	51.2	D	47.2	0.846	51.8	D	47.3	0.836	- 0.010	52.4	+ 0.6	D	47.6	0.844	52.9
#6	El Camino Real/ Grant Ave	C	0.8	0.183	0.8	C	0.8	0.183	0.8	C	0.6	0.137	- 0.046	0.6	- 0.2	C	0.6	0.137	0.6
#7	El Camino Real/ California Ave	C+	22.7	0.464	19.9	C+	22.9	0.468	20.4	C	29.8	0.604	+ 0.136	29.8	+ 9.4	C	30.0	0.604	29.8
#8	Middlefield Rd/ Oregon Expwy	D	44.9	0.784	49.1	D	45.3	0.793	49.8	D	46.9	0.758	- 0.035	52.2	+ 2.4	D	47.1	0.762	52.4
#9	Park Blvd/ Access#1	A	0.0	0.000	0.0	A	1.4	0.064	1.4	A	0.0	0.000	- 0.064	0.0	- 1.4	B	0.6	0.035	0.6

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background AM

Intersection #1: Park Blvd/ Page Mill Rd



Street Name:		Park Blvd							Page Mill Rd			
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	163	143	7	3	236	234	71	5	54	3	4	1
Growth 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
Initial Bse:	163	143	7	3	236	234	71	5	54	3	4	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	163	143	7	3	236	234	71	5	54	3	4	1
User 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
PHF 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
PHF Volume:	163	143	7	3	236	234	71	5	54	3	4	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	163	143	7	3	236	234	71	5	54	3	4	1
PCE 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
MLF 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
FinalVolume:	163	143	7	3	236	234	71	5	54	3	4	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.52	0.46	0.02	0.01	0.99	1.00	1.00	0.08	0.92	1.00	0.80	0.20
Final Sat.:	911	800	39	23	1777	1750	1750	153	1647	1750	1440	360
Capacity Analysis Module:												
Vol/Sat:	0.18	0.18	0.18	0.13	0.13	0.13	0.04	0.03	0.03	0.00	0.00	0.00
Crit Moves:		****					****					
Green Time:	79.9	79.9	79.9	79.9	79.9	79.9	18.1	18.1	18.1	18.1	18.1	18.1
Volume/Cap:	0.23	0.23	0.23	0.17	0.17	0.17	0.23	0.19	0.19	0.01	0.02	0.02
Delay/Veh:	3.5	3.5	3.5	3.3	3.3	3.3	37.4	37.0	37.0	35.5	35.6	35.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	3.5	3.5	3.5	3.3	3.3	3.3	37.4	37.0	37.0	35.5	35.6	35.6
LOS by Move:	A	A	A	A	A	A	D+	D+	D+	D+	D+	D+
HCM2kAvgQ:	77	77	77	54	54	54	55	44	44	2	4	4

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background + Project AM

Intersection #1: Park Blvd/ Page Mill Rd

Signal=Permit/Rights=Include
Final Vol: 268 236 3
Lanes: 1 0 0 1 0

Signal=Permit Rights=Include (West)
Final Vol: / Lanes:
95*** 1
0
5 0
1
54 0

Vol Cnt Date: n/a
Cycle Time (sec): 104
Loss Time (sec): 6
Critical V/C: 0.247
Avg Crit Del (sec/veh): 11.7
Avg Delay (sec/veh): 9.5
LOS: A

Signal=Permit Rights=Include (East)
Lanes: / Final Vol:
0 1
1
0 4
0
1 3

Lanes: 0 0 1! 0 0
Final Vol: 163 143*** 7
Signal=Permit/Rights=Include

Street Name:	Park Blvd						Page Mill Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	163	143	7	3	236	234	71	5	54	3	4	1
Growth 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
Initial Bse:	163	143	7	3	236	234	71	5	54	3	4	1
Added Vol:	0	0	0	0	0	34	24	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	163	143	7	3	236	268	95	5	54	3	4	1
User 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
PHF 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
PHF Volume:	163	143	7	3	236	268	95	5	54	3	4	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	163	143	7	3	236	268	95	5	54	3	4	1
PCE 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
MLF 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
FinalVolume:	163	143	7	3	236	268	95	5	54	3	4	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.52	0.46	0.02	0.01	0.99	1.00	1.00	0.08	0.92	1.00	0.80	0.20
Final Sat.:	911	800	39	23	1777	1750	1750	153	1647	1750	1440	360
Capacity Analysis Module:												
Vol/Sat:	0.18	0.18	0.18	0.13	0.13	0.15	0.05	0.03	0.03	0.00	0.00	0.00
Crit Moves:		****					****					
Green Time:	75.2	75.2	75.2	75.2	75.2	75.2	22.8	22.8	22.8	22.8	22.8	22.8
Volume/Cap:	0.25	0.25	0.25	0.18	0.18	0.21	0.25	0.15	0.15	0.01	0.01	0.01
Delay/Veh:	5.0	5.0	5.0	4.7	4.7	4.8	33.8	32.9	32.9	31.7	31.8	31.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	5.0	5.0	5.0	4.7	4.7	4.8	33.8	32.9	32.9	31.7	31.8	31.8
LOS by Move:	A	A	A	A	A	A	C-	C-	C-	C	C	C
HCM2kAvgQ:	91	91	91	64	64	75	70	41	41	2	3	3

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background PM

Intersection #1: Park Blvd/ Page Mill Rd

Signal=Permit/Rights=Include
Final Vol: 415*** 228 1
Lanes: 1 0 0 1 0

Signal=Permit Rights=Include (West approach)
Final Vol: 36*** Lanes: 1
Lanes: 0
Final Vol: 3 Lanes: 0
Lanes: 1
Final Vol: 22 Lanes: 0

Vol Cnt Date: n/a
Cycle Time (sec): 104
Loss Time (sec): 6
Critical V/C: 0.273
Avg Crit Del (sec/veh): 5.1
Avg Delay (sec/veh): 4.9
LOS: A

Signal=Permit Rights=Include (East approach)
Lanes: 0 Final Vol: 5
Lanes: 1
Lanes: 0 Final Vol: 4
Lanes: 0
Lanes: 1 Final Vol: 5

Lanes: 0 0 1! 0 0
Final Vol: 111 128 1
Signal=Permit/Rights=Include

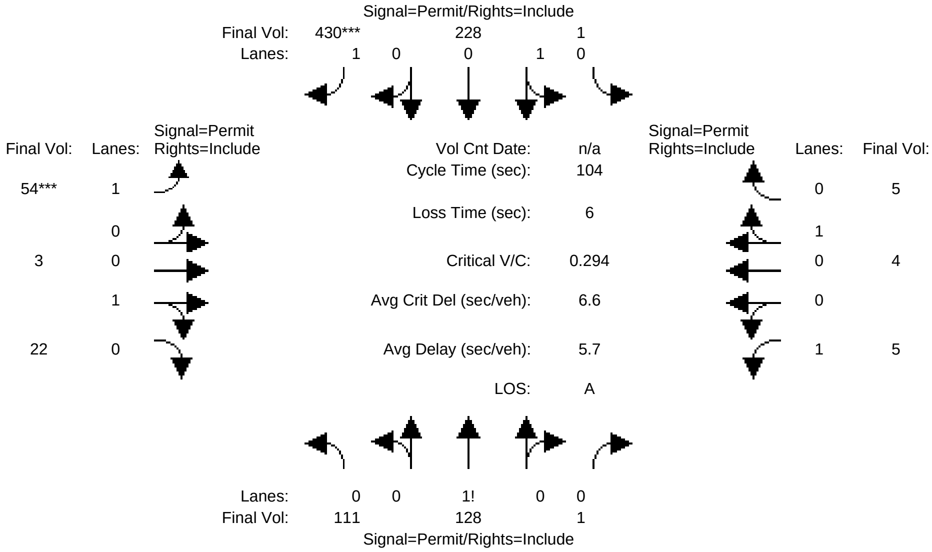
Street Name:	Park Blvd						Page Mill Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	111	128	1	1	228	415	36	3	22	5	4	5
Growth 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
Initial Bse:	111	128	1	1	228	415	36	3	22	5	4	5
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	128	1	1	228	415	36	3	22	5	4	5
User 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
PHF 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
PHF Volume:	111	128	1	1	228	415	36	3	22	5	4	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	111	128	1	1	228	415	36	3	22	5	4	5
PCE 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
MLF 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
FinalVolume:	111	128	1	1	228	415	36	3	22	5	4	5
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.46	0.53	0.01	0.01	0.99	1.00	1.00	0.12	0.88	1.00	0.44	0.56
Final Sat.:	809	933	7	8	1792	1750	1750	216	1584	1750	800	1000
Capacity Analysis Module:												
Vol/Sat:	0.14	0.14	0.14	0.13	0.13	0.24	0.02	0.01	0.01	0.00	0.01	0.01
Crit Moves:						****	****					
Green Time:	88.0	88.0	88.0	88.0	88.0	88.0	10.0	10.0	10.0	10.0	10.0	10.0
Volume/Cap:	0.16	0.16	0.16	0.15	0.15	0.28	0.21	0.14	0.14	0.03	0.05	0.05
Delay/Veh:	1.5	1.5	1.5	1.5	1.5	1.7	44.0	43.5	43.5	42.7	42.8	42.8
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.5	1.5	1.5	1.5	1.5	1.7	44.0	43.5	43.5	42.7	42.8	42.8
LOS by Move:	A	A	A	A	A	A	D	D	D	D	D	D
HCM2kAvgQ:	38	38	38	35	35	75	33	22	22	4	8	8

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background + Project PM

Intersection #1: Park Blvd/ Page Mill Rd



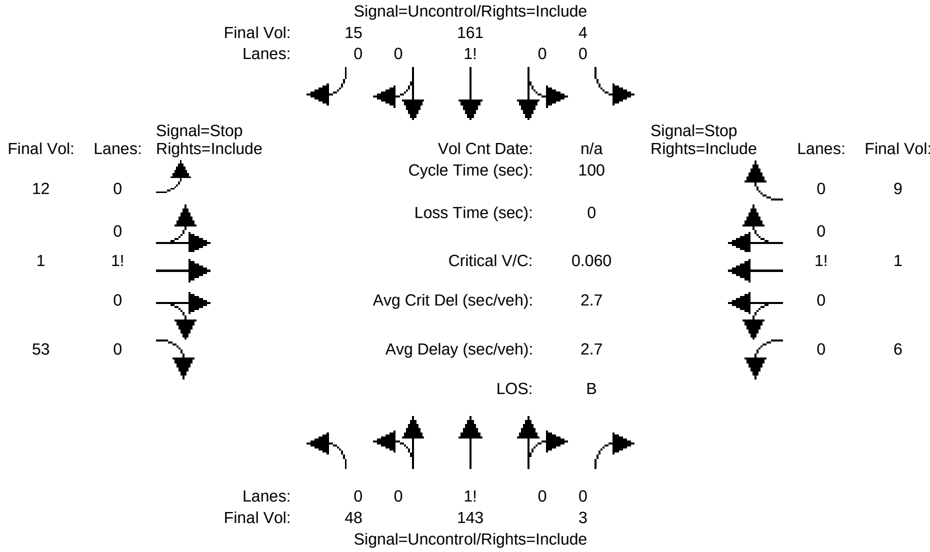
Street Name:	Park Blvd						Page Mill Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	111	128	1	1	228	415	36	3	22	5	4	5
Growth 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
Initial Bse:	111	128	1	1	228	415	36	3	22	5	4	5
Added Vol:	0	0	0	0	0	15	18	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	111	128	1	1	228	430	54	3	22	5	4	5
User 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
PHF 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
PHF Volume:	111	128	1	1	228	430	54	3	22	5	4	5
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	111	128	1	1	228	430	54	3	22	5	4	5
PCE 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
MLF 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
FinalVolume:	111	128	1	1	228	430	54	3	22	5	4	5
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.46	0.53	0.01	0.01	0.99	1.00	1.00	0.12	0.88	1.00	0.44	0.56
Final Sat.:	809	933	7	8	1792	1750	1750	216	1584	1750	800	1000
Capacity Analysis Module:												
Vol/Sat:	0.14	0.14	0.14	0.13	0.13	0.25	0.03	0.01	0.01	0.00	0.01	0.01
Crit Moves:						****	****					
Green Time:	87.1	87.1	87.1	87.1	87.1	87.1	10.9	10.9	10.9	10.9	10.9	10.9
Volume/Cap:	0.16	0.16	0.16	0.15	0.15	0.29	0.29	0.13	0.13	0.03	0.05	0.05
Delay/Veh:	1.7	1.7	1.7	1.6	1.6	1.9	43.9	42.5	42.5	41.8	42.0	42.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.7	1.7	1.7	1.6	1.6	1.9	43.9	42.5	42.5	41.8	42.0	42.0
LOS by Move:	A	A	A	A	A	A	D	D	D	D	D	D
HCM2kAvgQ:	40	40	40	37	37	83	49	21	21	4	7	7

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background AM

Intersection #2: Park Blvd /Sherman Ave




```
Street Name:                Park Blvd                    Park Blvd /Sherman Ave
Approach:      North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      48  143     3     4  161    15    12     1    53     6     1     9
Growth 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
Initial Bse:   48  143     3     4  161    15    12     1    53     6     1     9
Added Vol:      0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:   48  143     3     4  161    15    12     1    53     6     1     9
User 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
PHF 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
PHF Volume:    48  143     3     4  161    15    12     1    53     6     1     9
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:   48  143     3     4  161    15    12     1    53     6     1     9
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  176 xxxx xxxxx   146 xxxx xxxxx   422  419   169   444  425   145
Potent Cap.: 1412 xxxx xxxxx  1448 xxxx xxxxx   546  529   881   528  525   908
Move Cap.:   1412 xxxx xxxxx  1448 xxxx xxxxx   524  509   881   481  505   908
Volume/Cap:  0.03 xxxx  xxxx  0.00 xxxx  xxxx  0.02 0.00  0.06  0.01 0.00  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    2.6 xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.6 xxxx xxxxx   7.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  776 xxxxx  xxxx  657 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.3 xxxxx xxxxx  0.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 10.1 xxxxx xxxxx 10.6 xxxxx
Shared LOS:     *    *     *     *    *     *     *    B     *     *    B     *
ApproachDel:     xxxxxx            xxxxxx              10.1              10.6
ApproachLOS:        *                 *                  B                 B
Note: Queue reported is the distance per lane in feet.
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled     Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
Initial Vol:   48  143     3     4  161    15    12    1    53     6    1     9
ApproachDel:    xxxxxx           xxxxxx             10.1              10.6
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=66]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=456]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=16]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=456]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled     Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
Initial Vol:   48  143     3     4  161    15    12    1    53     6    1     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             374
Minor Approach Volume:           66
Minor Approach Volume Threshold: 482
--------------------------------------------------------------------------------
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a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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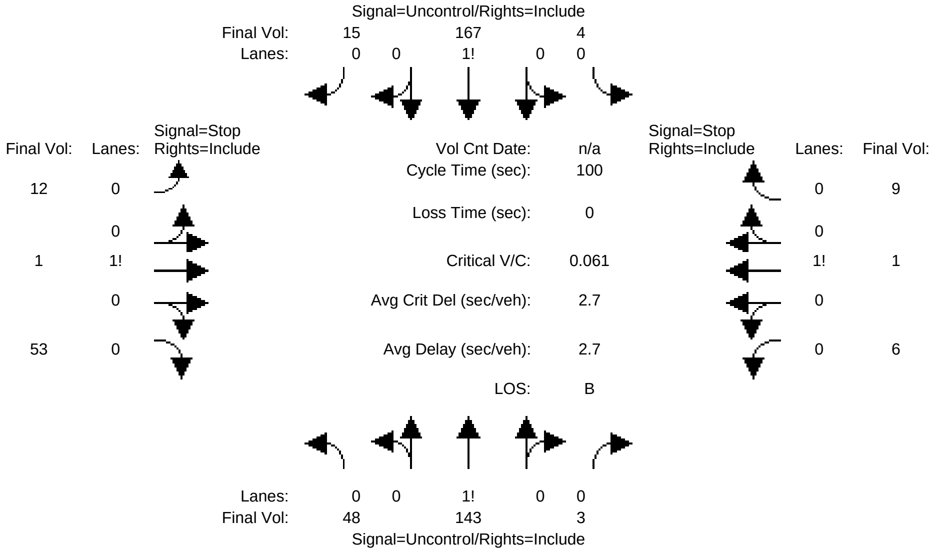
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background + Project AM

Intersection #2: Park Blvd /Sherman Ave




```
Street Name:                Park Blvd                     Park Blvd /Sherman Ave
Approach:       North Bound       South Bound        East Bound         West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      48  143     3     4  161    15    12     1    53     6     1     9
Growth 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
Initial Bse:   48  143     3     4  161    15    12     1    53     6     1     9
Added Vol:      0    0     0     0    6     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:   48  143     3     4  167    15    12     1    53     6     1     9
User 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
PHF 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
PHF Volume:    48  143     3     4  167    15    12     1    53     6     1     9
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:   48  143     3     4  167    15    12     1    53     6     1     9
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  182 xxxx xxxxx   146 xxxx xxxxx   428  425   175   450  431   145
Potent Cap.: 1405 xxxx xxxxx  1448 xxxx xxxxx   541  525   874   523  520   908
Move Cap.:   1405 xxxx xxxxx  1448 xxxx xxxxx   519  505   874   476  501   908
Volume/Cap:  0.03 xxxx  xxxx  0.00 xxxx  xxxx  0.02 0.00  0.06  0.01 0.00  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    2.7 xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.7 xxxx xxxxx   7.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  770 xxxxx  xxxx  653 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.3 xxxxx xxxxx  0.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 10.1 xxxxx xxxxx 10.7 xxxxx
Shared LOS:     *    *     *     *    *     *     *    B     *     *    B     *
ApproachDel:      xxxxxx            xxxxxx              10.1              10.7
ApproachLOS:           *                 *                 B                 B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   48  143     3     4  167    15    12    1    53     6    1     9
ApproachDel:    xxxxxx           xxxxxx             10.1             10.7
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=66]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=462]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=16]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=462]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   48  143     3     4  167    15    12    1    53     6    1     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            380
Minor Approach Volume:          66
Minor Approach Volume Threshold: 477
--------------------------------------------------------------------------------
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a traffic signal in the future.  Intersections that exceed this warrant
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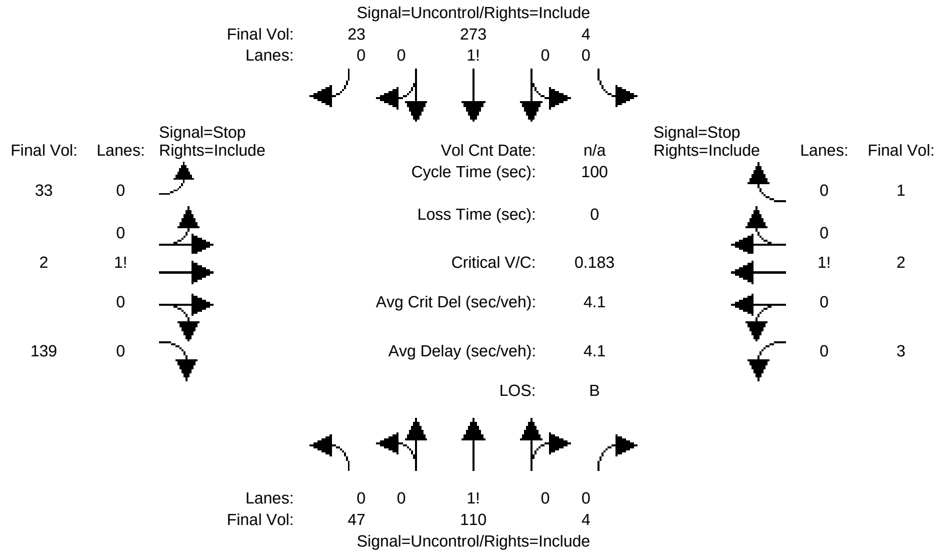
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background PM

Intersection #2: Park Blvd /Sherman Ave




```
Street Name:              Park Blvd                   Park Blvd /Sherman Ave
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       47  110     4     4  273    23    33     2   139     3     2     1
Growth 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
Initial Bse:    47  110     4     4  273    23    33     2   139     3     2     1
Added Vol:       0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:     0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    47  110     4     4  273    23    33     2   139     3     2     1
User 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
PHF 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
PHF Volume:     47  110     4     4  273    23    33     2   139     3     2     1
Reduct Vol:      0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    47  110     4     4  273    23    33     2   139     3     2     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:   4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:   2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   296 xxxx xxxxx   114 xxxx xxxxx   500  501   285   569  510   112
Potent Cap.:  1277 xxxx xxxxx  1488 xxxx xxxxx   484  475   759   436  469   947
Move Cap.:    1277 xxxx xxxxx  1488 xxxx xxxxx   467  456   759   344  450   947
Volume/Cap:   0.04 xxxx  xxxx  0.00 xxxx  xxxx  0.07 0.00  0.18  0.01 0.00  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:     2.9 xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:   7.9 xxxx xxxxx   7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     A    *     *     A    *     *     *    *     *     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  674 xxxxx  xxxx  422 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.0 xxxxx xxxxx  0.0 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 12.2 xxxxx xxxxx 13.7 xxxxx
Shared LOS:      *    *     *     *    *     *     *    B     *     *    B     *
ApproachDel:     xxxxxx            xxxxxx             12.2              13.7
ApproachLOS:        *                 *                B                 B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   47  110     4     4  273    23    33    2   139     3    2     1
ApproachDel:    xxxxxx           xxxxxx              12.2             13.7
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.6]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=174]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=641]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=6]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=641]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
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                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   47  110     4     4  273    23    33    2   139     3    2     1
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             461
Minor Approach Volume:           174
Minor Approach Volume Threshold: 426
--------------------------------------------------------------------------------
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```

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Palo Alto, CA
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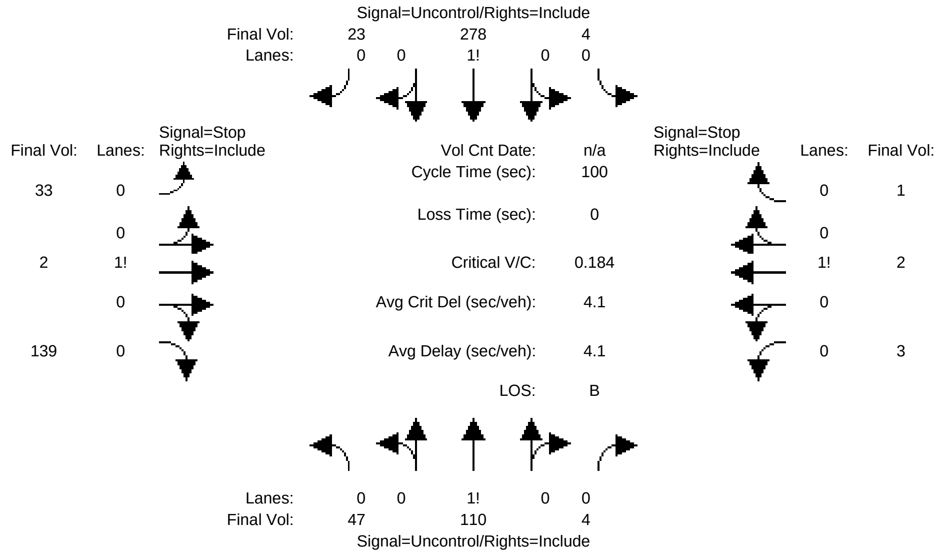
Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background + Project PM

Intersection #2: Park Blvd /Sherman Ave




```
Street Name:                Park Blvd                      Park Blvd /Sherman Ave
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      47  110     4     4  273    23    33     2   139     3     2     1
Growth 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
Initial Bse:   47  110     4     4  273    23    33     2   139     3     2     1
Added Vol:      0    0     0     0    5     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:   47  110     4     4  278    23    33     2   139     3     2     1
User 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
PHF 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
PHF Volume:    47  110     4     4  278    23    33     2   139     3     2     1
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:   47  110     4     4  278    23    33     2   139     3     2     1
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  301 xxxx xxxxx   114 xxxx xxxxx   505  506   290   574  515   112
Potent Cap.: 1272 xxxx xxxxx  1488 xxxx xxxxx   481  472   754   433  466   947
Move Cap.:   1272 xxxx xxxxx  1488 xxxx xxxxx   464  453   754   341  447   947
Volume/Cap:  0.04 xxxx  xxxx  0.00 xxxx  xxxx  0.07 0.00  0.18  0.01 0.00  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    2.9 xxxx xxxxx   0.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.9 xxxx xxxxx   7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  670 xxxxx  xxxx  419 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.0 xxxxx xxxxx  0.0 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 12.3 xxxxx xxxxx 13.7 xxxxx
Shared LOS:     *    *     *     *    *     *     *    B     *     *    B     *
ApproachDel:     xxxxxx            xxxxxx               12.3              13.7
ApproachLOS:          *                 *                  B                 B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   47  110    4     4  278    23    33    2   139     3    2     1
ApproachDel:    xxxxxx           xxxxxx              12.3             13.7
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.6]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=174]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=646]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=6]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=646]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   47  110    4     4  278    23    33    2   139     3    2     1
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            466
Minor Approach Volume:          174
Minor Approach Volume Threshold: 423
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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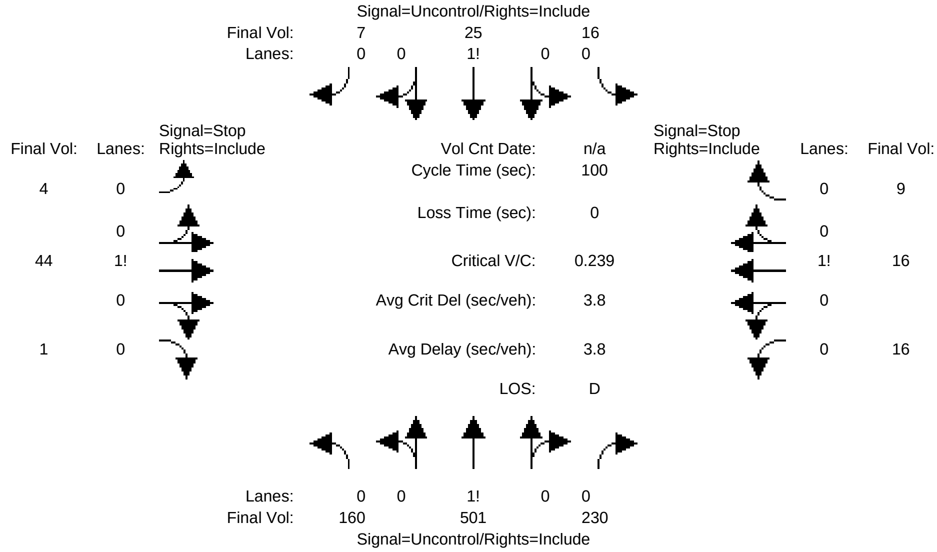
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background AM

Intersection #3: Birch St/ Sheridan Ave



Street Name:	Birch St						Sheridan Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	160	501	230	16	25	7	4	44	1	16	16	9
Growth 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
Initial Bse:	160	501	230	16	25	7	4	44	1	16	16	9
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	160	501	230	16	25	7	4	44	1	16	16	9
User 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
PHF 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
PHF Volume:	160	501	230	16	25	7	4	44	1	16	16	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	160	501	230	16	25	7	4	44	1	16	16	9
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	32	xxxx	xxxxx	731	xxxx	xxxxx	1009	1112	29	1019	1000	616
Potent Cap.:	1593	xxxx	xxxxx	883	xxxx	xxxxx	221	211	1052	217	245	494
Move Cap.:	1593	xxxx	xxxxx	883	xxxx	xxxxx	185	184	1052	161	214	494
Volume/Cap:	0.10	xxxx	xxxx	0.02	xxxx	xxxx	0.02	0.24	0.00	0.10	0.07	0.02
Level Of Service Module:												
2Way95thQ:	8.4	xxxx	xxxxx	1.4	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.5	xxxx	xxxxx	9.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	187	xxxxx	xxxx	213	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	1.0	xxxxx	xxxxx	0.7	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	30.9	xxxxx	xxxxx	25.9	xxxxx
Shared LOS:	*	*	*	*	*	*	*	D	*	*	D	*
ApproachDel:		xxxxxx			xxxxxx			30.9			25.9	
ApproachLOS:		*			*			D			D	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

****

Intersection #3 Birch St/ Sheridan Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met


```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
Initial Vol:  160  501   230    16   25     7     4   44     1    16   16     9
ApproachDel:    xxxxxx           xxxxxx             30.9             25.9
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=49]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1029]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=41]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1029]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
Initial Vol:  160  501   230    16   25     7     4   44     1    16   16     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             939
Minor Approach Volume:           49
Minor Approach Volume Threshold: 236
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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a traffic signal in the future.  Intersections that exceed this warrant
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signal warrant (such as the 4-hour or 8-hour warrants).

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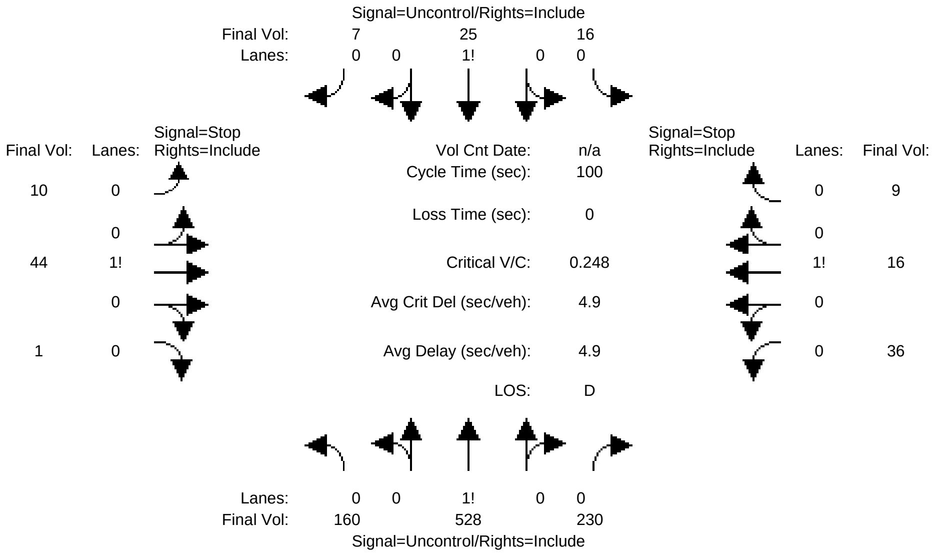
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background + Project AM

Intersection #3: Birch St/ Sheridan Ave




```
Street Name:                 Birch St                            Sheridan Ave
Approach:       North Bound       South Bound        East Bound         West Bound
Movement:     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      160  501   230    16   25     7     4   44     1    16   16     9
Growth 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
Initial Bse:   160  501   230    16   25     7     4   44     1    16   16     9
Added Vol:       0   27     0     0    0     0     6    0     0    20    0     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   160  528   230    16   25     7    10   44     1    36   16     9
User 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
PHF 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
PHF Volume:    160  528   230    16   25     7    10   44     1    36   16     9
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   160  528   230    16   25     7    10   44     1    36   16     9
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:   4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:   2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:    32 xxxx xxxxx   758 xxxx xxxxx  1036 1139    29  1046 1027   643
Potent Cap.: 1593 xxxx xxxxx   862 xxxx xxxxx   212  203  1052   208  236   477
Move Cap.:   1593 xxxx xxxxx   862 xxxx xxxxx   176  177  1052   153  206   477
Volume/Cap:  0.10 xxxx  xxxx  0.02 xxxx  xxxx  0.06 0.25  0.00  0.24 0.08  0.02
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:     8.4 xxxx xxxxx   1.4 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:   7.5 xxxx xxxxx   9.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  180 xxxxx  xxxx  184 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.2 xxxxx xxxxx  1.4 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 33.6 xxxxx xxxxx 34.1 xxxxx
Shared LOS:      *    *     *     *    *     *     *    D     *     *    D     *
ApproachDel:      xxxxxx            xxxxxx              33.6              34.1
ApproachLOS:           *                 *                 D                 D
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:  160  528   230    16   25     7    10   44     1    36   16     9
ApproachDel:    xxxxxx           xxxxxx              33.6             34.1
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=55]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1082]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.6]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=61]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1082]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:  160  528   230    16   25     7    10   44     1    36   16     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            966
Minor Approach Volume:          61
Minor Approach Volume Threshold: 229
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background PM

Intersection #3: Birch St/ Sheridan Ave

Signal=Uncontrol/Rights=Include
Final Vol: 4 74 18
Lanes: 0 0 1! 0 0

Signal=Stop
Rights=Include
Final Vol: 6, 31, 4
Lanes: 0, 0, 1!, 0, 0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.225
Avg Crit Del (sec/veh): 4.3
Avg Delay (sec/veh): 4.3
LOS: C

Signal=Stop
Rights=Include
Lanes: 0, 0, 1!, 0, 0
Final Vol: 8, 17, 67

Lanes: 0 0 1! 0 0
Final Vol: 89 340 152
Signal=Uncontrol/Rights=Include

Street Name:	Birch St						Sheridan Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	89	340	152	18	74	4	6	31	4	67	17	8
Growth 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
Initial Bse:	89	340	152	18	74	4	6	31	4	67	17	8
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	89	340	152	18	74	4	6	31	4	67	17	8
User 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
PHF 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
PHF Volume:	89	340	152	18	74	4	6	31	4	67	17	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	89	340	152	18	74	4	6	31	4	67	17	8
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	78	xxxx	xxxxx	492	xxxx	xxxxx	719	782	76	724	708	416
Potent Cap.:	1533	xxxx	xxxxx	1082	xxxx	xxxxx	347	328	991	344	362	641
Move Cap.:	1533	xxxx	xxxxx	1082	xxxx	xxxxx	310	303	991	297	334	641
Volume/Cap:	0.06	xxxx	xxxx	0.02	xxxx	xxxx	0.02	0.10	0.00	0.23	0.05	0.01
Level Of Service Module:												
2Way95thQ:	4.6	xxxx	xxxxx	1.3	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.5	xxxx	xxxxx	8.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	326	xxxxx	xxxx	319	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.4	xxxxx	xxxxx	1.2	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	17.6	xxxxx	xxxxx	20.8	xxxxx
Shared LOS:	*	*	*	*	*	*	*	C	*	*	C	*
ApproachDel:		xxxxxx			xxxxxx			17.6			20.8	
ApproachLOS:		*			*			C			C	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

****

Intersection #3 Birch St/ Sheridan Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled     Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
Initial Vol:   89  340   152    18   74     4     6   31     4    67   17     8
ApproachDel:    xxxxxx           xxxxxx            17.6             20.8
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=41]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=810]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=92]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=810]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled     Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
Initial Vol:   89  340   152    18   74     4     6   31     4    67   17     8
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            677
Minor Approach Volume:          92
Minor Approach Volume Threshold: 323
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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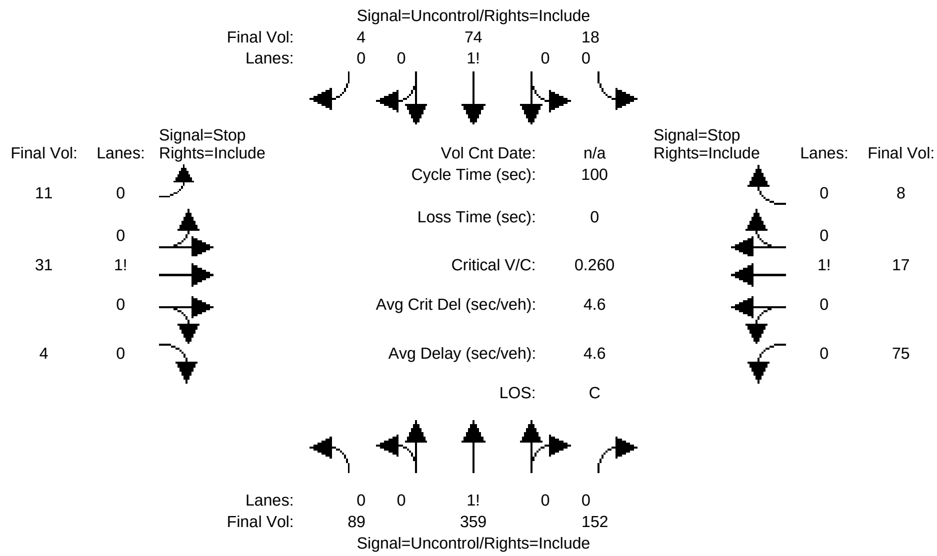
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background + Project PM

Intersection #3: Birch St/ Sheridan Ave



Street Name:	Birch St						Sheridan Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	89	340	152	18	74	4	6	31	4	67	17	8
Growth 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
Initial Bse:	89	340	152	18	74	4	6	31	4	67	17	8
Added Vol:	0	19	0	0	0	0	5	0	0	8	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	89	359	152	18	74	4	11	31	4	75	17	8
User 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
PHF 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
PHF Volume:	89	359	152	18	74	4	11	31	4	75	17	8
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	89	359	152	18	74	4	11	31	4	75	17	8
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	78	xxxx	xxxxx	511	xxxx	xxxxx	738	801	76	743	727	435
Potent Cap.:	1533	xxxx	xxxxx	1065	xxxx	xxxxx	336	320	991	334	353	625
Move Cap.:	1533	xxxx	xxxxx	1065	xxxx	xxxxx	300	295	991	288	326	625
Volume/Cap:	0.06	xxxx	xxxx	0.02	xxxx	xxxx	0.04	0.10	0.00	0.26	0.05	0.01
Level Of Service Module:												
2Way95thQ:	4.6	xxxx	xxxxx	1.3	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.5	xxxx	xxxxx	8.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	316	xxxxx	xxxx	307	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.5	xxxxx	xxxxx	1.4	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	18.3	xxxxx	xxxxx	22.3	xxxxx
Shared LOS:	*	*	*	*	*	*	*	C	*	*	C	*
ApproachDel:		xxxxxx			xxxxxx			18.3			22.3	
ApproachLOS:		*			*			C			C	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

****

Intersection #3 Birch St/ Sheridan Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
Initial Vol:   89  359   152    18   74     4    11   31     4    75   17     8
ApproachDel:    xxxxxx          xxxxxx              18.3             22.3
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=46]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=842]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.6]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=100]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=842]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

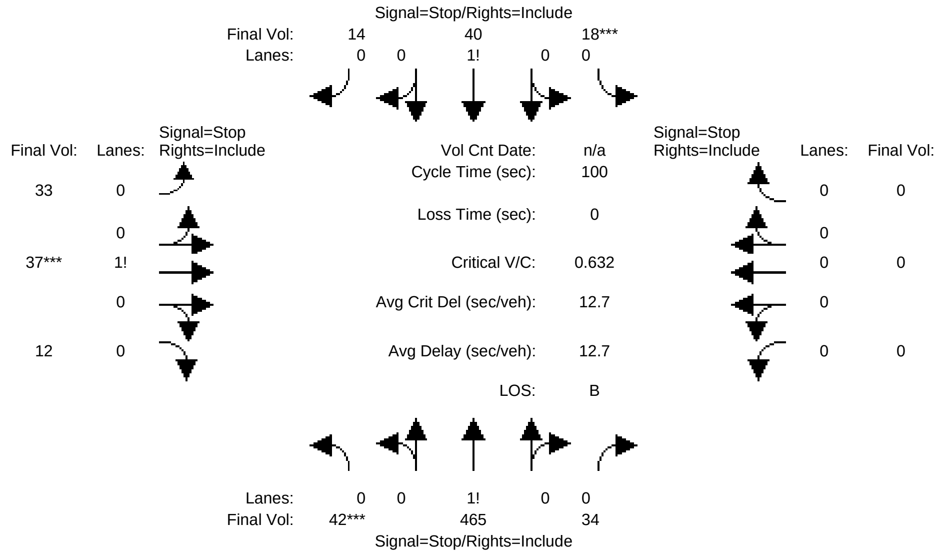
The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
Initial Vol:   89  359   152    18   74     4    11   31     4    75   17     8
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             696
Minor Approach Volume:           100
Minor Approach Volume Threshold: 316
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Background AM

Intersection #4: Birch St/ Grant Ave



Street Name:	Birch St						Grant Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	42	465	34	18	40	14	33	37	12	0	0	0
Growth 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
Initial Bse:	42	465	34	18	40	14	33	37	12	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	42	465	34	18	40	14	33	37	12	0	0	0
User 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
PHF 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
PHF Volume:	42	465	34	18	40	14	33	37	12	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	42	465	34	18	40	14	33	37	12	0	0	0
PCE 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
MLF 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
FinalVolume:	42	465	34	18	40	14	33	37	12	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.08	0.86	0.06	0.25	0.56	0.19	0.40	0.45	0.15	0.00	0.00	0.00
Final Sat.:	66	736	54	190	422	148	257	288	93	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.63	0.63	0.63	0.09	0.09	0.09	0.13	0.13	0.13	xxxx	xxxx	xxxx
Crit Moves:	****			****				****				
Delay/Veh:	13.9	13.9	13.9	8.0	8.0	8.0	8.8	8.8	8.8	0.0	0.0	0.0
Delay 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
AdjDel/Veh:	13.9	13.9	13.9	8.0	8.0	8.0	8.8	8.8	8.8	0.0	0.0	0.0
LOS by Move:	B	B	B	A	A	A	A	A	A	*	*	*
ApproachDel:		13.9			8.0			8.8			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		13.9			8.0			8.8			xxxxxx	
LOS by Appr:		B			A			A			*	
AllWayAvgQ:	40.0	40.0	40.0	2.4	2.4	2.4	3.0	3.0	3.0	0.0	0.0	0.0

Note: Queue reported is the distance per lane in feet.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #4 Birch St/ Grant Ave

****


```
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   42  465    34    18   40    14    33   37    12     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            613
Minor Approach Volume:          82
Minor Approach Volume Threshold: 350
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Background + Project AM

Intersection #4: Birch St/ Grant Ave

Signal=Stop/Rights=Include
Final Vol: 14 40*** 18
Lanes: 0 0 1! 0 0

Final Vol:	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Final Vol:
			Vol Cnt Date:	n/a			
33	0		Cycle Time (sec):	100		0	0
			Loss Time (sec):	0			
	0					0	
37***	1!		Critical V/C:	0.666		0	0
	0		Avg Crit Del (sec/veh):	13.6		0	
12	0		Avg Delay (sec/veh):	13.6		0	0
			LOS:	B			

Lanes: 0 0 1! 0 0
Final Vol: 66 469*** 34
Signal=Stop/Rights=Include

```
Street Name:                Birch St                          Grant Ave
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      42   465    34    18    40    14    33    37    12     0     0     0
Growth 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
Initial Bse:   42   465    34    18    40    14    33    37    12     0     0     0
Added Vol:     24     4     0     0     0     0     0     0     0     0     0     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   66   469    34    18    40    14    33    37    12     0     0     0
User 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
PHF 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
PHF Volume:    66   469    34    18    40    14    33    37    12     0     0     0
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   66   469    34    18    40    14    33    37    12     0     0     0
PCE 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
MLF 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
FinalVolume:   66   469    34    18    40    14    33    37    12     0     0     0
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       0.12  0.82  0.06  0.25  0.56  0.19  0.40  0.45  0.15  0.00  0.00  0.00
Final Sat.:    99   704    51   189   419   147   253   284    92     0     0     0
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:     0.67  0.67  0.67  0.10  0.10  0.10  0.13  0.13  0.13  xxxx  xxxx  xxxx
Crit Moves:        ****              ****              ****
Delay/Veh:   14.9  14.9  14.9   8.1   8.1   8.1   8.9   8.9   8.9   0.0   0.0   0.0
Delay 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
AdjDel/Veh:  14.9  14.9  14.9   8.1   8.1   8.1   8.9   8.9   8.9   0.0   0.0   0.0
LOS by Move:    B     B     B     A     A     A     A     A     A     *     *     *
ApproachDel:       14.9              8.1               8.9             xxxxxx
Delay Adj:         1.00              1.00              1.00             xxxxx
ApprAdjDel:        14.9              8.1               8.9             xxxxxx
LOS by Appr:         B                 A                 A                 *
AllWayAvgQ:  46.0  46.0  46.0   2.4   2.4   2.4   3.1   3.1   3.1   0.0   0.0   0.0
Note: Queue reported is the distance per lane in feet.
                Peak Hour Volume Signal Warrant Report [Urban]
*********************************************************************************
Intersection #4 Birch St/ Grant Ave
*********************************************************************************
```



```
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   66  469    34    18   40    14    33   37    12     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            641
Minor Approach Volume:          82
Minor Approach Volume Threshold: 338
--------------------------------------------------------------------------------
```

SIGNAL WARRANT DISCLAIMER
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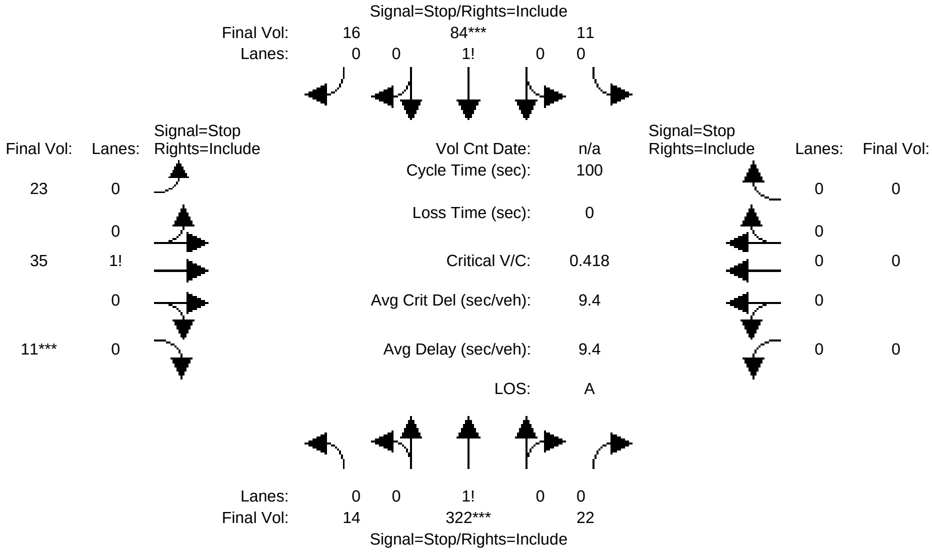
231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Background PM

Intersection #4: Birch St/ Grant Ave



Street Name:	Birch St						Grant Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	14	322	22	11	84	16	23	35	11	0	0	0
Growth 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
Initial Bse:	14	322	22	11	84	16	23	35	11	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	14	322	22	11	84	16	23	35	11	0	0	0
User 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
PHF 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
PHF Volume:	14	322	22	11	84	16	23	35	11	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	14	322	22	11	84	16	23	35	11	0	0	0
PCE 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
MLF 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
FinalVolume:	14	322	22	11	84	16	23	35	11	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.04	0.90	0.06	0.10	0.76	0.14	0.33	0.51	0.16	0.00	0.00	0.00
Final Sat.:	34	771	53	80	611	116	231	351	110	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.42	0.42	0.42	0.14	0.14	0.14	0.10	0.10	0.10	xxxx	xxxx	xxxx
Crit Moves:		****			****				****			
Delay/Veh:	10.0	10.0	10.0	8.0	8.0	8.0	8.3	8.3	8.3	0.0	0.0	0.0
Delay 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
AdjDel/Veh:	10.0	10.0	10.0	8.0	8.0	8.0	8.3	8.3	8.3	0.0	0.0	0.0
LOS by Move:	B	B	B	A	A	A	A	A	A	*	*	*
ApproachDel:		10.0			8.0			8.3			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		10.0			8.0			8.3			xxxxxx	
LOS by Appr:		B			A			A			*	
AllWayAvgQ:	17.2	17.2	17.2	3.8	3.8	3.8	2.4	2.4	2.4	0.0	0.0	0.0

Note: Queue reported is the distance per lane in feet.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #4 Birch St/ Grant Ave

****


```
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   14  322    22    11   84    16    23   35    11     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            469
Minor Approach Volume:          69
Minor Approach Volume Threshold: 421
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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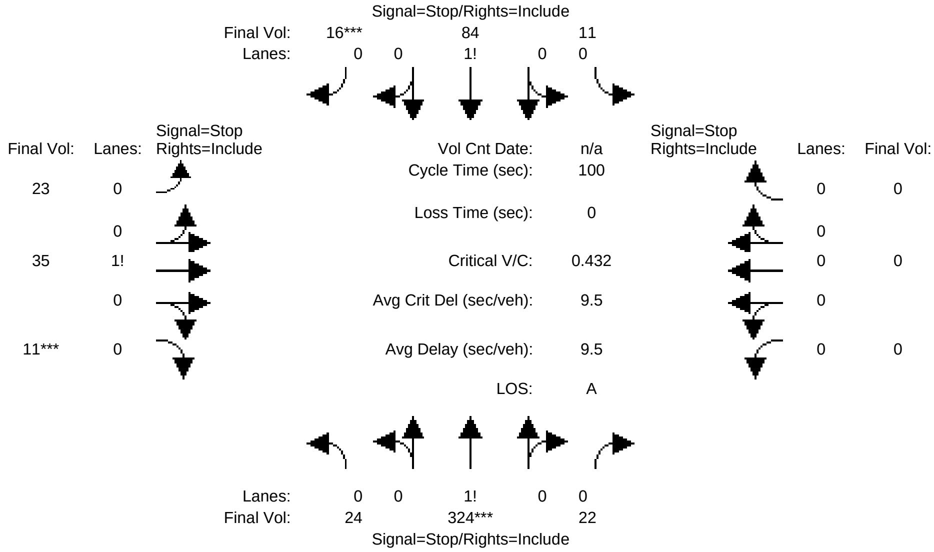
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Background + Project PM

Intersection #4: Birch St/ Grant Ave



Street Name:	Birch St						Grant Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	14	322	22	11	84	16	23	35	11	0	0	0
Growth 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
Initial Bse:	14	322	22	11	84	16	23	35	11	0	0	0
Added Vol:	10	2	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	24	324	22	11	84	16	23	35	11	0	0	0
User 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
PHF 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
PHF Volume:	24	324	22	11	84	16	23	35	11	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	24	324	22	11	84	16	23	35	11	0	0	0
PCE 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
MLF 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
FinalVolume:	24	324	22	11	84	16	23	35	11	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.06	0.88	0.06	0.10	0.76	0.14	0.33	0.51	0.16	0.00	0.00	0.00
Final Sat.:	56	749	51	80	609	116	229	349	110	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.43	0.43	0.43	0.14	0.14	0.14	0.10	0.10	0.10	xxxx	xxxx	xxxx
Crit Moves:		****				****			****			
Delay/Veh:	10.2	10.2	10.2	8.0	8.0	8.0	8.3	8.3	8.3	0.0	0.0	0.0
Delay 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
AdjDel/Veh:	10.2	10.2	10.2	8.0	8.0	8.0	8.3	8.3	8.3	0.0	0.0	0.0
LOS by Move:	B	B	B	A	A	A	A	A	A	*	*	*
ApproachDel:		10.2			8.0			8.3			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		10.2			8.0			8.3			xxxxxx	
LOS by Appr:		B			A			A			*	
AllWayAvgQ:	18.2	18.2	18.2	3.8	3.8	3.8	2.4	2.4	2.4	0.0	0.0	0.0

Note: Queue reported is the distance per lane in feet.

Peak Hour Volume Signal Warrant Report [Urban]

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Intersection #4 Birch St/ Grant Ave

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Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   24  324    22    11   84    16    23   35    11     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             481
Minor Approach Volume:           69
Minor Approach Volume Threshold: 415
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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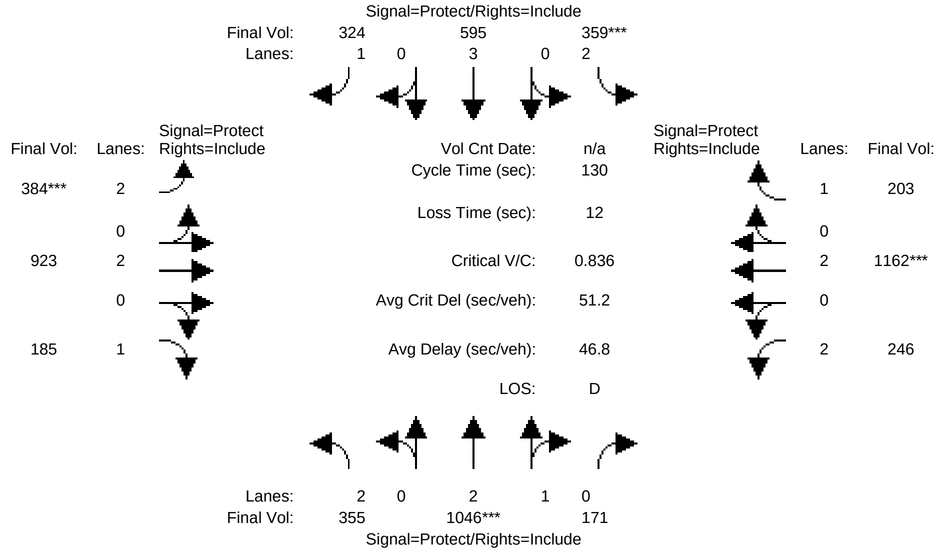
231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background AM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy



Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	355	1046	171	359	595	324	384	923	185	246	1162	203
Growth 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
Initial Bse:	355	1046	171	359	595	324	384	923	185	246	1162	203
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	355	1046	171	359	595	324	384	923	185	246	1162	203
User 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
PHF 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
PHF Volume:	355	1046	171	359	595	324	384	923	185	246	1162	203
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	355	1046	171	359	595	324	384	923	185	246	1162	203
PCE 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
MLF 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
FinalVolume:	355	1046	171	359	595	324	384	923	185	246	1162	203
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	1.00	0.92
Lanes:	2.00	2.56	0.44	2.00	3.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3150	4812	787	3150	5700	1750	3150	3800	1750	3150	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.11	0.22	0.22	0.11	0.10	0.19	0.12	0.24	0.11	0.08	0.31	0.12
Crit Moves:		****		****			****				****	
Green Time:	19.5	33.8	33.8	17.7	32.0	32.0	19.0	50.3	50.3	16.2	47.5	47.5
Volume/Cap:	0.75	0.84	0.84	0.84	0.42	0.75	0.84	0.63	0.27	0.63	0.84	0.32
Delay/Veh:	59.6	49.9	49.9	68.1	41.4	52.6	66.6	33.1	27.5	57.3	42.3	29.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	59.6	49.9	49.9	68.1	41.4	52.6	66.6	33.1	27.5	57.3	42.3	29.9
LOS by Move:	E+	D	D	E	D	D-	E	C-	C	E+	D	C
HCM2kAvgQ:	245	446	446	270	169	358	285	378	134	164	579	154

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background + Project AM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy

Signal=Protect/Rights=Include
Final Vol: 324 595 359***
Lanes: 1 0 3 0 2

Final Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Include	Lanes:	Final Vol:
			Vol Cnt Date:	n/a			
384***	2		Cycle Time (sec):	130		1	203
			Loss Time (sec):	12			
	0					0	
947	2		Critical V/C:	0.846		2	1193***
	0		Avg Crit Del (sec/veh):	51.8		0	
185	1		Avg Delay (sec/veh):	47.2		2	254
			LOS:	D			

Lanes: 2 0 2 1 0
Final Vol: 355 1052*** 171
Signal=Protect/Rights=Include

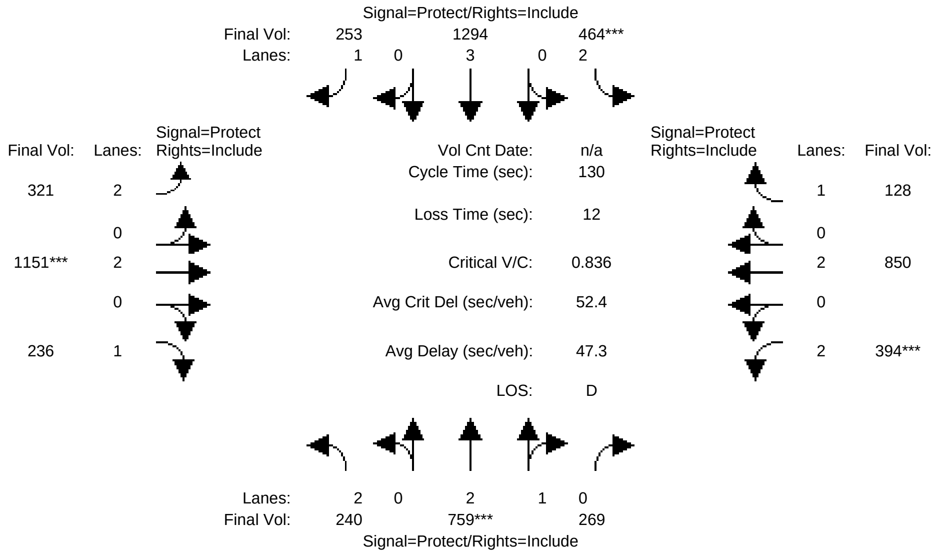
Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	355	1046	171	359	595	324	384	923	185	246	1162	203
Growth 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
Initial Bse:	355	1046	171	359	595	324	384	923	185	246	1162	203
Added Vol:	0	6	0	0	0	0	0	24	0	8	31	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	355	1052	171	359	595	324	384	947	185	254	1193	203
User 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
PHF 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
PHF Volume:	355	1052	171	359	595	324	384	947	185	254	1193	203
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	355	1052	171	359	595	324	384	947	185	254	1193	203
PCE 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
MLF 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
FinalVolume:	355	1052	171	359	595	324	384	947	185	254	1193	203
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	1.00	0.92
Lanes:	2.00	2.57	0.43	2.00	3.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3150	4816	783	3150	5700	1750	3150	3800	1750	3150	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.11	0.22	0.22	0.11	0.10	0.19	0.12	0.25	0.11	0.08	0.31	0.12
Crit Moves:		****		****			****				****	
Green Time:	19.3	33.6	33.6	17.5	31.7	31.7	18.7	50.6	50.6	16.4	48.2	48.2
Volume/Cap:	0.76	0.85	0.85	0.85	0.43	0.76	0.85	0.64	0.27	0.64	0.85	0.31
Delay/Veh:	60.1	50.6	50.6	69.5	41.7	53.3	68.0	33.3	27.3	57.5	42.4	29.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	60.1	50.6	50.6	69.5	41.7	53.3	68.0	33.3	27.3	57.5	42.4	29.4
LOS by Move:	E	D	D	E	D	D-	E	C-	C	E+	D	C
HCM2kAvgQ:	246	453	453	273	169	361	288	390	133	170	599	153

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background PM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy



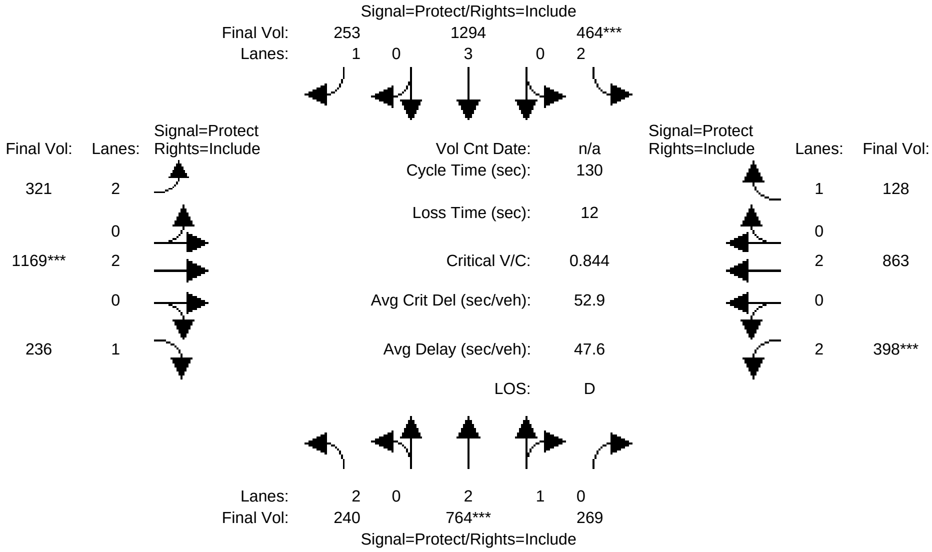
Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	240	759	269	464	1294	253	321	1151	236	394	850	128
Growth 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
Initial Bse:	240	759	269	464	1294	253	321	1151	236	394	850	128
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	240	759	269	464	1294	253	321	1151	236	394	850	128
User 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
PHF 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
PHF Volume:	240	759	269	464	1294	253	321	1151	236	394	850	128
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	240	759	269	464	1294	253	321	1151	236	394	850	128
PCE 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
MLF 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
FinalVolume:	240	759	269	464	1294	253	321	1151	236	394	850	128
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	1.00	0.92
Lanes:	2.00	2.19	0.81	2.00	3.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3150	4133	1465	3150	5700	1750	3150	3800	1750	3150	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.08	0.18	0.18	0.15	0.23	0.14	0.10	0.30	0.13	0.13	0.22	0.07
Crit Moves:		****		****				****		****		
Green Time:	12.9	28.6	28.6	22.9	38.5	38.5	20.8	47.1	47.1	19.4	45.7	45.7
Volume/Cap:	0.77	0.84	0.84	0.84	0.77	0.49	0.64	0.84	0.37	0.84	0.64	0.21
Delay/Veh:	67.8	53.6	53.6	62.4	43.8	38.3	53.7	42.6	30.9	66.0	36.2	29.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	67.8	53.6	53.6	62.4	43.8	38.3	53.7	42.6	30.9	66.0	36.2	29.6
LOS by Move:	E	D-	D-	E	D	D+	D-	D	C	E	D+	C
HCM2kAvgQ:	185	391	391	329	424	227	203	575	185	290	362	94

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background + Project PM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy



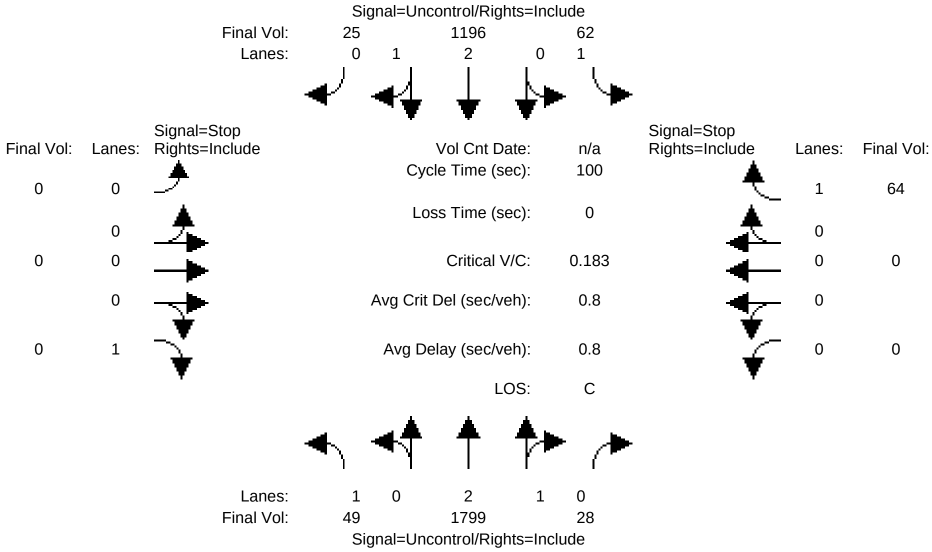
Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	240	759	269	464	1294	253	321	1151	236	394	850	128
Growth 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
Initial Bse:	240	759	269	464	1294	253	321	1151	236	394	850	128
Added Vol:	0	5	0	0	0	0	0	18	0	4	13	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	240	764	269	464	1294	253	321	1169	236	398	863	128
User 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
PHF 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
PHF Volume:	240	764	269	464	1294	253	321	1169	236	398	863	128
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	240	764	269	464	1294	253	321	1169	236	398	863	128
PCE 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
MLF 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
FinalVolume:	240	764	269	464	1294	253	321	1169	236	398	863	128
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	1.00	0.92
Lanes:	2.00	2.19	0.81	2.00	3.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3150	4140	1458	3150	5700	1750	3150	3800	1750	3150	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.08	0.18	0.18	0.15	0.23	0.14	0.10	0.31	0.13	0.13	0.23	0.07
Crit Moves:		****		****				****		****		
Green Time:	12.8	28.4	28.4	22.7	38.3	38.3	20.7	47.4	47.4	19.5	46.2	46.2
Volume/Cap:	0.77	0.84	0.84	0.84	0.77	0.49	0.64	0.84	0.37	0.84	0.64	0.21
Delay/Veh:	68.4	54.2	54.2	63.3	44.1	38.6	53.9	42.8	30.7	66.8	36.0	29.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	68.4	54.2	54.2	63.3	44.1	38.6	53.9	42.8	30.7	66.8	36.0	29.3
LOS by Move:	E	D-	D-	E	D	D+	D-	D	C	E	D+	C
HCM2kAvgQ:	186	396	396	332	427	228	203	588	184	295	367	94

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background AM

Intersection #6: El Camino Real/ Grant Ave

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Street Name:          El Camino Real                     Grant Ave
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      49 1799    28     62 1196    25      0    0     0      0    0    64
Growth 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
Initial Bse:   49 1799    28     62 1196    25      0    0     0      0    0    64
Added Vol:      0    0     0      0    0     0      0    0     0      0    0     0
PasserByVol:    0    0     0      0    0     0      0    0     0      0    0     0
Initial Fut:   49 1799    28     62 1196    25      0    0     0      0    0    64
User 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
PHF 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
PHF Volume:    49 1799    28     62 1196    25      0    0     0      0    0    64
Reduct Vol:     0    0     0      0    0     0      0    0     0      0    0     0
FinalVolume:   49 1799    28     62 1196    25      0    0     0      0    0    64
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1221 xxxx xxxxx  1827 xxxx xxxxx  xxxx xxxx   411  xxxx xxxx   614
Potent Cap.:  578 xxxx xxxxx   339 xxxx xxxxx  xxxx xxxx   595  xxxx xxxx   440
Move Cap.:    578 xxxx xxxxx   339 xxxx xxxxx  xxxx xxxx   595  xxxx xxxx   440
Volume/Cap:  0.08 xxxx  xxxx  0.18 xxxx  xxxx  xxxx xxxx  0.00  xxxx xxxx  0.15
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    6.9 xxxx xxxxx  16.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  12.6
Control Del: 11.8 xxxx xxxxx  18.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  14.6
LOS by Move:    B    *     *     C    *     *     *    *     *     *    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx             14.6
ApproachLOS:          *                 *                 *                 B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   49 1799    28    62 1196    25     0    0     0     0    0    64
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             14.6
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=64]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3223]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

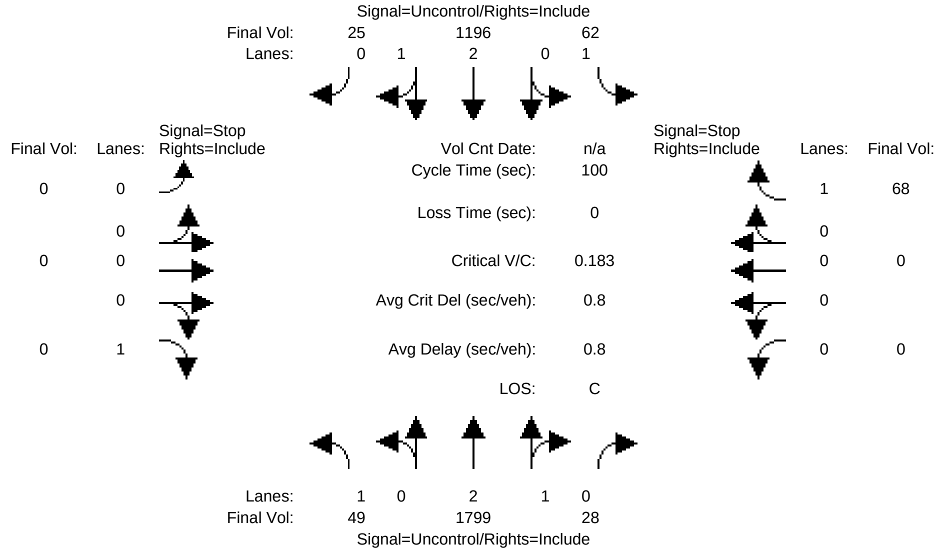
The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   49 1799    28    62 1196    25     0    0     0     0    0    64
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             3159
Minor Approach Volume:           64
Minor Approach Volume Threshold: -111 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```


231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background + Project AM

Intersection #6: El Camino Real/ Grant Ave




```
Street Name:            El Camino Real                        Grant Ave
Approach:      North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      49 1799    28     62 1196    25      0    0     0      0    0    64
Growth 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
Initial Bse:   49 1799    28     62 1196    25      0    0     0      0    0    64
Added Vol:      0    0     0      0    0     0      0    0     0      0    0     4
PasserByVol:    0    0     0      0    0     0      0    0     0      0    0     0
Initial Fut:   49 1799    28     62 1196    25      0    0     0      0    0    68
User 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
PHF 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
PHF Volume:    49 1799    28     62 1196    25      0    0     0      0    0    68
Reduct Vol:     0    0     0      0    0     0      0    0     0      0    0     0
FinalVolume:   49 1799    28     62 1196    25      0    0     0      0    0    68
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1221 xxxx xxxxx  1827 xxxx xxxxx  xxxx xxxx   411  xxxx xxxx   614
Potent Cap.:  578 xxxx xxxxx   339 xxxx xxxxx  xxxx xxxx   595  xxxx xxxx   440
Move Cap.:    578 xxxx xxxxx   339 xxxx xxxxx  xxxx xxxx   595  xxxx xxxx   440
Volume/Cap:  0.08 xxxx  xxxx  0.18 xxxx  xxxx  xxxx xxxx  0.00  xxxx xxxx  0.15
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    6.9 xxxx xxxxx  16.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  13.6
Control Del: 11.8 xxxx xxxxx  18.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  14.7
LOS by Move:    B    *     *     C    *     *     *    *     *     *    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx              14.7
ApproachLOS:        *                 *                 *                  B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   49 1799    28    62 1196    25     0    0     0     0    0    68
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             14.7
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=68]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3227]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   49 1799    28    62 1196    25     0    0     0     0    0    68
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             3159
Minor Approach Volume:           68
Minor Approach Volume Threshold: -111 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background PM

Intersection #6: El Camino Real/ Grant Ave

```
                          Signal=Uncontrol/Rights=Include
              Final Vol:      14         2266        53
                  Lanes:        0    1     2      0    1

                 Signal=Stop                                        Signal=Stop
Final Vol:  Lanes:  Rights=Include        Vol Cnt Date:      n/a    Rights=Include     Lanes:  Final Vol:
                                      Cycle Time (sec):      100
   0          0                                                                          1        63
                                       Loss Time (sec):        0
              0                                                                          0
   0          0                            Critical V/C:   0.137                         0         0
              0                     Avg Crit Del (sec/veh):  0.6                         0
   0          1                          Avg Delay (sec/veh):  0.6                       0         0
                                                    LOS:       C

                  Lanes:        1    0     2      1    0
              Final Vol:      31         1520        45
                          Signal=Uncontrol/Rights=Include
```

```
Street Name:          El Camino Real                         Grant Ave
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      31 1520    45     53 2266    14      0    0     0      0    0    63
Growth 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
Initial Bse:   31 1520    45     53 2266    14      0    0     0      0    0    63
Added Vol:      0    0     0      0    0     0      0    0     0      0    0     0
PasserByVol:    0    0     0      0    0     0      0    0     0      0    0     0
Initial Fut:   31 1520    45     53 2266    14      0    0     0      0    0    63
User 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
PHF 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
PHF Volume:    31 1520    45     53 2266    14      0    0     0      0    0    63
Reduct Vol:     0    0     0      0    0     0      0    0     0      0    0     0
FinalVolume:   31 1520    45     53 2266    14      0    0     0      0    0    63
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 2280 xxxx xxxxx  1565 xxxx xxxxx  xxxx xxxx   762  xxxx xxxx   529
Potent Cap.:  226 xxxx xxxxx   428 xxxx xxxxx  xxxx xxxx   352  xxxx xxxx   499
Move Cap.:    226 xxxx xxxxx   428 xxxx xxxxx  xxxx xxxx   352  xxxx xxxx   499
Volume/Cap:  0.14 xxxx  xxxx  0.12 xxxx  xxxx  xxxx xxxx  0.00  xxxx xxxx  0.13
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   11.7 xxxx xxxxx  10.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  10.7
Control Del: 23.4 xxxx xxxxx  14.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  13.2
LOS by Move:    C    *     *     B    *     *     *    *     *     *    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx              13.2
ApproachLOS:          *                 *                 *                 B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0   1  0  2  1  0   0  0  0  0  1   0  0  0  0  1
Initial Vol:   31 1520    45   53 2266    14    0    0     0    0    0    63
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             13.2
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=63]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3992]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
```

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

```
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0   1  0  2  1  0   0  0  0  0  1   0  0  0  0  1
Initial Vol:   31 1520    45   53 2266    14    0    0     0    0    0    63
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             3929
Minor Approach Volume:           63
Minor Approach Volume Threshold: -187 [less than minimum of 100]
--------------------------------------------------------------------------------
```

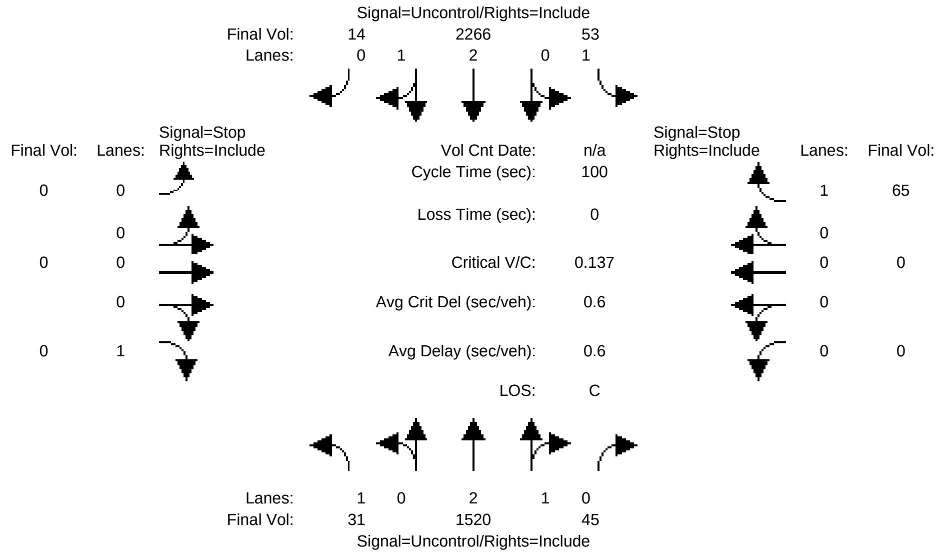
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background + Project PM

Intersection #6: El Camino Real/ Grant Ave




```
Street Name:          El Camino Real                      Grant Ave
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     31 1520    45    53 2266    14     0    0     0     0    0    63
Growth 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
Initial Bse:  31 1520    45    53 2266    14     0    0     0     0    0    63
Added Vol:     0    0     0     0    0     0     0    0     0     0    0     2
PasserByVol:   0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  31 1520    45    53 2266    14     0    0     0     0    0    65
User 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
PHF 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
PHF Volume:   31 1520    45    53 2266    14     0    0     0     0    0    65
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:  31 1520    45    53 2266    14     0    0     0     0    0    65
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 2280 xxxx xxxxx  1565 xxxx xxxxx  xxxx xxxx   762  xxxx xxxx   529
Potent Cap.:  226 xxxx xxxxx   428 xxxx xxxxx  xxxx xxxx   352  xxxx xxxx   499
Move Cap.:    226 xxxx xxxxx   428 xxxx xxxxx  xxxx xxxx   352  xxxx xxxx   499
Volume/Cap:  0.14 xxxx  xxxx  0.12 xxxx  xxxx  xxxx xxxx  0.00  xxxx xxxx  0.13
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   11.7 xxxx xxxxx  10.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  11.1
Control Del: 23.4 xxxx xxxxx  14.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  13.3
LOS by Move:    C    *     *     B    *     *     *    *     *     *    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx             13.3
ApproachLOS:        *                *                *                 B
Note: Queue reported is the distance per lane in feet.
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   31 1520    45    53 2266    14     0    0     0     0    0    65
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            13.3
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=65]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3994]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   31 1520    45    53 2266    14     0    0     0     0    0    65
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            3929
Minor Approach Volume:          65
Minor Approach Volume Threshold: -187 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
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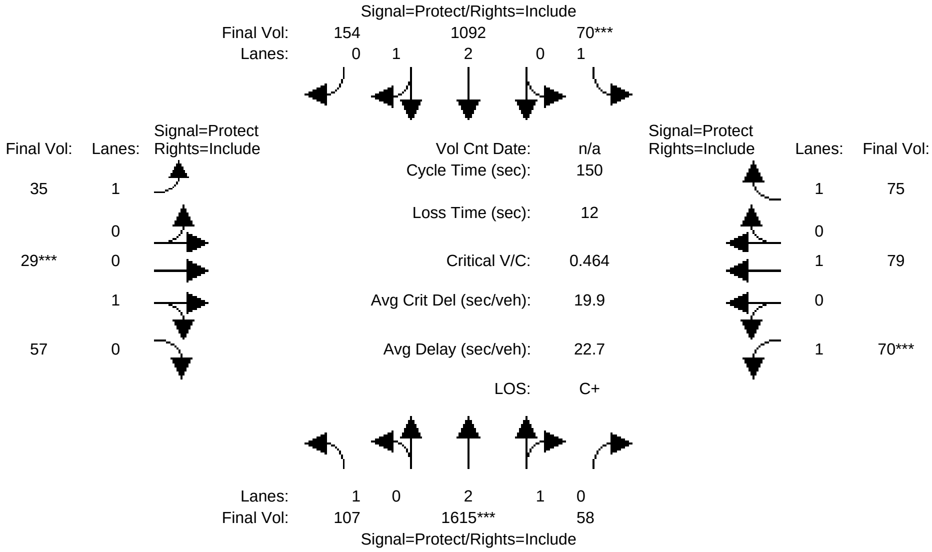
231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background AM

Intersection #7: El Camino Real/ California Ave



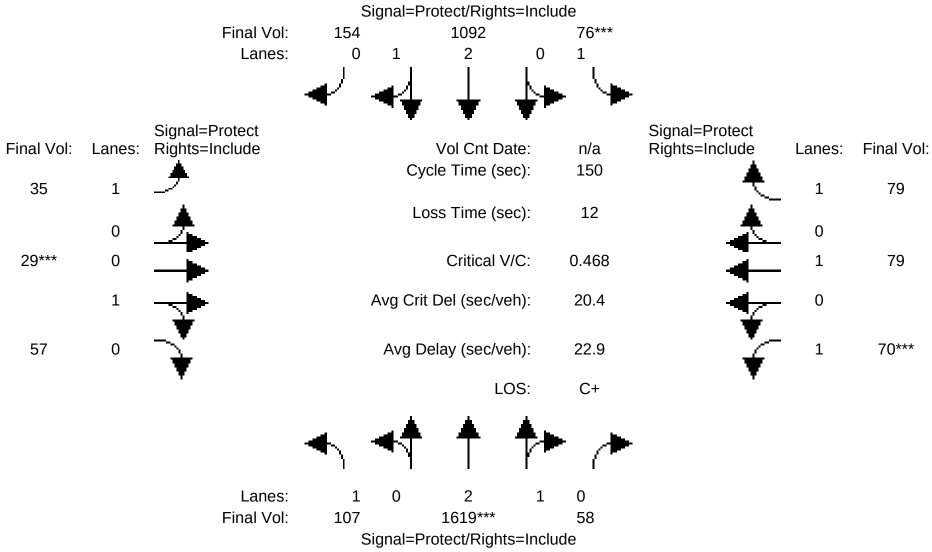
Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	107	1615	58	70	1092	154	35	29	57	70	79	75
Growth 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
Initial Bse:	107	1615	58	70	1092	154	35	29	57	70	79	75
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	107	1615	58	70	1092	154	35	29	57	70	79	75
User 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
PHF 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
PHF Volume:	107	1615	58	70	1092	154	35	29	57	70	79	75
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	107	1615	58	70	1092	154	35	29	57	70	79	75
PCE 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
MLF 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
FinalVolume:	107	1615	58	70	1092	154	35	29	57	70	79	75
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.99	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.89	0.11	1.00	2.62	0.38	1.00	0.34	0.66	1.00	1.00	1.00
Final Sat.:	1750	5406	194	1750	4907	692	1750	607	1193	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.06	0.30	0.30	0.04	0.22	0.22	0.02	0.05	0.05	0.04	0.04	0.04
Crit Moves:		****		****				****		****		
Green Time:	23.6	96.7	96.7	12.9	86.0	86.0	11.7	15.5	15.5	12.9	16.7	16.7
Volume/Cap:	0.39	0.46	0.46	0.46	0.39	0.39	0.26	0.46	0.46	0.46	0.37	0.38
Delay/Veh:	57.6	13.6	13.6	67.5	17.7	17.7	66.1	65.2	65.2	67.5	62.9	63.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	57.6	13.6	13.6	67.5	17.7	17.7	66.1	65.2	65.2	67.5	62.9	63.1
LOS by Move:	E+	B	B	E	B	B	E	E	E	E	E	E
HCM2kAvgQ:	124	321	321	95	258	258	46	109	109	95	91	94

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background + Project AM

Intersection #7: El Camino Real/ California Ave



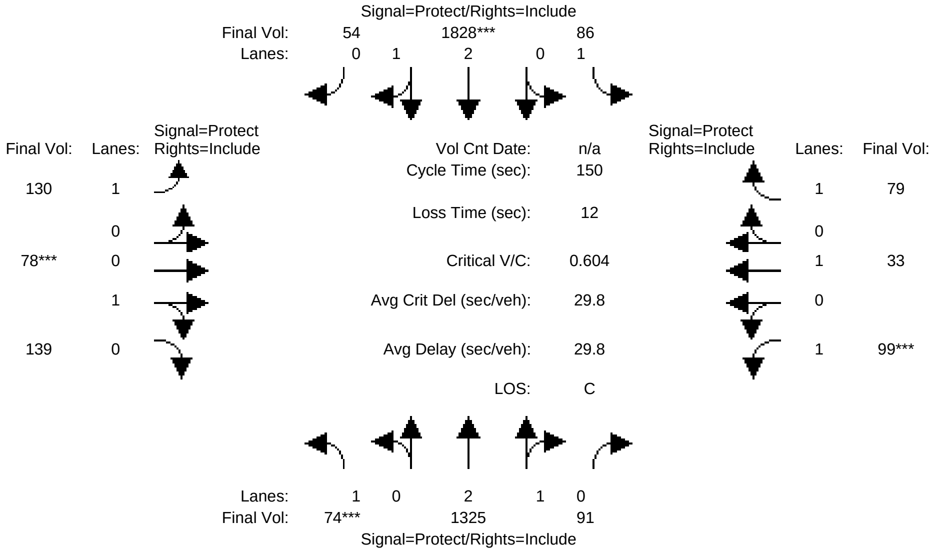
Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	107	1615	58	70	1092	154	35	29	57	70	79	75
Growth 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
Initial Bse:	107	1615	58	70	1092	154	35	29	57	70	79	75
Added Vol:	0	4	0	6	0	0	0	0	0	0	0	4
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	107	1619	58	76	1092	154	35	29	57	70	79	79
User 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
PHF 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
PHF Volume:	107	1619	58	76	1092	154	35	29	57	70	79	79
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	107	1619	58	76	1092	154	35	29	57	70	79	79
PCE 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
MLF 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
FinalVolume:	107	1619	58	76	1092	154	35	29	57	70	79	79
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.99	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.89	0.11	1.00	2.62	0.38	1.00	0.34	0.66	1.00	1.00	1.00
Final Sat.:	1750	5406	194	1750	4907	692	1750	607	1193	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.06	0.30	0.30	0.04	0.22	0.22	0.02	0.05	0.05	0.04	0.04	0.05
Crit Moves:		****		****				****		****		
Green Time:	23.7	96.0	96.0	13.9	86.2	86.2	11.6	15.3	15.3	12.8	16.5	16.5
Volume/Cap:	0.39	0.47	0.47	0.47	0.39	0.39	0.26	0.47	0.47	0.47	0.38	0.41
Delay/Veh:	57.6	14.0	14.0	66.7	17.5	17.5	66.2	65.4	65.4	67.7	63.1	63.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	57.6	14.0	14.0	66.7	17.5	17.5	66.2	65.4	65.4	67.7	63.1	63.6
LOS by Move:	E+	B	B	E	B	B	E	E	E	E	E	E
HCM2kAvgQ:	124	327	327	102	257	257	46	110	110	96	91	100

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background PM

Intersection #7: El Camino Real/ California Ave



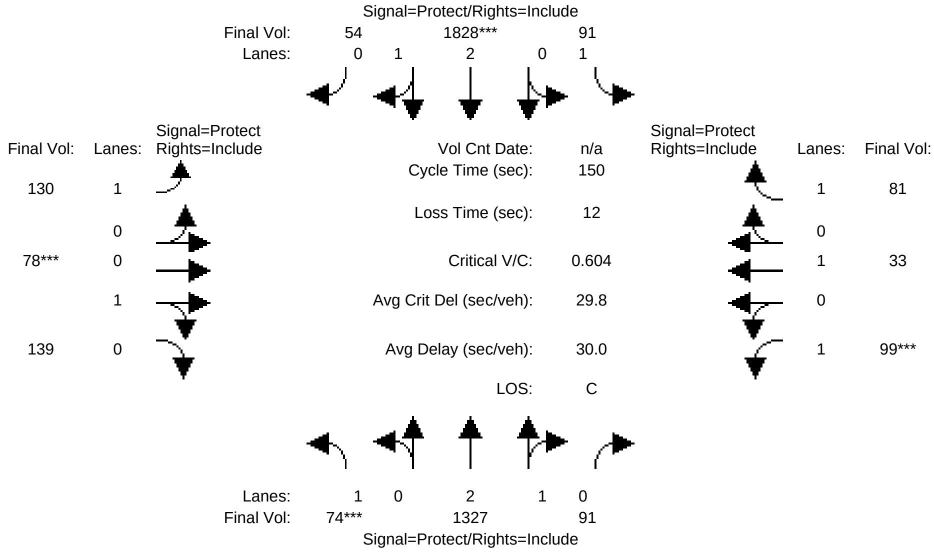
Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	74	1325	91	86	1828	54	130	78	139	99	33	79
Growth 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
Initial Bse:	74	1325	91	86	1828	54	130	78	139	99	33	79
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	74	1325	91	86	1828	54	130	78	139	99	33	79
User 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
PHF 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
PHF Volume:	74	1325	91	86	1828	54	130	78	139	99	33	79
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	74	1325	91	86	1828	54	130	78	139	99	33	79
PCE 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
MLF 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
FinalVolume:	74	1325	91	86	1828	54	130	78	139	99	33	79
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.98	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.80	0.20	1.00	2.91	0.09	1.00	0.36	0.64	1.00	1.00	1.00
Final Sat.:	1750	5240	360	1750	5439	161	1750	647	1153	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.04	0.25	0.25	0.05	0.34	0.34	0.07	0.12	0.12	0.06	0.02	0.05
Crit Moves:	****				****			****		****		
Green Time:	10.5	78.7	78.7	15.3	83.5	83.5	23.2	29.9	29.9	14.1	20.8	20.8
Volume/Cap:	0.60	0.48	0.48	0.48	0.60	0.60	0.48	0.60	0.60	0.60	0.13	0.33
Delay/Veh:	76.0	22.8	22.8	65.7	22.5	22.5	59.2	57.5	57.5	71.5	56.8	59.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	76.0	22.8	22.8	65.7	22.5	22.5	59.2	57.5	57.5	71.5	56.8	59.0
LOS by Move:	E-	C+	C+	E	C+	C+	E+	E+	E+	E	E+	E+
HCM2kAvgQ:	113	341	341	114	481	481	156	253	253	141	34	92

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background + Project PM

Intersection #7: El Camino Real/ California Ave



Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	74	1325	91	86	1828	54	130	78	139	99	33	79
Growth 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
Initial Bse:	74	1325	91	86	1828	54	130	78	139	99	33	79
Added Vol:	0	2	0	5	0	0	0	0	0	0	0	2
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	74	1327	91	91	1828	54	130	78	139	99	33	81
User 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
PHF 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
PHF Volume:	74	1327	91	91	1828	54	130	78	139	99	33	81
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	74	1327	91	91	1828	54	130	78	139	99	33	81
PCE 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
MLF 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
FinalVolume:	74	1327	91	91	1828	54	130	78	139	99	33	81
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.98	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.80	0.20	1.00	2.91	0.09	1.00	0.36	0.64	1.00	1.00	1.00
Final Sat.:	1750	5240	359	1750	5439	161	1750	647	1153	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.04	0.25	0.25	0.05	0.34	0.34	0.07	0.12	0.12	0.06	0.02	0.05
Crit Moves:	****				****			****		****		
Green Time:	10.5	78.0	78.0	16.0	83.5	83.5	23.2	29.9	29.9	14.1	20.8	20.8
Volume/Cap:	0.60	0.49	0.49	0.49	0.60	0.60	0.48	0.60	0.60	0.60	0.13	0.33
Delay/Veh:	76.0	23.3	23.3	65.1	22.5	22.5	59.2	57.5	57.5	71.5	56.8	59.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	76.0	23.3	23.3	65.1	22.5	22.5	59.2	57.5	57.5	71.5	56.8	59.1
LOS by Move:	E-	C	C	E	C+	C+	E+	E+	E+	E	E+	E+
HCM2kAvgQ:	113	346	346	119	481	481	156	253	253	141	34	95

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background AM

Intersection #8: Middlefield Rd/ Oregon Expwy

Signal=Protect/Rights=Include

Final Vol: 139 391*** 54
Lanes: 0 1 1 0 1

Final Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Include	Lanes:	Final Vol:
			Vol Cnt Date:	n/a			
157***	1		Cycle Time (sec):	150		1	25
	0		Loss Time (sec):	12		0	
928	2		Critical V/C:	0.784		2	1403***
	0		Avg Crit Del (sec/veh):	49.1		0	
171	1		Avg Delay (sec/veh):	44.9		1	144
			LOS:	D			

Lanes: 1 0 1 0 1
Final Vol: 208*** 346 121
Signal=Protect/Rights=Include

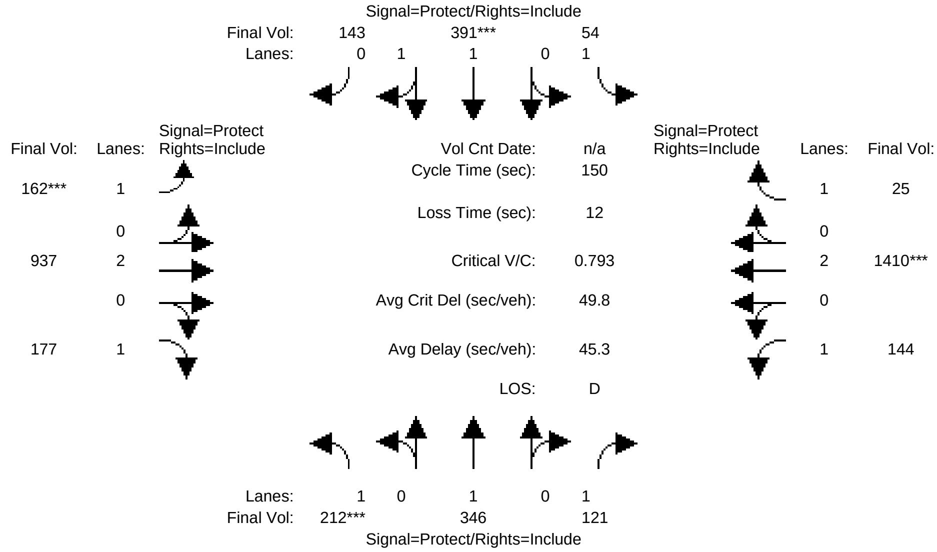
Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	208	346	121	54	391	139	157	928	171	144	1403	25
Growth 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
Initial Bse:	208	346	121	54	391	139	157	928	171	144	1403	25
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	208	346	121	54	391	139	157	928	171	144	1403	25
User 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
PHF 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
PHF Volume:	208	346	121	54	391	139	157	928	171	144	1403	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	208	346	121	54	391	139	157	928	171	144	1403	25
PCE 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
MLF 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
FinalVolume:	208	346	121	54	391	139	157	928	171	144	1403	25
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.46	0.54	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	2729	970	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.12	0.18	0.07	0.03	0.14	0.14	0.09	0.24	0.10	0.08	0.37	0.01
Crit Moves:	****				****		****				****	
Green Time:	22.7	39.9	39.9	10.2	27.4	27.4	17.2	65.7	65.7	22.1	70.7	70.7
Volume/Cap:	0.78	0.68	0.26	0.45	0.78	0.78	0.78	0.56	0.22	0.56	0.78	0.03
Delay/Veh:	75.4	53.2	43.7	69.9	64.4	64.4	82.7	31.8	26.4	62.1	35.6	21.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	75.4	53.2	43.7	69.9	64.4	64.4	82.7	31.8	26.4	62.1	35.6	21.3
LOS by Move:	E-	D-	D	E	E	E	F	C	C	E	D+	C+
HCM2kAvgQ:	294	373	117	78	340	340	236	390	128	181	693	16

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background + Project AM

Intersection #8: Middlefield Rd/ Oregon Expwy



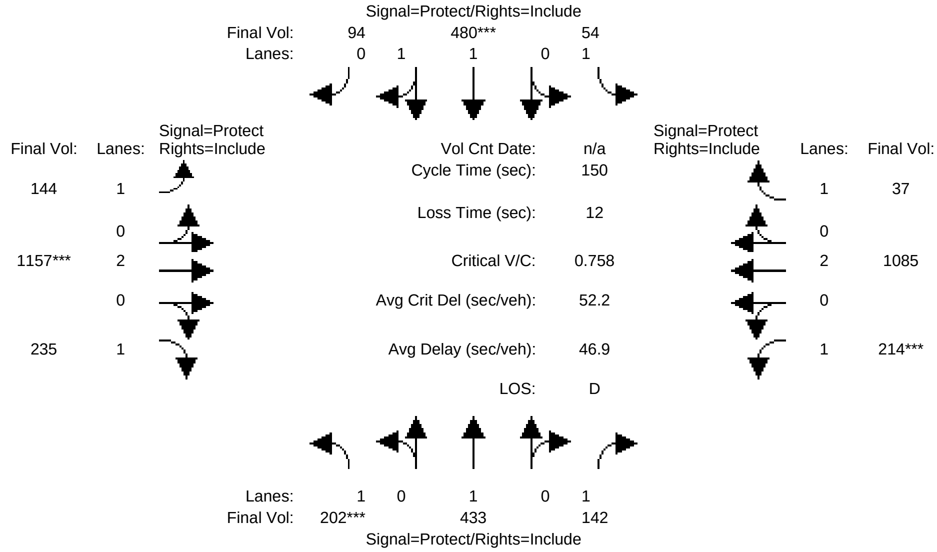
Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	208	346	121	54	391	139	157	928	171	144	1403	25
Growth 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
Initial Bse:	208	346	121	54	391	139	157	928	171	144	1403	25
Added Vol:	4	0	0	0	0	4	5	9	6	0	7	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	212	346	121	54	391	143	162	937	177	144	1410	25
User 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
PHF 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
PHF Volume:	212	346	121	54	391	143	162	937	177	144	1410	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	212	346	121	54	391	143	162	937	177	144	1410	25
PCE 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
MLF 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
FinalVolume:	212	346	121	54	391	143	162	937	177	144	1410	25
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.45	0.55	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	2708	991	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.12	0.18	0.07	0.03	0.14	0.14	0.09	0.25	0.10	0.08	0.37	0.01
Crit Moves:	****				****		****				****	
Green Time:	22.9	40.0	40.0	10.3	27.3	27.3	17.5	65.8	65.8	22.0	70.2	70.2
Volume/Cap:	0.79	0.68	0.26	0.45	0.79	0.79	0.79	0.56	0.23	0.56	0.79	0.03
Delay/Veh:	76.1	53.1	43.6	69.9	65.0	65.0	83.2	31.8	26.5	62.4	36.2	21.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	76.1	53.1	43.6	69.9	65.0	65.0	83.2	31.8	26.5	62.4	36.2	21.5
LOS by Move:	E-	D-	D	E	E	E	F	C	C	E	D+	C+
HCM2kAvgQ:	301	372	116	78	345	345	244	395	132	181	704	16

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background PM

Intersection #8: Middlefield Rd/ Oregon Expwy



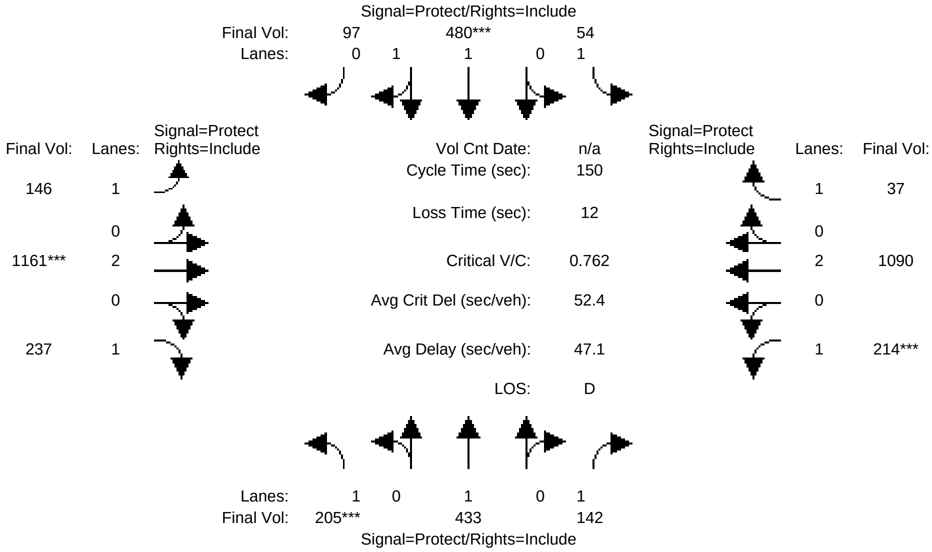
Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	202	433	142	54	480	94	144	1157	235	214	1085	37
Growth 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
Initial Bse:	202	433	142	54	480	94	144	1157	235	214	1085	37
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	202	433	142	54	480	94	144	1157	235	214	1085	37
User 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
PHF 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
PHF Volume:	202	433	142	54	480	94	144	1157	235	214	1085	37
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	202	433	142	54	480	94	144	1157	235	214	1085	37
PCE 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
MLF 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
FinalVolume:	202	433	142	54	480	94	144	1157	235	214	1085	37
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.66	0.34	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	3094	606	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.12	0.23	0.08	0.03	0.16	0.16	0.08	0.30	0.13	0.12	0.29	0.02
Crit Moves:	****				****			****		****		
Green Time:	22.8	44.4	44.4	9.1	30.7	30.7	18.9	60.3	60.3	24.2	65.6	65.6
Volume/Cap:	0.76	0.77	0.27	0.51	0.76	0.76	0.65	0.76	0.33	0.76	0.65	0.05
Delay/Veh:	72.8	54.5	40.7	72.3	60.6	60.6	69.3	40.8	31.3	71.3	34.2	24.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	72.8	54.5	40.7	72.3	60.6	60.6	69.3	40.8	31.3	71.3	34.2	24.3
LOS by Move:	E	D-	D	E	E	E	E	D	C	E	C-	C
HCM2kAvgQ:	280	482	132	82	353	353	196	588	196	293	490	25

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background + Project PM

Intersection #8: Middlefield Rd/ Oregon Expwy



Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	202	433	142	54	480	94	144	1157	235	214	1085	37
Growth 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
Initial Bse:	202	433	142	54	480	94	144	1157	235	214	1085	37
Added Vol:	3	0	0	0	0	3	2	4	2	0	5	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	205	433	142	54	480	97	146	1161	237	214	1090	37
User 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
PHF 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
PHF Volume:	205	433	142	54	480	97	146	1161	237	214	1090	37
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	205	433	142	54	480	97	146	1161	237	214	1090	37
PCE 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
MLF 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
FinalVolume:	205	433	142	54	480	97	146	1161	237	214	1090	37
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.65	0.35	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	3078	622	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.12	0.23	0.08	0.03	0.16	0.16	0.08	0.31	0.14	0.12	0.29	0.02
Crit Moves:	****				****			****		****		
Green Time:	23.1	44.6	44.6	9.1	30.7	30.7	19.0	60.2	60.2	24.1	65.3	65.3
Volume/Cap:	0.76	0.77	0.27	0.51	0.76	0.76	0.66	0.76	0.34	0.76	0.66	0.05
Delay/Veh:	72.9	54.2	40.6	72.2	60.8	60.8	69.6	41.1	31.4	71.8	34.6	24.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	72.9	54.2	40.6	72.2	60.8	60.8	69.6	41.1	31.4	71.8	34.6	24.5
LOS by Move:	E	D-	D	E	E	E	E	D	C	E	C-	C
HCM2kAvgQ:	284	480	132	82	356	356	199	593	198	294	496	25

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background AM

Intersection #9: Park Blvd/ Access#1

```
                    Signal=Uncontrol/Rights=Include
          Final Vol:    0         218         0
              Lanes:    0    1     0     0    0

                    Signal=Stop                                   Signal=Stop
Final Vol: Lanes:   Rights=Include       Vol Cnt Date:     n/a    Rights=Include   Lanes:  Final Vol:
                                    Cycle Time (sec):      100
    0        0                                                                       0        0
                                     Loss Time (sec):        0
             0                                                                       0
    0        1!                         Critical V/C:    0.000                       0        0
             0                     Avg Crit Del (sec/veh):  0.0                      0
    0        0                      Avg Delay (sec/veh):    0.0                      0        0
                                                 LOS:       A

              Lanes:    0    1     0     0    0
          Final Vol:    0         195         0
                    Signal=Uncontrol/Rights=Include
```

```
Street Name:            Park Blvd                           Access#1
Approach:      North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  195     0     0  218     0     0     0     0     0     0     0
Growth 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
Initial Bse:    0  195     0     0  218     0     0     0     0     0     0     0
Added Vol:      0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0  195     0     0  218     0     0     0     0     0     0     0
User 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
PHF 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
PHF Volume:     0  195     0     0  218     0     0     0     0     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0  195     0     0  218     0     0     0     0     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx   413  413   218  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   599  532   827  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   599  532   827  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.00 0.00  0.00  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx            xxxxxx
ApproachLOS:          *                 *                 *                 *
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
*********************************************************************************
Intersection #9 Park Blvd/ Access#1
*********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:       0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   0  195     0     0  218     0     0    0     0     0    0     0
ApproachDel:   xxxxxx           xxxxxx           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

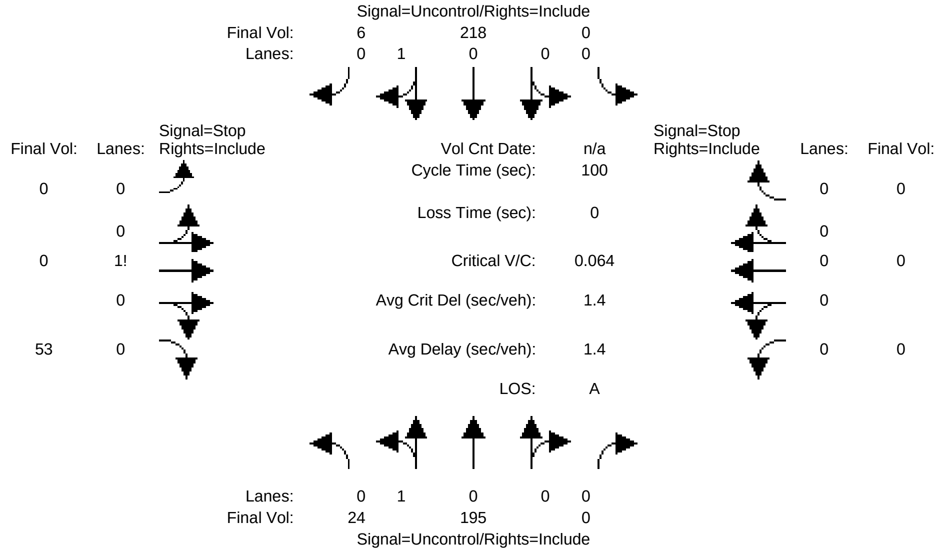
The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:       0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   0  195     0     0  218     0     0    0     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            413
Minor Approach Volume:          0
Minor Approach Volume Threshold: 455
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background + Project AM

Intersection #9: Park Blvd/ Access#1




```
Street Name:              Park Blvd                            Access#1
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:      L  -  T  -  R   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0  195     0     0  218     0     0     0     0     0     0     0
Growth 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
Initial Bse:     0  195     0     0  218     0     0     0     0     0     0     0
Added Vol:      24    0     0     0    0     6     0     0    53     0     0     0
PasserByVol:     0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    24  195     0     0  218     6     0     0    53     0     0     0
User 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
PHF 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
PHF Volume:     24  195     0     0  218     6     0     0    53     0     0     0
Reduct Vol:      0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    24  195     0     0  218     6     0     0    53     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:   4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:   2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   224 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   221  xxxx xxxx xxxxx
Potent Cap.:  1357 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   824  xxxx xxxx xxxxx
Move Cap.:    1357 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   824  xxxx xxxx xxxxx
Volume/Cap:   0.02 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.06  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:     1.4 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   5.1  xxxx xxxx xxxxx
Control Del:   7.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   9.7 xxxxx xxxx xxxxx
LOS by Move:     A    *     *     *    *     *     *    *     A     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.:  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:   0.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:   7.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:      A    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx              9.7            xxxxxx
ApproachLOS:          *                 *                A                 *
Note: Queue reported is the distance per lane in feet.
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  1   0  0  0  0  0
Initial Vol:   24  195     0     0  218     6     0    0    53     0    0     0
ApproachDel:     xxxxxx           xxxxxx              9.7           xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=53]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=496]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

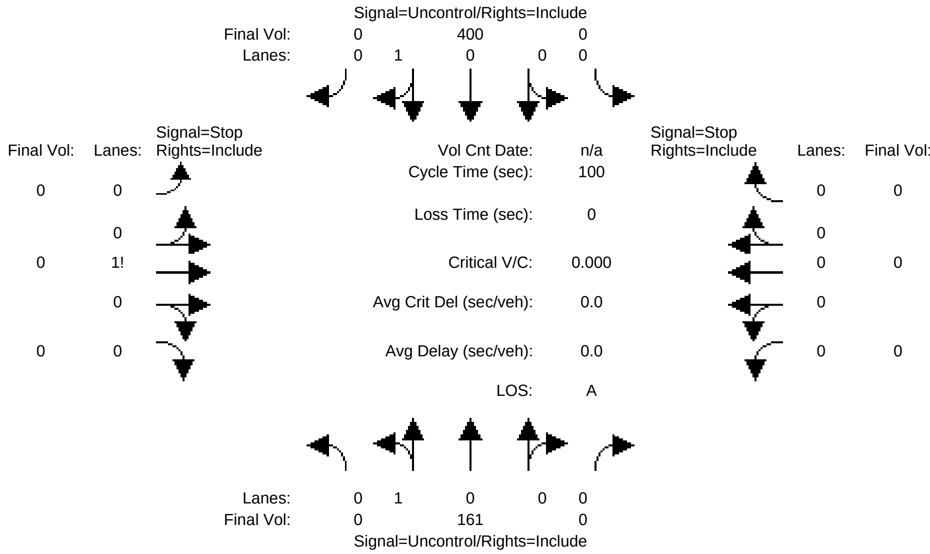
The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  1   0  0  0  0  0
Initial Vol:   24  195     0     0  218     6     0    0    53     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            443
Minor Approach Volume:          53
Minor Approach Volume Threshold: 437
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```


231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background PM

Intersection #9: Park Blvd/ Access#1




```
Street Name:              Park Blvd                          Access#1
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  161     0     0  400     0     0    0     0     0    0     0
Growth 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
Initial Bse:    0  161     0     0  400     0     0    0     0     0    0     0
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0  161     0     0  400     0     0    0     0     0    0     0
User 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
PHF 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
PHF Volume:     0  161     0     0  400     0     0    0     0     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  161     0     0  400     0     0    0     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx   561  561   400  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   492  439   654  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   492  439   654  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.00 0.00  0.00  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx            xxxxxx
ApproachLOS:          *                 *                 *                 *
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    0  161     0     0  400     0     0    0     0     0    0     0
ApproachDel:    xxxxxx           xxxxxx           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
--------------------------------------------------------------------------------
```

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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```
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    0  161     0     0  400     0     0    0     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            561
Minor Approach Volume:          0
Minor Approach Volume Threshold: 374
--------------------------------------------------------------------------------
```

SIGNAL WARRANT DISCLAIMER
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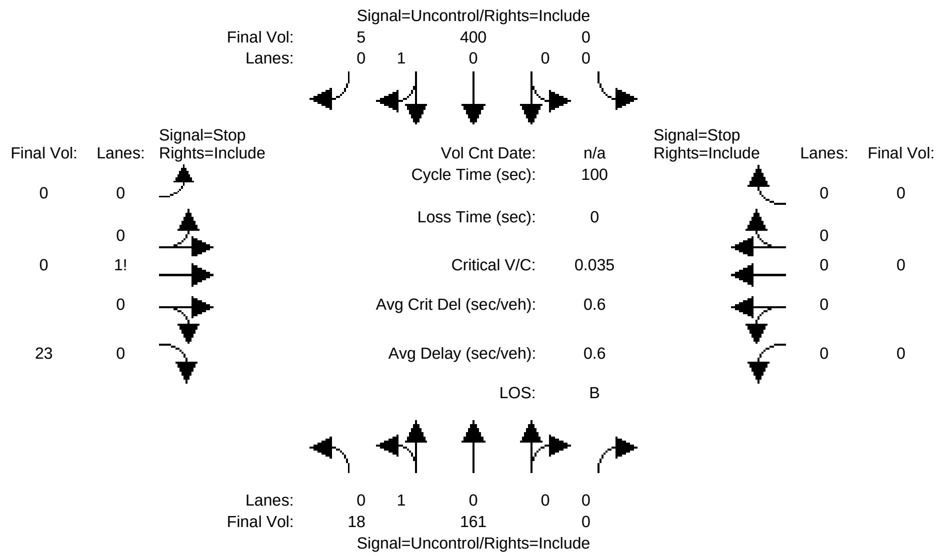
231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background + Project PM

Intersection #9: Park Blvd/ Access#1




```
Street Name:                Park Blvd                            Access#1
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0  161     0     0  400     0     0     0     0     0     0     0
Growth 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
Initial Bse:     0  161     0     0  400     0     0     0     0     0     0     0
Added Vol:      18    0     0     0    0     5     0     0    23     0     0     0
PasserByVol:     0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    18  161     0     0  400     5     0     0    23     0     0     0
User 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
PHF 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
PHF Volume:     18  161     0     0  400     5     0     0    23     0     0     0
Reduct Vol:      0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    18  161     0     0  400     5     0     0    23     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:   4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:   2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   405 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   403  xxxx xxxx xxxxx
Potent Cap.:  1165 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   652  xxxx xxxx xxxxx
Move Cap.:    1165 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   652  xxxx xxxx xxxxx
Volume/Cap:   0.02 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.04  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:     1.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   2.7  xxxx xxxx xxxxx
Control Del:   8.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  10.7 xxxxx xxxx xxxxx
LOS by Move:     A    *     *     *    *     *     *    *     B     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:   0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:   8.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:      A    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:      xxxxxx            xxxxxx              10.7            xxxxxx
ApproachLOS:           *                 *                 B                 *
Note: Queue reported is the distance per lane in feet.
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  1   0  0  0  0  0
Initial Vol:   18  161     0     0  400     5     0     0    23     0     0     0
ApproachDel:    xxxxxx           xxxxxx             10.7            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=23]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=607]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  0  0  1   0  0  0  0  0
Initial Vol:   18  161     0     0  400     5     0     0    23     0     0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             584
Minor Approach Volume:           23
Minor Approach Volume Threshold: 363
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

APPENDIX F

City of Palo Alto Comprehensive Plan 2030

Study Scenarios Summary

Comp Plan Key Characteristics

	Existing (2014)	Scenario 1 (2030)	Scenario 2 (2030)	Scenario 3 (2030)	Scenario 4 (2030)	Scenario 5 (2030)	Scenario 6 (2030)	Preferred Scenario - Low (2030)	Preferred Scenario - High (2030)	Preferred Scenario - Mid-Point (2030)	Preferred Scenario - Council Reduced (2030)	No Growth (2030)	
POPULATION													
Additional residents in City	--	6,599	6,599	8,436	10,455	8,436	14,078	8,432	10,455	9,444	9,444	1,233	
Additional residents in City + SOI	--	9,405	9,405	11,242	13,261	11,242	16,884	11,238	13,261	12,250	12,250	1,233	
Total in City	65,686	72,284	72,284	74,121	76,141	74,121	79,764	74,118	76,141	75,130	75,130	66,919	
Total in City + SOI	80,806	90,210	90,210	92,047	94,067	92,047	97,690	92,044	94,067	93,056	93,056	82,039	
Average household size in City	2.40	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.41	2.40	
Average household size in SOI	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
HOUSING													
Additional housing units in City	--	2,720	2,720	3,546	4,418	3,546	6,000	3,547	4,418	3,983	3,983	540	
Additional housing units in City + SOI	--	3,881	3,881	4,707	5,579	4,707	7,161	4,707	5,579	5,143	5,143	540	
Total in City	28,546	31,266	31,266	32,092	32,964	32,092	34,547	32,093	32,964	32,529	32,529	29,086	
Total in City and SOI	33,071	36,952	36,952	37,778	38,650	37,778	40,233	37,778	38,650	38,214	38,214	33,611	
JOBS													
Gain in City	--	15,482	9,853	12,758	15,482	8,869	8,869	9,853	11,500	10,677	7,321	3,882	
Total in City	95,458	110,940	105,311	108,216	110,940	104,327	104,327	105,311	106,958	106,135	102,779	99,340	*Note: assumes same SOI*
Total in City + SOI	100,829	116,700	111,071	113,977	116,700	110,087	110,087	111,072	112,719	111,895	108,539	104,711	*buildout as Scenarios 1-4*
EMPLOYED RESIDENTS													
City	31,165	34,696	34,696	35,578	36,548	35,578	38,287	35,577	36,548	36,062	36,062	32,121	
City + SOI	36,004	40,595	40,595	41,421	42,330	41,421	43,960	41,420	42,330	41,875	41,875	36,918	
JOBS/EMPLOYED RESIDENTS RATIO													
City	3.06	3.20	3.04	3.04	3.04	2.93	2.72	2.96	2.93	2.94	2.85	3.09	
City + SOI	2.80	2.87	2.74	2.75	2.76	2.66	2.50	2.68	2.66	2.67	2.59	2.84	

Date Modified: 5/26/2017

APPENDIX G

City of Palo Alto Comprehensive Plan 2030

Intersection Volumes

Comprehensive Plan Update TIA - November 2016
City of Palo Alto

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Scenario 5 AM

Intersection #17: Middlefield Road & Oregon Expressway (CMP #5108)

Signal=Split/Rights=Include
Final Vol: 247 246 131***
Lanes: 0 1 0 1 0

Signal=Protect Rights=Overlap (Eastbound)
Final Vol: / Lanes:
123*** 1
0
1145 2
0
173 1

Vol Cnt Date: 2/26/2013
Cycle Time (sec): 149
Loss Time (sec): 12
Critical V/C: 0.862
Avg Crit Del (sec/veh): 58.7
Avg Delay (sec/veh): 53.5
LOS: D

Signal=Protect Rights=Overlap (Westbound)
Lanes: / Final Vol:
1 57
0
2 1256***
0
1 127

Lanes: 0 1 0 1 0
Final Vol: 286 303 196***
Signal=Split/Rights=Include

Street Name:	Middlefield Road						Oregon Expressway					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module: >> Count Date: 26 Feb 2013 << AM												
Base Vol:	286	303	196	131	246	247	123	1145	173	127	1256	57
Growth 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
Initial Bse:	286	303	196	131	246	247	123	1145	173	127	1256	57
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	286	303	196	131	246	247	123	1145	173	127	1256	57
User 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
PHF 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
PHF Volume:	286	303	196	131	246	247	123	1145	173	127	1256	57
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	286	303	196	131	246	247	123	1145	173	127	1256	57
PCE 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
MLF 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
FinalVolume:	286	303	196	131	246	247	123	1145	173	127	1256	57
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.95	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	0.73	0.77	0.50	0.42	0.79	0.79	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1312	1390	899	756	1419	1425	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.22	0.22	0.22	0.17	0.17	0.17	0.07	0.30	0.10	0.07	0.33	0.03
Crit Moves:			****	****			****				****	
Green Time:	37.7	37.7	37.7	30.0	30.0	30.0	12.2	55.9	93.6	13.5	57.2	87.1
Volume/Cap:	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.80	0.16	0.80	0.86	0.06
Delay/Veh:	61.6	61.6	61.6	67.8	67.8	67.8	105.6	45.1	11.5	91.4	47.8	13.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	61.6	61.6	61.6	67.8	67.8	67.8	105.6	45.1	11.5	91.4	47.8	13.3
LOS by Move:	E	E	E	E	E	E	F	D	B	F	D	B
HCM2kAvgQ:	21	21	21	17	17	17	8	25	3	8	29	1

Note: Queue reported is the number of cars per lane.

Comprehensive Plan Update TIA - November 2016
City of Palo Alto

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Scenario 5 AM

Intersection #6: El Camino Real & Page Mill Rd/Oregon Expwy (CMP #1104)

Signal=Protect/Rights=Overlap
Final Vol: 429 687 339***
Lanes: 1 0 3 0 2

Signal=Protect
Rights=Overlap
Final Vol: Lanes:
439*** 2
0
849 2
0
159 1

Vol Cnt Date: 3/18/2014
Cycle Time (sec): 167
Loss Time (sec): 12
Critical V/C: 0.814
Avg Crit Del (sec/veh): 65.5
Avg Delay (sec/veh): 63.7
LOS: E

Signal=Protect
Rights=Include
Lanes: Final Vol:
1 164
0
2 976***
0
2 259

Lanes: 2 0 2 1 0
Final Vol: 558 1202*** 207
Signal=Protect/Rights=Include

Street Name:	El Camino Real						Page Mill Rd/Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module: >> Count Date: 18 Mar 2014 << 8:00 AM - 9:00 AM												
Base Vol:	558	1202	207	339	687	429	439	849	159	259	976	164
Growth 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
Initial Bse:	558	1202	207	339	687	429	439	849	159	259	976	164
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	558	1202	207	339	687	429	439	849	159	259	976	164
User 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
PHF 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
PHF Volume:	558	1202	207	339	687	429	439	849	159	259	976	164
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	558	1202	207	339	687	429	439	849	159	259	976	164
PCE 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
MLF 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
FinalVolume:	558	1202	207	339	687	429	439	849	159	259	976	164
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	1.00	0.92
Lanes:	2.00	2.54	0.46	2.00	3.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3150	4776	823	3150	5700	1750	3150	3800	1750	3150	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.18	0.25	0.25	0.11	0.12	0.25	0.14	0.22	0.09	0.08	0.26	0.09
Crit Moves:		****		****			****				****	
Green Time:	43.9	51.6	51.6	22.1	29.8	58.4	28.6	59.4	103.3	21.9	52.7	52.7
Volume/Cap:	0.67	0.81	0.81	0.81	0.67	0.70	0.81	0.63	0.15	0.63	0.81	0.30
Delay/Veh:	57.4	56.3	56.3	82.1	65.8	50.4	75.9	45.6	13.4	71.8	57.0	43.5
User DelAdj:	1.00	1.00	1.00	1.40	1.40	1.40	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	57.4	56.3	56.3	115.0	92.2	70.5	75.9	45.6	13.4	71.8	57.0	43.5
LOS by Move:	E	E	E	F	F	E	E	D	B	E	E	D
HCM2kAvgQ:	16	24	24	12	12	21	15	18	4	8	24	7

Note: Queue reported is the number of cars per lane.

Comprehensive Plan Update TIA - November 2016
City of Palo Alto

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Scenario 5 PM

Intersection #6: El Camino Real & Page Mill Rd/Oregon Expwy (CMP #1104)

Signal=Protect/Rights=Include
Final Vol: 397 1622 555***
Lanes: 1 0 3 0 2

Signal=Protect Rights=Overlap

Final Vol:	Lanes:
633	2
	0
1273***	2
	0
403	1

Vol Cnt Date:	3/18/2014
Cycle Time (sec):	130
Loss Time (sec):	12
Critical V/C:	0.990
Avg Crit Del (sec/veh):	72.7
Avg Delay (sec/veh):	64.1
LOS:	E

Signal=Protect Rights=Include

Lanes:	Final Vol:
1	212
0	
2	903
0	
2	332***

Lanes: 2 0 2 1 0
Final Vol: 381 1140*** 437
Signal=Protect/Rights=Include

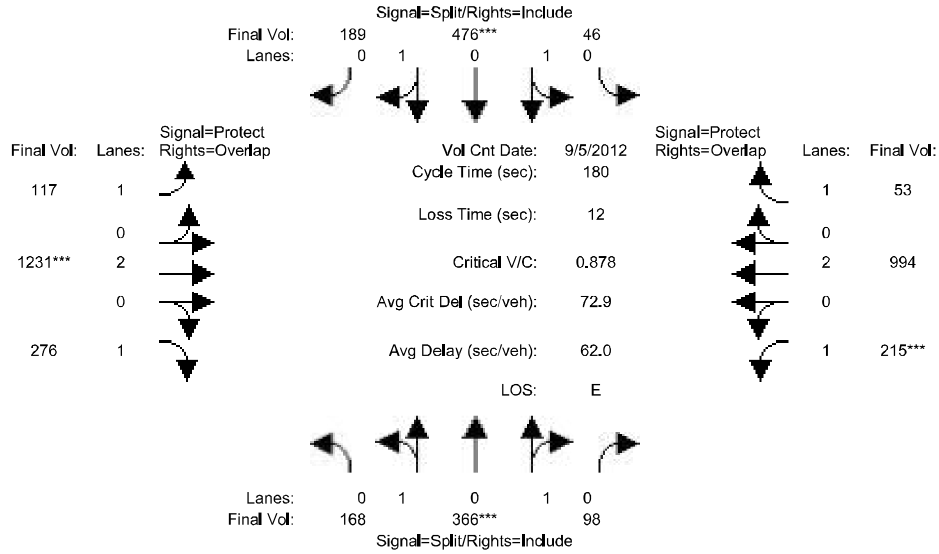
Street Name:	El Camino Real						Page Mill Rd/Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module: >> Count Date: 18 Mar 2014 << 5:00 PM - 6:00 PM												
Base Vol:	381	1140	437	555	1622	397	633	1273	403	332	903	212
Growth 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
Initial Bse:	381	1140	437	555	1622	397	633	1273	403	332	903	212
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	381	1140	437	555	1622	397	633	1273	403	332	903	212
User 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
PHF 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
PHF Volume:	381	1140	437	555	1622	397	633	1273	403	332	903	212
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	381	1140	437	555	1622	397	633	1273	403	332	903	212
PCE 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
MLF 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
FinalVolume:	381	1140	437	555	1622	397	633	1273	403	332	903	212
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	1.00	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	1.00	0.92
Lanes:	2.00	2.14	0.86	2.00	3.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3150	4046	1551	3150	5700	1750	3150	3800	1750	3150	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.12	0.28	0.28	0.18	0.28	0.23	0.20	0.34	0.23	0.11	0.24	0.12
Crit Moves:		****		****				****		****		
Green Time:	17.9	37.0	37.0	23.1	42.2	42.2	26.5	44.0	61.9	13.8	31.3	31.3
Volume/Cap:	0.88	0.99	0.99	0.99	0.88	0.70	0.99	0.99	0.48	0.99	0.99	0.50
Delay/Veh:	72.8	66.4	66.4	88.6	46.5	42.2	83.3	65.3	23.6	104.2	75.2	43.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	72.8	66.4	66.4	88.6	46.5	42.2	83.3	65.3	23.6	104.2	75.2	43.6
LOS by Move:	E	E	E	F	D	D	F	E	C	F	E	D
HCM2kAvgQ:	12	27	27	18	23	16	20	31	12	12	23	8

Note: Queue reported is the number of cars per lane.

Comprehensive Plan Update TIA - November 2016
City of Palo Alto

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Scenario 5 PM

Intersection #17: Middlefield Road & Oregon Expressway (CMP #5108)



Street Name:	Middlefield Road						Oregon Expressway					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	14	10	10	14	10	10	14	67	10	14	68	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module: >> Count Date: 5 Sep 2012 << 5:30-6:30PM												
Base Vol:	168	366	98	46	476	189	117	1231	276	215	994	53
Growth 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
Initial Bse:	168	366	98	46	476	189	117	1231	276	215	994	53
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	168	366	98	46	476	189	117	1231	276	215	994	53
User 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
PHF 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
PHF Volume:	168	366	98	46	476	189	117	1231	276	215	994	53
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	168	366	98	46	476	189	117	1231	276	215	994	53
PCE 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
MLF 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
FinalVolume:	168	366	98	46	476	189	117	1231	276	215	994	53
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.95	0.95	0.95	0.95	0.95	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	0.53	1.16	0.31	0.13	1.34	0.53	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	957	2085	558	233	2410	957	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.18	0.18	0.18	0.20	0.20	0.20	0.07	0.32	0.16	0.12	0.26	0.03
Crit Moves:		****			****			****		****		
Green Time:	35.8	35.8	35.8	40.2	40.2	40.2	15.7	67.0	102.8	25.0	76.3	116.5
Volume/Cap:	0.88	0.88	0.88	0.88	0.88	0.88	0.77	0.87	0.28	0.88	0.62	0.05
Delay/Veh:	82.7	82.7	82.7	79.0	79.0	79.0	100.8	58.6	19.8	105.4	41.2	11.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	82.7	82.7	82.7	79.0	79.0	79.0	100.8	58.6	19.8	105.4	41.2	11.6
LOS by Move:	F	F	F	E	E	E	F	E	B	F	D	B
HCM2kAvgQ:	21	21	21	23	23	23	8	33	8	15	21	1

Note: Queue reported is the number of cars per lane.

Comprehensive Plan Update TIA - August 2015
City of Palo Alto

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Count Year AM Peak Hour

Intersection #6: El Camino Real & Page Mill Rd/Oregon Expwy (CMP #1104)

Signal=Protect/Rights=Overlap
Final Vol: 290 564 311***
Lanes: 1 0 3 0 2

Final Vol:	Lanes:	Signal=Protect Rights=Overlap			Signal=Protect Rights=Include	Lanes:	Final Vol:
			Vol Cnt Date:	3/18/2014			
439***	2		Cycle Time (sec):	167		0	157
	0		Loss Time (sec):	12		1	
849	2		Critical V/C:	0.819		1	970***
	0		Avg Crit Del (sec/veh):	65.6		0	
127	1		Avg Delay (sec/veh):	62.7		2	259
			LOS:	E			

Lanes: 2 0 2 1 0
Final Vol: 416 1010*** 207
Signal=Protect/Rights=Include

Street Name:	El Camino Real						Page Mill Rd/Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module: >> Count Date: 18 Mar 2014 << 8:00 AM - 9:00 AM												
Base Vol:	416	1010	207	311	564	290	439	849	127	259	970	157
Growth 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
Initial Bse:	416	1010	207	311	564	290	439	849	127	259	970	157
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	416	1010	207	311	564	290	439	849	127	259	970	157
User 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
PHF 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
PHF Volume:	416	1010	207	311	564	290	439	849	127	259	970	157
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	416	1010	207	311	564	290	439	849	127	259	970	157
PCE 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
MLF 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
FinalVolume:	416	1010	207	311	564	290	439	849	127	259	970	157
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	0.98	0.95
Lanes:	2.00	2.47	0.53	2.00	3.00	1.00	2.00	2.00	1.00	2.00	1.71	0.29
Final Sat.:	3150	4646	952	3150	5700	1750	3150	3800	1750	3150	3184	515
Capacity Analysis Module:												
Vol/Sat:	0.13	0.22	0.22	0.10	0.10	0.17	0.14	0.22	0.07	0.08	0.30	0.30
Crit Moves:		****		****			****				****	
Green Time:	36.9	44.3	44.3	20.1	27.6	56.0	28.4	66.2	103.0	24.4	62.1	62.1
Volume/Cap:	0.60	0.82	0.82	0.82	0.60	0.49	0.82	0.56	0.12	0.56	0.82	0.82
Delay/Veh:	59.9	61.3	61.3	84.8	65.6	44.8	76.5	39.7	13.3	68.0	51.4	51.4
User DelAdj:	1.00	1.00	1.00	1.40	1.40	1.40	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	59.9	61.3	61.3	118.7	91.9	62.8	76.5	39.7	13.3	68.0	51.4	51.4
LOS by Move:	E	E	E	F	F	E	E	D	B	E	D	D
HCM2kAvgQ:	12	21	21	11	9	13	15	17	3	8	28	28

Note: Queue reported is the number of cars per lane.

Comprehensive Plan Update TIA - November 2016
City of Palo Alto

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Count Year AM Peak Hour

Intersection #17: Middlefield Road & Oregon Expressway (CMP #5108)

Signal=Protect/Rights=Overlap
Final Vol: 131 246*** 35
Lanes: 1 0 1 0 1

Signal=Protect Rights=Overlap (Eastbound) | Signal=Protect Rights=Overlap (Westbound)

Final Vol:	Lanes:					Lanes:	Final Vol:
123***	1		Vol Cnt Date:	9/28/2016		1	56
			Cycle Time (sec):	150			
	0		Loss Time (sec):	12		0	
1137	2		Critical V/C:	0.754		2	1256***
	0		Avg Crit Del (sec/veh):	48.3		0	
162	1		Avg Delay (sec/veh):	42.8		1	127
			LOS:	D			

Lanes: 1 0 1 0 1
Final Vol: 286*** 297 196
Signal=Protect/Rights=Overlap

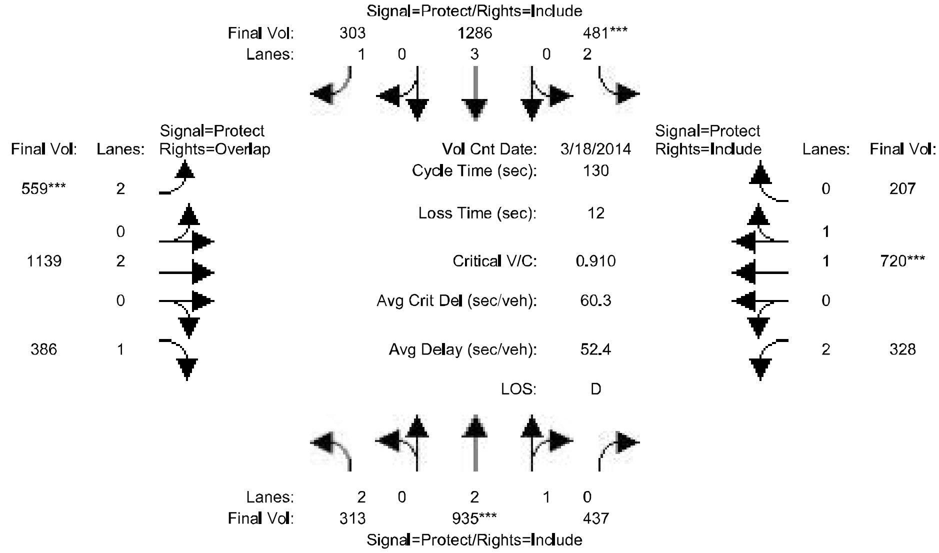
Street Name:	Middlefield Road						Oregon Expressway					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module: >> Count Date: 28 Sep 2016 << AM												
Base Vol:	286	297	196	35	246	131	123	1137	162	127	1256	56
Growth 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
Initial Bse:	286	297	196	35	246	131	123	1137	162	127	1256	56
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	286	297	196	35	246	131	123	1137	162	127	1256	56
User 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
PHF 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
PHF Volume:	286	297	196	35	246	131	123	1137	162	127	1256	56
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	286	297	196	35	246	131	123	1137	162	127	1256	56
PCE 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
MLF 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
FinalVolume:	286	297	196	35	246	131	123	1137	162	127	1256	56
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	1.00	0.92	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	1900	1750	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.16	0.16	0.11	0.02	0.13	0.07	0.07	0.30	0.09	0.07	0.33	0.03
Crit Moves:	****				****		****				****	
Green Time:	32.5	44.9	60.4	13.4	25.8	39.7	14.0	64.2	96.7	15.6	65.8	79.1
Volume/Cap:	0.75	0.52	0.28	0.22	0.75	0.28	0.75	0.70	0.14	0.70	0.75	0.06
Delay/Veh:	63.3	44.6	30.3	64.2	68.7	44.1	84.3	36.4	10.5	76.4	37.3	17.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	63.3	44.6	30.3	64.2	68.7	44.1	84.3	36.4	10.5	76.4	37.3	17.3
LOS by Move:	E	D	C	E	E	D	F	D	B	E	D	B
HCM2kAvgQ:	15	11	6	2	12	5	8	22	3	7	25	1

Note: Queue reported is the number of cars per lane.

Comprehensive Plan Update TIA - August 2015
City of Palo Alto

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Count Year PM Peak Hour

Intersection #6: El Camino Real & Page Mill Rd/Oregon Expwy (CMP #1104)



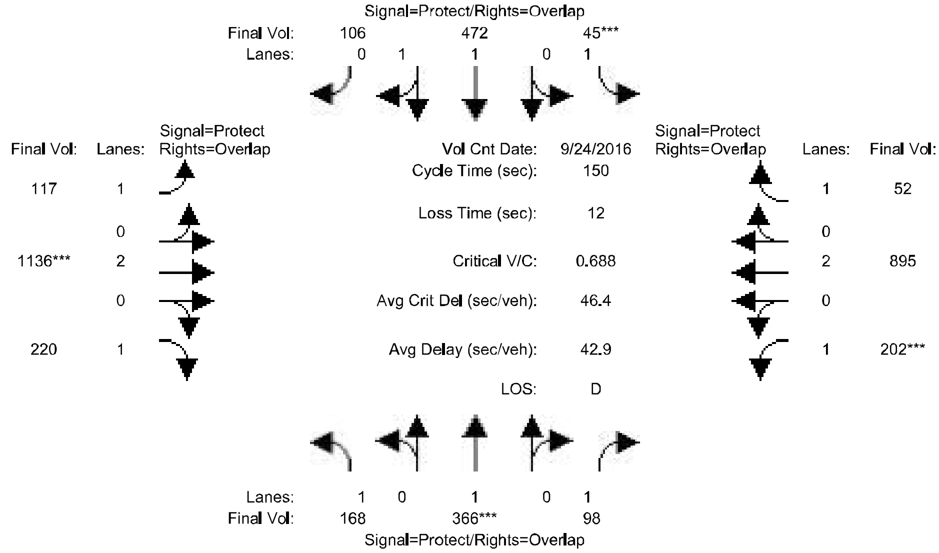
Street Name:	El Camino Real						Page Mill Rd/Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module: >> Count Date: 18 Mar 2014 << 5:00 PM - 6:00 PM												
Base Vol:	313	935	437	481	1286	303	559	1139	386	328	720	207
Growth 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
Initial Bse:	313	935	437	481	1286	303	559	1139	386	328	720	207
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	313	935	437	481	1286	303	559	1139	386	328	720	207
User 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
PHF 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
PHF Volume:	313	935	437	481	1286	303	559	1139	386	328	720	207
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	313	935	437	481	1286	303	559	1139	386	328	720	207
PCE 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
MLF 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
FinalVolume:	313	935	437	481	1286	303	559	1139	386	328	720	207
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	1.00	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	0.98	0.95
Lanes:	2.00	2.01	0.99	2.00	3.00	1.00	2.00	2.00	1.00	2.00	1.54	0.46
Final Sat.:	3150	3814	1783	3150	5700	1750	3150	3800	1750	3150	2873	826
Capacity Analysis Module:												
Vol/Sat:	0.10	0.25	0.25	0.15	0.23	0.17	0.18	0.30	0.22	0.10	0.25	0.25
Crit Moves:		****		****			****				****	
Green Time:	17.4	35.0	35.0	21.8	39.5	39.5	25.4	45.4	62.8	15.8	35.8	35.8
Volume/Cap:	0.74	0.91	0.91	0.91	0.74	0.57	0.91	0.86	0.46	0.86	0.91	0.91
Delay/Veh:	61.2	54.5	54.5	72.9	42.5	39.6	68.8	45.2	22.7	73.4	57.4	57.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	61.2	54.5	54.5	72.9	42.5	39.6	68.8	45.2	22.7	73.4	57.4	57.4
LOS by Move:	E	D	D	E	D	D	E	D	C	E	E	E
HCM2kAvgQ:	9	22	22	15	16	11	17	24	11	10	22	22

Note: Queue reported is the number of cars per lane.

Comprehensive Plan Update TIA - November 2016
City of Palo Alto

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Count Year PM Peak Hour

Intersection #17: Middlefield Road & Oregon Expressway (CMP #5108)



Street Name:	Middlefield Road						Oregon Expressway					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	14	10	10	14	10	10	14	65	10	14	63	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module: >> Count Date: 24 Sep 2016 << PM												
Base Vol:	168	366	98	45	472	106	117	1136	220	202	895	52
Growth 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
Initial Bse:	168	366	98	45	472	106	117	1136	220	202	895	52
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	168	366	98	45	472	106	117	1136	220	202	895	52
User 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
PHF 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
PHF Volume:	168	366	98	45	472	106	117	1136	220	202	895	52
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	168	366	98	45	472	106	117	1136	220	202	895	52
PCE 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
MLF 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
FinalVolume:	168	366	98	45	472	106	117	1136	220	202	895	52
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.62	0.38	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	3021	678	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.10	0.19	0.06	0.03	0.16	0.16	0.07	0.30	0.13	0.12	0.24	0.03
Crit Moves:		****		****				****		****		
Green Time:	19.4	36.9	59.0	14.0	31.5	47.4	15.8	65.0	84.4	22.1	71.3	85.3
Volume/Cap:	0.74	0.78	0.14	0.28	0.74	0.49	0.63	0.69	0.22	0.78	0.50	0.05
Delay/Veh:	75.4	61.2	29.3	64.2	59.4	41.9	71.3	35.6	16.5	76.1	27.2	14.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	75.4	61.2	29.3	64.2	59.4	41.9	71.3	35.6	16.5	76.1	27.2	14.4
LOS by Move:	E	E	C	E	E	D	E	D	B	E	C	B
HCM2kAvgQ:	10	18	4	2	15	13	7	21	5	11	14	1

Note: Queue reported is the number of cars per lane.

APPENDIX H

Cumulative Conditions

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

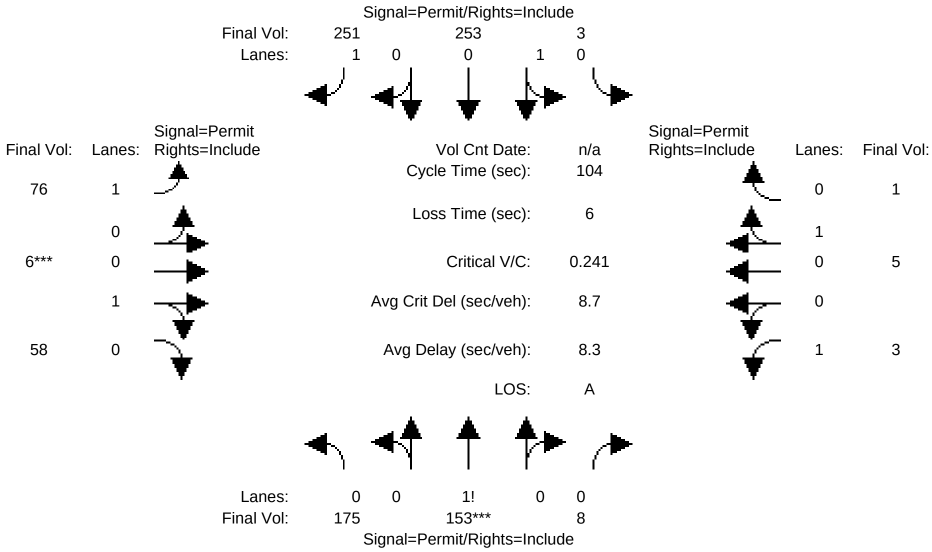
Summary Scenario Comparison Report (With Average Critical Delay)
Future Volume Alternative

		Cumulative AM				Cumulative + Project AM				Cumulative PM						Cumulative + Project PM			
Intersection		LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Crit V/C Change	Avg Crit Del (sec)	Avg Crit Del Change	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)
#1	Park Blvd/ Page Mill Rd	A	8.3	0.241	8.7	A	9.6	0.264	11.7	A	5.0	0.286	+ 0.021	4.2	- 7.5	A	5.7	0.314	6.6
#2	Park Blvd /Sherman Ave	B	2.8	0.066	2.8	B	2.7	0.066	2.7	B	4.2	0.202	+ 0.135	4.2	+ 1.5	B	4.2	0.203	4.2
#3	Birch St/ Sheridan Ave	E	4.3	0.287	4.3	E	5.6	0.298	5.6	C	4.7	0.269	- 0.029	4.7	- 0.9	D	5.1	0.308	5.1
#4	Birch St/ Grant Ave	B	14.0	0.681	14.0	C	15.1	0.716	15.1	A	9.7	0.451	- 0.264	9.7	- 5.4	A	9.9	0.466	9.9
#5	El Camino Real/ Page Mill Rd/ Oregon Expwy	D	50.2	0.890	56.0	D	50.9	0.901	57.0	D-	52.6	0.917	+ 0.016	60.6	+ 3.6	D-	53.2	0.924	61.6
#6	El Camino Real/ Grant Ave	C	0.9	0.261	0.9	C	1.0	0.261	1.0	D	0.7	0.204	- 0.058	0.7	- 0.3	D	0.7	0.204	0.7
#7	El Camino Real/ California Ave	C+	22.8	0.519	20.3	C	23.1	0.523	20.7	C	30.5	0.675	+ 0.152	30.6	+ 9.9	C	30.7	0.675	30.6
#8	Middlefield Rd/ Oregon Expwy	D	48.9	0.842	54.5	D	49.4	0.851	55.5	D	48.7	0.808	- 0.043	54.8	- 0.7	D	48.9	0.812	55.1
#9	Park Blvd/ Access#1	A	0.0	0.000	0.0	A	1.3	0.066	1.3	A	0.0	0.000	- 0.066	0.0	- 1.3	B	0.6	0.037	0.6

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative AM

Intersection #1: Park Blvd/ Page Mill Rd



Street Name:	Park Blvd						Page Mill Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	175	153	8	3	253	251	76	6	58	3	5	1
Growth 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
Initial Bse:	175	153	8	3	253	251	76	6	58	3	5	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	175	153	8	3	253	251	76	6	58	3	5	1
User 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
PHF 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
PHF Volume:	175	153	8	3	253	251	76	6	58	3	5	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	175	153	8	3	253	251	76	6	58	3	5	1
PCE 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
MLF 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
FinalVolume:	175	153	8	3	253	251	76	6	58	3	5	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.52	0.46	0.02	0.01	0.99	1.00	1.00	0.09	0.91	1.00	0.83	0.17
Final Sat.:	911	797	42	21	1779	1750	1750	169	1631	1750	1500	300
Capacity Analysis Module:												
Vol/Sat:	0.19	0.19	0.19	0.14	0.14	0.14	0.04	0.04	0.04	0.00	0.00	0.00
Crit Moves:		****						****				
Green Time:	82.7	82.7	82.7	82.7	82.7	82.7	15.3	15.3	15.3	15.3	15.3	15.3
Volume/Cap:	0.24	0.24	0.24	0.18	0.18	0.18	0.29	0.24	0.24	0.01	0.02	0.02
Delay/Veh:	2.8	2.8	2.8	2.6	2.6	2.6	40.2	39.7	39.7	37.9	38.0	38.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	2.8	2.8	2.8	2.6	2.6	2.6	40.2	39.7	39.7	37.9	38.0	38.0
LOS by Move:	A	A	A	A	A	A	D	D	D	D+	D+	D+
HCM2kAvgQ:	75	75	75	52	52	53	63	51	51	2	4	4

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative + Project AM

Intersection #1: Park Blvd/ Page Mill Rd

Signal=Permit/Rights=Include
Final Vol: 285 253 3
Lanes: 1 0 0 1 0

Signal=Permit Rights=Include (Eastbound) — Final Vol: / Lanes:
100*** 1
0
6 0
1
58 0

Vol Cnt Date: n/a
Cycle Time (sec): 104
Loss Time (sec): 6
Critical V/C: 0.264
Avg Crit Del (sec/veh): 11.7
Avg Delay (sec/veh): 9.6
LOS: A

Signal=Permit Rights=Include (Westbound) — Lanes: / Final Vol:
0 1
1
0 5
0
1 3

Lanes: 0 0 1! 0 0
Final Vol: 175 153*** 8
Signal=Permit/Rights=Include

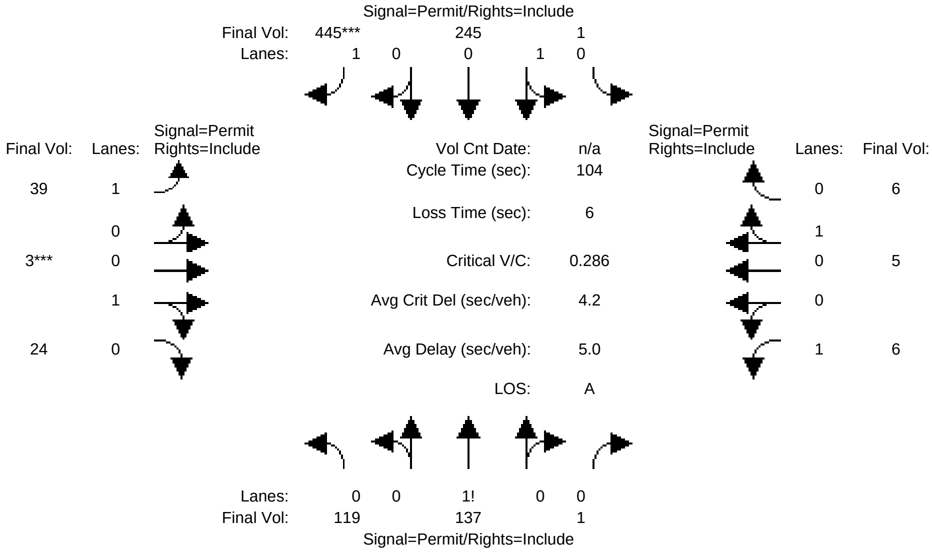
Street Name:	Park Blvd						Page Mill Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	175	153	8	3	253	251	76	6	58	3	5	1
Growth 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
Initial Bse:	175	153	8	3	253	251	76	6	58	3	5	1
Added Vol:	0	0	0	0	0	34	24	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	175	153	8	3	253	285	100	6	58	3	5	1
User 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
PHF 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
PHF Volume:	175	153	8	3	253	285	100	6	58	3	5	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	175	153	8	3	253	285	100	6	58	3	5	1
PCE 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
MLF 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
FinalVolume:	175	153	8	3	253	285	100	6	58	3	5	1
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.52	0.46	0.02	0.01	0.99	1.00	1.00	0.09	0.91	1.00	0.83	0.17
Final Sat.:	911	797	42	21	1779	1750	1750	169	1631	1750	1500	300
Capacity Analysis Module:												
Vol/Sat:	0.19	0.19	0.19	0.14	0.14	0.16	0.06	0.04	0.04	0.00	0.00	0.00
Crit Moves:		****					****					
Green Time:	75.5	75.5	75.5	75.5	75.5	75.5	22.5	22.5	22.5	22.5	22.5	22.5
Volume/Cap:	0.26	0.26	0.26	0.20	0.20	0.22	0.26	0.16	0.16	0.01	0.02	0.02
Delay/Veh:	4.9	4.9	4.9	4.6	4.6	4.7	34.3	33.3	33.3	32.0	32.1	32.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	4.9	4.9	4.9	4.6	4.6	4.7	34.3	33.3	33.3	32.0	32.1	32.1
LOS by Move:	A	A	A	A	A	A	C-	C-	C-	C-	C-	C-
HCM2kAvgQ:	98	98	98	68	68	80	74	45	45	2	4	4

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative PM

Intersection #1: Park Blvd/ Page Mill Rd



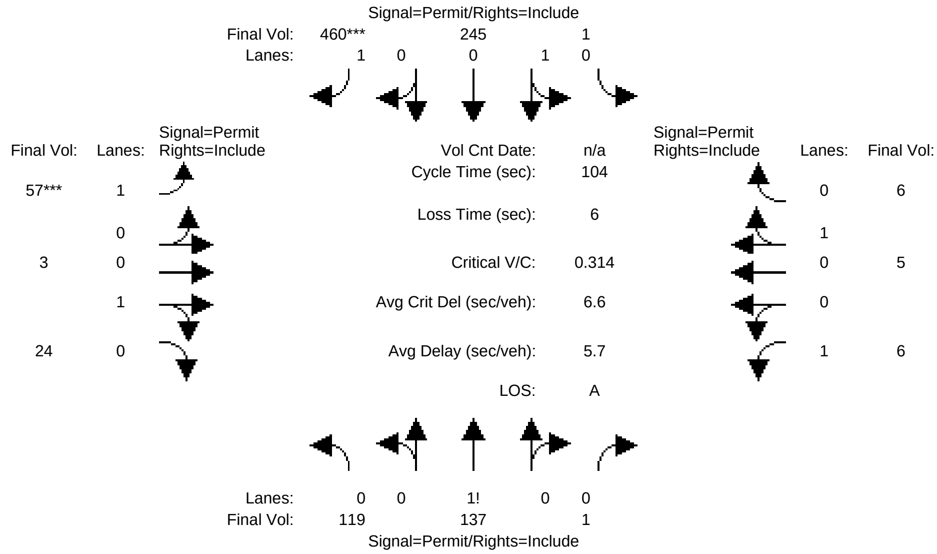
Street Name:	Park Blvd						Page Mill Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	119	137	1	1	245	445	39	3	24	6	5	6
Growth 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
Initial Bse:	119	137	1	1	245	445	39	3	24	6	5	6
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	119	137	1	1	245	445	39	3	24	6	5	6
User 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
PHF 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
PHF Volume:	119	137	1	1	245	445	39	3	24	6	5	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	119	137	1	1	245	445	39	3	24	6	5	6
PCE 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
MLF 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
FinalVolume:	119	137	1	1	245	445	39	3	24	6	5	6
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.46	0.53	0.01	0.01	0.99	1.00	1.00	0.11	0.89	1.00	0.45	0.55
Final Sat.:	810	933	7	7	1793	1750	1750	200	1600	1750	818	982
Capacity Analysis Module:												
Vol/Sat:	0.15	0.15	0.15	0.14	0.14	0.25	0.02	0.02	0.02	0.00	0.01	0.01
Crit Moves:						****		****				
Green Time:	88.0	88.0	88.0	88.0	88.0	88.0	10.0	10.0	10.0	10.0	10.0	10.0
Volume/Cap:	0.17	0.17	0.17	0.16	0.16	0.30	0.23	0.16	0.16	0.04	0.06	0.06
Delay/Veh:	1.5	1.5	1.5	1.5	1.5	1.8	44.2	43.6	43.6	42.7	42.9	42.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.5	1.5	1.5	1.5	1.5	1.8	44.2	43.6	43.6	42.7	42.9	42.9
LOS by Move:	A	A	A	A	A	A	D	D	D	D	D	D
HCM2kAvgQ:	42	42	42	38	38	83	36	23	23	5	9	9

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative + Project PM

Intersection #1: Park Blvd/ Page Mill Rd



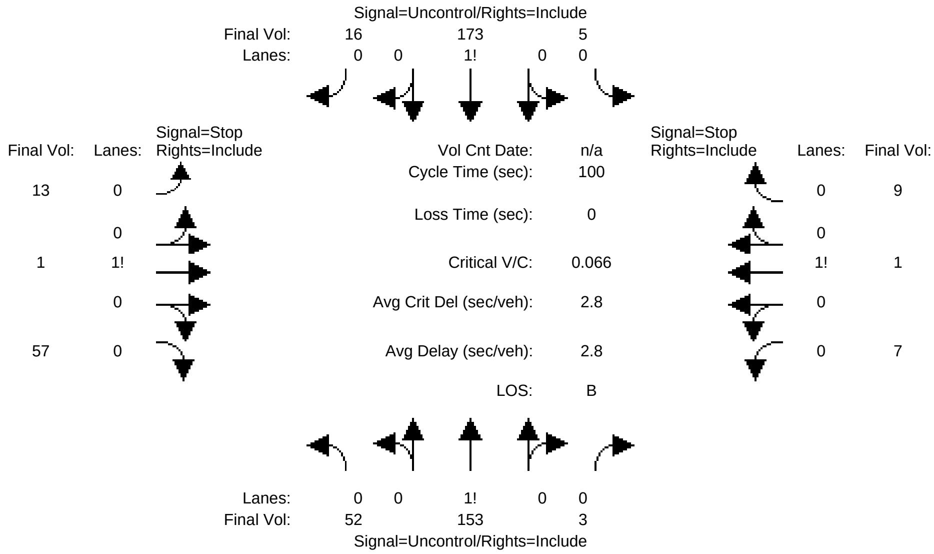
Street Name:	Park Blvd						Page Mill Rd					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	10	10	10	10	10	10	10	10	10	10	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	119	137	1	1	245	445	39	3	24	6	5	6
Growth 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
Initial Bse:	119	137	1	1	245	445	39	3	24	6	5	6
Added Vol:	0	0	0	0	0	15	18	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	119	137	1	1	245	460	57	3	24	6	5	6
User 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
PHF 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
PHF Volume:	119	137	1	1	245	460	57	3	24	6	5	6
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	119	137	1	1	245	460	57	3	24	6	5	6
PCE 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
MLF 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
FinalVolume:	119	137	1	1	245	460	57	3	24	6	5	6
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.92	0.92	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.95	0.95
Lanes:	0.46	0.53	0.01	0.01	0.99	1.00	1.00	0.11	0.89	1.00	0.45	0.55
Final Sat.:	810	933	7	7	1793	1750	1750	200	1600	1750	818	982
Capacity Analysis Module:												
Vol/Sat:	0.15	0.15	0.15	0.14	0.14	0.26	0.03	0.02	0.02	0.00	0.01	0.01
Crit Moves:						****	****					
Green Time:	87.2	87.2	87.2	87.2	87.2	87.2	10.8	10.8	10.8	10.8	10.8	10.8
Volume/Cap:	0.18	0.18	0.18	0.16	0.16	0.31	0.31	0.14	0.14	0.03	0.06	0.06
Delay/Veh:	1.6	1.6	1.6	1.6	1.6	2.0	44.2	42.7	42.7	42.0	42.1	42.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	1.6	1.6	1.6	1.6	1.6	2.0	44.2	42.7	42.7	42.0	42.1	42.1
LOS by Move:	A	A	A	A	A	A	D	D	D	D	D	D
HCM2kAvgQ:	43	43	43	40	40	90	53	23	23	5	9	9

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

Intersection #2: Park Blvd /Sherman Ave




```
Street Name:                Park Blvd                      Park Blvd /Sherman Ave
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      52  153     3     5  173    16    13     1    57     7     1     9
Growth 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
Initial Bse:   52  153     3     5  173    16    13     1    57     7     1     9
Added Vol:      0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:   52  153     3     5  173    16    13     1    57     7     1     9
User 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
PHF 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
PHF Volume:    52  153     3     5  173    16    13     1    57     7     1     9
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:   52  153     3     5  173    16    13     1    57     7     1     9
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  189 xxxx xxxxx   156 xxxx xxxxx   455  451   181   479  458   155
Potent Cap.: 1397 xxxx xxxxx  1436 xxxx xxxxx   519  507   867   501  503   897
Move Cap.:   1397 xxxx xxxxx  1436 xxxx xxxxx   497  486   867   452  482   897
Volume/Cap:  0.04 xxxx  xxxx  0.00 xxxx  xxxx  0.03 0.00  0.07  0.02 0.00  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    2.9 xxxx xxxxx   0.3 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.7 xxxx xxxxx   7.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  755 xxxxx  xxxx  616 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.3 xxxxx xxxxx  0.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 10.3 xxxxx xxxxx 11.0 xxxxx
Shared LOS:     *    *     *     *    *     *     *    B     *     *    B     *
ApproachDel:     xxxxxx           xxxxxx             10.3              11.0
ApproachLOS:         *                *                 B                 B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #2 Park Blvd /Sherman Ave
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   52  153    3     5  173    16    13    1    57     7    1     9
ApproachDel:    xxxxxx           xxxxxx              10.3             11.0
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=71]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=490]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=17]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=490]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   52  153    3     5  173    16    13    1    57     7    1     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            402
Minor Approach Volume:          71
Minor Approach Volume Threshold: 462
--------------------------------------------------------------------------------
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a traffic signal in the future.  Intersections that exceed this warrant
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signal warrant (such as the 4-hour or 8-hour warrants).

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jurisdiction.  Consideration of the other signal warrants, which is beyond
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```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative + Project AM

Intersection #2: Park Blvd /Sherman Ave

Signal=Uncontrol/Rights=Include
Final Vol: 16 179 5
Lanes: 0 0 1! 0 0

Final Vol:	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Final Vol:
			Vol Cnt Date:	n/a			
13	0		Cycle Time (sec):	100		0	9
	0		Loss Time (sec):	0		0	
1	1!		Critical V/C:	0.066		1!	1
	0		Avg Crit Del (sec/veh):	2.7		0	
57	0		Avg Delay (sec/veh):	2.7		0	7
			LOS:	B			

Lanes: 0 0 1! 0 0
Final Vol: 52 153 3
Signal=Uncontrol/Rights=Include

```
Street Name:                Park Blvd                    Park Blvd /Sherman Ave
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      52  153     3     5  173    16    13    1    57     7    1     9
Growth 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
Initial Bse:   52  153     3     5  173    16    13    1    57     7    1     9
Added Vol:      0    0     0     0    6     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   52  153     3     5  179    16    13    1    57     7    1     9
User 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
PHF 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
PHF Volume:    52  153     3     5  179    16    13    1    57     7    1     9
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   52  153     3     5  179    16    13    1    57     7    1     9
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  195 xxxx xxxxx   156 xxxx xxxxx   461  457   187   485  464   155
Potent Cap.: 1390 xxxx xxxxx  1436 xxxx xxxxx   515  503   860   496  499   897
Move Cap.:   1390 xxxx xxxxx  1436 xxxx xxxxx   492  482   860   448  478   897
Volume/Cap:  0.04 xxxx  xxxx  0.00 xxxx  xxxx  0.03 0.00  0.07  0.02 0.00  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    2.9 xxxx xxxxx   0.3 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.7 xxxx xxxxx   7.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  749 xxxxx  xxxx  612 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.3 xxxxx xxxxx  0.1 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 10.3 xxxxx xxxxx 11.0 xxxxx
Shared LOS:     *    *     *     *    *     *     *    B     *     *    B     *
ApproachDel:     xxxxxx            xxxxxx             10.3              11.0
ApproachLOS:        *                 *                 B                 B
Note: Queue reported is the distance per lane in feet.
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   52  153    3     5  179    16    13    1    57     7    1     9
ApproachDel:    xxxxxx           xxxxxx             10.3             11.0
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=71]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=496]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=17]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=496]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   52  153    3     5  179    16    13    1    57     7    1     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            408
Minor Approach Volume:          71
Minor Approach Volume Threshold: 458
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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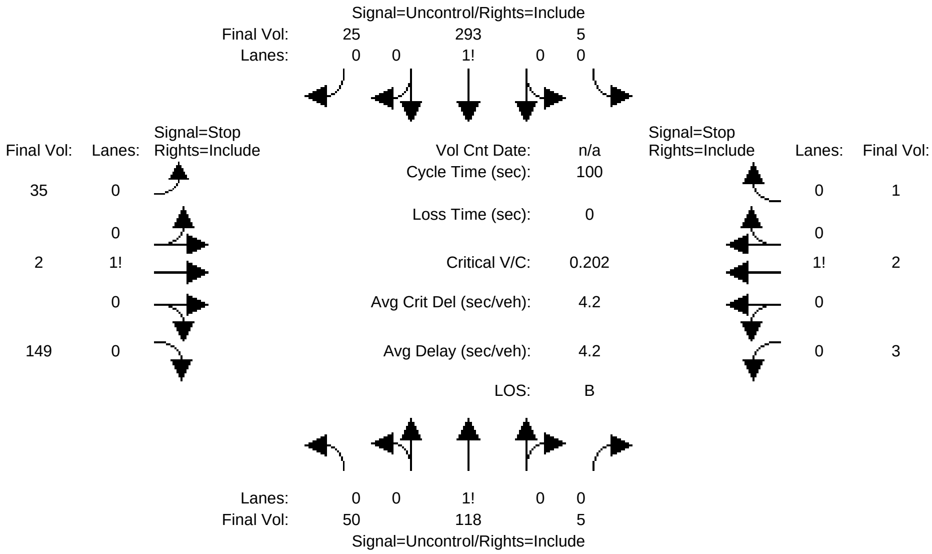
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```


231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM

Intersection #2: Park Blvd /Sherman Ave



Street Name:	Park Blvd						Park Blvd /Sherman Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	50	118	5	5	293	25	35	2	149	3	2	1
Growth 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
Initial Bse:	50	118	5	5	293	25	35	2	149	3	2	1
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	50	118	5	5	293	25	35	2	149	3	2	1
User 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
PHF 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
PHF Volume:	50	118	5	5	293	25	35	2	149	3	2	1
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	50	118	5	5	293	25	35	2	149	3	2	1
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	318	xxxx	xxxxx	123	xxxx	xxxxx	538	539	306	612	549	121
Potent Cap.:	1253	xxxx	xxxxx	1477	xxxx	xxxxx	458	452	739	408	446	936
Move Cap.:	1253	xxxx	xxxxx	1477	xxxx	xxxxx	440	432	739	314	427	936
Volume/Cap:	0.04	xxxx	xxxx	0.00	xxxx	xxxx	0.08	0.00	0.20	0.01	0.00	0.00
Level Of Service Module:												
2Way95thQ:	3.1	xxxx	xxxxx	0.3	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	8.0	xxxx	xxxxx	7.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	651	xxxxx	xxxx	392	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	1.2	xxxxx	xxxxx	0.0	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	12.7	xxxxx	xxxxx	14.3	xxxxx
Shared LOS:	*	*	*	*	*	*	*	B	*	*	B	*
ApproachDel:		xxxxxx			xxxxxx			12.7			14.3	
ApproachLOS:		*			*			B			B	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

****

Intersection #2 Park Blvd /Sherman Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met


```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   50  118     5     5  293    25    35    2   149     3    2     1
ApproachDel:    xxxxxx           xxxxxx              12.7             14.3
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.7]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=186]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=688]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=6]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=688]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
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signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   50  118     5     5  293    25    35    2   149     3    2     1
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            496
Minor Approach Volume:          186
Minor Approach Volume Threshold: 406
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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signal warrant (such as the 4-hour or 8-hour warrants).

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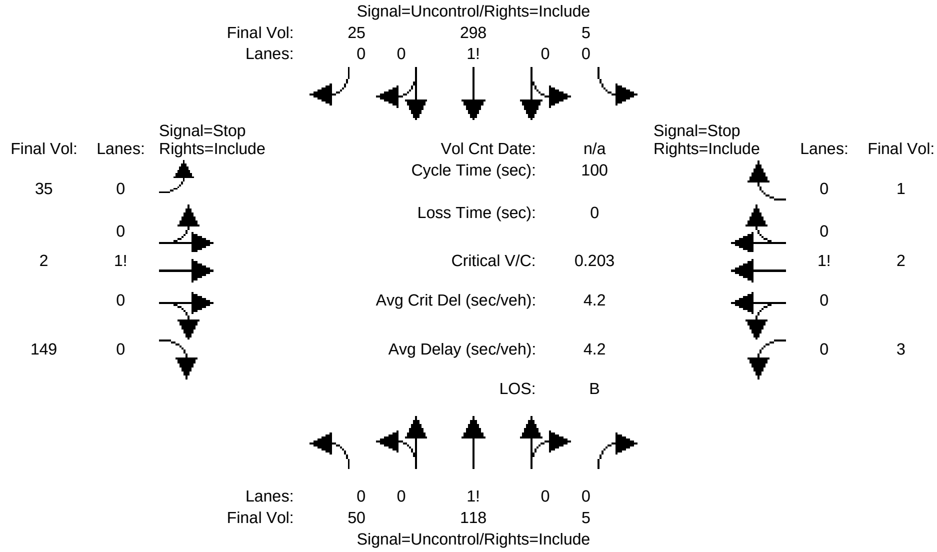
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative + Project PM

Intersection #2: Park Blvd /Sherman Ave




```
Street Name:                Park Blvd                    Park Blvd /Sherman Ave
Approach:      North Bound      South Bound        East Bound        West Bound
Movement:     L  -  T  -  R   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||----------------||---------------|
Volume Module:
Base Vol:      50  118     5     5  293    25    35     2   149     3     2     1
Growth 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
Initial Bse:   50  118     5     5  293    25    35     2   149     3     2     1
Added Vol:      0    0     0     0    5     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:   50  118     5     5  298    25    35     2   149     3     2     1
User 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
PHF 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
PHF Volume:    50  118     5     5  298    25    35     2   149     3     2     1
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:   50  118     5     5  298    25    35     2   149     3     2     1
------------|---------------||---------------||----------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||----------------||---------------|
Capacity Module:
Cnflict Vol:  323 xxxx xxxxx   123 xxxx xxxxx   543  544   311   617  554   121
Potent Cap.: 1248 xxxx xxxxx  1477 xxxx xxxxx   454  449   734   405  444   936
Move Cap.:   1248 xxxx xxxxx  1477 xxxx xxxxx   437  429   734   311  424   936
Volume/Cap:  0.04 xxxx  xxxx  0.00 xxxx  xxxx  0.08 0.00  0.20  0.01 0.00  0.00
------------|---------------||---------------||----------------||---------------|
Level Of Service Module:
2Way95thQ:    3.1 xxxx xxxxx   0.3 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  8.0 xxxx xxxxx   7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  646 xxxxx  xxxx  389 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  1.2 xxxxx xxxxx  0.0 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 12.8 xxxxx xxxxx 14.4 xxxxx
Shared LOS:     *    *     *     *    *     *     *    B     *     *    B     *
ApproachDel:     xxxxxx           xxxxxx             12.8              14.4
ApproachLOS:         *                *                B                 B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   50  118     5     5  298    25    35    2   149     3    2     1
ApproachDel:    xxxxxx           xxxxxx              12.8             14.4
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.7]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=186]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=693]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=6]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=693]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #2 Park Blvd /Sherman Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   50  118     5     5  298    25    35    2   149     3    2     1
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            501
Minor Approach Volume:          186
Minor Approach Volume Threshold: 404
--------------------------------------------------------------------------------
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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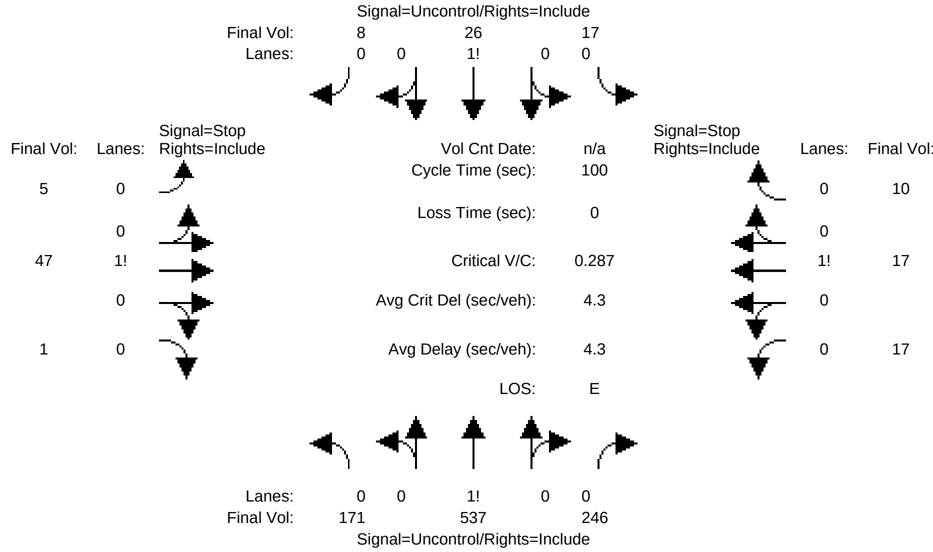
```


231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

Intersection #3: Birch St/ Sheridan Ave



Street Name:	Birch St						Sheridan Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	171	537	246	17	26	8	5	47	1	17	17	10
Growth 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
Initial Bse:	171	537	246	17	26	8	5	47	1	17	17	10
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	171	537	246	17	26	8	5	47	1	17	17	10
User 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
PHF 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
PHF Volume:	171	537	246	17	26	8	5	47	1	17	17	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	171	537	246	17	26	8	5	47	1	17	17	10
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	34	xxxx	xxxxx	783	xxxx	xxxxx	1080	1189	30	1090	1070	660
Potent Cap.:	1591	xxxx	xxxxx	844	xxxx	xxxxx	198	190	1050	194	223	467
Move Cap.:	1591	xxxx	xxxxx	844	xxxx	xxxxx	162	164	1050	136	192	467
Volume/Cap:	0.11	xxxx	xxxx	0.02	xxxx	xxxx	0.03	0.29	0.00	0.13	0.09	0.02
Level Of Service Module:												
2Way95thQ:	9.0	xxxx	xxxxx	1.5	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.5	xxxx	xxxxx	9.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	166	xxxxx	xxxx	187	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	1.3	xxxxx	xxxxx	0.9	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	36.5	xxxxx	xxxxx	30.0	xxxxx
Shared LOS:	*	*	*	*	*	*	*	E	*	*	D	*
ApproachDel:		xxxxxx			xxxxxx			36.5			30.0	
ApproachLOS:		*			*			E			D	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

Intersection #3 Birch St/ Sheridan Ave

Future Volume Alternative: Peak Hour Warrant NOT Met


```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:  171  537   246    17   26     8     5   47     1    17   17    10
ApproachDel:    xxxxxx           xxxxxx              36.5             30.0
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=53]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1102]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=44]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1102]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
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signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:  171  537   246    17   26     8     5   47     1    17   17    10
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1005
Minor Approach Volume:           53
Minor Approach Volume Threshold: 218
--------------------------------------------------------------------------------
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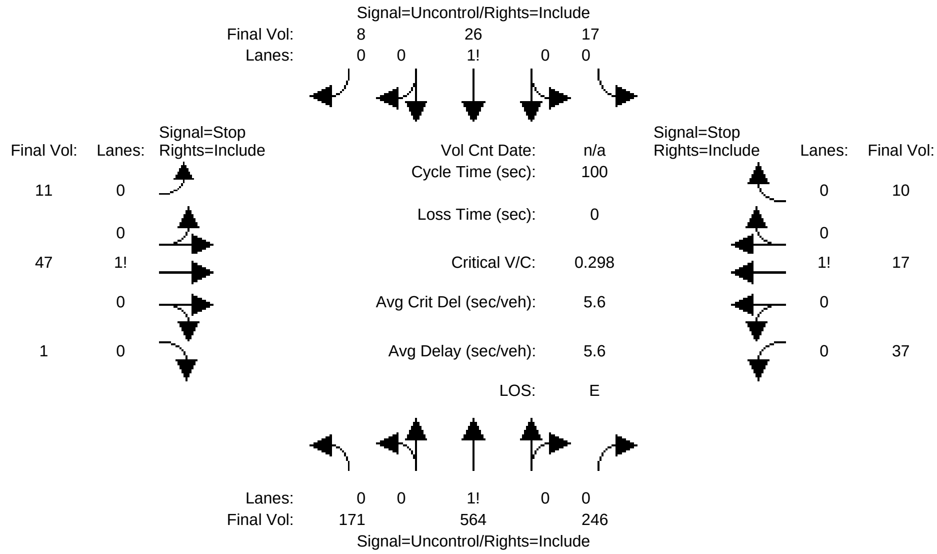
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative + Project AM

Intersection #3: Birch St/ Sheridan Ave



Street Name:	Birch St						Sheridan Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	171	537	246	17	26	8	5	47	1	17	17	10
Growth 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
Initial Bse:	171	537	246	17	26	8	5	47	1	17	17	10
Added Vol:	0	27	0	0	0	0	6	0	0	20	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	171	564	246	17	26	8	11	47	1	37	17	10
User 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
PHF 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
PHF Volume:	171	564	246	17	26	8	11	47	1	37	17	10
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	171	564	246	17	26	8	11	47	1	37	17	10
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	34	xxxx	xxxxx	810	xxxx	xxxxx	1107	1216	30	1117	1097	687
Potent Cap.:	1591	xxxx	xxxxx	825	xxxx	xxxxx	189	183	1050	186	215	450
Move Cap.:	1591	xxxx	xxxxx	825	xxxx	xxxxx	154	158	1050	129	185	450
Volume/Cap:	0.11	xxxx	xxxx	0.02	xxxx	xxxx	0.07	0.30	0.00	0.29	0.09	0.02
Level Of Service Module:												
2Way95thQ:	9.0	xxxx	xxxxx	1.6	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.5	xxxx	xxxxx	9.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	159	xxxxx	xxxx	160	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	1.6	xxxxx	xxxxx	1.8	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	40.3	xxxxx	xxxxx	41.9	xxxxx
Shared LOS:	*	*	*	*	*	*	*	E	*	*	E	*
ApproachDel:		xxxxxx			xxxxxx			40.3			41.9	
ApproachLOS:		*			*			E			E	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

Intersection #3 Birch St/ Sheridan Ave

Future Volume Alternative: Peak Hour Warrant NOT Met


```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:  171  564   246    17   26     8    11   47     1    37   17    10
ApproachDel:    xxxxxx           xxxxxx              40.3             41.9
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.7]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=59]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1155]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.7]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=64]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=1155]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
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jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:  171  564   246    17   26     8    11   47     1    37   17    10
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             1032
Minor Approach Volume:           64
Minor Approach Volume Threshold: 211
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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a traffic signal in the future.  Intersections that exceed this warrant
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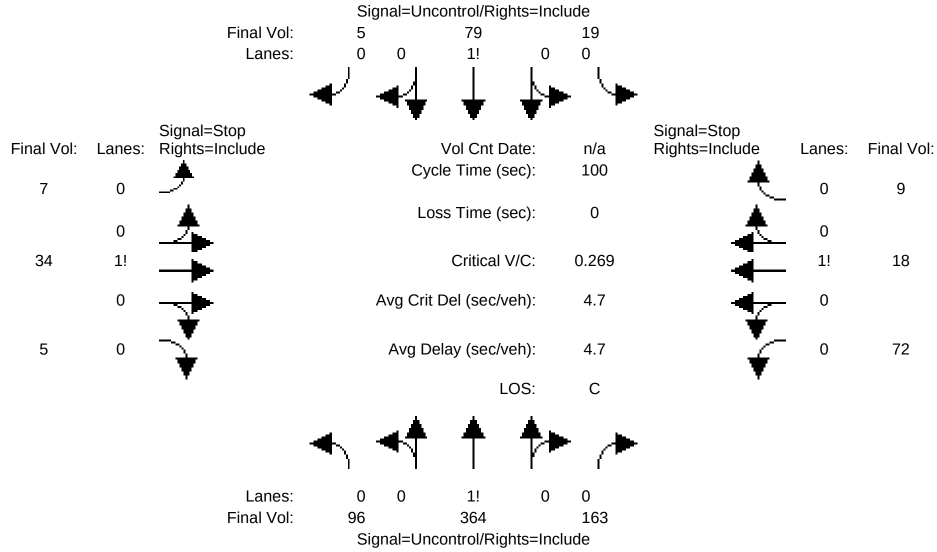
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM

Intersection #3: Birch St/ Sheridan Ave



Street Name:	Birch St						Sheridan Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	96	364	163	19	79	5	7	34	5	72	18	9
Growth 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
Initial Bse:	96	364	163	19	79	5	7	34	5	72	18	9
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	96	364	163	19	79	5	7	34	5	72	18	9
User 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
PHF 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
PHF Volume:	96	364	163	19	79	5	7	34	5	72	18	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	96	364	163	19	79	5	7	34	5	72	18	9
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	84	xxxx	xxxxx	527	xxxx	xxxxx	771	839	82	777	760	446
Potent Cap.:	1526	xxxx	xxxxx	1050	xxxx	xxxxx	320	304	984	317	338	617
Move Cap.:	1526	xxxx	xxxxx	1050	xxxx	xxxxx	282	279	984	268	310	617
Volume/Cap:	0.06	xxxx	xxxx	0.02	xxxx	xxxx	0.02	0.12	0.01	0.27	0.06	0.01
Level Of Service Module:												
2Way95thQ:	5.0	xxxx	xxxxx	1.4	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.5	xxxx	xxxxx	8.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	303	xxxxx	xxxx	290	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.5	xxxxx	xxxxx	1.5	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	19.0	xxxxx	xxxxx	23.7	xxxxx
Shared LOS:	*	*	*	*	*	*	*	C	*	*	C	*
ApproachDel:		xxxxxx			xxxxxx			19.0			23.7	
ApproachLOS:		*			*			C			C	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

****

Intersection #3 Birch St/ Sheridan Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   96  364   163    19   79     5     7   34     5    72   18     9
ApproachDel:    xxxxxx           xxxxxx             19.0             23.7
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=46]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=871]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.7]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=99]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=871]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

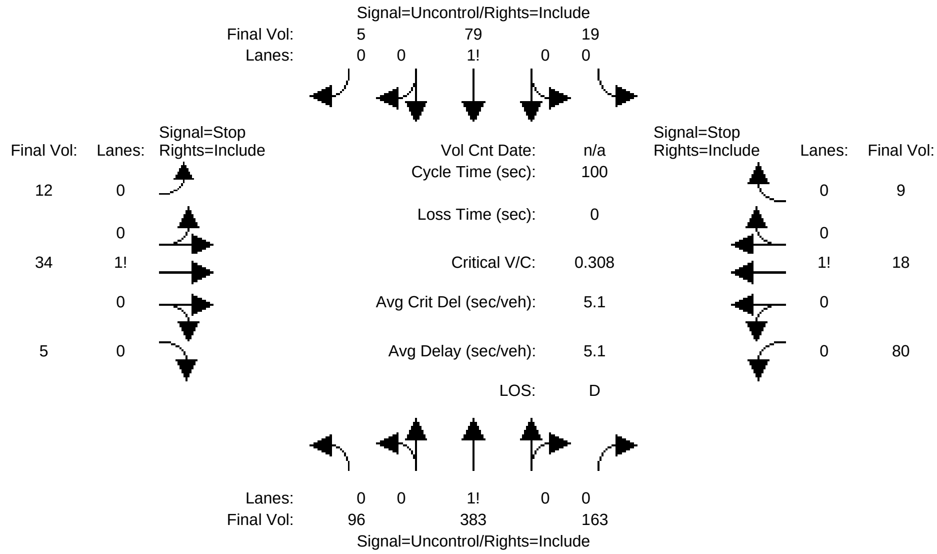
The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   96  364   163    19   79     5     7   34     5    72   18     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            726
Minor Approach Volume:          99
Minor Approach Volume Threshold: 305
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative + Project PM

Intersection #3: Birch St/ Sheridan Ave



Street Name:	Birch St						Sheridan Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	96	364	163	19	79	5	7	34	5	72	18	9
Growth 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
Initial Bse:	96	364	163	19	79	5	7	34	5	72	18	9
Added Vol:	0	19	0	0	0	0	5	0	0	8	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	96	383	163	19	79	5	12	34	5	80	18	9
User 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
PHF 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
PHF Volume:	96	383	163	19	79	5	12	34	5	80	18	9
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	96	383	163	19	79	5	12	34	5	80	18	9
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	7.1	6.5	6.2	7.1	6.5	6.2
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	3.5	4.0	3.3	3.5	4.0	3.3
Capacity Module:												
Cnflict Vol:	84	xxxx	xxxxx	546	xxxx	xxxxx	790	858	82	796	779	465
Potent Cap.:	1526	xxxx	xxxxx	1033	xxxx	xxxxx	311	297	984	308	330	602
Move Cap.:	1526	xxxx	xxxxx	1033	xxxx	xxxxx	273	272	984	259	302	602
Volume/Cap:	0.06	xxxx	xxxx	0.02	xxxx	xxxx	0.04	0.13	0.01	0.31	0.06	0.01
Level Of Service Module:												
2Way95thQ:	5.0	xxxx	xxxxx	1.4	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.5	xxxx	xxxxx	8.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	A	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	293	xxxxx	xxxx	279	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.6	xxxxx	xxxxx	1.7	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	19.9	xxxxx	xxxxx	25.7	xxxxx
Shared LOS:	*	*	*	*	*	*	*	C	*	*	D	*
ApproachDel:		xxxxxx			xxxxxx			19.9			25.7	
ApproachLOS:		*			*			C			D	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

****

Intersection #3 Birch St/ Sheridan Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   96  383   163    19   79     5    12   34     5    80   18     9
ApproachDel:    xxxxxx           xxxxxx              19.9             25.7
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=51]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=903]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.8]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=107]
   SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=903]
   SUCCEED - Total volume greater than or equal to 800 for intersection
             with four or more approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #3 Birch St/ Sheridan Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
Initial Vol:   96  383   163    19   79     5    12   34     5    80   18     9
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            745
Minor Approach Volume:          107
Minor Approach Volume Threshold: 298
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```


231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative AM

Intersection #4: Birch St/ Grant Ave

Signal=Stop/Rights=Include
Final Vol: 15 43*** 19
Lanes: 0 0 1! 0 0

Final Vol: | Lanes: | Signal=Stop Rights=Include
35 0
0
40*** 1!
0
13 0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.681
Avg Crit Del (sec/veh): 14.0
Avg Delay (sec/veh): 14.0
LOS: B

Signal=Stop Rights=Include | Lanes: | Final Vol:
0 0
0
0 0
0
0 0

Lanes: 0 0 1! 0 0
Final Vol: 45 498*** 37
Signal=Stop/Rights=Include

Street Name:	Birch St						Grant Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	45	498	37	19	43	15	35	40	13	0	0	0
Growth 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
Initial Bse:	45	498	37	19	43	15	35	40	13	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	45	498	37	19	43	15	35	40	13	0	0	0
User 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
PHF 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
PHF Volume:	45	498	37	19	43	15	35	40	13	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	45	498	37	19	43	15	35	40	13	0	0	0
PCE 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
MLF 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
FinalVolume:	45	498	37	19	43	15	35	40	13	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.08	0.86	0.06	0.25	0.56	0.19	0.40	0.45	0.15	0.00	0.00	0.00
Final Sat.:	66	731	54	185	418	146	249	284	92	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.68	0.68	0.68	0.10	0.10	0.10	0.14	0.14	0.14	xxxx	xxxx	xxxx
Crit Moves:		****			****			****				
Delay/Veh:	15.5	15.5	15.5	8.1	8.1	8.1	9.0	9.0	9.0	0.0	0.0	0.0
Delay 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
AdjDel/Veh:	15.5	15.5	15.5	8.1	8.1	8.1	9.0	9.0	9.0	0.0	0.0	0.0
LOS by Move:	C	C	C	A	A	A	A	A	A	*	*	*
ApproachDel:		15.5			8.1			9.0			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		15.5			8.1			9.0			xxxxxx	
LOS by Appr:		C			A			A			*	
AllWayAvgQ:	49.0	49.0	49.0	2.6	2.6	2.6	3.3	3.3	3.3	0.0	0.0	0.0

Note: Queue reported is the distance per lane in feet.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #4 Birch St/ Grant Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Lanes:	0 0	1! 0	0	0 0	1! 0	0	0 0	1! 0	0	0 0	0 0	0
Initial Vol:	45	498	37	19	43	15	35	40	13	0	0	0

Major Street Volume: 657
Minor Approach Volume: 88
Minor Approach Volume Threshold: 331

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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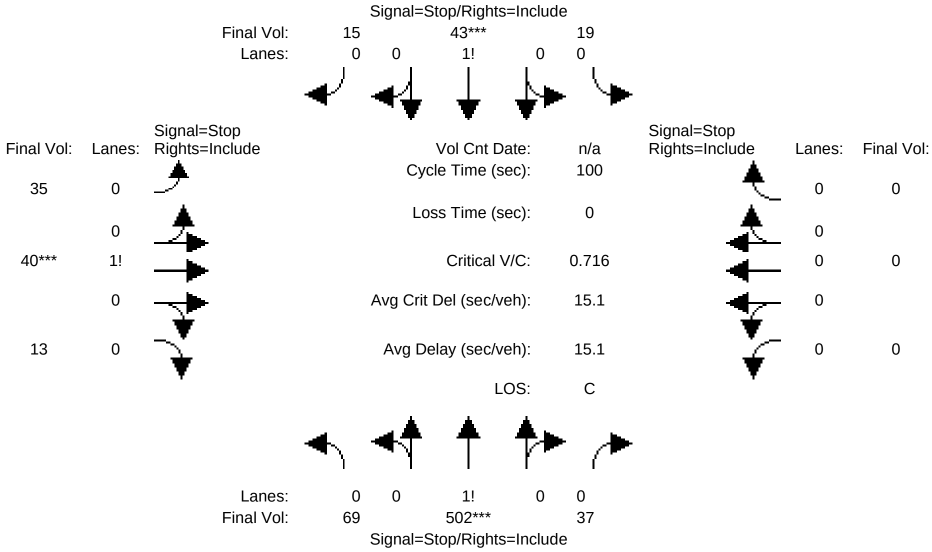
231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative + Project AM

Intersection #4: Birch St/ Grant Ave



Street Name:	Birch St						Grant Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	45	498	37	19	43	15	35	40	13	0	0	0
Growth 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
Initial Bse:	45	498	37	19	43	15	35	40	13	0	0	0
Added Vol:	24	4	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	69	502	37	19	43	15	35	40	13	0	0	0
User 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
PHF 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
PHF Volume:	69	502	37	19	43	15	35	40	13	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	69	502	37	19	43	15	35	40	13	0	0	0
PCE 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
MLF 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
FinalVolume:	69	502	37	19	43	15	35	40	13	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.11	0.83	0.06	0.25	0.56	0.19	0.40	0.45	0.15	0.00	0.00	0.00
Final Sat.:	96	701	52	183	415	145	245	280	91	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.72	0.72	0.72	0.10	0.10	0.10	0.14	0.14	0.14	xxxx	xxxx	xxxx
Crit Moves:		****			****			****				
Delay/Veh:	16.8	16.8	16.8	8.2	8.2	8.2	9.1	9.1	9.1	0.0	0.0	0.0
Delay 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
AdjDel/Veh:	16.8	16.8	16.8	8.2	8.2	8.2	9.1	9.1	9.1	0.0	0.0	0.0
LOS by Move:	C	C	C	A	A	A	A	A	A	*	*	*
ApproachDel:		16.8			8.2			9.1			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		16.8			8.2			9.1			xxxxxx	
LOS by Appr:		C			A			A			*	
AllWayAvgQ:	56.8	56.8	56.8	2.7	2.7	2.7	3.4	3.4	3.4	0.0	0.0	0.0

Note: Queue reported is the distance per lane in feet.

Peak Hour Volume Signal Warrant Report [Urban]

****

Intersection #4 Birch St/ Grant Ave

****

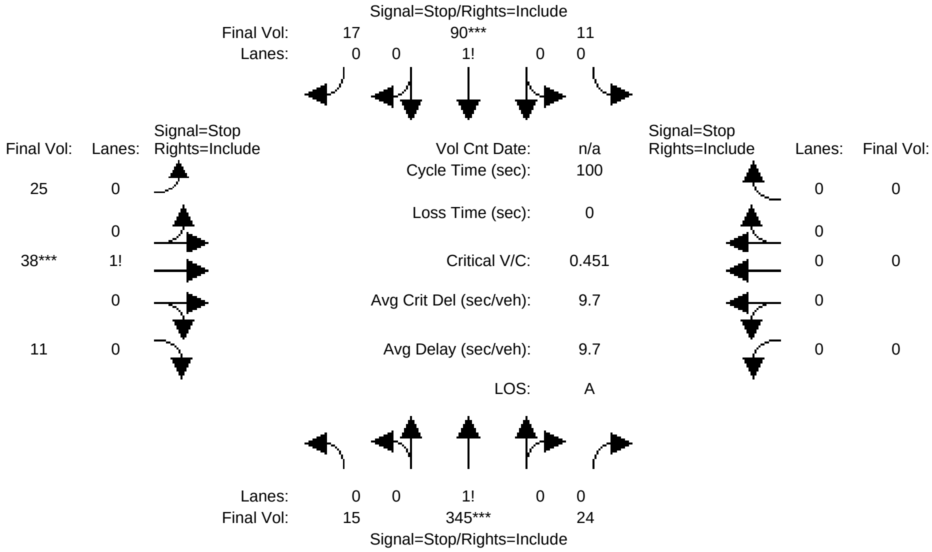

```
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   69  502    37    19   43    15    35   40    13     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            685
Minor Approach Volume:          88
Minor Approach Volume Threshold: 320
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```


231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative PM

Intersection #4: Birch St/ Grant Ave



Street Name:	Birch St						Grant Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	15	345	24	11	90	17	25	38	11	0	0	0
Growth 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
Initial Bse:	15	345	24	11	90	17	25	38	11	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	15	345	24	11	90	17	25	38	11	0	0	0
User 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
PHF 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
PHF Volume:	15	345	24	11	90	17	25	38	11	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	15	345	24	11	90	17	25	38	11	0	0	0
PCE 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
MLF 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
FinalVolume:	15	345	24	11	90	17	25	38	11	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.04	0.90	0.06	0.09	0.77	0.14	0.34	0.51	0.15	0.00	0.00	0.00
Final Sat.:	33	765	53	74	609	115	229	349	101	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.45	0.45	0.45	0.15	0.15	0.15	0.11	0.11	0.11	xxxx	xxxx	xxxx
Crit Moves:		****			****			****				
Delay/Veh:	10.5	10.5	10.5	8.1	8.1	8.1	8.4	8.4	8.4	0.0	0.0	0.0
Delay 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
AdjDel/Veh:	10.5	10.5	10.5	8.1	8.1	8.1	8.4	8.4	8.4	0.0	0.0	0.0
LOS by Move:	B	B	B	A	A	A	A	A	A	*	*	*
ApproachDel:		10.5			8.1			8.4			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		10.5			8.1			8.4			xxxxxx	
LOS by Appr:		B			A			A			*	
AllWayAvgQ:	19.5	19.5	19.5	4.1	4.1	4.1	2.6	2.6	2.6	0.0	0.0	0.0

Note: Queue reported is the distance per lane in feet.

Peak Hour Volume Signal Warrant Report [Urban]

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Intersection #4 Birch St/ Grant Ave

****


```
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   15  345    24    11   90    17    25   38    11     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            502
Minor Approach Volume:          74
Minor Approach Volume Threshold: 403
--------------------------------------------------------------------------------
```

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative + Project PM

Intersection #4: Birch St/ Grant Ave

Signal=Stop/Rights=Include
Final Vol: 17 90 11***
Lanes: 0 0 1! 0 0

Final Vol:	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Final Vol:
			Vol Cnt Date:	n/a			
25	0		Cycle Time (sec):	100		0	0
	0		Loss Time (sec):	0		0	
38***	1!		Critical V/C:	0.466		0	0
	0		Avg Crit Del (sec/veh):	9.9		0	
11	0		Avg Delay (sec/veh):	9.9		0	0
			LOS:	A			

Lanes: 0 0 1! 0 0
Final Vol: 25 347*** 24
Signal=Stop/Rights=Include

Street Name:		Birch St						Grant Ave				
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	15	345	24	11	90	17	25	38	11	0	0	0
Growth 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
Initial Bse:	15	345	24	11	90	17	25	38	11	0	0	0
Added Vol:	10	2	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	25	347	24	11	90	17	25	38	11	0	0	0
User 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
PHF 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
PHF Volume:	25	347	24	11	90	17	25	38	11	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	25	347	24	11	90	17	25	38	11	0	0	0
PCE 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
MLF 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
FinalVolume:	25	347	24	11	90	17	25	38	11	0	0	0
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.06	0.88	0.06	0.09	0.77	0.14	0.34	0.51	0.15	0.00	0.00	0.00
Final Sat.:	54	745	52	74	608	115	228	347	100	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.47	0.47	0.47	0.15	0.15	0.15	0.11	0.11	0.11	xxxx	xxxx	xxxx
Crit Moves:		****		****				****				
Delay/Veh:	10.7	10.7	10.7	8.1	8.1	8.1	8.5	8.5	8.5	0.0	0.0	0.0
Delay 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
AdjDel/Veh:	10.7	10.7	10.7	8.1	8.1	8.1	8.5	8.5	8.5	0.0	0.0	0.0
LOS by Move:	B	B	B	A	A	A	A	A	A	*	*	*
ApproachDel:		10.7			8.1			8.5			xxxxxx	
Delay Adj:		1.00			1.00			1.00			xxxxx	
ApprAdjDel:		10.7			8.1			8.5			xxxxxx	
LOS by Appr:		B			A			A			*	
AllWayAvgQ:	20.7	20.7	20.7	4.1	4.1	4.1	2.6	2.6	2.6	0.0	0.0	0.0

Note: Queue reported is the distance per lane in feet.

Peak Hour Volume Signal Warrant Report [Urban]

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Intersection #4 Birch St/ Grant Ave

****


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Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:   25  347    24    11   90    17    25   38    11     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            514
Minor Approach Volume:          74
Minor Approach Volume Threshold: 397
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative AM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy

Signal=Protect/Rights=Include
Final Vol: 375 687 415***
Lanes: 1 0 3 0 2

Final Vol: Lanes: Signal=Protect Rights=Include
390*** 2
0
936 2
0
187 1

Vol Cnt Date: n/a
Cycle Time (sec): 130
Loss Time (sec): 12
Critical V/C: 0.890
Avg Crit Del (sec/veh): 56.0
Avg Delay (sec/veh): 50.2
LOS: D

Signal=Protect Rights=Include Lanes: Final Vol:
1 204
0
2 1169***
0
2 248

Lanes: 2 0 2 1 0
Final Vol: 401 1179*** 193
Signal=Protect/Rights=Include

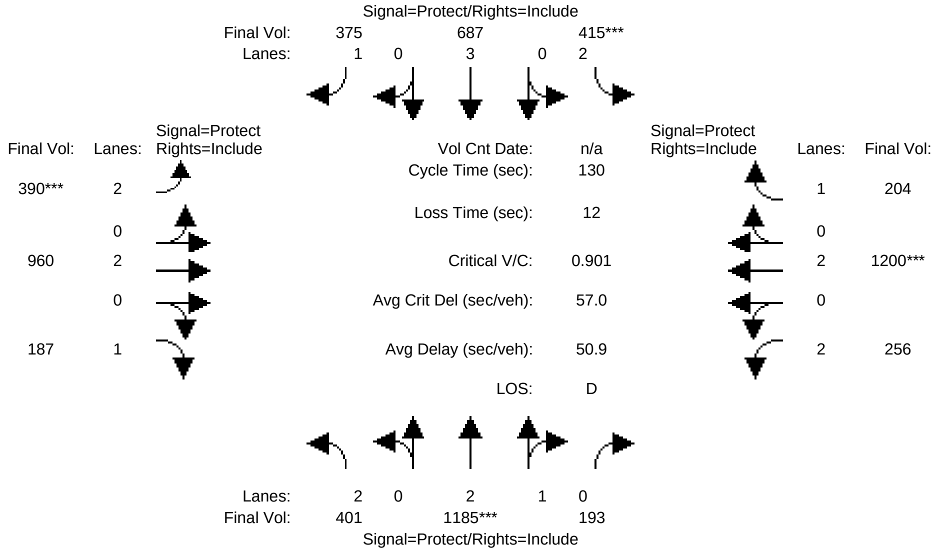
Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	401	1179	193	415	687	375	390	936	187	248	1169	204
Growth 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
Initial Bse:	401	1179	193	415	687	375	390	936	187	248	1169	204
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	401	1179	193	415	687	375	390	936	187	248	1169	204
User 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
PHF 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
PHF Volume:	401	1179	193	415	687	375	390	936	187	248	1169	204
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	401	1179	193	415	687	375	390	936	187	248	1169	204
PCE 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
MLF 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
FinalVolume:	401	1179	193	415	687	375	390	936	187	248	1169	204
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	1.00	0.92
Lanes:	2.00	2.56	0.44	2.00	3.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3150	4811	788	3150	5700	1750	3150	3800	1750	3150	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.13	0.25	0.25	0.13	0.12	0.21	0.12	0.25	0.11	0.08	0.31	0.12
Crit Moves:		****		****			****				****	
Green Time:	20.5	35.8	35.8	19.2	34.5	34.5	18.1	47.7	47.7	15.3	44.9	44.9
Volume/Cap:	0.81	0.89	0.89	0.89	0.45	0.81	0.89	0.67	0.29	0.67	0.89	0.34
Delay/Veh:	62.3	52.1	52.1	73.1	40.1	54.7	74.7	35.8	29.4	59.7	48.1	31.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	62.3	52.1	52.1	73.1	40.1	54.7	74.7	35.8	29.4	59.7	48.1	31.9
LOS by Move:	E	D-	D-	E	D	D-	E	D+	C	E+	D	C
HCM2kAvgQ:	285	525	525	322	193	426	306	403	140	172	628	161

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative + Project AM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy



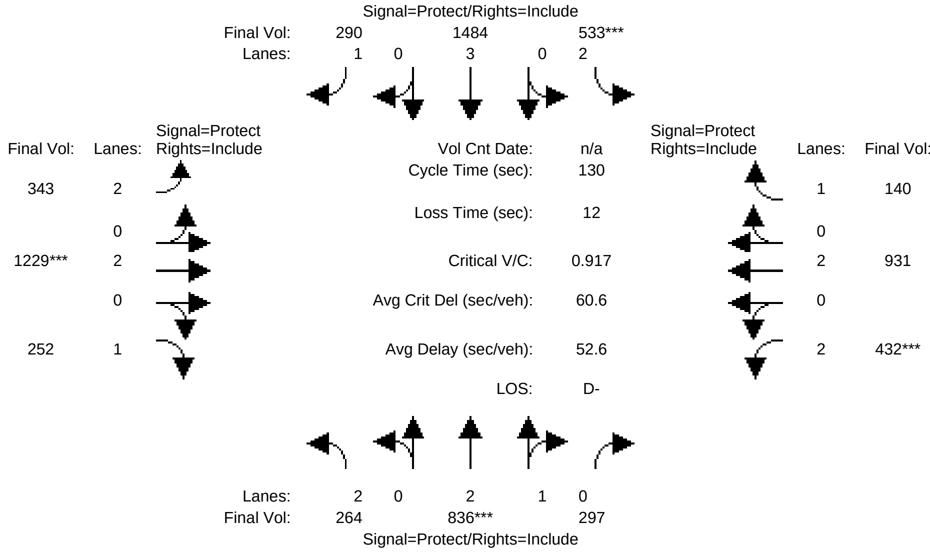
Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	401	1179	193	415	687	375	390	936	187	248	1169	204
Growth 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
Initial Bse:	401	1179	193	415	687	375	390	936	187	248	1169	204
Added Vol:	0	6	0	0	0	0	0	24	0	8	31	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	401	1185	193	415	687	375	390	960	187	256	1200	204
User 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
PHF 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
PHF Volume:	401	1185	193	415	687	375	390	960	187	256	1200	204
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	401	1185	193	415	687	375	390	960	187	256	1200	204
PCE 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
MLF 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
FinalVolume:	401	1185	193	415	687	375	390	960	187	256	1200	204
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	1.00	0.92
Lanes:	2.00	2.56	0.44	2.00	3.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3150	4815	784	3150	5700	1750	3150	3800	1750	3150	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.13	0.25	0.25	0.13	0.12	0.21	0.12	0.25	0.11	0.08	0.32	0.12
Crit Moves:		****		****			****				****	
Green Time:	20.3	35.5	35.5	19.0	34.2	34.2	17.9	48.0	48.0	15.4	45.6	45.6
Volume/Cap:	0.81	0.90	0.90	0.90	0.46	0.81	0.90	0.68	0.29	0.68	0.90	0.33
Delay/Veh:	63.1	53.2	53.2	75.0	40.3	55.6	76.6	36.0	29.2	60.1	48.7	31.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	63.1	53.2	53.2	75.0	40.3	55.6	76.6	36.0	29.2	60.1	48.7	31.3
LOS by Move:	E	D-	D-	E	D	E+	E-	D+	C	E	D	C
HCM2kAvgQ:	287	534	534	325	194	429	310	416	140	179	651	159

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative PM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy



Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	264	836	297	533	1484	290	343	1229	252	432	931	140
Growth 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
Initial Bse:	264	836	297	533	1484	290	343	1229	252	432	931	140
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	264	836	297	533	1484	290	343	1229	252	432	931	140
User 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
PHF 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
PHF Volume:	264	836	297	533	1484	290	343	1229	252	432	931	140
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	264	836	297	533	1484	290	343	1229	252	432	931	140
PCE 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
MLF 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
FinalVolume:	264	836	297	533	1484	290	343	1229	252	432	931	140
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	1.00	0.92
Lanes:	2.00	2.18	0.82	2.00	3.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3150	4130	1467	3150	5700	1750	3150	3800	1750	3150	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.08	0.20	0.20	0.17	0.26	0.17	0.11	0.32	0.14	0.14	0.25	0.08
Crit Moves:		****		****				****		****		
Green Time:	12.8	28.7	28.7	24.0	39.9	39.9	20.1	45.9	45.9	19.4	45.2	45.2
Volume/Cap:	0.85	0.92	0.92	0.92	0.85	0.54	0.70	0.92	0.41	0.92	0.70	0.23
Delay/Veh:	76.9	60.3	60.3	71.5	46.4	38.6	56.8	50.3	32.3	77.2	38.4	30.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	76.9	60.3	60.3	71.5	46.4	38.6	56.8	50.3	32.3	77.2	38.4	30.2
LOS by Move:	E-	E	E	E	D	D+	E+	D	C-	E-	D+	C
HCM2kAvgQ:	217	466	466	404	521	265	227	679	204	342	418	105

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative + Project PM

Intersection #5: El Camino Real/ Page Mill Rd/ Oregon Expwy

Signal=Protect/Rights=Include
Final Vol: 290 1484 533***
Lanes: 1 0 3 0 2

Signal=Protect
Rights=Include
Final Vol: Lanes:
343 2
0
1247*** 2
0
252 1

Vol Cnt Date: n/a
Cycle Time (sec): 130
Loss Time (sec): 12
Critical V/C: 0.924
Avg Crit Del (sec/veh): 61.6
Avg Delay (sec/veh): 53.2
LOS: D-

Signal=Protect
Rights=Include
Lanes: Final Vol:
1 140
0
2 944
0
2 436***

Lanes: 2 0 2 1 0
Final Vol: 264 841*** 297
Signal=Protect/Rights=Include

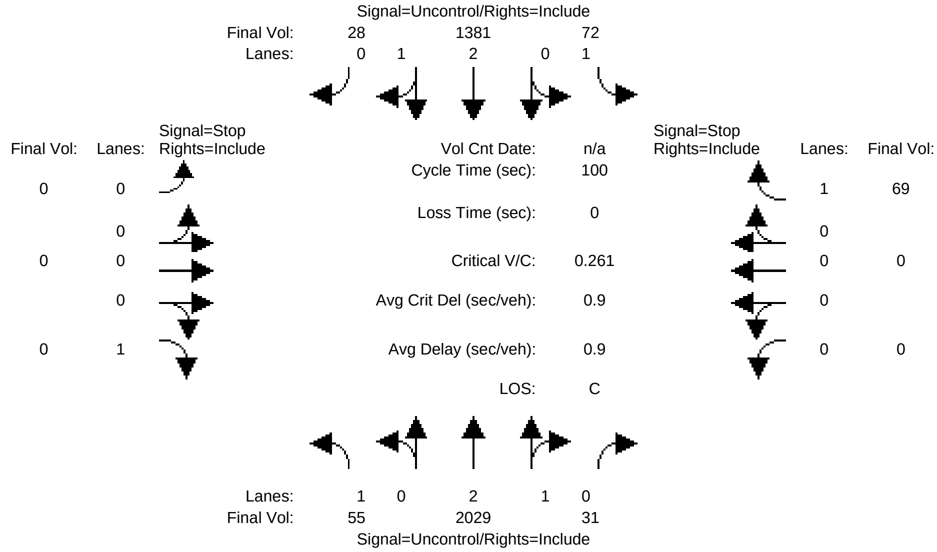
Street Name:	El Camino Real						Page Mill Rd/ Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	264	836	297	533	1484	290	343	1229	252	432	931	140
Growth 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
Initial Bse:	264	836	297	533	1484	290	343	1229	252	432	931	140
Added Vol:	0	5	0	0	0	0	0	18	0	4	13	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	264	841	297	533	1484	290	343	1247	252	436	944	140
User 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
PHF 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
PHF Volume:	264	841	297	533	1484	290	343	1247	252	436	944	140
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	264	841	297	533	1484	290	343	1247	252	436	944	140
PCE 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
MLF 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
FinalVolume:	264	841	297	533	1484	290	343	1247	252	436	944	140
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.83	0.99	0.95	0.83	1.00	0.92	0.83	1.00	0.92	0.83	1.00	0.92
Lanes:	2.00	2.19	0.81	2.00	3.00	1.00	2.00	2.00	1.00	2.00	2.00	1.00
Final Sat.:	3150	4137	1461	3150	5700	1750	3150	3800	1750	3150	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.08	0.20	0.20	0.17	0.26	0.17	0.11	0.33	0.14	0.14	0.25	0.08
Crit Moves:		****		****				****		****		
Green Time:	12.8	28.6	28.6	23.8	39.6	39.6	20.0	46.1	46.1	19.5	45.6	45.6
Volume/Cap:	0.85	0.92	0.92	0.92	0.85	0.54	0.71	0.92	0.41	0.92	0.71	0.23
Delay/Veh:	77.7	61.3	61.3	73.0	46.8	38.8	57.0	51.1	32.0	78.6	38.2	30.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	77.7	61.3	61.3	73.0	46.8	38.8	57.0	51.1	32.0	78.6	38.2	30.0
LOS by Move:	E-	E	E	E	D	D+	E+	D-	C-	E-	D+	C
HCM2kAvgQ:	218	473	473	408	524	266	228	695	203	348	424	104

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

Intersection #6: El Camino Real/ Grant Ave




```
Street Name:           El Camino Real                    Grant Ave
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      55 2029    31    72 1381    28     0    0     0     0    0    69
Growth 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
Initial Bse:   55 2029    31    72 1381    28     0    0     0     0    0    69
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   55 2029    31    72 1381    28     0    0     0     0    0    69
User 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
PHF 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
PHF Volume:    55 2029    31    72 1381    28     0    0     0     0    0    69
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   55 2029    31    72 1381    28     0    0     0     0    0    69
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1409 xxxx xxxxx  2060 xxxx xxxxx  xxxx xxxx   474  xxxx xxxx   692
Potent Cap.:  490 xxxx xxxxx   275 xxxx xxxxx  xxxx xxxx   542  xxxx xxxx   391
Move Cap.:    490 xxxx xxxxx   275 xxxx xxxxx  xxxx xxxx   542  xxxx xxxx   391
Volume/Cap:  0.11 xxxx  xxxx  0.26 xxxx  xxxx  xxxx xxxx  0.00  xxxx xxxx  0.18
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    9.4 xxxx xxxxx  25.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  15.8
Control Del: 13.3 xxxx xxxxx  22.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  16.2
LOS by Move:    B    *     *     C    *     *     *    *     *     *    *     C
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            16.2
ApproachLOS:        *                *                *                C
Note: Queue reported is the distance per lane in feet.
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign         Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   55 2029    31    72 1381    28     0    0     0     0    0    69
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             16.2
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=69]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3665]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign         Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   55 2029    31    72 1381    28     0    0     0     0    0    69
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             3596
Minor Approach Volume:           69
Minor Approach Volume Threshold: -156 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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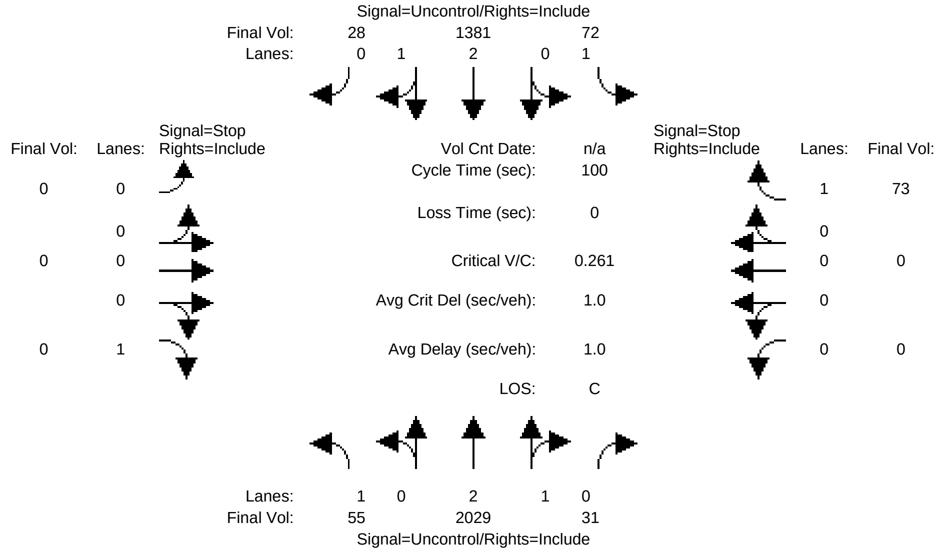
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative + Project AM

Intersection #6: El Camino Real/ Grant Ave




```
Street Name:           El Camino Real                      Grant Ave
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      55 2029    31     72 1381    28     0     0     0     0     0    69
Growth 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
Initial Bse:   55 2029    31     72 1381    28     0     0     0     0     0    69
Added Vol:      0    0     0      0    0     0     0     0     0     0     0     4
PasserByVol:    0    0     0      0    0     0     0     0     0     0     0     0
Initial Fut:   55 2029    31     72 1381    28     0     0     0     0     0    73
User 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
PHF 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
PHF Volume:    55 2029    31     72 1381    28     0     0     0     0     0    73
Reduct Vol:     0    0     0      0    0     0     0     0     0     0     0     0
FinalVolume:   55 2029    31     72 1381    28     0     0     0     0     0    73
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1409 xxxx xxxxx  2060 xxxx xxxxx  xxxx xxxx   474  xxxx xxxx   692
Potent Cap.:  490 xxxx xxxxx   275 xxxx xxxxx  xxxx xxxx   542  xxxx xxxx   391
Move Cap.:    490 xxxx xxxxx   275 xxxx xxxxx  xxxx xxxx   542  xxxx xxxx   391
Volume/Cap:  0.11 xxxx  xxxx  0.26 xxxx  xxxx  xxxx xxxx  0.00  xxxx xxxx  0.19
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    9.4 xxxx xxxxx  25.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  16.9
Control Del: 13.3 xxxx xxxxx  22.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  16.3
LOS by Move:    B    *     *     C    *     *     *    *     *     *    *     C
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx             16.3
ApproachLOS:        *                 *                 *                 C
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L - T - R     L - T - R     L - T - R     L - T - R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   55 2029    31    72 1381    28     0    0     0     0    0    73
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             16.3
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=73]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=3669]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L - T - R     L - T - R     L - T - R     L - T - R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   55 2029    31    72 1381    28     0    0     0     0    0    73
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            3596
Minor Approach Volume:          73
Minor Approach Volume Threshold: -156 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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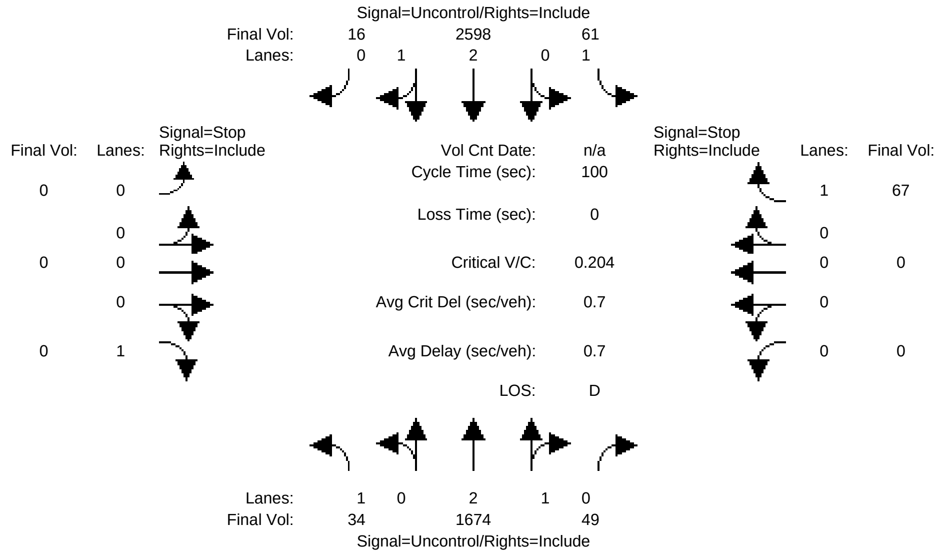
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM

Intersection #6: El Camino Real/ Grant Ave



Street Name:	El Camino Real						Grant Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	34	1674	49	61	2598	16	0	0	0	0	0	67
Growth 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
Initial Bse:	34	1674	49	61	2598	16	0	0	0	0	0	67
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	34	1674	49	61	2598	16	0	0	0	0	0	67
User 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
PHF 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
PHF Volume:	34	1674	49	61	2598	16	0	0	0	0	0	67
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	34	1674	49	61	2598	16	0	0	0	0	0	67
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	6.9	xxxxx	xxxx	6.9
FollowUpTim:	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	3.3	xxxxx	xxxx	3.3
Capacity Module:												
Cnflict Vol:	2614	xxxx	xxxxx	1723	xxxx	xxxxx	xxxx	xxxx	874	xxxx	xxxx	583
Potent Cap.:	167	xxxx	xxxxx	372	xxxx	xxxxx	xxxx	xxxx	297	xxxx	xxxx	461
Move Cap.:	167	xxxx	xxxxx	372	xxxx	xxxxx	xxxx	xxxx	297	xxxx	xxxx	461
Volume/Cap:	0.20	xxxx	xxxx	0.16	xxxx	xxxx	xxxx	xxxx	0.00	xxxx	xxxx	0.15
Level Of Service Module:												
2Way95thQ:	18.4	xxxx	xxxxx	14.5	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	12.6
Control Del:	32.0	xxxx	xxxxx	16.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	14.1
LOS by Move:	D	*	*	C	*	*	*	*	*	*	*	B
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:		xxxxxx			xxxxxx			xxxxxx			14.1	
ApproachLOS:		*			*			*			B	

Note: Queue reported is the distance per lane in feet.

Peak Hour Delay Signal Warrant Report

****

Intersection #6 El Camino Real/ Grant Ave

****

Future Volume Alternative: Peak Hour Warrant NOT Met


```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0   1  0  2  1  0   0  0  0  0  1   0  0  0  0  1
Initial Vol:   34 1674    49   61 2598    16     0    0     0     0    0    67
ApproachDel:    xxxxxx           xxxxxx           xxxxxx             14.1
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=67]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=4499]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0   1  0  2  1  0   0  0  0  0  1   0  0  0  0  1
Initial Vol:   34 1674    49   61 2598    16     0    0     0     0    0    67
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            4432
Minor Approach Volume:          67
Minor Approach Volume Threshold: -228 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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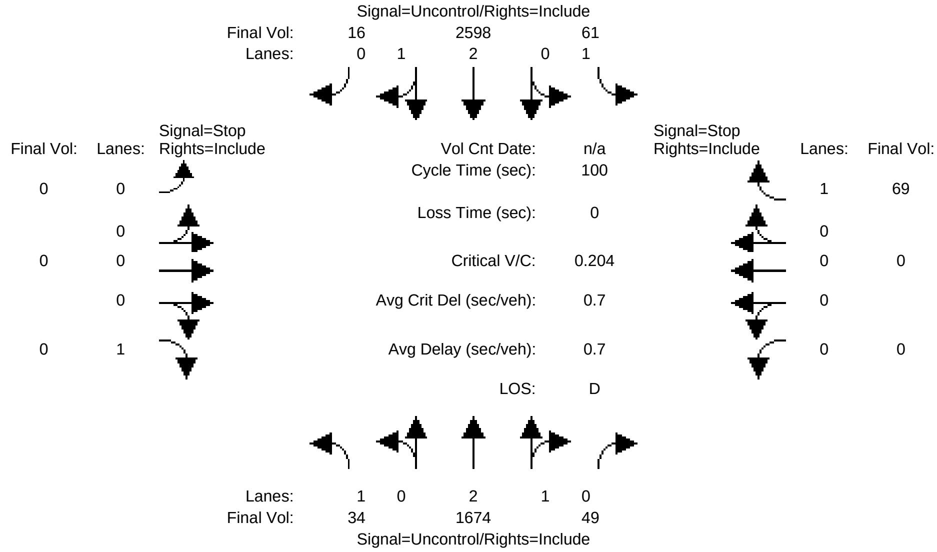
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative + Project PM

Intersection #6: El Camino Real/ Grant Ave




```
Street Name:            El Camino Real                    Grant Ave
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      34 1674    49    61 2598    16     0    0     0     0    0    67
Growth 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
Initial Bse:   34 1674    49    61 2598    16     0    0     0     0    0    67
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     2
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   34 1674    49    61 2598    16     0    0     0     0    0    69
User 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
PHF 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
PHF Volume:    34 1674    49    61 2598    16     0    0     0     0    0    69
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   34 1674    49    61 2598    16     0    0     0     0    0    69
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx   6.9 xxxxx xxxx   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 2614 xxxx xxxxx  1723 xxxx xxxxx  xxxx xxxx   874  xxxx xxxx   583
Potent Cap.:  167 xxxx xxxxx   372 xxxx xxxxx  xxxx xxxx   297  xxxx xxxx   461
Move Cap.:    167 xxxx xxxxx   372 xxxx xxxxx  xxxx xxxx   297  xxxx xxxx   461
Volume/Cap:  0.20 xxxx  xxxx  0.16 xxxx  xxxx  xxxx xxxx  0.00  xxxx xxxx  0.15
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   18.4 xxxx xxxxx  14.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx  13.1
Control Del: 32.0 xxxx xxxxx  16.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  14.2
LOS by Move:    D    *     *     C    *     *     *    *     *     *    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx             14.2
ApproachLOS:          *                *                *                B
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   34 1674    49    61 2598    16     0    0     0     0    0    69
ApproachDel:    xxxxxx           xxxxxx           xxxxxx            14.2
------------|---------------||---------------||---------------||---------------|
Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.3]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=69]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=4501]
   SUCCEED - Total volume greater than or equal to 650 for intersection
             with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

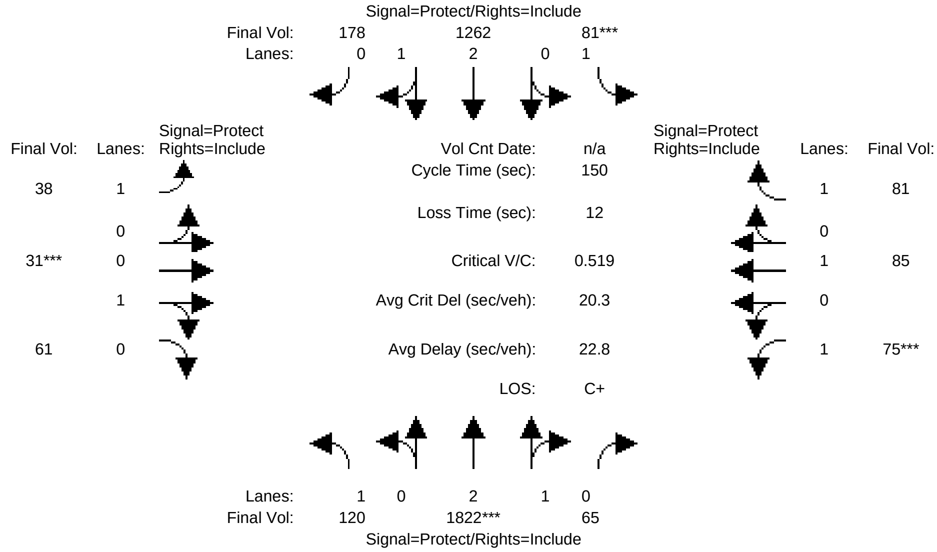
The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #6 El Camino Real/ Grant Ave
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        1  0  2  1  0    1  0  2  1  0    0  0  0  0  1    0  0  0  0  1
Initial Vol:   34 1674    49    61 2598    16     0    0     0     0    0    69
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            4432
Minor Approach Volume:          69
Minor Approach Volume Threshold: -228 [less than minimum of 100]
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative AM

Intersection #7: El Camino Real/ California Ave



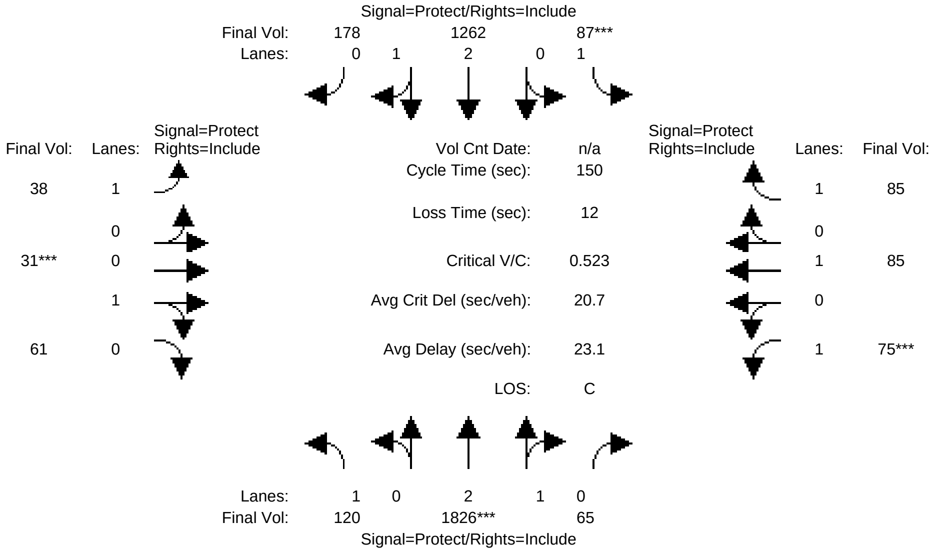
Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	120	1822	65	81	1262	178	38	31	61	75	85	81
Growth 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
Initial Bse:	120	1822	65	81	1262	178	38	31	61	75	85	81
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	120	1822	65	81	1262	178	38	31	61	75	85	81
User 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
PHF 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
PHF Volume:	120	1822	65	81	1262	178	38	31	61	75	85	81
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	120	1822	65	81	1262	178	38	31	61	75	85	81
PCE 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
MLF 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
FinalVolume:	120	1822	65	81	1262	178	38	31	61	75	85	81
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.99	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.89	0.11	1.00	2.62	0.38	1.00	0.34	0.66	1.00	1.00	1.00
Final Sat.:	1750	5407	193	1750	4907	692	1750	607	1193	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.07	0.34	0.34	0.05	0.26	0.26	0.02	0.05	0.05	0.04	0.04	0.05
Crit Moves:		****		****				****		****		
Green Time:	23.3	97.4	97.4	13.4	87.5	87.5	11.2	14.8	14.8	12.4	16.0	16.0
Volume/Cap:	0.44	0.52	0.52	0.52	0.44	0.44	0.29	0.52	0.52	0.52	0.42	0.43
Delay/Veh:	58.6	14.0	14.0	68.3	17.6	17.6	66.9	66.9	66.9	69.2	64.1	64.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	58.6	14.0	14.0	68.3	17.6	17.6	66.9	66.9	66.9	69.2	64.1	64.4
LOS by Move:	E+	B	B	E	B	B	E	E	E	E	E	E
HCM2kAvgQ:	142	379	379	112	305	305	51	121	121	106	100	104

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative + Project AM

Intersection #7: El Camino Real/ California Ave



Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	120	1822	65	81	1262	178	38	31	61	75	85	81
Growth 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
Initial Bse:	120	1822	65	81	1262	178	38	31	61	75	85	81
Added Vol:	0	4	0	6	0	0	0	0	0	0	0	4
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	120	1826	65	87	1262	178	38	31	61	75	85	85
User 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
PHF 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
PHF Volume:	120	1826	65	87	1262	178	38	31	61	75	85	85
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	120	1826	65	87	1262	178	38	31	61	75	85	85
PCE 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
MLF 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
FinalVolume:	120	1826	65	87	1262	178	38	31	61	75	85	85
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.99	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.89	0.11	1.00	2.62	0.38	1.00	0.34	0.66	1.00	1.00	1.00
Final Sat.:	1750	5407	192	1750	4907	692	1750	607	1193	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.07	0.34	0.34	0.05	0.26	0.26	0.02	0.05	0.05	0.04	0.04	0.05
Crit Moves:		****		****				****		****		
Green Time:	23.4	96.8	96.8	14.3	87.7	87.7	11.1	14.7	14.7	12.3	15.8	15.8
Volume/Cap:	0.44	0.52	0.52	0.52	0.44	0.44	0.29	0.52	0.52	0.52	0.42	0.46
Delay/Veh:	58.5	14.4	14.4	67.7	17.5	17.5	67.0	67.2	67.2	69.5	64.2	64.9
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	58.5	14.4	14.4	67.7	17.5	17.5	67.0	67.2	67.2	69.5	64.2	64.9
LOS by Move:	E+	B	B	E	B	B	E	E	E	E	E	E
HCM2kAvgQ:	142	385	385	119	304	304	51	121	121	106	100	110

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative PM

Intersection #7: El Camino Real/ California Ave

Signal=Protect/Rights=Include
Final Vol: 62 2096*** 99
Lanes: 0 1 2 0 1

Signal=Protect Rights=Include (West approach)
Final Vol: / Lanes:
140 / 1
 / 0
83*** / 0
 / 1
149 / 0

Vol Cnt Date: n/a
Cycle Time (sec): 150
Loss Time (sec): 12
Critical V/C: 0.675
Avg Crit Del (sec/veh): 30.6
Avg Delay (sec/veh): 30.5
LOS: C

Signal=Protect Rights=Include (East approach)
Lanes: / Final Vol:
1 / 84
0 /
1 / 35
0 /
1 / 106***

Lanes: 1 0 2 1 0
Final Vol: 81*** 1459 100
Signal=Protect/Rights=Include

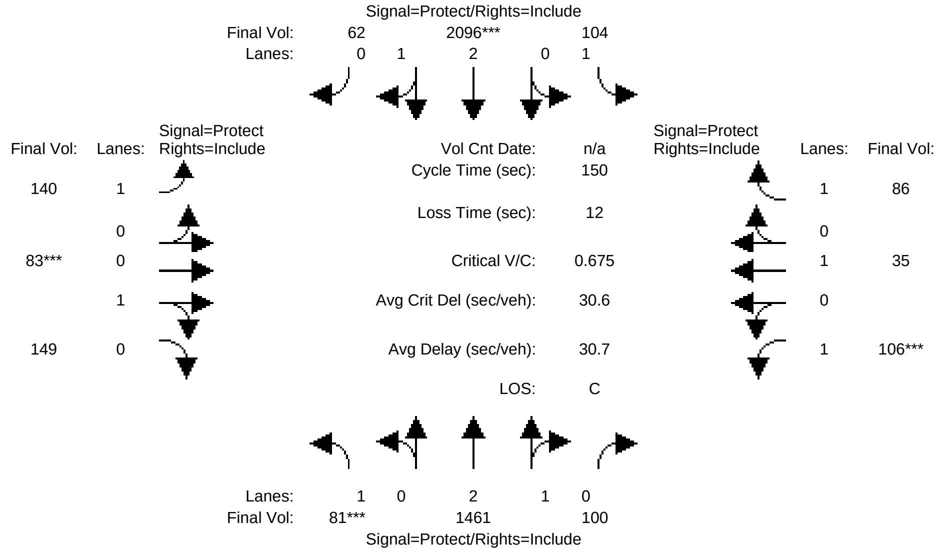
Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	81	1459	100	99	2096	62	140	83	149	106	35	84
Growth 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
Initial Bse:	81	1459	100	99	2096	62	140	83	149	106	35	84
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	81	1459	100	99	2096	62	140	83	149	106	35	84
User 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
PHF 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
PHF Volume:	81	1459	100	99	2096	62	140	83	149	106	35	84
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	81	1459	100	99	2096	62	140	83	149	106	35	84
PCE 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
MLF 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
FinalVolume:	81	1459	100	99	2096	62	140	83	149	106	35	84
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.98	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.80	0.20	1.00	2.91	0.09	1.00	0.36	0.64	1.00	1.00	1.00
Final Sat.:	1750	5240	359	1750	5439	161	1750	644	1156	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.05	0.28	0.28	0.06	0.39	0.39	0.08	0.13	0.13	0.06	0.02	0.05
Crit Moves:	****				****			****		****		
Green Time:	10.3	79.7	79.7	16.2	85.6	85.6	23.0	28.6	28.6	13.5	19.1	19.1
Volume/Cap:	0.68	0.52	0.52	0.52	0.68	0.68	0.52	0.68	0.68	0.68	0.14	0.38
Delay/Veh:	82.4	23.0	23.0	65.9	23.1	23.1	60.3	61.6	61.6	77.2	58.4	61.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	82.4	23.0	23.0	65.9	23.1	23.1	60.3	61.6	61.6	77.2	58.4	61.0
LOS by Move:	F	C+	C+	E	C	C	E	E	E	E-	E+	E
HCM2kAvgQ:	129	385	385	131	582	582	172	283	283	158	37	102

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative + Project PM

Intersection #7: El Camino Real/ California Ave



Street Name:	El Camino Real						California Ave					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	81	1459	100	99	2096	62	140	83	149	106	35	84
Growth 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
Initial Bse:	81	1459	100	99	2096	62	140	83	149	106	35	84
Added Vol:	0	2	0	5	0	0	0	0	0	0	0	2
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	81	1461	100	104	2096	62	140	83	149	106	35	86
User 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
PHF 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
PHF Volume:	81	1461	100	104	2096	62	140	83	149	106	35	86
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	81	1461	100	104	2096	62	140	83	149	106	35	86
PCE 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
MLF 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
FinalVolume:	81	1461	100	104	2096	62	140	83	149	106	35	86
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	0.98	0.95	0.92	0.98	0.95	0.92	0.95	0.95	0.92	1.00	0.92
Lanes:	1.00	2.80	0.20	1.00	2.91	0.09	1.00	0.36	0.64	1.00	1.00	1.00
Final Sat.:	1750	5241	359	1750	5439	161	1750	644	1156	1750	1900	1750
Capacity Analysis Module:												
Vol/Sat:	0.05	0.28	0.28	0.06	0.39	0.39	0.08	0.13	0.13	0.06	0.02	0.05
Crit Moves:	****				****			****		****		
Green Time:	10.3	79.1	79.1	16.9	85.6	85.6	23.0	28.6	28.6	13.5	19.1	19.1
Volume/Cap:	0.68	0.53	0.53	0.53	0.68	0.68	0.52	0.68	0.68	0.68	0.14	0.39
Delay/Veh:	82.4	23.4	23.4	65.5	23.1	23.1	60.3	61.6	61.6	77.2	58.4	61.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	82.4	23.4	23.4	65.5	23.1	23.1	60.3	61.6	61.6	77.2	58.4	61.1
LOS by Move:	F	C	C	E	C	C	E	E	E	E-	E+	E
HCM2kAvgQ:	129	389	389	137	582	582	172	283	283	158	37	104

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative AM

Intersection #8: Middlefield Rd/ Oregon Expwy

Signal=Protect/Rights=Include
Final Vol: 190 534*** 74
Lanes: 0 1 1 0 1

Final Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Include	Lanes:	Final Vol:
			Vol Cnt Date:	n/a			
158***	1		Cycle Time (sec):	150		1	25
			Loss Time (sec):	12			
	0					0	
937	2		Critical V/C:	0.842		2	1404***
	0		Avg Crit Del (sec/veh):	54.5		0	
172	1		Avg Delay (sec/veh):	48.9		1	144
			LOS:	D			

Lanes: 1 0 1 0 1
Final Vol: 209*** 348 121
Signal=Protect/Rights=Include

Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	209	348	121	74	534	190	158	937	172	144	1404	25
Growth 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
Initial Bse:	209	348	121	74	534	190	158	937	172	144	1404	25
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	209	348	121	74	534	190	158	937	172	144	1404	25
User 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
PHF 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
PHF Volume:	209	348	121	74	534	190	158	937	172	144	1404	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	209	348	121	74	534	190	158	937	172	144	1404	25
PCE 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
MLF 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
FinalVolume:	209	348	121	74	534	190	158	937	172	144	1404	25
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.46	0.54	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	2728	971	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.12	0.18	0.07	0.04	0.20	0.20	0.09	0.25	0.10	0.08	0.37	0.01
Crit Moves:	****				****		****				****	
Green Time:	21.3	44.7	44.7	11.4	34.9	34.9	16.1	61.4	61.4	20.5	65.8	65.8
Volume/Cap:	0.84	0.61	0.23	0.56	0.84	0.84	0.84	0.60	0.24	0.60	0.84	0.03
Delay/Veh:	84.8	47.2	39.9	72.0	62.5	62.5	93.3	35.4	29.2	65.2	41.6	24.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	84.8	47.2	39.9	72.0	62.5	62.5	93.3	35.4	29.2	65.2	41.6	24.0
LOS by Move:	F	D	D	E	E	E	F	D+	C	E	D	C
HCM2kAvgQ:	313	349	111	108	463	463	251	419	135	187	757	17

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative + Project AM

Intersection #8: Middlefield Rd/ Oregon Expwy

Signal=Protect/Rights=Include
Final Vol: 194 534*** 74
Lanes: 0 1 1 0 1

Westbound side: Signal=Protect Rights=Include

Final Vol:	Lanes:	Signal=Protect Rights=Include			Signal=Protect Rights=Include	Lanes:	Final Vol:
163***	1		Vol Cnt Date:	n/a		1	25
			Cycle Time (sec):	150			
	0		Loss Time (sec):	12		0	
946	2		Critical V/C:	0.851		2	1411***
	0		Avg Crit Del (sec/veh):	55.5		0	
178	1		Avg Delay (sec/veh):	49.4		1	144
			LOS:	D			

Lanes: 1 0 1 0 1
Final Vol: 213*** 348 121
Signal=Protect/Rights=Include

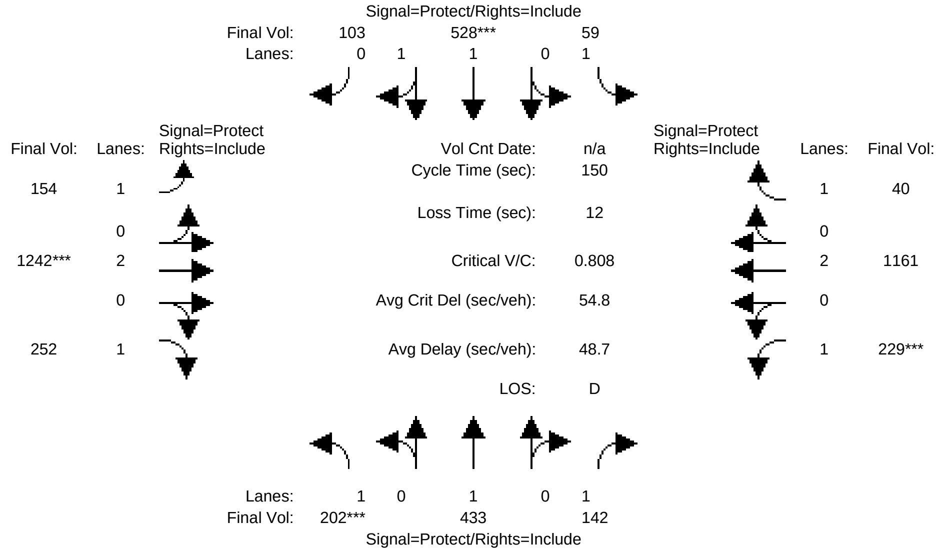
Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	209	348	121	74	534	190	158	937	172	144	1404	25
Growth 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
Initial Bse:	209	348	121	74	534	190	158	937	172	144	1404	25
Added Vol:	4	0	0	0	0	4	5	9	6	0	7	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	213	348	121	74	534	194	163	946	178	144	1411	25
User 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
PHF 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
PHF Volume:	213	348	121	74	534	194	163	946	178	144	1411	25
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	213	348	121	74	534	194	163	946	178	144	1411	25
PCE 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
MLF 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
FinalVolume:	213	348	121	74	534	194	163	946	178	144	1411	25
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.45	0.55	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	2713	986	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.12	0.18	0.07	0.04	0.20	0.20	0.09	0.25	0.10	0.08	0.37	0.01
Crit Moves:	****				****		****				****	
Green Time:	21.5	44.7	44.7	11.4	34.7	34.7	16.4	61.5	61.5	20.3	65.4	65.4
Volume/Cap:	0.85	0.61	0.23	0.56	0.85	0.85	0.85	0.61	0.25	0.61	0.85	0.03
Delay/Veh:	86.0	47.2	39.9	72.0	63.3	63.3	94.2	35.4	29.2	65.5	42.3	24.2
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	86.0	47.2	39.9	72.0	63.3	63.3	94.2	35.4	29.2	65.5	42.3	24.2
LOS by Move:	F	D	D	E	E	E	F	D+	C	E	D	C
HCM2kAvgQ:	320	349	111	108	470	470	260	424	140	188	770	17

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative PM

Intersection #8: Middlefield Rd/ Oregon Expwy



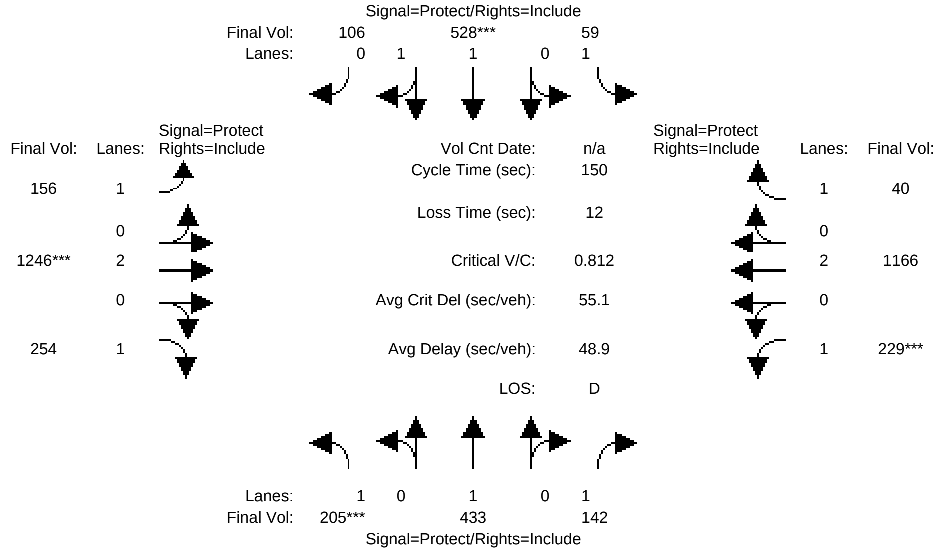
Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	202	433	142	59	528	103	154	1242	252	229	1161	40
Growth 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
Initial Bse:	202	433	142	59	528	103	154	1242	252	229	1161	40
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	202	433	142	59	528	103	154	1242	252	229	1161	40
User 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
PHF 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
PHF Volume:	202	433	142	59	528	103	154	1242	252	229	1161	40
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	202	433	142	59	528	103	154	1242	252	229	1161	40
PCE 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
MLF 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
FinalVolume:	202	433	142	59	528	103	154	1242	252	229	1161	40
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.66	0.34	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	3096	604	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.12	0.23	0.08	0.03	0.17	0.17	0.09	0.33	0.14	0.13	0.31	0.02
Crit Moves:	****				****			****		****		
Green Time:	21.4	44.0	44.0	9.0	31.7	31.7	19.0	60.6	60.6	24.3	65.9	65.9
Volume/Cap:	0.81	0.78	0.28	0.56	0.81	0.81	0.70	0.81	0.36	0.81	0.70	0.05
Delay/Veh:	79.8	55.2	41.0	75.3	62.6	62.6	72.0	42.8	31.4	76.3	35.2	24.1
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	79.8	55.2	41.0	75.3	62.6	62.6	72.0	42.8	31.4	76.3	35.2	24.1
LOS by Move:	E-	E+	D	E-	E	E	E	D	C	E-	D+	C
HCM2kAvgQ:	294	486	133	92	400	400	214	661	212	325	541	27

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative + Project PM

Intersection #8: Middlefield Rd/ Oregon Expwy



Street Name:	Middlefield Rd						Oregon Expwy					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	7	10	10	7	10	10	7	10	10	7	10	10
Y+R:	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Volume Module:												
Base Vol:	202	433	142	59	528	103	154	1242	252	229	1161	40
Growth 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
Initial Bse:	202	433	142	59	528	103	154	1242	252	229	1161	40
Added Vol:	3	0	0	0	0	3	2	4	2	0	5	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	205	433	142	59	528	106	156	1246	254	229	1166	40
User 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
PHF 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
PHF Volume:	205	433	142	59	528	106	156	1246	254	229	1166	40
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	205	433	142	59	528	106	156	1246	254	229	1166	40
PCE 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
MLF 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
FinalVolume:	205	433	142	59	528	106	156	1246	254	229	1166	40
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	0.92	1.00	0.92	0.92	0.98	0.95	0.92	1.00	0.92	0.92	1.00	0.92
Lanes:	1.00	1.00	1.00	1.00	1.66	0.34	1.00	2.00	1.00	1.00	2.00	1.00
Final Sat.:	1750	1900	1750	1750	3081	619	1750	3800	1750	1750	3800	1750
Capacity Analysis Module:												
Vol/Sat:	0.12	0.23	0.08	0.03	0.17	0.17	0.09	0.33	0.15	0.13	0.31	0.02
Crit Moves:	****				****			****		****		
Green Time:	21.6	44.2	44.2	9.1	31.6	31.6	19.1	60.6	60.6	24.2	65.6	65.6
Volume/Cap:	0.81	0.77	0.28	0.56	0.81	0.81	0.70	0.81	0.36	0.81	0.70	0.05
Delay/Veh:	80.0	54.9	40.9	75.1	62.8	62.8	72.3	43.1	31.5	76.9	35.6	24.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	80.0	54.9	40.9	75.1	62.8	62.8	72.3	43.1	31.5	76.9	35.6	24.3
LOS by Move:	F	D-	D	E-	E	E	E	D	C	E-	D+	C
HCM2kAvgQ:	299	484	133	92	404	404	217	666	214	326	547	27

Note: Queue reported is the distance per lane in feet.

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

Intersection #9: Park Blvd/ Access#1

```
                      Signal=Uncontrol/Rights=Include
          Final Vol:  0         233        0
             Lanes:   0    1     0     0   0

                   Signal=Stop                                    Signal=Stop
Final Vol: Lanes:  Rights=Include      Vol Cnt Date:      n/a     Rights=Include   Lanes:  Final Vol:
                                       Cycle Time (sec):  100
    0        0                                                                        0       0
                                       Loss Time (sec):    0
             0                                                                        0
    0        1!                        Critical V/C:      0.000                       0       0
             0                         Avg Crit Del (sec/veh): 0.0                    0
    0        0                         Avg Delay (sec/veh):    0.0                    0       0
                                       LOS:                A

             Lanes:   0    1     0     0   0
          Final Vol:  0         208        0
                      Signal=Uncontrol/Rights=Include
```

```
Street Name:                Park Blvd                             Access#1
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0  208     0     0  233     0     0     0     0     0     0     0
Growth 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
Initial Bse:     0  208     0     0  233     0     0     0     0     0     0     0
Added Vol:       0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:     0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:     0  208     0     0  233     0     0     0     0     0     0     0
User 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
PHF 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
PHF Volume:      0  208     0     0  233     0     0     0     0     0     0     0
Reduct Vol:      0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:     0  208     0     0  233     0     0     0     0     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx   441  441   233  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   577  513   811  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   577  513   811  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.00 0.00  0.00  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx     0 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx            xxxxxx
ApproachLOS:          *                 *                 *                 *
Note: Queue reported is the distance per lane in feet.
                    Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    0  208     0     0  233     0     0    0     0     0    0     0
ApproachDel:    xxxxxx           xxxxxx           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

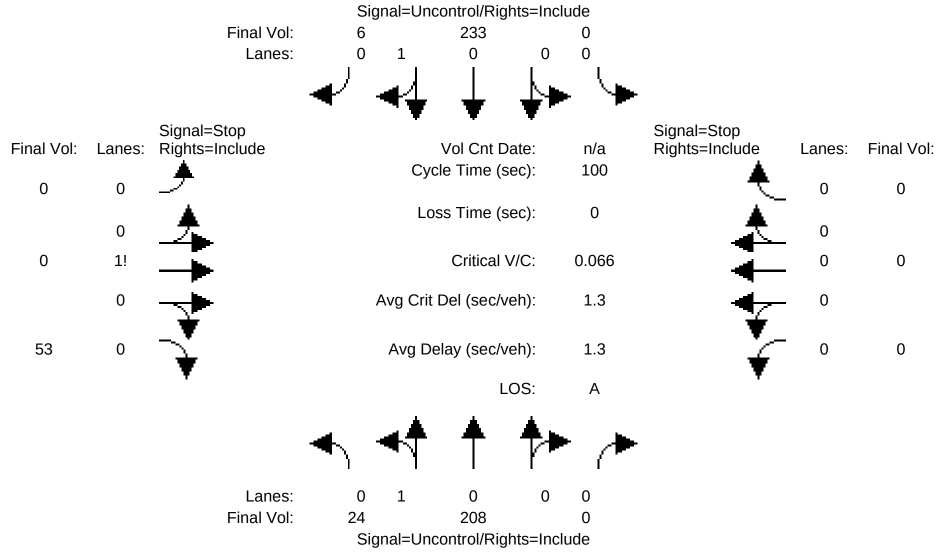
The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    0  208     0     0  233     0     0    0     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            441
Minor Approach Volume:          0
Minor Approach Volume Threshold: 438
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
```

231 Grant Ave TIA
Palo Alto, CA
AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative + Project AM

Intersection #9: Park Blvd/ Access#1




```
Street Name:              Park Blvd                          Access#1
Approach:       North Bound       South Bound       East Bound        West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  208     0     0  233     0     0     0     0     0     0     0
Growth 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
Initial Bse:    0  208     0     0  233     0     0     0     0     0     0     0
Added Vol:     24    0     0     0    0     6     0     0    53     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:   24  208     0     0  233     6     0     0    53     0     0     0
User 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
PHF 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
PHF Volume:    24  208     0     0  233     6     0     0    53     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:   24  208     0     0  233     6     0     0    53     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  239 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   236  xxxx xxxx xxxxx
Potent Cap.: 1340 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   808  xxxx xxxx xxxxx
Move Cap.:   1340 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   808  xxxx xxxx xxxxx
Volume/Cap:  0.02 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.07  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    1.4 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   5.3  xxxx xxxx xxxxx
Control Del:  7.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   9.8 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     *    *     A     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:  0.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:  7.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx               9.8            xxxxxx
ApproachLOS:        *                 *                  A                *
Note: Queue reported is the distance per lane in feet.
                    Peak Hour Delay Signal Warrant Report
*******************************************************************************
Intersection #9 Park Blvd/ Access#1
*******************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:       0  1  0  0  0    0  0  0  1  0    0  0  0  0  1    0  0  0  0  0
Initial Vol:  24  208    0     0  233    6     0    0    53     0    0     0
ApproachDel:   xxxxxx           xxxxxx              9.8            xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=53]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=524]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:       0  1  0  0  0    0  0  0  1  0    0  0  0  0  1    0  0  0  0  0
Initial Vol:  24  208    0     0  233    6     0    0    53     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            471
Minor Approach Volume:          53
Minor Approach Volume Threshold: 420
--------------------------------------------------------------------------------
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AECOM Transportation

Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM

Intersection #9: Park Blvd/ Access#1

Signal=Uncontrol/Rights=Include
Final Vol: 0 429 0
Lanes: 0 1 0 0 0

Final Vol:	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Final Vol:
0	0		Vol Cnt Date:	n/a		0	0
			Cycle Time (sec):	100			
	0		Loss Time (sec):	0		0	
0	1!		Critical V/C:	0.000		0	0
	0		Avg Crit Del (sec/veh):	0.0		0	
0	0		Avg Delay (sec/veh):	0.0		0	0
			LOS:	A			

Lanes: 0 1 0 0 0
Final Vol: 0 172 0
Signal=Uncontrol/Rights=Include

```
Street Name:                Park Blvd                            Access#1
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  172     0     0  429     0     0     0     0     0     0     0
Growth 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
Initial Bse:    0  172     0     0  429     0     0     0     0     0     0     0
Added Vol:      0    0     0     0    0     0     0     0     0     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:    0  172     0     0  429     0     0     0     0     0     0     0
User 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
PHF 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
PHF Volume:     0  172     0     0  429     0     0     0     0     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:    0  172     0     0  429     0     0     0     0     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx   601  601   429  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   467  417   630  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   467  417   630  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.00 0.00  0.00  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx            xxxxxx            xxxxxx
ApproachLOS:          *                 *                 *                 *
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```

```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    0  172     0     0  429     0     0    0     0     0    0     0
ApproachDel:    xxxxxx           xxxxxx           xxxxxx           xxxxxx
------------|---------------||---------------||---------------||---------------|
--------------------------------------------------------------------------------
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a traffic signal in the future.  Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction.  Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  0  1  0  0    0  0  1  0  0    0  0  1! 0  0    0  0  0  0  0
Initial Vol:    0  172     0     0  429     0     0    0     0     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:            601
Minor Approach Volume:          0
Minor Approach Volume Threshold: 355
--------------------------------------------------------------------------------
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signal warrant (such as the 4-hour or 8-hour warrants).

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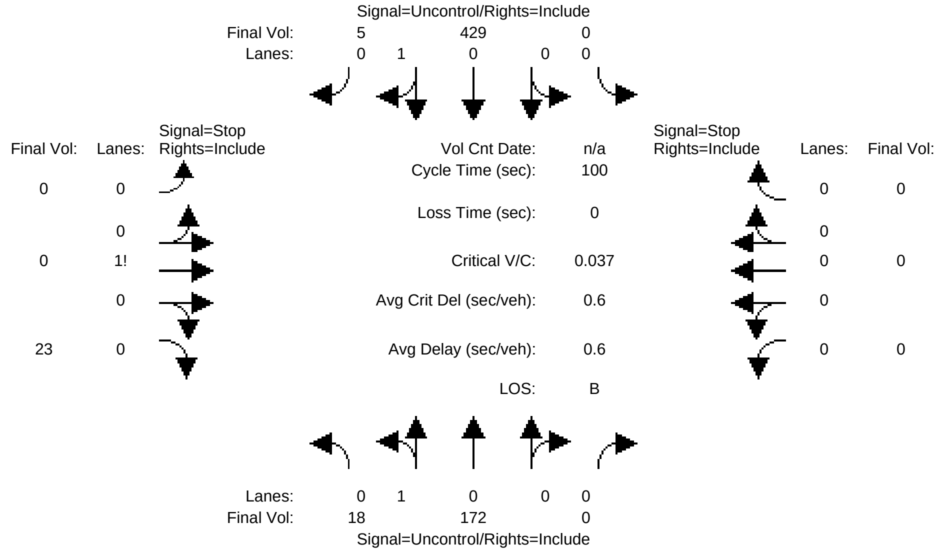
Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative + Project PM

Intersection #9: Park Blvd/ Access#1




```
Street Name:                Park Blvd                         Access#1
Approach:       North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  172     0     0  429     0     0     0     0     0     0     0
Growth 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
Initial Bse:    0  172     0     0  429     0     0     0     0     0     0     0
Added Vol:     18    0     0     0    0     5     0     0    23     0     0     0
PasserByVol:    0    0     0     0    0     0     0     0     0     0     0     0
Initial Fut:   18  172     0     0  429     5     0     0    23     0     0     0
User 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
PHF 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
PHF Volume:    18  172     0     0  429     5     0     0    23     0     0     0
Reduct Vol:     0    0     0     0    0     0     0     0     0     0     0     0
FinalVolume:   18  172     0     0  429     5     0     0    23     0     0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  434 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   432  xxxx xxxx xxxxx
Potent Cap.: 1136 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   628  xxxx xxxx xxxxx
Move Cap.:   1136 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   628  xxxx xxxx xxxxx
Volume/Cap:  0.02 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.04  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    1.2 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   2.8  xxxx xxxx xxxxx
Control Del:  8.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  10.9 xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     *    *     B     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:  0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:  8.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx            xxxxxx              10.9            xxxxxx
ApproachLOS:          *                 *                 B                 *
Note: Queue reported is the distance per lane in feet.
                     Peak Hour Delay Signal Warrant Report
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
```



```
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  0    0  0  0  1  0    0  0  0  0  1    0  0  0  0  0
Initial Vol:   18  172    0      0  429    5      0    0    23     0    0     0
ApproachDel:    xxxxxx           xxxxxx             10.9             xxxxxx
------------|---------------||---------------||---------------||---------------|
Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=23]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=647]
   FAIL - Total volume less than 650 for intersection
          with less than four approaches.
--------------------------------------------------------------------------------
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signal warrant (such as the 4-hour or 8-hour warrants).

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                Peak Hour Volume Signal Warrant Report [Urban]
********************************************************************************
Intersection #9 Park Blvd/ Access#1
********************************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
------------|---------------||---------------||---------------||---------------|
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Lanes:        0  1  0  0  0    0  0  0  1  0    0  0  0  0  1    0  0  0  0  0
Initial Vol:   18  172    0      0  429    5      0    0    23     0    0     0
------------|---------------||---------------||---------------||---------------|
Major Street Volume:             624
Minor Approach Volume:           23
Minor Approach Volume Threshold: 345
--------------------------------------------------------------------------------
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