APPENDIX A.
NOTICE OF PREPARATION FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT AND COMMENT LETTERS

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San Luis Obispo Office
1422 Monterey Street, Suite C200
San Luis Obispo, CA 93401
Tel 805.543.7095 Fax 805.543.2367
www.swca.com

NOTICE OF PREPARATION: DRAFT ENVIRONMENTAL IMPACT REPORT

DATE: September 25, 2013

TO: Responsible and Trustee Agencies
Other Interested Parties

FROM: California State University Board of Trustees and
California Polytechnic State University, San Luis Obispo

PROJECT: California Polytechnic State University, San Luis Obispo Student Housing South Project

The California State University Board of Trustees (Trustees) will be the lead agency for the preparation of an environmental impact report (EIR) for the California Polytechnic State University, San Luis Obispo (University) Student Housing South Project (project). A detailed description of the project is provided in the attached Initial Study.

The Trustees and the University need to know the views of your agency relative to the scope and content of the analysis to be provided in the EIR. In accordance with the time limits prescribed by State law, your response must be sent at the earliest date possible but not later than 30 days after receipt of this notice. Please send your comments to:

CSU Board of Trustees
c/o Nicole Carter, Senior Planner
SWCA Environmental Consultants
1422 Monterey Street, C200
San Luis Obispo, CA 93401

We would also appreciate the name(s) of contact personnel at your agency. A public scoping meeting is being scheduled; a separate notice of the meeting will be provided. If you have any questions regarding the project or this notice, please call me at 805.543.7095, extension 6822, or email me at ncarter@swca.com.

Sincerely,

Nicole Carter
Planner
(on behalf of the Trustees)

Attached: Initial Study

INITIAL STUDY
FOR
STUDENT HOUSING SOUTH

Prepared for:
CALIFORNIA POLYTECHNIC STATE UNIVERSITY, SAN LUIS OBISPO

Prepared by:

SWCA Environmental Consultants
1422 Monterey Street, Suite C200
San Luis Obispo, California 93401

September 2013

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INTRODUCTION

California Polytechnic State University, San Luis Obispo (the University or Cal Poly) proposes to construct approximately 1,475 beds of freshman housing and a 300 to 500-space parking structure at the present location of the General (G)-1, G-4 and Residential (R)-2 parking lots. This project is subject to the discretionary approval of The California State University (CSU) Board of Trustees (The Trustees) and is, therefore, a project under the California Environmental Quality Act (CEQA).

COMPLIANCE WITH CEQA

The Trustees, as the lead agency in this project, have entered into the environmental review process to assess potential impacts that could arise from the construction and occupancy of the proposed project. Through this documentation process, The Trustees ensure that all of the possible environmental effects of the proposed project are fully disclosed according to the requirements of CEQA.

PURPOSE OF THE INITIAL STUDY

This initial study has been prepared to assess the impacts of the proposed project, as required by CEQA. The project requires discretionary approval of The Trustees, who will act as the lead agency.

The Trustees have prepared this initial study to determine if the project would have a significant effect on the environment. The purposes of the initial study are to:

- Provide the lead agency with information to use in deciding whether to prepare an environmental impact report (EIR) or negative declaration;
- Enable the lead agency to modify the project to avoid adverse impacts before an EIR is prepared, thereby enabling the project to qualify for a negative declaration;
- Document the factual basis for the finding, in a negative declaration, that a project will not have a significant impact on the environment.

The University has elected to prepare an EIR for the project. This document serves to scope the analysis of the EIR and provide information to interested parties regarding the project.

PROJECT LOCATION AND SETTING

Cal Poly is located northeast of the city of San Luis Obispo, approximately midway between San Francisco and Los Angeles on California's central coast. The university campus occupies over 6,000 acres. University lands include range and agricultural areas as well as natural preserves, in addition to more developed areas. The more developed portion of campus is identified as the "campus instructional core" and includes agricultural support facilities and academic, housing, and administrative buildings. The campus instructional core is generally bound by Highland Drive on the north, California Boulevard on the west, Slack Street on the south, and primarily undeveloped foothills on the east.

The project location and project boundaries are shown in Figures 1, 2, and 3. The project site is located at the southeastern edge of the campus instructional core northwest of the intersection of Grand Avenue and Slack Street. The Grand Avenue and Slack Street entrance is the main entry point for the campus. The site is currently occupied by the G-1, G-4, and R-2 parking lots and encompasses approximately 12 acres. These parking lots provide approximately 1,327 surface parking spaces for staff, campus residents, and the general population.

The site is bordered by Slack Street and the former Pacheco Elementary School to the south. The site is elevated approximately 6-10 feet above Slack Street and is screened by this topographical separation and existing mature trees. The former school is owned by the San Luis Coastal Unified School District but is leased to several entities. As of July 2013, the buildings most proximate to the project site are occupied by several private schools. Other occupants of the facility include a public preschool and public children's therapeutic services.

Residential neighborhoods are located to the east and west of the former school, south of the project site. Residences in these areas are predominantly single family, and include many units rented to students. Proximate campus development includes the Performing Arts Center, Vista Grande Dining, and Sage Restaurant to the north; student residence halls, a parking kiosk, and vacant University-owned land to the east; and a parking structure, athletic fields, and athletic facilities to the west. The project location is shown in Figures 1, 2, and 3. Representative photos of the site are provided as Figure 4.

PROJECT OBJECTIVES

The project is being pursued with the following objectives:

- Reallocate beds currently occupied by freshman in complexes designed for upperclassmen.
- Reduce the use of triple-bed configurations in existing units.
- Address ongoing excess demand for on-campus housing.
- Progress towards the goal of housing 100% of the freshman class on campus.
- Continue to enrich and develop the residential community on campus.
- Continue to reduce impacts associated with commuting students, including traffic and related air quality impacts.
- Continue to utilize campus lands for the "highest and best use" including reallocation of excess parking areas for instructional or residential uses within the developed campus instructional core.

Figure 1. Project Vicinity



Figure 2. Project Location

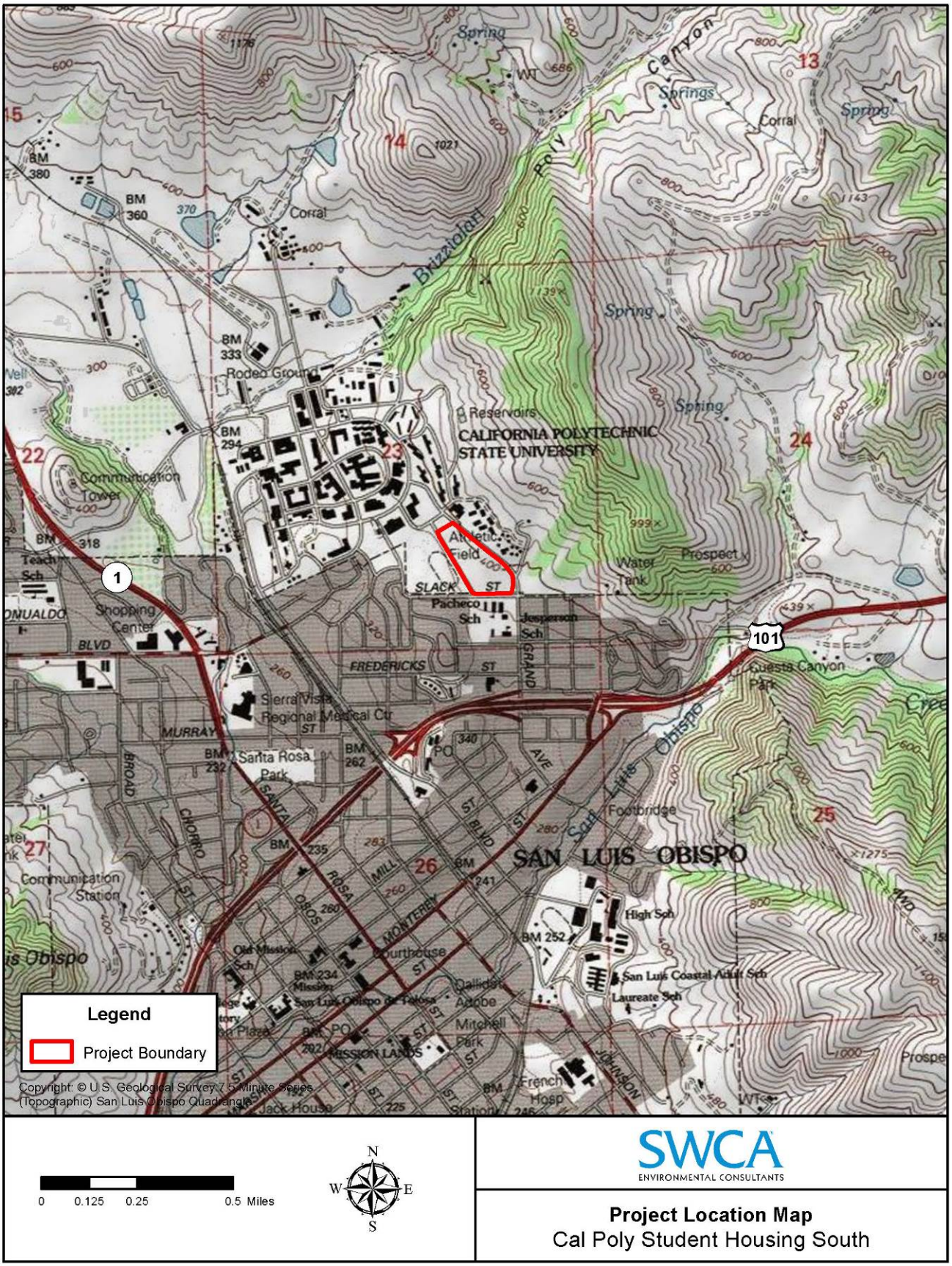


Figure 3. Site Map

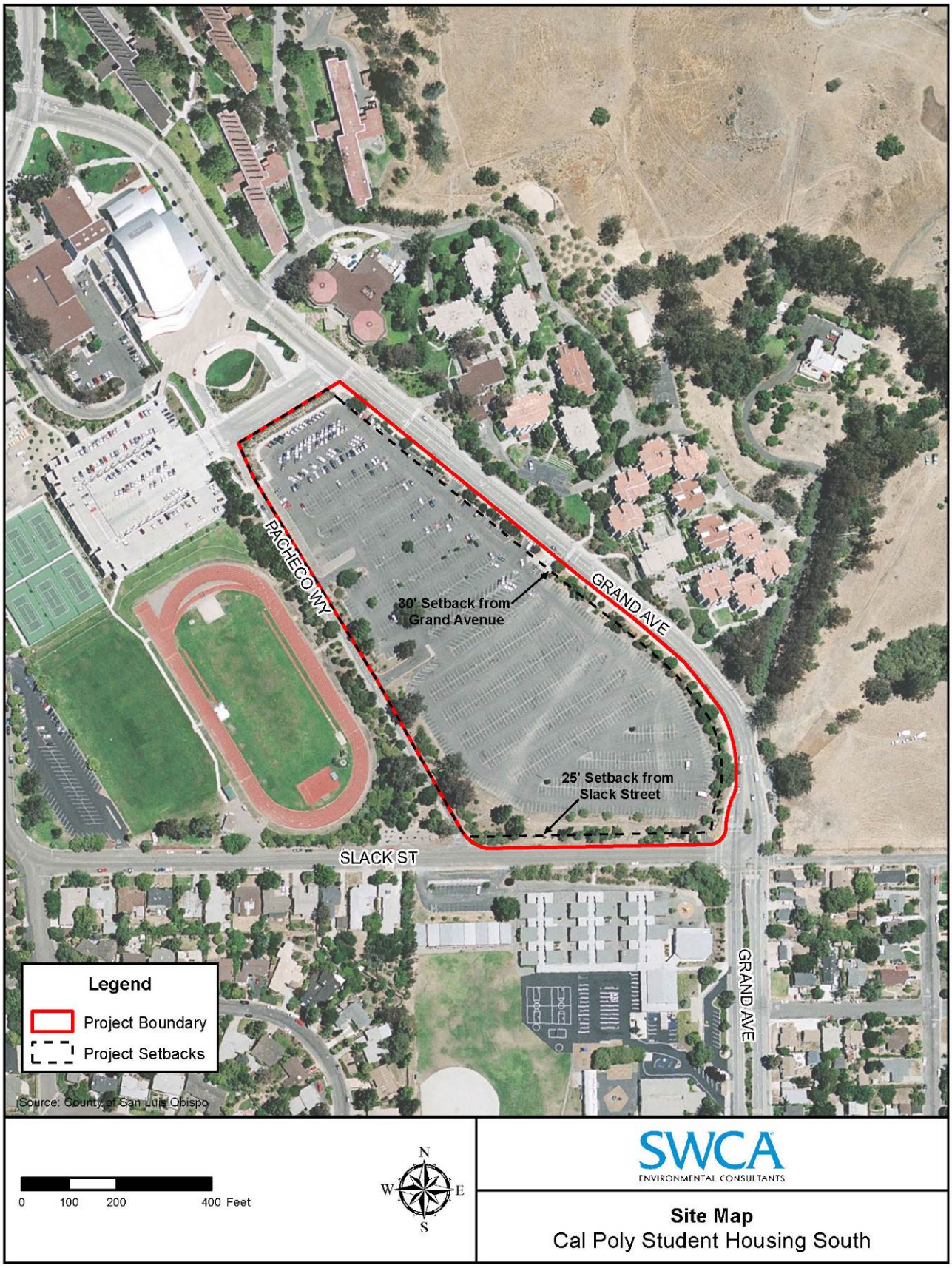


Figure 4. Site Photographs



PHOTO 1:

View of the site from the intersection of Grand Avenue and Slack Street.



PHOTO 2:

View of the site north from Slack Street.

Figure 4. Site Photographs, continued



PHOTO 3:

View across the southern portion of the site west from Grand Avenue.



PHOTO 4:

View of the site to the south from the entrance off Grand Avenue

Figure 4. Site Photographs (continued)



PHOTO 5:

View across the mid-portion of the site to the west.



PHOTO 6:

View east from the intersection of Longview Lane and Slack Street, 850 feet east of the project site

PROJECT DESCRIPTION

Background. The 2001 Cal Poly Master Plan is the primary document governing land use and capital improvements on campus through the year 2020. The Master Plan includes several elements which guide development on campus, including, but not limited to: Campus Instructional Core, Residential Communities, Circulation, and Parking. The Master Plan establishes land uses for the entire campus and outlines principles to guide future development. The Master Plan does not set specific standards for development; however, development pursuant to the Master Plan is conditioned by mitigation measures outlined in the Master Plan EIR, as applicable (refer to Attachment A).

The Residential Communities element identifies constraints associated with housing on campus and communitywide, outlines principles to guide the housing program on campus, and identifies several locations for housing communities on University lands (refer to Figure 5). Housing constraints on campus at the time the Master Plan was prepared included limited choice of housing type, restrictive meal plans, and long waiting lists. Off-campus, constraints included low vacancy rates, high costs, neighborhood concerns, and issues with access to the campus. A program of residential development was prepared for the Master Plan in response to ongoing housing constraints. Since the Master Plan was adopted, several of the planned housing complexes have been constructed (refer to Table 1).

Table 1. Residential Complexes Completed Since 2001

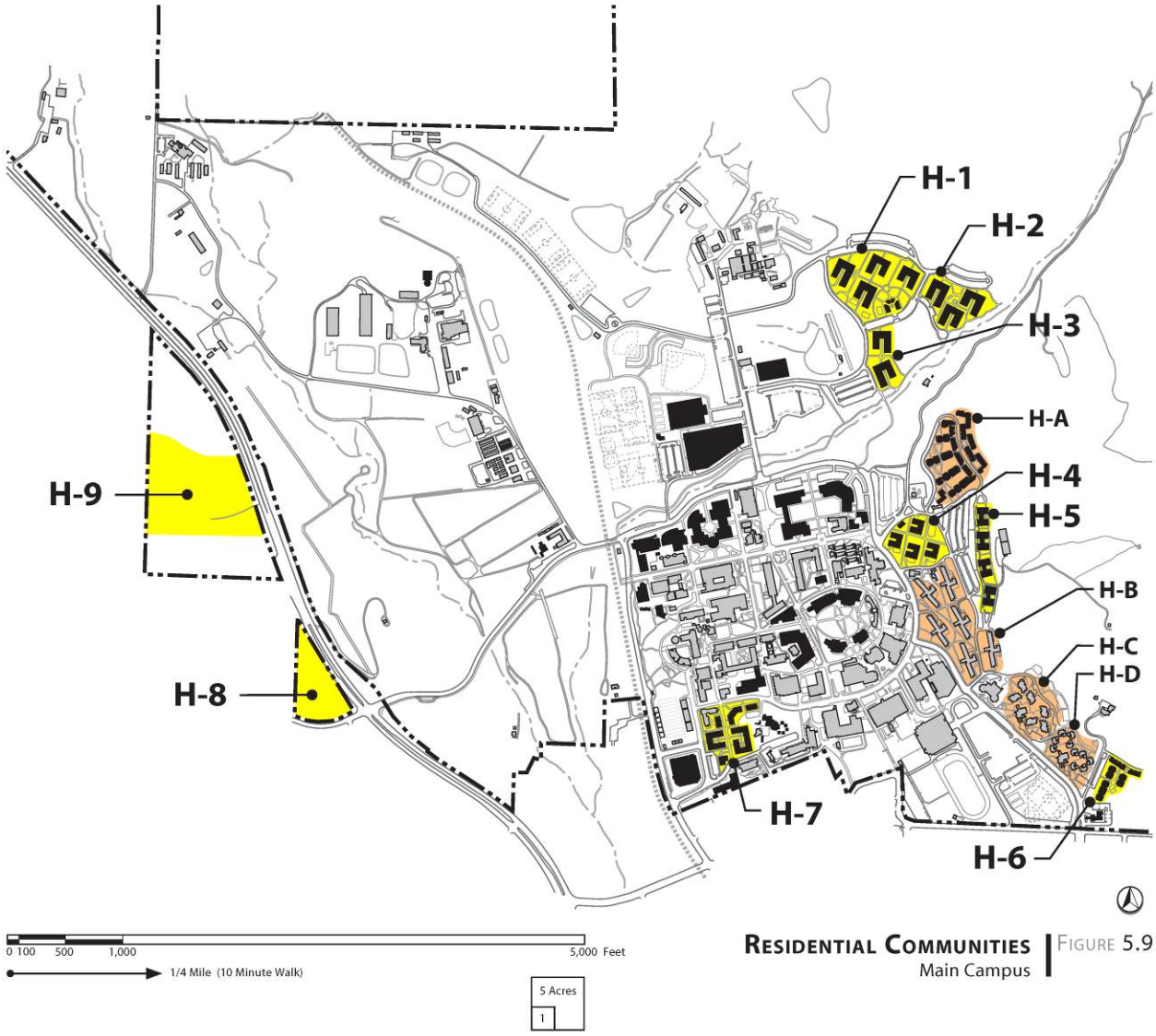
Housing Project	Name	Notes
H-1, H-2, and H-3	Poly Canyon Village	The three housing site were combined, and amended to increase total beds from 1,620 to 2,660 in an apartment configuration. Constructed in 2008.
H-8	Bella Montana	Constructed in 2006. Provides 69 condominiums for faculty and staff.
H-A	Cerro Vista Apartments	Construction was completed in 2003. Provides 796 beds in an apartment configuration.

With the completion of the complexes outlined in Table 1, Cal Poly offers 6,239 beds in student housing, a significant increase from the 2,838 beds available at the time of Master Plan adoption. The percent of students housed on campus has increased from approximately 16% in 2001 to over 35% in 2012[1]; however, the current demand continues to exceed the available supply. The existing bed count includes over 600 beds in triple occupancy to meet some portion of the excess demand, and the campus continues to maintain a waiting list. Therefore, Cal Poly continues to explore additional residential development options on campus.

As noted in Figure 5, several additional housing sites have been included in the housing program. However, the University has identified constraints to development on the following mapped locations (refer to Table 2).

[1] Brailsford & Dunlavey, 2013. Cal Poly Student Housing Market Study Final Report.

Figure 5. Residential Communities Plan, 2001 Master Plan



RESIDENTIAL COMMUNITIES | FIGURE 5.9
Main Campus

LEGEND

- New Residential Communities
- **H-1** Apartment Style Residences - 720 Beds
- **H-2** Apartment Style Residences - 540 Beds
- **H-3** Apartment Style Residences - 360 Beds
- **H-4** North Mountain Housing Redevopment Apartment Style Residences - 420 Beds (120 beds net)
- **H-5** Dormitory Style Residences - 512 Beds
- **H-6** Apartment Style Residences - 136 Beds
- **H-7** Apartment Style Residences - 612 Beds
- **H-8,9** Off-Campus Housing - Faculty and Staff

- Existing Residential Communities
- **H-A** New Housing - Underway
- **H-B** South Mountain (Red Brick) Residence Halls
- **H-C** Sierra Madre Hall
- **H-D** Yosemite Hall

Note: Apartment Style Residences will accommodate returning students

Table 2. Constraints to Residential Development

Housing Project	Notes
H-4	The Master Plan envisioned redevelopment of the existing North Mountain Housing to net a gain of 120 beds. The North Mountain Housing units were completed in 1953, and are not financed. The University has determined that the temporary loss of housing units would be detrimental, and that the increased debt burden would not be cost-effective.
H-5	This project would entail the replacement of a portion of a surface parking lot with 512 dormitory-style beds. Site constraints, including slope and drainage, limit potential bed count on this site and significantly increase costs associated with development.
H-6	The Master Plan identified the potential for 136 apartment-style beds at this location. Subsequent site review identified slope and drainage constraints which would severely limit potential bed count on-site.
H-7	The Master Plan identified the potential for 612 apartment-style beds in this location. Subsequent environmental review of the area in the Mustang Stadium EIR (2004) identified the historic resource potential of structures in the area, further limiting the development potential in this portion of campus.

Constraints at the remaining housing sites identified in the Master Plan have led to the consideration of the proposed site for residential development. Under the current proposal, the bed count identified in the Master Plan for housing (H) sites H-4 through H-7 would be consolidated at the current site and the complexes at sites H-4 through H-7 would not be pursued under the current Master Plan. The project is intended to meet existing and projected demand for housing. The project does not increase enrollment over current levels. The Poly Canyon Village project, developed in 2008, included an amendment to the total Master Plan bed count, and an EIR was certified for the project. The proposed housing does not increase bed count over projections in the Master Plan, as amended.

The proposed site is currently designated for Parking and Recreation, Athletics, and Physical Education. The Master Plan would be amended to reflect the alteration in the land use, the parking and residential community elements, as well as the ultimate project footprint. The Master Plan amendment is limited to location of beds; total bed count projected, enrollment projected, and other aspects of the residential community plan would be unchanged. Development of a parking structure in this location requires a Master Plan amendment to denote the ultimate footprint.

Other campus planning documents have already identified the potential for residential use of the proposed site. The 2010 Campus Land Use and Design Guidelines (Guidelines) "zone" the area in question "R-4." Allowable uses are specified as "residential uses, with parking and related support services, including open spaces, recreation facilities, study areas, and retail." The Guidelines were developed using both direction given in the Master Plan and subsequent studies throughout the campus. The Guidelines are intended as an advisory document and have not been formally adopted. The difference in land use specified for the proposed site in the Guidelines as opposed to the Master Plan indicates an evolution in both the housing program and in the understanding of constraints to development on campus.

Parking. Parking on campus is managed by the Parking Services division of the University Police Department. Parking has evolved considerably since adoption of the current Master Plan, resulting in several changes in development and management strategies. At the time of Master Plan adoption, parking supplies were constrained, as a much higher percentage of the campus population commuted. Several new structures and surface lots, including remote storage lots, were programmed in the Master Plan to accommodate projected demand, and consolidate supply. Two structures were completed as part of the Poly Canyon Village housing project, a new gravel parking lot was constructed off Mount Bishop Road, and an additional parking structure was programmed and approved as part of the Mustang (Spanos) Stadium project. The stadium parking has not yet been built and is not currently programmed for construction. Two additional parking structures were proposed in the Master Plan for locations north of the library, but have not been pursued to date.

Additional, approved parking structures have not been built in part because of declining use of existing parking facilities. Reductions in use are associated with reduced commute trips to campus, increased on-campus housing, and reductions in parking demand from campus residents. Implementation of the Master Plan has also included improvements in bicycle and pedestrian systems in and near campus, including striping, signage, bicycle racks, closure of South Perimeter Road, and installation of pathways along California Boulevard, as well as the continuation of bus and carpool subsidies. These factors have combined to create excess capacity in the existing parking facilities on campus. Table 3 outlines general occupancy statistics for several campus parking facilities.

Table 3. Parking Facility Occupancy

Facility	Capacity	Average Occupancy	Percent Occupancy
General (Non-Residential Parking)			
H-1	366	23	6%
H-12	436	417	96%
H-14	367	108	30%
H-16	506	365	72%
G-1	426	354	83%
Grand Avenue Structure	618	561	91%
Resident Only Parking			
R-1	789	718	91%
R-3	940	532	57%
R-4	971	604	62%
Combined Residential/General Parking			
R-2/G-4	898	503	56%

Source: University Police Department and Fehr & Peers, July 2013.

Although use fluctuates depending on the season and events on campus, such as construction projects, tours, and special events, parking facilities on campus generally provide excess capacity. The R-2/G-4 lot on site, for example, is used for overflow parking for tours and construction worker vehicle parking.

The Master Plan, while programming several new parking facilities, set forth a joint goal of reducing parking demand by 2,000 spaces. New parking facilities were intended to consolidate, rather than expand, parking, and to provide redevelopment opportunities in areas of existing surface lots. Although the project site was not initially proposed for housing, the Master Plan allowed for redevelopment of a portion of the site with Recreation, Athletics, and Physical Education land uses. As stated previously, subsequent planning documents, such as the 2010 Design Guidelines, anticipated redevelopment of the site with housing. Consolidation of parking on-site, reduction in parking spaces, and redevelopment of a portion of the site is generally consistent with principles outlined in the Master Plan.

Project Components

Grading and Site Preparation. Initial site preparation would include removal of pavement and other existing features. Where feasible, the University recycles debris on campus; for this project, it is assumed that paving debris and lighting features would be disposed of off-site at an approved landfill. According to the Geotechnical Report (Earth Systems 2013) prepared for the project there is evidence of undocumented fill underlying the existing parking area. The project assumes excavation of approximately 5 feet of soil across the entire site, or 2.6 million cubic feet (96,800 cubic yards). Excavated material may be recompacted and reused on-site, used

elsewhere on campus, or may be exported.[2] Existing landscaping, which consists mainly of mature, non-native trees, will be removed. Primary access for construction vehicles will be provided off Grand Avenue, with alternate access provided via Pacheco Way to Slack Street.

Structures. The project will provide approximately 1,475 beds in several three- to five-story towers totaling approximately 450,000 gross square feet. The Campus Design Guidelines note that site design should orient towards Grand Avenue, and that site design should improve aesthetics at the Grand Avenue and Slack Street entrance to campus. Design guidance includes articulation and staggering for buildings over 35 feet in height, to reduce the impression of a continuous wall. The Guidelines also specify setbacks from major roadways—at least 25 feet from Slack Street and 30 feet from Grand Avenue, as shown in Figure 3.

For the purposes of this analysis, it is assumed that housing structures would cover most of the site, with the parking structure generally located on the northern portion. However, the ultimate configuration of housing and parking has yet to be determined. Development will be set back pursuant to the Design Guidelines, and buildings will be staggered. It is assumed that buildings or parking located closer to Slack Street will be three to four stories high. Taller structures, up to five stories, will be located to the north, in the site's interior.

Building height is assumed to be a maximum of 75 feet. Design components will include articulated facades, and staggering of roofs, buildings, and facades. Proposed retail use is limited to a small coffee shop or similar use designed for residents. Structures will be fully outfitted with sprinklers for fire suppression.

The project will consist of large student suites with double occupancy bedrooms and will include shared showers and restrooms. Each suite will have approximately 50 students and 1 resident advisor. Amenities within suites will include a refrigerator, living room and study room. Full kitchens will not be provided in the units. Outdoor areas will be landscaped with turf and drought tolerant landscaping, and pathways will be installed connecting to campus.

Utilities. For the purposes of this analysis, it is assumed that the project will require entirely new on-site water infrastructure, wastewater infrastructure, and gas and electrical power infrastructure, as well as new on-site stormwater facilities. The majority of improvements to infrastructure will occur on-site, or on nearby developed portions of campus (within existing road rights-of-way). Upgrades to infrastructure will include removal of surface materials (generally concrete or landscaping), installation of new or larger capacity lines and pipes, and backfill and resurfacing. Heating for climate control and water would be provided by one of three options: additional capacity at the central plant, installation of a cogeneration or fuel cell system on-site, or installation of approximately 10 boilers within the buildings.

Access and Parking. Primary access to the site will be provided from Grand Avenue. The parking program is still being developed, however a 300-500 space parking structure is anticipated, and is the basis for the analysis provided in this document.

Service and emergency vehicle access along Pacheco Way will be retained. Additional emergency vehicle access will be provided from points along Grand Avenue and the existing northern access road (current entry point for the G-1 parking structure).

Timing/Schedule. Construction of the project is expected to occur in one phase over approximately 31 months beginning in 2016.

APPLICABLE REGULATIONS

As stated previously, the Cal Poly Master Plan provides the framework for planning and policy guidance for development on campus. The Master Plan EIR includes mitigation applicable to development on campus. Master Plan mitigation measures are incorporated into the project description (attached as Appendix A).

[2] The topical analyses in this document assume export of all material to Cold Canyon Landfill or to another receiving site at a similar distance. This is considered a reasonable worst-case scenario.

The project does not increase current enrollment or the bed count projected in the Master Plan, as amended to date. Where the project is consistent with the Master Plan and no new substantive information exists, this is noted and analysis references the Master Plan and Master Plan EIR documents.

NPDES Phase II Regulations (Non-point Source Stormwater Pollution Prevention). The project encompasses an area more than 1 acre in size; therefore, a Stormwater Pollution Prevention Plan (SWPPP) will be prepared for the project pursuant to the approval of the Regional Water Quality Control Board (RWQCB). The SWPPP will outline site management practices for site preparation, construction, and post-construction phases of the project. The project will utilize Low Impact Design (LID) to improve infiltration of stormwater.

INITIAL STUDY ENVIRONMENTAL CHECKLIST

This section discusses potential environmental impacts associated with approval of the proposed project.

Required Information

Project Title: Student Housing South

Lead Agency: California State University Board of Trustees

Contact Person: Joel Neel
Facilities Planning and Capital Projects
Building 70
Cal Poly State University
San Luis Obispo, CA 93407
(805) 756-2193

Project Location: Campus Instructional Core, Cal Poly State University, San Luis Obispo

Project Sponsor: Facilities Planning, Housing

Master Plan Designation: Recreation, Athletics, and Physical Education

Project Description: Development of 1,475 beds in up to five-story towers on 12 acres, removal of approximately 1,300-space surface parking lot, and construction of a 300 to 500-space parking structure

Surrounding Land Uses and Setting: Athletics to west, Performing Arts Center to the north, residential halls and open land to east, city of San Luis Obispo to the south (roads, former school site, residences)

Other Agencies Whose Approval is Required: Regional Water Quality Control Board, County of San Luis Obispo Air Pollution Control District

CEQA Guidance

Appendix G of the State CEQA Guidelines was used in answering the checklist questions:

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the discussion. A "No Impact" answer is adequately supported if the discussion shows that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained when it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

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

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

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

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

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

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

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

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

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

8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9. The explanation of each issue should identify:

    a) the significance criteria or threshold, if any, used to evaluate each question; and

    b) the mitigation measure identified, if any, to reduce the impact to less than significance

Identification of the potential for residual significant adverse environmental impacts would trigger the need for preparation of an EIR. For issue areas in which no significant adverse impact would result or impacts would be reduced to a less-than-significant level by mitigation, further analysis is not required.

	Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I.	**AESTHETICS**				
	Would the proposal:				
a.	Have a substantial adverse effect on a scenic vista?	X			
b.	Substantially damage scenic resources, including, but not limited to, tree, rock outcroppings, and historic buildings within a scenic state highway?	X			
c.	Substantially degrade the existing visual character or quality of the site and its surroundings?	X			
d.	Create a new source of substantial light or glare which would adversely affect day or nighttime views in this area?			X	

Environmental Setting

The proposed site is a surface parking lot, located near the intersection of Grand Avenue and Slack Street. Existing development on-site consists of earthen banks at the eastern and southern edges, a landscaped border with a mix of mature trees, light standards, and striped pavement for parking. The lot is regularly occupied with vehicles, including tour buses. Existing views of the site are dominated by parked cars partially screened by landscape trees. Grand Avenue, where it fronts the project site, provides sporadic visual access to the Morros to the west. The City of San Luis Obispo (City) Conservation and Open Space Element designates the one-block stretch of Grand Avenue where it approaches the campus entrance as "moderate scenic value." The Master Plan does not designate visually sensitive areas.

Discussion of Checklist Answers

a. The project would affect the visual environment in both the short and long-term. Short-term, construction of the project would necessitate removal of existing vegetation, installation of temporary construction fencing and signage, and re-grading of the site to accommodate the site plan. Construction will involve staging of materials and equipment visible from surrounding roadways. Construction of project components will occur over three years, during which time a variety of vehicles, equipment, materials, and unfinished structures will be visible. Aesthetic impacts associated with construction are temporary, limited to the duration of the activity. Mitigation is recommended to reduce impacts during this period.

   The development of the project would introduce three- to five-story-tall residential and parking structures into the view which would dominate views of the site. Impacts are considered potentially significant and will be addressed further in the EIR.

b. Scenic resources in the vicinity of the project include the campus gateway and the hillsides east of campus. The EIR will address the impacts of the project on scenic resources in the area.

c. The project will introduce three- to five-story-tall residential and parking structures into the viewshed. The impacts of proposed development are considered potentially significant and will be addressed further in the EIR.

d. The project will include lighting for safety and ambience. The existing nighttime visual environment includes light from standards along the street and within the parking area. Lighting design for the site will be subject to mitigation outlined in the Master Plan EIR, which generally requires shielding and downcasting of light, in addition to minimization of spillover to off-campus areas. The project will not

substantially alter nighttime lighting levels in the area; the area is currently lit to levels consistent with an urban environment. Impacts are considered less than significant and will not be addressed further in the EIR.

Conclusion

The EIR will address aesthetic impacts, including short-term construction impacts, and impacts to views associated with proposed development. Impacts associated with lighting are not considered significant and will not be addressed further.

Issues	Potentially Significant Impact	Potentially Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. AGRICULTURE AND FORESTRY RESOURCES In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. **Would the project:**				
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
d. Result in the loss of forest land or conversion of forest land to non-forest use?				X
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				X

Environmental Setting and Discussion of Checklist Answers

a-d. The project site consists of a paved surface parking lot within the campus instructional core. Construction of the project would not impact farmland, including farmland under Williamson Act contract, and would not impact timber or forestland. The project would not involve other changes in the environment such as road or other infrastructure improvements near an agricultural or forested area which would result in indirect conversion of farm or forestland. There is no impact.

Conclusion

There are no impacts to forestry or agricultural resources associated with the project. These issues will not be addressed further in the EIR.

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY				
Where available, the significance criteria established by the applicable air quality management or pollution control district may be relied upon to make the following determinations.				
Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?			X	
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	X			
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	X			
d. Expose sensitive receptors to substantial pollutant concentrations?	X			
e. Create objectionable odors affecting a substantial number of people?			X	

Environmental Setting

The project is located within the South Central Coast Air Basin, which includes San Luis Obispo, Santa Barbara, and Ventura Counties. The Air Basin is in non-attainment for ozone and respirable particulate matter (PM_{10}). The San Luis Obispo Air Pollution Control District (SLOAPCD) has primary authority for controlling air pollution in San Luis Obispo County, and works cooperatively with other districts in the air basin. Guidance for the evaluation and mitigation of air quality impacts is provided in the following SLOAPCD documents:

- PM Report, 2005
- CEQA Handbook, 2012

Current conditions are considered the environmental setting or baseline. In the case of the proposed project, the baseline condition includes a 1,327-space parking lot. Existing conditions also include general campus operations—the site is located along a major campus transportation corridor (Grand Avenue), with a parking

structure to the northwest and campus residences to the east. The project site is located within 100 feet of a former elementary school site, which is currently leased to private elementary schools.

Campus operations, including vehicle traffic, contribute to existing emissions and pollutant levels in the area. The University has a multi-pronged approach to the reduction of air quality impacts associated with operations based in large part on strategies set forth in the 2001 Master Plan. These include, but are not limited to:

- Increased on-campus housing
- Development of on-campus markets and other opportunities to reduce shopping trips
- Continued bus subsidies
- Improved bus shelters and signage/information
- Improved bicycle facilities, including new pathways along the Union Pacific Railroad (UPRR) and California Boulevard, bicycle racks, improved striping, and signage on campus
- Closure of South Perimeter Drive to vehicle traffic
- Improved pedestrian pathways and signage on campus

Continued development of on-campus housing and reductions in parking are consistent with previous efforts to reduce vehicle trips and air emissions associated with campus operations.

Discussion of Checklist Answers

a. The applicable air quality plan is the SLOAPCD Clean Air Plan (2001). The plan projects air quality emissions and standard attainment goals based on growth rates in population and vehicle travel in San Luis Obispo County. The project would not conflict with or obstruct the Clean Air Plan. The project would not alter enrollment growth rates for the University. The project is consistent with local planning efforts to reduce reliance on vehicles, improve pedestrian facilities, and shorten commutes. The project would not have significant adverse effects related to Clean Air Plan implementation.

b. The EIR will provide modeling of construction and operational emissions resulting from the project using the most recent version of the California Emissions Estimator Model (CalEEMod Version 2013.2). Worksheets outlining the model assumptions will be included. Impacts are considered potentially significant.

c. The EIR will address cumulative air quality impacts. Impacts are considered potentially significant pending further investigation in the EIR.

d. The project site is within an existing, developed urban and campus environment, which includes residents, primary school children, and other sensitive receptors. The proximity of sensitive receptors poses special conditions which warrant additional discussion in the EIR, particularly addressing idling of vehicles. Impacts are considered potentially significant pending further investigation.

   The project site is located more than 1,500 feet from U.S. Highway 101 (US 101). The project site is considered too distant for emissions associated with that roadway to pose a special risk to the residents on-site. Emissions associated with operation of US 101 will not be considered further in the EIR.

   Site soils have been tested and do not contain naturally-occurring asbestos (see documentation in Appendix B). This issue will not be addressed further in the EIR. Manmade sources of asbestos such as transite pipe are not anticipated but will be discussed in the EIR.

e. The project is residential in nature and would not be a source of objectionable odors, and future residents would not be exposed to objectionable odors. Impacts are considered less than significant and no further analysis is necessary.

Conclusion

The project is consistent with the Clean Air Plan. The EIR will model emissions associated with the project and discuss impacts to sensitive receptors, and potential for discovery of manmade sources of asbestos. The project would not be a source of objectionable odors, and will not cause exposure to naturally-occurring asbestos. These topics will not be addressed further in the EIR.

Issues	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES				
Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	X			
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?				X
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				X
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native residents or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	X			
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			X	
f. Conflict with provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

Environmental Setting

The project site is a paved surface parking lot, bordered by individual, generally non-native, planted ornamental trees. There are no water features or other natural features or habitat located on the site.

Discussion of Checklist Answers

a. The site generally lacks habitat to support sensitive species. Existing trees may provide suitable nesting habitat for birds, including nesting migratory birds. Additional analysis of impacts to nesting birds will be provided in the EIR. Impacts are considered potentially significant.

b. There is no riparian habitat or other sensitive natural community located on or near the project site. There is no impact and this issue will not be addressed further in the EIR.

c. There are no wetland features on-site or otherwise hydrologically connected to the site. Drainage downslope of the project is via existing urban storm drain infrastructure. There are no impacts to wetlands associated with construction or operation of the project. This issue will not be addressed further in the EIR.

d. The site, with the exception of the mature trees planted at the perimeter, does not provide habitat for native resident or migratory wildlife species, and lacks structure and connectivity required for use as a movement corridor. The site is paved, used by vehicles, and located within an urban area. However, removal of trees on site may affect nesting birds. Additional analysis of impacts to nesting birds will be provided in the EIR. Impacts to native resident or migratory wildlife and their movements are otherwise considered less than significant and will not be addressed further in the EIR.

e. The project would not conflict with University policies regarding biological resources. The University does not have an adopted tree preservation policy and the project would not have an adverse effect on nearby trees within the city limits. Master Plan policies which address biological resources generally call for the siting of new development proximate to or within existing developed areas, and avoidance of sensitive areas such as creeks. The project consists of infill development in an existing developed portion of campus, and is, therefore, consistent with guidance provided in the Master Plan. Impacts are considered less than significant. This issue will not be addressed further in the EIR.

f. The project site is not within an area subject to a Habitat Conservation Plan (HCP) or Natural Community Conservation Planning (NCCP), or other local or regional conservation planning document. There is no impact.

Conclusion

The site is a developed parking lot located in an urban area. Habitat for wildlife is limited to use of mature trees on site for nesting birds, which will be addressed in the EIR. The project will not otherwise have significant impacts related to biological resources.

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES				
Would the proposal:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?				X
b. Cause a substantial adverse change in the significance of an archeological resource pursuant to §15064.5?				X

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	X			
d. Disturb any human remains, including those interred outside of formal cemeteries?				X

Environmental Setting and Discussion of Checklist Answers

a-d. The site is underlain by fill material and bedrock. There is no evidence of prior occupation of the site with buildings or populations. The fill diminishes the potential for buried resources during the majority of the excavation effort. However, should the ultimate project design and construction methodologies require installation of caissons or otherwise require disturbance of bedrock formations, impact to paleontological resources may occur. Bedrock on-site consists of sandstone, shale, and claystone of the Franciscan Melange, which has the potential to yield fossilized remains. The EIR will provide further analysis of potential discovery of fossilized remains. Impacts are considered potentially significant.

Conclusion

Based on the results of the records searches completed for the 2001 Master Plan, and the presence of fill on-site, the project will not impact cultural resources. However, bedrock formations underlying the site may yield fossilized remains. The EIR will address impacts related to fossilized remains. All other impacts are considered less than significant and will not be addressed further in the EIR.

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS				
Would the project:				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated in the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	X			
ii. Strong seismic ground shaking?	X			
iii. Seismic-related ground failure, including liquefaction?	X			
iv. Landslides?	X			
b. Result in substantial soil erosion or loss of topsoil?	X			

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Be located on a geologic unit or soil that is unstable, or that would become unstable because of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	X			
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	X			
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X

Environmental Setting

A Geotechnical Report has been prepared for the project by Earth Systems, Inc. The EIR will provide an analysis of geotechnical impacts based on information provided in that report.

Discussion of Checklist Answers and Conclusion

a-d. A Geotechnical Report has been prepared for the project by Earth Systems, Inc. The EIR will provide an analysis of geotechnical impacts based on information provided in that report.

e. The project will be supported by a developed wastewater system; no alternative systems, such as septic systems, are proposed. There is no impact and no further analysis is required.

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

Environmental Setting

Greenhouse gas (GHG) emissions are associated with the phenomenon of climate change. GHGs are emitted from a variety of sources, including intensive agricultural operations, and the production and use of fossil fuels.

To address climate change, California passed Assembly Bill 32, the California Global Warming Solutions Act (2006). The legislation enacted GHG emissions reduction goals for the state, specifically requiring the reduction of emissions to 1990 levels by the year 2020. Subsequent legislation directed the California Air Resources Board to develop statewide thresholds.

The SLOAPCD has approved thresholds for greenhouse gas emissions and incorporated guidance for analysis in the 2012 CEQA Air Quality Handbook. The evaluation of GHG emissions impacts can be performed using qualitative analysis, a Bright-Line Threshold, which assigns a numerical value to annual emissions, or an Efficiency-Based Threshold, which assesses impacts per capita.

Other factors beyond specific projects are at work in reducing GHG emissions, including fuel efficiency standards for vehicle, and alterations in the mix of power sources contributing to the state's grid. The CSU system, including Cal Poly, is working to meet the reduction targets mentioned previously. CSU is currently considering inventories of emissions, and developing system-wide strategies for reductions. Executive Order 987 established sustainability goals, including increased energy efficiency in operations and design, increased use of renewable sources of power, and "green" purchasing standards. Cal Poly monitors compliance with these goals through the biennial "Sustainability Report" most recently published in 2012.

Discussion of Checklist Answers and Conclusion

a-b. The EIR will model generation of GHG emissions using CalEEMod. Impacts are considered potentially significant pending further investigation.

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

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			X	

Environmental Setting

There are no known hazardous materials sites within or adjacent to the project site. The project is in a moderate to high severity risk area for fire. The site is not within an Airport Review area. The site is within a developed campus and urban area with established infrastructure for emergency response and evacuation.

Discussion of Checklist Answers

a. The project is residential in nature. Construction and operation of the project will not create a substantial risk to people or the environment associated with the routine use, transport, or disposal of hazardous waste. Materials used on-site will be typical of other campus projects and will include cleaning and other maintenance products. Proper use and storage of such materials is sufficient to reduce risks associated with exposure. Construction equipment, if damaged, can release fuel, oil, lubricants, and other materials into the environment and expose workers and the campus population. The campus requires contractors to prepare, maintain, and implement management plans for upset and accident condition on-site, including protocols for stop work, spill containment, notification, and remediation. These measures are considered sufficient to reduce risks associated with use of such materials during construction. Impacts are considered less than significant and no further analysis is required in the EIR.

b. Upset and accident conditions which may release hazardous materials into the environment are most likely during the construction phase of the project. Construction equipment, if damaged, can release fuel, oil, lubricants, and other materials into the environment and expose workers and the campus population. The campus requires contractors to prepare, maintain, and implement management plans for upset and accident condition on-site, including protocols for stop work, spill containment, notification, and remediation. These measures are considered sufficient to reduce risks associated with accidents. Materials used on-site during operation will be typical of other campus residential areas and will include cleaning and other maintenance products. Proper use and storage of such materials is sufficient to reduce risks associated with exposure. Impacts are considered less than significant and no further analysis is required in the EIR.

c. The EIR will include an assessment of emissions associated with the project. The proximity of sensitive receptors poses special conditions which warrant additional analysis in the EIR.

The site has tested negative for naturally-occurring asbestos (Earth Systems 2013; memo attached in Appendix B). No known man-made sources of asbestos (such as abandoned transite pipe) are known to exist on-site; however, given the undocumented nature of fill underlying the site, such materials may be encountered. The EIR will address potential discovery of manmade sources of asbestos on site.

The project site is located more than 1,500 feet from US 101. The project site is considered too distant for emissions associated with that roadway to pose a special risk to the residents on-site. No further discussion of this source will be provided in the EIR.

d. The site is not a known hazardous waste or materials site. There is no impact and no further analysis is warranted.

e-f. The project is not located in the vicinity of a public or private airport. The closest airport, San Luis Obispo County Regional Airport, is located approximately 3.5 miles to the south and there are no airstrips on campus. There is no impact and no further analysis is warranted.

g. The project is located within the developed campus instructional core. The EIR will address sufficiency of emergency access. Impacts are considered potentially significant pending further investigation.

h. The campus is at an elevated fire hazard risk because of proximity to undeveloped land to the north and east. The project is located within the developed campus instructional core within a 5-minute response time from the nearest California Department of Forestry and Fire Protection (CAL FIRE) station. The project site is served by existing fire suppression infrastructure (i.e., hydrant systems). The project is required to comply with existing Fire and Building Code regulations intended to reduce risk of damage to property and persons. Applicable regulations address roofing and roof access, fire flow (water) infrastructure, design of hydrant systems, fire protection systems (sprinklers and alarms), fire extinguishers, and structure egress. The project must also comply with access requirements (primary and secondary), provide adequate fire lanes, and maintain defensible space. The project's location in a developed area with existing fire suppression infrastructure reduces risks associated with wildland fire to a less than significant level and no further analysis is required.

Conclusion

The EIR will address impacts related to air quality emissions, including proximity of sensitive receptors, and potential discovery of manmade sources of asbestos. The EIR will also address impacts related to emergency access. The project site has tested negative for naturally-occurring asbestos, is not in the vicinity of an airport, is not within a known hazardous materials site, and does not pose a significant fire risk. These issues will not be addressed further in the EIR.

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY				
Would the project:				
a. Violate any water quality standards or waste discharge requirements?	X			
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			X	
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	X			
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	X			
e. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	X			

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
f. Otherwise substantially degrade water quality?	X			
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j. Inundation by seiche, tsunami, or mudflow?				X

Environmental Setting

The project will utilize existing campus water systems for supply. The University owns a share of Whale Rock Reservoir, in addition to surface and groundwater rights.

Existing drainage patterns on-site are sheet flow across the paved surface parking lot to existing drainage infrastructure in Grand Avenue and Slack Street. The topography of the sight is gently sloping to steeply sloping at the site boundaries. There are no creeks or other natural water features near the site. Underlying soils are a mix of undocumented fill and bedrock.

Discussion of Checklist Answers

a. The site is currently developed with a paved surface parking lot, which discharges to a developed storm water system. The project would remove most of the parking, replacing the existing land use with residential structures, a parking structure, landscaping, and pedestrian and vehicle access pathways.

The project will involve disturbance over the entire 12-acre site. The site is bordered by existing developed campus and urban infrastructure, including paved sidewalks and streets, and developed storm drainage infrastructure. During construction, particularly during initial site clearance and excavation, the project would pose short-term risks associated with erosion, sediment transport, and off-site flooding. Construction equipment on-site would pose risk of release of fuels, lubricants, and other contaminants. Natural waterways are not at risk; impacts would occur in the storm drain system and on neighboring property.

The project includes development of residential uses, with replacement of approximately 300 to 500 spaces of parking. Risks to water quality associated with ongoing operation of the site are limited to leaking hydrocarbons from vehicles. The project will not increase impervious surfaces over existing conditions, and would result in fewer cars parked on site.

The project is greater than 1 acre in size, and the University or its designee is, therefore, required to prepare a SWPPP which will cover site preparation, active construction, and post-construction conditions. The SWPPP must be approved by the RWQCB prior to activity on the site. The EIR will provide further information regarding storm water associated with the project, and potential impacts related to water quality standards. Impacts are considered potentially significant pending further investigation in the EIR.

b. The project will not be served by groundwater. Domestic supplies on campus are provided by existing entitlements to Whale Rock Reservoir via the City's treatment plant at Stenner Creek. The existing pavement on-site prevents infiltration of precipitation. The project will increase the infiltration capacity of

the site compared to existing conditions. Impacts are considered less than significant and no further analysis is required in the EIR.

c-d. The existing drainage pattern of the site is sheet flow to surrounding streets and storm drains. The site contains no natural drainage features. The project will include the design and installation of new stormwater collection and conveyance systems pursuant to building code standards. The project will also be subject to measures outlined in the SWPPP. The EIR will provide further information regarding storm water associated with the project, and potential impacts to drainage patterns. Impacts are considered potentially significant pending further investigation in the EIR.

e. The project will not increase stormwater reaching existing drainage systems; the site is currently paved and runoff is directed to developed stormwater systems. The project will include the design and installation of new stormwater collection and conveyance systems pursuant to building code standards. The project will also be subject to measures outlined in the SWPPP. The EIR will provide further information regarding storm water associated with the project, and potential impacts to drainage patterns. Impacts are considered potentially significant pending further investigation in the EIR.

f. The EIR will address whether the project otherwise substantially degrade water quality. Impacts are considered potentially significant pending further investigation in the EIR.

g-j. The project site is not located in a 100-year flood hazard area. The project is not located in an area at risk from inundation by dam or levee failure, and is not in an area at risk of mudflow, tsunami, or seiche. There is no impact and no further analysis in the EIR is required.

Conclusion

The project site is currently occupied by a paved surface parking lot, which will largely be removed to develop residential and parking structures. The project will include new stormwater systems designed to currently applicable codes, and the project will be required to have a SWPPP prepared, approved, and implemented. The EIR will address stormwater and related impacts; the project will not utilize groundwater, and is not located in a flood hazard area; no further analysis of these topics is warranted.

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
X. LAND USE PLANNING				
Would the project:				
a. Physically divide an established community?				X
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	X			
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

Environmental Setting

Development on campus is regulated by the 2001 Master Plan. The Master Plan sets forth principles to guide development of the campus and extended ranches, including principles regarding Residential Communities and Parking.

Discussion of Checklist Answers

a. The site is on campus, and is currently developed as a surface parking lot. The development of the site with residential structures would not physically divide an established community. There is no impact and no further analysis is required.

b. The project will require minor amendment of the Master Plan in order to approve the ultimate project footprint. The project will be assessed for consistency with applicable plans and policies, including the Master Plan.

c. There are no HCPs or NCCPs which cover the project site. There is no impact and no further analysis is required.

Conclusion

The EIR will address consistency of the project with applicable plans and policies, including the Master Plan. The project will not physically divide an established community and will not conflict with conservation plans; therefore, no further analysis of these topics is warranted.

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

Environmental Setting and Discussion of Checklist Answers

a-b. There are no known mineral resources located on the project site. There is no impact and no further analysis is warranted.

Conclusions

There would be no impact to mineral resources as a result of the project. The EIR will not provide further analysis of this topic.

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. NOISE				
Would the project result in:				
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	X			
b. Exposure of persons to or generation of excessive groundbourne vibration or groundbourne noise levels?	X			
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	X			
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	X			
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

Environmental Setting

The existing ambient noise environment is dominated by periodic vehicle traffic along Grand Avenue and Slack Street, and operation of the existing parking lot. Other contributors to the existing noise environment include periodic generalized crowd noise on campus, bus traffic, and amplified sound at the outdoor athletic fields. US 101 is located approximately 1,500 feet south of the project site. Traffic noise from this source is not discernible at the project site (SWCA staff site visit, August 2013).

Discussion of Checklist Answers

a-d. The project will generate both construction-related and operational noise. Construction-related noise is a short-term, periodic, and temporary impact of the project. Earthmoving, materials handling, stationary equipment, and construction vehicles generate noise during clearing, excavation, grading, structure, and utility construction. Once operational, noise sources will be limited due to the predominantly residential nature of the project. The EIR will assess impacts related to noise.

e-f. The project is not in the vicinity of a public airport or private airstrip. There is no impact and no further analysis is required.

Conclusion

Impacts associated with construction and operational noise will be addressed further in the EIR. The project is not in the vicinity of an airport or airstrip and therefore no further analysis of noise associated with these sources is warranted.

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

Environmental Setting and Discussion of Checklist Answers

a. The project consists of the development of approximately 1,475 beds of student housing to serve the existing freshman population. The project will serve an existing student population, and will not result in extension of infrastructure to new locations. The project does not increase enrollment or faculty and staff counts. The project will not, therefore, induce substantial population growth. Impacts are considered less than significant and no further analysis is required.

b-c. The project site is occupied by a surface parking lot. The construction of the project will not displace housing or populations. There is no impact and no further analysis is required.

Conclusion

Impacts to population and housing are considered less than significant and no further analysis is required.

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
XIV. PUBLIC SERVICES				
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i. Fire protection?			X	
ii. Police protection?			X	
iii. Schools?				X
iv. Parks?				X

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less-Than-Significant Impact	No Impact
v. Other Public Facilities?				X

Environmental Setting

The University is provided fire protection through a contractual agreement with CAL FIRE. University Police are charged with protecting public safety, with reinforcement from City and County of San Luis Obispo law enforcement through mutual aid agreements.

Discussion of Checklist Answers

a-i. The campus is served by CAL FIRE for emergency response and fire suppression. The project site is served by existing fire suppression infrastructure (i.e., hydrant systems). The project is required to comply with existing Fire and Building Code regulations intended to reduce risk of damage to property and persons. Applicable regulations address roofing and roof access, fire flow (water) infrastructure, design of hydrant systems, fire protection systems (sprinklers and alarms), fire extinguishers, and structure egress. The project must also comply with access requirements (primary and secondary), provide adequate fire lanes, and maintain defensible space. The implementation of the project would result in additional campus structures requiring protection. However, by complying with existing fire codes, the University minimizes risk to the extent feasible. No new or physically altered fire service facilities are anticipated as a result of this project; therefore, no environmental impacts associated with construction of new facilities are expected. Impacts are considered less than significant. No further investigation of this issue is required in the EIR.

a-ii. The campus is served by University police. The University police may call upon City and County of San Luis Obispo law enforcement for backup as needed. The project would not alter enrollment; therefore, the total population served by University police would not be affected by this project. The project would increase the number of on-campus residents; however, the area under patrol would not increase. No new or physically altered police facilities are anticipated as a result of this project; therefore, no environmental impacts associated with construction of new facilities are expected. Impacts are considered less than significant. This issue will not be addressed further in the EIR.

a-iii. The project would not increase populations of school-age children, or otherwise increase potential demand for school facilities. There is no impact and no further analysis is required.

a-iv. Student residents will be served by recreational facilities on campus. The project would not increase population in the City, necessitating additional park space. There is no impact and no further analysis is required.

a-v. The project would not adversely impact other governmental facilities such as libraries or government functions. There is no impact and no further analysis is required.

Conclusion

Impacts to public services are considered less than significant. No further analysis is required in the EIR.

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. RECREATION				
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			X	
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?			X	

Environmental Setting

Students and student residents alike are served by existing recreational facilities on campus, which are generally concentrated west of the project site. Facilities include the recently expanded and renovated Recreation Center, Mott Gym, and outdoor athletic fields. Additional fields are provided on the north side of campus. The campus offers additional outdoor recreational opportunities through a system of hiking, biking, and running trails throughout the campus ranches.

Discussion of Checklist Answers

a-b. The project would not increase enrollment and, therefore, would not result in additional impacts to existing campus recreational facilities. The project would not increase use of City parks or recreational facilities or result in substantial physical deterioration of City facilities. The project would not result in construction of recreational facilities which may adversely affect the environment. The University actively manages recreational facilities and programs on campus; major facilities proximate to the proposed project recently underwent substantive upgrades. Impacts are less than significant and this issue will not be addressed further in the EIR.

Conclusion

Impacts to recreation are considered less than significant. This issue will not be carried forward to the EIR analysis.

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC				
Would the proposal:				
a. Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	X			
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	X			

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	X			
e. Result in inadequate emergency access?	X			
f. Result in inadequate parking capacity?	X			
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	X			

Environmental Setting

The California State University (CSU) has developed and adopted a systemwide Transportation Impact Study Manual (TSM) (November 2012), which provides guidance for the evaluation of impacts to transportation from CSU projects. The TSM sets forth significance thresholds, and guidance for the preparation of Transportation Impact Analysis (TIA). In accordance with the TSM, Fehr & Peers is preparing a TIA for the proposed project.

Discussion of Checklist Answers

a-b. The project would generate traffic during both construction and operational phases. During construction, equipment, worker trips, and materials deliveries will have temporary impacts to the area road network. Closure of the existing parking lot may result in diversion of trips to other area intersections, and development of additional on-campus housing will alter the travel patterns of those housed. The TIA being prepared for the project will address impacts related to both construction and operation of the project. Impacts are considered potentially significant pending further investigation.

c. The project would not impact air traffic patterns. There is no impact and this issue will not be addressed further in the EIR.

d. The TIA will assess whether the project poses specific safety hazards. Impacts are considered potentially significant pending further investigation in the EIR.

e. The EIR will review the site plan and determine whether adequate emergency access is being provided. The University is required to comply with applicable standards and regulations regarding the provision of emergency access. Impacts are considered potentially significant pending further investigation in the EIR.

f. The TIA will assess capacity within the existing parking system on campus. Impacts are considered potentially significant pending further investigation in the EIR.

g. The TIA will address impacts to alternative transportation modes. Impacts are considered potentially significant pending further investigation in the EIR.

Conclusion

Impacts associated with transportation and traffic will be addressed further in the EIR. A Transportation Impact Analysis is being prepared for the project pursuant to the CSU Guidelines.

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. UTILITIES AND SERVICE SYSTEMS				
Would the project:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	X			
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	X			
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could have significant environmental effects?	X			
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements necessary?	X			
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	X			
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	X			
g. Comply with federal, state, and local statutes and regulations related to solid waste?	X			

Environmental Setting

The City provides wastewater collection and treatment services to the University through a contractual agreement, which provides Cal Poly a share of the City's sewer collection and treatment infrastructure. The University is responsible for providing and maintaining collections infrastructure on campus. Stormwater is likewise handled jointly by the University and the City; the University is responsible for collection infrastructure on campus. Water is provided from a variety of sources; potable water is provided from the University's Whale Rock Reservoir entitlement via the City's treatment plant at Stenner Creek. Solid waste is disposed of at Cold Canyon Landfill.

Discussion of Checklist Answers

a. The City's wastewater treatment plant is located at Prado Road. Existing plant capacity totals 5.1 million gallons per day (mgd). Current citywide flows, including Cal Poly, total approximately 4.2 mgd. Cal Poly's current share totals approximately 0.471 mgd, calculated as a monthly average. Cal Poly's average daily flow, calculated annually, is currently 0.251 mgd; peak flow months total 0.313 mgd. The EIR will quantify wastewater flow resulting from the project and determine whether sufficient capacity exists. Impacts are considered less than significant.

b. The project will require the construction of new wastewater collection and water distribution infrastructure on and adjacent to the site. The majority of new infrastructure will be installed within the project boundaries, and will be sized to support the proposed buildings and ultimate configurations. It is anticipated that additional upgrades may be required to existing main lines on campus; repair or

replacement of such lines will occur within existing road rights-of way or otherwise developed portions of campus adjacent to the site. Impacts of infrastructure construction will be addressed in the EIR.

c. Stormwater on-site currently sheet flows across the paved surface parking area to landscaped areas and surrounding streets. The development of the site would include an entirely new stormwater drainage and conveyance system, largely built within the confines of the site or within campus rights-of-way adjacent to the site. Impacts of infrastructure construction will be addressed in the EIR.

d. The University obtains water from both surface and groundwater sources. Cal Poly owns 33% capacity in Whale Rock Reservoir, located east of the town of Cayucos. The 33% ownership translates into approximately 13,707 acre feet (AF) in normal years. The City, which also has ownership in the reservoir, has modeled safe annual yields (SAY) for water users. The SAY for Cal Poly's share is currently estimated at 1,384 AF per year (AFY). Average total demand for the last 3 years on record is 1,071 AF. Agricultural and landscape irrigation demand is a significant portion of the total; average agricultural demand for the same period was 501 AF (47% of total) and annual water demand for irrigation averaged 280 AF (26%). Approximately 288 AFY (27%) was used for indoor or domestic purposes during that period. The current water surplus for Whale Rock Reservoir averages 313 AFY, 560 AFY for the entire campus when groundwater supplies are included.

   The EIR will quantify projected water demand associated with the project and campus growth through a Water Supply Assessment. Impacts are considered potentially significant pending further analysis. The analysis will also discuss adequacy of water supplies to provide sufficient flows for fire protection.

e. Refer to a., above. Impacts to the capacity of the City's treatment plant will be addressed in the EIR.

f-g. As documented in the University's 2012 Sustainability Progress Report, Cal Poly has a 50% diversion goal for solid waste. The University has met or exceeded that goal since 2003, with almost 80% diversion achieved in 2010. According to the Sustainability Report:

> *Paper, cardboard, aluminum, glass, and plastics are collected and sent to recycling facilities. Campus Dining sends food waste to a composting operation. The University also encourages recycling through its procurement policies: to the extent possible, all products must be recyclable or made from recycled materials.*

   The University also requires contractors to divert as much waste as possible during construction projects. Recent development projects on campus have achieved construction diversion rates as high at 97%.

   Solid waste which is not diverted by the University is transported to the Cold Canyon Landfill. The landfill is located approximately 7 miles from San Luis Obispo. The landfill serves private entities and municipalities throughout San Luis Obispo County. The landfill has recently expanded and now operates near 50% of permitted capacity (250,000 tons per year [TPY] of a 500,000 TPY capacity).

   The EIR will quantify solid waste volumes during construction and operational phases of the project, and assess whether sufficient capacity exists. Impacts are considered potentially significant pending further investigation.

Conclusion

Impacts associated with utilities will be addressed further in the EIR.

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

Discussion of Checklist Answers

a. As described throughout this document, the project may degrade the quality of the environment, including through air quality and traffic congestion. The EIR will address the project's potential to degrade the environment.

b. The EIR will address the project's contribution to cumulative impacts.

c. As described throughout this document, the project may degrade the quality of the environment, including air quality and traffic congestion. The EIR will provide further analysis of environmental impacts which may affect humans.

DETERMINATION

Pursuant to Sections 15152 and 15168 of the State CEQA Guidelines, this initial study has been prepared to evaluate the potential impacts of the proposed project.

On the basis of this initial evaluation:

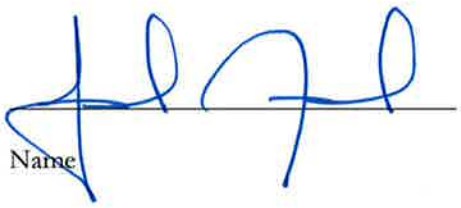
____ I find that the proposed project **COULD NOT** have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared.

____ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because of the mitigation measures described in the initial study. **A NEGATIVE DECLARATION** will be prepared.

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

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

____ I find that although the proposed project could have a significant effect on the environment, there **WILL NOT** be a significant effect in this case because all potentially significant effects (a) have been analyzed adequately in an earlier EIR pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier EIR, including revisions or mitigation measures that are imposed upon the proposed project.



Name

9/25/13

Date

CITATIONS

Brailsford & Dunlavey, 2013. Cal Poly Student Housing Market Study Final Report
Cal Poly Master Plan and FEIR, 2001
Cal Poly WQMP, 2005
Campus Land Use and Design Guidelines, 2010
Parking Structure I EIR, 1997
Sustainability for Cal Poly Facilities & Operations, Fourth Biennial Progress Report, 2012

LIST OF PREPARERS

Nicole Carter, Planner, SWCA

Adriana Neal, GIS-CAD Specialist, SWCA

Jaimie Jones, Document QA/QC, SWCA

ATTACHMENT A. MASTER PLAN MITIGATION INCORPORATED INTO THE PROJECT

Topic	Mitigation Measures Incorporated From the Master Plan	Notes
Aesthetics	All exterior lighting associated with the proposed Master Plan shall be hooded. No unobstructed beam of light shall be directed toward sensitive uses (e.g., Brizzolara Creek, Drumm Reservoir, environmental and Horticultural Sciences (EHS), and neighborhoods). The use of reflective materials in all structures shall be minimized (e.g., metal roofing, expanses of reflective glass on west-facing walls).	
Aesthetics	Parking Structures. All interior lighting associated with proposed parking structures shall be directed internally with lamp "cut-off shields. Unobstructed beams of light shall not be directed toward land uses outside the structures and shall not interfere with vehicular traffic on nearby streets. Examples of specifications for minimizing light and glare include the following: All lights must be shielded to avoid glare and light spill-over onto adjacent areas and onto public right-of-way areas; Landscape illumination should be done with low level, unobtrusive fixtures; Parking structure lighting shall be designed to provide the minimum safe lighting levels. Per IES standards, this is 6 foot-candles (fc) maintained throughout internal to the structure, and 1 fc minimum on the roof; The use of reflective materials on the exterior of all structures shall be minimized; Internal lightwells will be provided to maximize the amount of natural light; Light fixtures will include a vertical component to create an even distribution of light; Solid rails shall be included around the perimeter to block light spillage from headlights on cars within the structure; and All roof light fixtures shall be located on the interior columns to keep light from spilling out on to adjacent areas, and will include "cut-off" shields.	
Air Quality	The University shall consult with the APCD prior to the project to determine the applicability of the following: A. Employ measures to avoid the creation of dust and air pollution B. Unpaved areas shall be wetted down, to eliminate dust formation, a minimum of twice a day or as needed to prevent air borne dust from leaving the site. When wind velocity exceeds 15 mph, the site shall be watered down more frequently C. Store all volatile liquids, including fuels or solvents, in closed containers D. No open burning of debris, lumber or other scrap will be permitted E. Properly maintain equipment to reduce gaseous pollutant emissions F. Exposed areas, new driveways and sidewalks shall be seeded, treated with soil binders, or paved as soon as possible G. Cover stockpiles of soil, sand and other loose materials H. Cover trucks hauling soil, debris or other loose materials I. Sweep project area streets at least once daily J. All PM10 mitigation measures required must be included on grading and building plans. In addition, the contractor or builder shall designate a person or persons to monitor the dust control program, and to order increased watering, when necessary, to prevent transport of dust off site. Their duties shall include holiday and weekend periods when work may not be progress. The name and telephone number of the monitor shall be provided to the APCD prior to the start of work at the site. K. The Contractor shall maintain continuous control of dust resulting from construction operations. Particular care must be paid to door openings to prevent construction dust and debris from entering adjacent areas. L. If airborne dust is leaving the site or becoming a nuisance, the Contractor	

Topic	Mitigation Measures Incorporated From the Master Plan	Notes
	shall water exposed areas. M. Water down the project site, access routes, and lay down areas proactively to ensure dust does not become a nuisance. N. The campus reserves the right to request watering of the site whenever dust complaints are received O. During construction, the amount of disturbed area shall be minimized P. Onsite vehicle speeds shall be reduced to 15 mph or less Q. Exposed ground areas that are left exposed after project completion shall be sown with a fast-germinating native grass seed and watered until vegetation is established R. After clearing, grading, earth moving, or excavating is completed, the entire area of disturbed soil shall be treated immediately by watering or revegetating or spreading soil binders or jute netting to minimize dust generation until the area is paved or otherwise developed so that dust generation will be minimized S. All roadways, driveways, and sidewalks associated with construction activities shall be paved as soon as possible. In addition, building and other pads shall be laid as soon as possible after grading, unless seeding or soil binders are used.	
Geology	Landslide. Mitigation measures would need to be developed on the basis of site-specific study of the landslide. The general degree of required mitigation would depend on the findings, which could range from: 1) finding that the existing landslide is relatively stable and therefore no significant mitigation is needed; to 2) the existing landslide is marginally stable and will require extensive strengthening and/or subsurface drainage improvements to provide adequate factors of safety for design and construction. This EIR therefore recommends that such a study be performed to estimate the factor of safety of the existing landslide for existing static and earthquake loading conditions, and to evaluate what impact the proposed site improvements could have on the stability of the landslide. The study will specify mitigation measures for any site improvements that are needed.	The geotechnical study addresses this issue; information will be provided in the EIR
Noise	Cal Poly shall apply the following during construction: Cal Poly Standard Requirements A. The requirements of the Article are in addition to those of Article 4.02 of the Contract General Conditions. B. Maximum noise levels within 1,000 feet of any classroom, laboratory, residence, business, adjacent buildings, or other populated area; noise levels for trenchers, pavers, graders and trucks shall not exceed 90 dBA at 50 feet as measured under the noisiest operating conditions. For all other equipment, noise levels shall not exceed 85 dBA at 50 feet. C. Equipment: equip jackhammers with exhaust mufflers and steel muffling sleeves. Air compressors should be of a quiet type such as a "whisperized" compressor. Compressor hoods shall be closed while equipment is in operation. Use electrically powered rather than gasoline or diesel powered forklifts. Provide portable noise barriers around jack hammering, and barriers constructed of 3/4-inch plywood lined with 1-inch thick fiberglass on the work side. D. Operations: keep noisy equipment as far as possible from noise-sensitive site boundaries. Machines should not be left idling. Use electric power in lieu of internal combustion engine power wherever possible. Maintain equipment properly to reduce noise from excessive vibration, faulty mufflers, or other sources. All engines shall have properly functioning mufflers. E. Scheduling: schedule noisy operations so as to minimize their duration at any given location, and to minimize disruption to the adjoining users. Notify the Trustees and the Architect in advance of performing work creating unusual	

Topic	Mitigation Measures Incorporated From the Master Plan	Notes
	noise and schedule such work at times mutually agreeable. F. Do not play radios, tape recorders, televisions, and other similar items at construction site. G. When work occurs in or near occupied buildings, the Contractor is cautioned to keep noise associated with any activities to a minimum. If excessively noisy operations that disrupt academic activities are anticipated, they must be scheduled after normal work hours. H. All work in the area of the residence halls will be restricted to 10:00 a.m. to 10:00 p.m., seven days per week, throughout the year. No work will be allowed in the residence hall areas during the finals week. University reserves the right to stop construction work, including but not limited to noisy work, during the following events: Spring and Winter Commencement, Open House, Finals Week, residence hall move-in, or at other times that may be identified by the University. University reserves the right to stop noisy work at any time when said work disrupts classes or other planned events. In addition to these standard measures, the following measures are recommended: • A haul route plan shall be prepared for review and approval by the University which designates hall routes as far as possible from sensitive receptors. • Stockpiling and vehicle staging areas shall be located as far as practical from occupied structures. • Whenever practical, the noisiest construction operations shall be scheduled to occur together in the construction program to avoid continuous periods of noise generation. Scheduling of noisier construction activities shall also take advantage of summer sessions and other times when classes are not in session. • Project construction activities that generate noise in excess of 60 dB at the project site boundary shall be limited to the hours of 7 a.m. to 6 p.m. Pile Driver Use. If possible, the use of pile drivers shall be minimized in construction. Alternative techniques that produce less noise, such as drilled or bored piles, shall be considered.	
Safety	Circulation Plan. Where vehicle and pedestrian routes and residential areas conflict with construction activities, a circulation plan will be developed, which will include warning signs and detours, as well as efforts to minimize noise in residential areas.	

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

Notice of Preparation

September 26, 2013

To: Reviewing Agencies

Re: Student Housing South
SCH# 2013091085

Attached for your review and comment is the Notice of Preparation (NOP) for the Student Housing South draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Joel Neel
California State Polytechnic University, San Luis Obispo
1 Grand Avenue
San Luis Obispo, CA 93407

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2013091085
Project Title Student Housing South
Lead Agency California State Polytechnic University, San Luis Obispo

Type NOP Notice of Preparation

Description Provide up to 1,475 housing units and a 300 to 500-space parking structure with access and appurtenant facilities on 12 acres currently in use as the R-1, R-2 and G-4 parking lot.

Lead Agency Contact

Name Joel Neel
Agency California State Polytechnic University, San Luis Obispo
Phone (805) 756-2193 **Fax**
email
Address 1 Grand Avenue
City San Luis Obispo **State** CA **Zip** 93407

Project Location

County San Luis Obispo
City San Luis Obispo
Region
Cross Streets Grand Avenue and Slack Street
Lat / Long 35° 17' 49.2" N / 120° 39' 17" W
Parcel No.
Township 23 **Range** 12E **Section** 30S **Base**

Proximity to:

Highways Hwy 101, 1
Airports No
Railways UPRR
Waterways Stenner Creek, Brizzolara Creek
Schools Former Pacheco ES
Land Use Parking and Outdoor Recreation/Athletics

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Minerals; Noise; Public Services; Recreation/Parks; Schools/Universities; Septic System; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Growth Inducing; Landuse; Cumulative Effects

Reviewing Agencies Resources Agency; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Wildlife, Region 4; Native American Heritage Commission; Public Utilities Commission; California Highway Patrol; Department of Housing and Community Development; Caltrans, District 6; Department of Toxic Substances Control

Date Received 09/26/2013 **Start of Review** 09/26/2013 **End of Review** 10/25/2013

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List

SL **County:** San Luis Obispo **SCH#** 2013031085

Resources Agency

- [x] **Resources Agency** Nadell Gayou
- [ ] **Dept. of Boating & Waterways** Nicole Wong
- [ ] **California Coastal Commission** Elizabeth A. Fuchs
- [ ] **Colorado River Board** Tamya Trujillo
- [ ] **Dept. of Conservation** Elizabeth Carpenter
- [ ] **California Energy Commission** Eric Knight
- [ ] **Cal Fire** Dan Foster
- [ ] **Central Valley Flood Protection Board** James Herota
- [ ] **Office of Historic Preservation** Ron Parsons
- [x] **Dept of Parks & Recreation** Environmental Stewardship Section
- [ ] **California Department of Resources, Recycling & Recovery** Sue O'Leary
- [ ] **S.F. Bay Conservation & Dev't. Comm.** Steve McAdam
- [ ] **Dept. of Water Resources** Resources Agency Nadell Gayou

Fish and Game

- [ ] **Depart. of Fish & Wildlife** Scott Flint Environmental Services Division
- [ ] **Fish & Wildlife Region 1** Donald Koch
- [ ] **Fish & Wildlife Region 1E** Laurie Harnsberger
- [ ] **Fish & Wildlife Region 2** Jeff Drongesen
- [ ] **Fish & Wildlife Region 3** Charles Armor
- [ ] **Fish & Wildlife Region 4** Julie Vance
- [ ] **Fish & Wildlife Region 5** Leslie Newton-Reed Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6** Gabrina Gatchel Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6 I/M** Heidi Sickler Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Wildlife M** George Isaac Marine Region

Other Departments

- [ ] **Food & Agriculture** Sandra Schubert Dept. of Food and Agriculture
- [ ] **Depart. of General Services** Public School Construction
- [ ] **Dept. of General Services** Anna Garbeff Environmental Services Section
- [ ] **Dept. of Public Health** Jeffery Worth Dept. of Health/Drinking Water
- [ ] **Delta Stewardship Council** **Kevan Samsam**

Independent Commissions,Boards

- [ ] **Delta Protection Commission** Michael Machado
- [ ] **Cal EMA (Emergency Management Agency)** Dennis Castrillo
- [x] **Native American Heritage Comm.** Debbie Treadway
- [x] **Public Utilities Commission** Leo Wong
- [ ] **Santa Monica Bay Restoration** Guangyu Wang
- [ ] **State Lands Commission** Jennifer Deleong
- [ ] **Tahoe Regional Planning Agency (TRPA)** Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics** Philip Crimmins
- [ ] **Caltrans - Planning** Terri Pencovic
- [x] **California Highway Patrol** Suzann Ikeuchi Office of Special Projects
- [x] **Housing & Community Development** CEQA Coordinator Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1** Rex Jackman
- [ ] **Caltrans, District 2** Marcelino Gonzalez
- [ ] **Caltrans, District 3** Gary Arnold
- [ ] **Caltrans, District 4** Erik Alm
- [ ] **Caltrans, District 5** David Murray
- [ ] **Caltrans, District 6** Michael Navarro
- [ ] **Caltrans, District 7** Dianna Watson
- [ ] **Caltrans, District 8** Dan Kopulsky
- [ ] **Caltrans, District 9** Gayle Rosander
- [ ] **Caltrans, District 10** Tom Dumas
- [ ] **Caltrans, District 11** Jacob Armstrong
- [ ] **Caltrans, District 12** Maureen El Harake

Cal EPA

Air Resources Board

- [ ] All Projects CEQA Coordinator
- [ ] Transportation Projects Jon Taylor
- [ ] Industrial Projects Mike Tollstrup
- [ ] **State Water Resources Control Board** Regional Programs Unit Division of Financial Assistance
- [ ] **State Water Resources Control Board** Student Intern, 401 Water Quality Certification Unit Division of Water Quality
- [ ] **State Water Resouces Control Board** Phil Crader Division of Water Rights
- [x] **Dept. of Toxic Substances Control** CEQA Tracking Center
- [ ] **Department of Pesticide Regulation** CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1** Cathleen Hudson North Coast Region (1)
- [ ] **RWQCB 2** Environmental Document Coordinator San Francisco Bay Region (2)
- [x] **RWQCB 3** Central Coast Region (3)
- [ ] **RWQCB 4** Teresa Rodgers Los Angeles Region (4)
- [ ] **RWQCB 5S** Central Valley Region (5)
- [ ] **RWQCB 5F** Central Valley Region (5) Fresno Branch Office
- [ ] **RWQCB 5R** Central Valley Region (5) Redding Branch Office
- [ ] **RWQCB 6** Lahontan Region (6)
- [ ] **RWQCB 6V** Lahontan Region (6) Victorville Branch Office
- [ ] **RWQCB 7** Colorado River Basin Region (7)
- [ ] **RWQCB 8** Santa Ana Region (8)
- [ ] **RWQCB 9** San Diego Region (9)

- [ ] **Other** _____
- [ ] _____ Conservancy

Last Updated 9 /24/2013

DEPARTMENT OF TRANSPORTATION
50 HIGUERA STREET
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October 18, 2013

CSU Board of Trustees
c/o Nicole Carter, Senior Planner
SWCA Environmental Consultants
1422 Monterey Street, C200
San Luis Obispo CA 93401

05-SLO-101-029.77

Dear CSU Board of Trustees:

COMMENTS ON THE NOTICE OF PREPARATION (NOP) OF THE DRAFT ENIVIRONMENTAL IMPACT REPORT FOR THE CALIFORNIA STATE UNIVERSITY, SAN LUIS OBISPO STUDENT HOUSING SOUTH PROJECT

The California Department of Transportation (Caltrans) has reviewed the above referenced project and offers the following comments for your consideration in preparing the Environmental Impact Report (EIR).

1) To ensure the traffic study in the Draft EIR includes the information needed to analyze the impacts (both cumulative and project-specific) of this effort, it is recommended that the analysis be prepared in accordance with the Department's *Guide for the Preparation of Traffic Impact Studies* (2002).

2) Since Caltrans is responsible for the safety, operations, and maintenance of the State transportation system, Caltrans' Level of Service (LOS) standards should be used to determine the significance of the project's impact. Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on all State transportation facilities.

3) The traffic study should include information on existing traffic volumes within the study area, including the State transportation system, and should be based on recent traffic volumes less than two years old. Counts older than two years cannot be used as a baseline. Feel free to contact us for assistance in acquiring the most recent data available.

4) The methodologies used to calculate the LOS should be consistent with the methods in the current version of the Highway Capacity Manual. All LOS calculations should also be included in the Draft EIR for review.

5) Specific to this project, the traffic study should include an analysis of the interchange at Grand Avenue and US 101.

We look forward to receiving the Draft EIR, and providing comments from a more thorough analysis. If you have any questions or desire further clarification, feel free to contact me at (805) 549-3131 or adam.fukushima@dot.ca.gov.

Sincerely,

Adam Fukushima, PTP
Development Review
Caltrans District 5

Department of Toxic Substances Control

Deborah O. Raphael, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Matthew Rodriquez
Secretary for
Environmental Protection

Edmund G. Brown Jr.
Governor

October 21, 2013

CSU Board of Trustees
c/o Ms. Nicole Carter
Senior Planner
SWCA Environmental Consultants
1422 Monterey Street, C200
San Luis Obispo, CA 93401

NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT - INITIAL STUDY FOR CALIFORNIA STATE POLYTECHNIC UNIVERSITY SAN LUIS OBISPO, STUDENT HOUSING SOUTH PROJECT, SAN LUIS OBISPO, SAN LUIS OBISPO COUNTY
(SCH #2013091085)

Dear Ms. Carter:

The Department of Toxic Substances Control (DTSC) has reviewed the Notice of Preparation and Initial Study (NOP/IS), dated September 25, 2013, for a Draft Environmental Impact Report (EIR) for the California Polytechnic State University, San Luis Obispo Student Housing South project. The due date to submit comments is October 24, 2013.

The California Polytechnic State University, San Luis Obispo (Cal Poly) is proposing a project that would include the construction of approximately 1,475 beds of freshman housing and a 300 to 500-space parking structure at the present location of the General (G)-1, G-4 and Residential (R)-2 parking lots at the existing Cal Poly campus, located in San Luis Obispo, San Luis Obispo county (Site).

Based on a review of the NOP/IS, DTSC would like to provide the following comments:

1. Although exempt from the requirements of California Education Code, § 17213.1 and § 17213.2, DTSC recommends that if Cal Poly plans to use State funds for the project, then Cal Poly should comply with the above referenced regulations applicable to new or expanding K – 12 school sites in the State of California.

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In addition, California Department of Education (CDE) approval is not required for non-state-funded (100% locally funded) school site acquisition or construction/modernization projects solely using CDE 4.08 modernization funds; however, locally funded school projects (except those by charter schools) are still required to comply with California Code of Regulations (CCR) Title 5 school siting and design standards (and are required to keep documentation of compliance/exemption for any complaint investigation). Such projects will also need to comply with other applicable codes, including Government Code, Education Code, and Public Resources Code. A local education agency may voluntarily request CDE site/plan approval for locally funded projects to document a project's consistency with Title 5. In this case, CDE will require DTSC review and approval prior to its final approval (even though it is not a state-funded school project).

2. Although not required by law, because the project is school site related, DTSC recommends that an environmental review, such as a Phase I Environmental Site Assessment and/or Preliminary Endangerment Assessment, be conducted to determine whether there has been or may have been a release or threatened release of a hazardous material, or whether a naturally occurring hazardous material is present based on reasonably available information about the property and the areas in its vicinity. Such an environmental review should generally be conducted as part of the California Environmental Quality Act (CEQA) process. Such an environmental review is also recommended for compliance with the requirements of California Education Code, section 17268(a) or 17213(a). If the District elects to proceed and conduct an environmental assessment at the Site under DTSC oversight, it should enter into a Voluntary Cleanup Agreement (VCA) with DTSC to oversee the preparation of the environmental assessment.

3. If prior to the existing site use former structures existed on the Site, demolition of the old structures may have resulted in potential environmental concerns at the Site due to lead from lead-based paint and/or organochlorine pesticides from termiticide applications. DTSC recommends that these environmental concerns be investigated and possibly mitigated, in accordance with DTSC's "*Interim Guidance, Evaluation of School Sites with Potential Soil Contamination as a Result of Lead from Lead-Based Paint, Organochlorine Pesticides from Termiticides, and Polychlorinated Biphenyls from Electrical Transformers, dated June 9, 2006*".

4. If the Site was previously used for agricultural purposes, pesticides (such as DDT, DDE, chlordane and toxaphene) and fertilizers (usually containing heavy metals) commonly used as part of agricultural operations are likely to be present. These agricultural chemicals are persistent and bio-accumulative toxic substances. DTSC recommends that these environmental concerns be investigated and possibly mitigated, in accordance with the "*Interim Guidance for Sampling Agricultural Soils (Third Revision), dated August 2008*".

5. The Site appears to be located within 1-mile of a geological unit potentially containing naturally occurring asbestos (NOA). Pursuant to DTSC's "*Interim Guidance – Naturally Occurring Asbestos at School Sites, Revised September 24, 2004*", further action should be considered and conducted to determine whether a naturally occurring hazardous material (i.e. NOA) is present, based on reasonably available information about the property and the area in its vicinity.

6. If a response action is required at the Site based on the results of the above investigations, and/or other information, the EIR will require an analysis of the potential public health and environmental impacts associated with any proposed response action, pursuant to requirements of the CEQA (Pub. Resources Code, Div. 13, §21000 et seq.) and its implementing Guidelines (CCR, Title 14, §15000 et seq.), prior to approval or adoption of the EIR for the project. A discussion of the investigations and mitigation and/or removal actions, if necessary, and associated cumulative impacts to the Site and the surrounding environment, should be included in the EIR. If sufficient information to discuss the proposed mitigation and/or removal actions, and their associated impacts to the Site and the surrounding environment, are not available for inclusion in the EIR, then an Addendum or Supplement to the EIR may be required.

DTSC is also administering the Cleanup Loans and Environmental Assistance to Neighborhoods (CLEAN) Program which provides low-interest loans to investigate and cleanup hazardous materials at properties where redevelopment is likely to have a beneficial impact to a community. These loans are available to developers, businesses, schools, and local governments.

For additional information on DTSC's Schools process or CLEAN Program, please visit DTSC's web site at www.dtsc.ca.gov. If you would like to discuss this matter further, please contact me at (916) 255-3695, or via e-mail at bud.duke@dtsc.ca.gov.

Sincerely,

Harold (Bud) Duke, PG
Senior Engineering Geologist
Northern California Schools
Brownfields and Environmental Restoration Program

cc: (via e-mail)

State Clearinghouse (State.clearinghouse@opr.ca.gov)
Office of Planning and Research

Michael O'Neill (MONeill@cde.ca.gov)
Department of Education – Sacramento, CA

George Shaw (GShaw@cde.ca.gov)
Department of Education – Sacramento, CA

Nancy Ritter (Nancy.Ritter@dtsc.ca.gov)
DTSC CEQA Tracking Center – Sacramento, CA

CEQA Reading File – Chatsworth Office

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SLO COUNTY apcd | Air Pollution Control District
San Luis Obispo County

RECEIVED OCT 28 2013

October 23, 2013

CSU Board of Trustees
Nicole Carter Senior Planner
SWCA Environmental Consultants
1422 Monterey St., C200
San Luis Obispo, CA 93401

SUBJECT: APCD Comments Regarding the Cal Poly San Luis Obispo Student Housing South Project

Dear Ms. Carter,

Thank you for including the San Luis Obispo County Air Pollution Control District (APCD) in the environmental review process. We have completed our review of the Notice of Preparation for the above referenced project. The proposed project will include 1,475 beds for freshman housing and a 300 to 500-space parking structure at the present location of the General (G)-1, G-4 and Residential (R)-2 parking lots.

GENERAL COMMENTS

As a commenting agency in the California Environmental Quality Act (CEQA) review process for a project, the APCD assesses air pollution impacts from both the construction and operational phases of a project, with separate significant thresholds for each.

It should be noted that while mitigation measures were included in the initial study. Depending on the finding in the Environmental Impact Report additional measures may be required.

Please address the action items contained in this letter, with special attention to items that are highlighted by bold and underlined text.

1. Contact Person:

   Melissa Guise
   Air Pollution Control District
   3433 Roberto Court
   San Luis Obispo, CA 93401
   (805) 781-4667

2. Permit(s) or Approval(s) Authority:

Construction Permit Requirements
Portable equipment, 50 horsepower (hp) or greater, used during construction activities may require California statewide portable equipment registration (issued by the California Air Resources Board) or an APCD permit. Operational sources may also require APCD permits.

The following list is provided as a guide to equipment and operations that may have permitting requirements, but should not be viewed as exclusive. For a more detailed listing, refer to the Technical Appendices, page 4-4, in the APCD's 2009 CEQA Handbook.

- Power screens, conveyors, diesel engines, and/or crushers
- Portable generators and equipment with engines that are 50 hp or greater
- Electrical generation plants or the use of standby generator
- Internal combustion engines
- Rock and pavement crushing
- Unconfined abrasive blasting operations
- Tub grinders
- Trommel screens
- Portable plants (e.g. aggregate plant, asphalt batch plant, concrete batch plant, etc)

To minimize potential delays, prior to the start of the project, please contact the APCD Engineering Division at (805) 781-5912 for specific information regarding permitting requirements.

Operational Permit Requirements
Operational sources may require APCD permits. The following list is provided as a guide to equipment and operations that may have permitting requirements, but should not be viewed as exclusive. For a more detailed listing, refer to the Technical Appendix, page 4-4, in the APCD's 2009 CEQA Handbook.

- Portable generators and equipment with engines that are 50 hp or greater;
- Electrical generation plants or the use of standby generator;
- Boilers;
- Internal combustion engines; and
- Cogeneration facilities.

Most facilities applying for an Authority to Construct or Permit to Operate with stationary diesel engines greater than 50 hp, should be prioritized or screened for facility wide health risk impacts. A diesel engine-only facility limited to 20 non-emergency operating hours per year or that has demonstrated to have overall diesel particulate emissions less than or equal to 2 lb/yr does not need to do additional health risk assessment. **To minimize potential delays, prior to the start of the project, please contact the APCD Engineering Division at (805) 781-5912 for specific information regarding permitting requirements.**

Naturally Occurring Asbestos
The project site is located in a candidate area for Naturally Occurring Asbestos (NOA), which has been identified as a toxic air contaminant by the California Air Resources Board (ARB). Under the ARB Air Toxics Control Measure (ATCM) for Construction, Grading, Quarrying, and Surface

Mining Operations, **prior to any grading activities at the site, the project proponent shall ensure that a geologic evaluation is conducted to determine if NOA is present within the area that will be disturbed. If NOA is not present, an exemption request must be filed with the District (see Attachment 1). If NOA is found at the site the applicant must comply with all requirements outlined in the Asbestos ATCM.** This may include development of an Asbestos Dust Mitigation Plan and an Asbestos Health and Safety Program for approval by the APCD. Please refer to the APCD web page at *http://www.slocleanair.org/business/asbestos.asp* for more information or contact the Enforcement Division at 781-5912.

Demolition

Demolition and remodeling activities have potential negative air quality impacts, including issues surrounding proper demolition and disposal of asbestos containing material (ACM). Demolition and remodeling projects are subject to the requirements stipulated in the National Emission Standard for Hazardous Air Pollutants (NESHAP), which includes but is not limited to: 1) notification requirements to the APCD, 2) asbestos survey conducted by a Certified Asbestos Inspector, and, 3) applicable removal and disposal requirements of identified ACM. Please contact the APCD Enforcement Division at 781-5912 prior to final approval of these types of projects by your agency.

3. Environmental Information:

The potential air quality impacts from construction and operational phases of the project should be assessed in the EIR. The project under development has the potential for significant impacts to local air emissions, ambient air quality, sensitive receptors, and the implementation of the Clean Air Plan (CAP). A complete air quality analysis should be included in the DEIR to adequately evaluate the overall air quality impacts associated with implementation of the proposed project. This analysis should address both short-term (construction) and long-term (operational) emissions impacts (including traditional air pollutants, air toxics and greenhouse gas emissions). The following is an outline of items that should be included in the analysis: The "2012 CEQA Air Quality Handbook" (the Handbook) can be used as guidance for assessing the air quality impacts for this project and defining mitigation measures. A copy can be accessed on the APCD web page at:

http://slocleanair.org/images/cms/upload/files/CEQA_Handbook_2012_v1.pdf

a) A description of existing air quality and emissions in the impact area, including the attainment status of the APCD relative to State and Federal air quality standards and any existing regulatory restrictions to development.

b) A detailed description of all phases of the project should be included in the EIR. Based on the description, a detailed quantitative air emissions analysis at the project scale needs to be completed and all emissions from each phase of the project need to be quantified. A complete emission analysis should be performed on all relevant construction and operational phase emission sources using the latest approved version of CalEEMod

(www.caleemod.com) or other APCD approved emission calculator tools. This analysis should include both stationary and mobile sources (both on site and off site trips), regardless if APCD permits are needed for the equipment. All assumptions used in the air emissions calculations should be included in the DEIR. Modeling results should include detailed output reports that include data input parameters, assumptions, and default modification if applicable. The quantitative analysis needs to address criteria pollutants, greenhouse gases, air toxics, and diesel particulate matter and be compared to APCD's CEQA threshold.

c) As indicated above, greenhouse gases should be quantified as part of the project. The short term greenhouse gas impacts from the construction should be amortized over the life of the project and added to the operational phase impacts.

d) To aid in the air quality analysis, the traffic study should include the total daily traffic volumes projected. The traffic study results can be used in the quantitative and qualitative analyses by providing a tool for comparing trip generation between different alternatives and evaluating effectiveness of mitigation methods for reducing traffic impacts.

e) Since there is a private elementary school located adjacent to the site construction mitigation measures should be implemented to reduce air toxic exposure to sensitive receptors. The proposed mitigation should be discussed in the environmental document.

f) A cumulative impact analysis should be performed to evaluate the combined air quality impacts of this project and impact from existing and propose future development in the area. This should encompass all planned construction activities within one mile of the project.

g) The DEIR should include a range of alternatives that could effectively minimize air quality impacts. A quantitative analysis of the air quality impacts should be generated for each of the proposed alternatives.

h) Mitigation measures to reduce or avoid significant air quality impacts should be recommended. The DEIR should address any proposed off-site mitigation measures and describe feasible mitigation measure to reduce air quality impacts on-site. Off-site mitigation may be required in the event that emission cannot be reduced on-site below APCD specified thresholds.

4. Permit Stipulation/Conditions:

It is recommended reference material include the 2012 version of the "CEQA Air Quality Handbook" (the Handbook). It can be accessed on the APCD web http://slocleanair.org/images/cms/upload/files/CEQA_Handbook_2012_v1.pdf

5. Alternatives:

Any alternatives described in the DEIR should involve the same level of air quality analysis as described in section 3 listed above.

6. Reasonably Foreseeable Projects, Programs or Plans:

   None at this time.

7. Relevant Information:

   As mentioned earlier, the CEQA Air Quality Handbook should be referenced in the DEIR for determining the significance of impacts and level of mitigation recommended.

8. Further Comments:
   No further comments at this time.

Thank you for the opportunity to comment on this proposal. If you have any questions or comments, feel free to contact me at 781-4667.

Sincerely,

Melissa Guise
Air Quality Specialist
MAG/arr

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City of San Luis Obispo
Community Development Department • 919 Palm Street, San Luis Obispo, CA 93401-3218

October 23, 2013

CSU Board of Trustees
Nicole Carter, Senior Planner- ncarter@swca.com
SWCA Environmental Consultants
1422 Monterey Street, C200
San Luis Obispo CA 93401

SUBJECT: Notice of Preparation for Cal Poly Student Housing South Project

Thank you for providing the opportunity for the City of San Luis Obispo comment on the Notice of Preparation (NOP) for the Student Housing South project being proposed by Cal Poly. While these comments are specifically focused on the NOP for the Student Housing South Project, we look forward to collaborating with the University through the process of updating its Master Plan and further developing its plans for additional student housing on-campus to accommodate the recently announced growth in enrollment.

General Comments:
The evaluation of the updated Master Plan changes should address disposition of the existing identified housing sites as well as identify other potential sites for the proposed housing or housing to be considered in the future for both faculty, staff, and students. Our comments are framed by the *City of Marina v. Board of Trustees of California State University*, where the California Supreme Court ruled that the CSU has a duty to mitigate off-site impacts of a project. The University should evaluate both project specific and cumulative impacts and work with the City to implement mitigations that require City participation.

Cumulative Impacts:
On September 16, 2013, President Armstrong announced that Cal Poly would be seeking to increase enrollment at the San Luis Obispo campus by 4,000-5,000 students. Please ensure that cumulative impacts of the projected increased enrollment in addition to projected growth in the surrounding community is addressed as part of the cumulative impact evaluation. Moreover, please review and include the projected growth that is identified in the City's draft Land Use and Circulation Element update. These alternatives are available at the City's website.

Aesthetics:
Ensure that visual impacts to surrounding hillsides and ridgelines are evaluated from a variety of locations. The Initial Study identifies the hillsides east of campus, but other views from the approach to the Grand Avenue gateway entrance would likely also be obscured, to include the hillsides north of the Main Campus such as Kestrel Crest and Caballo Peak (labeled on the topographic maps shown on pages 6-9 of *Cal Poly Land: A Field Guide* (Marx, ed. 2002).

In addition to the anticipated mitigation measures that involve landscaping, color palette, and other design features of the buildings that are intended to reduce aesthetic impacts, Cal Poly

The City of San Luis Obispo is committed to include the disabled in all of its services, programs and activities.
Telecommunications Device for the Deaf (805) 781-7410.

should also consider implementing or participating in open space conservation initiatives that permanently protect scenic resources themselves (both on-site and off-site where geographical nexus exists). Please coordinate with the City's Natural Resources Manager, Robert Hill (rhill@slocity.org or 805-781-7211).

Additionally, the EIR should evaluate proposed project lighting and evaluate the impact that it will have on surrounding environmentally sensitive resources, neighborhoods and scenic views and impacts to the night sky. Mitigation measures that reduce the impacts to the maximum extent feasible should be implemented to address these impacts.

Greenhouse Gas Emissions:
The Initial Study identified this issue as potentially significant and that CalEEMod would be used to model emissions. Please scope the model in the EIR to include a variety of Greenhouse Gas Emitters (i.e. increase in food waste composted on campus, vehicle trips, etc.)

Land Use Planning:
The proposed project site is immediately adjacent to city neighborhoods. City's policies support housing students on campus but also support neighborhood preservation. Land Use Element policies to address neighborhood character and to address noise, parking and maintenance in neighborhoods should be addressed. In addition, to the extent that on-campus parking fees may have unintended consequences to incentivize student and faculty members choosing instead to park in the adjacent neighborhoods, the EIR should provide discussion and evaluation of ways to address off-site impacts.

Moreover, it is anticipated that students living in the new dorms will venture into the surrounding neighborhoods to socialize with other students and to use services and patronize stores in the surrounding commercial areas. The EIR should evaluate the potential to environmental impacts associated with concentrating additional students adjacent to these neighborhoods and commercial areas.

Noise:
Operational noise should include evaluation of impacts to adjacent city neighborhoods and proposed mitigations including site planning and building features (orientation, window placement, location of HVAC units, etc.) to address.

Parks and Open Space:
The impact of the Project on the City's parks and recreation facilities, parks and recreation programming, and open space trails should be evaluated. Although Cal Poly provides significant amenities of this nature, as noted in the Initial Study, students housed both on and off campus comprise a significant portion of the user groups taking advantage of the aforementioned facilities and services on an ongoing basis.

Population and Housing:
While the initial study indicates that the proposed housing will accommodate existing students and will not increase enrollment, the EIR should address any increase in staffing needed to serve the additional 1,475 students who will now be living on-campus.

Public Services:

Police:

Beyond mutual aid assistance, the San Luis Obispo Police Department has established a very good working relationship with the Cal Poly Police Department. The San Luis Obispo Police Department does provide limited patrol assistance on campus when requested by campus police, however, currently these assistance requests are minimal. As Cal Poly Police patrol the off campus neighborhoods around the school they may initiate citizen contacts and request assistance from our agency. Depending on the nature of the contact or criminal activity Cal Poly Police may be the primary responsible agency for the investigation (which typically includes infractions or low grade misdemeanor violations). If the violation is more substantial (such as a felony or significant misdemeanor) the incident would be turned over to our department as the agency with jurisdiction and primary investigative responsibilities.

Physical adjustment and growth of the student population housed on the Cal Poly campus will change the patrol dynamics and frequency regarding the calls for service for the Cal Poly Police Department. The EIR should evaluate if an increase of patrol staffing and administration to match the location and increase in on-campus housing is required. How this issue is assessed will have an impact on the City of San Luis Obispo's Police Department and the expectations of assistance expected both on and off campus.

Impacts associated with the project at the selected site include the potential to alter the traffic and pedestrian patterns on the City surface streets adjacent to this area. Student egress and ingress of this concentrated population into the City of San Luis Obispo will likely create several safety concerns including the need for safety lighting, safe pedestrian access and effective traffic engineering design to address potential criminal activity or vehicle/pedestrian collisions. A thoughtful consideration of these impacts should be included as part of the EIR.

The residential areas surrounding the selected site will likely experience "quality of life issues" such as noise complaints, parties, fights, vandalism, alcohol violations and general public disorder that impact these residential areas. Consideration of the impacts to response by City safety personnel to address this perceived or real activity needs to be addressed in the EIR.

Fire:

The EIR should address building and site design mitigations to address fire safety. While the Building Code allows R2 occupancies 3-4 stories in height to utilize Type VA construction (combustible) only non-combustible construction should be used due to lack of ladder truck access.[1] Other mitigations include providing emergency escape and *rescue* windows in Group R occupancies; Type I, IIA or IIIA construction that is fully sprinklered; inclusion of Standpipes for firefighter use in all buildings 3 stories and taller; and at least two stairways on each building that access the roof.

Transportation/Traffic

The EIR should discuss the methodology used to project trip generation. If not using the accepted ITE methodology, the EIR needs to provide background and justification for using alternative trip generation so that assumptions and impacts can be fully understood. The EIR needs to include an analysis of traffic impacts on adjacent neighborhoods using the volume and

[1] Fire Code Appendix Chapter D, section D105 and D106 requiring two fire apparatus access roads for buildings exceeding 30 feet in height, with at least one of the access routes located within a minimum of 15 feet and a maximum of 30 feet from the building, and positioned parallel to one entire side of the building. The berms on Slack Avenue and Pacheco Way further inhibit fire department aerial access.

speed thresholds established in the City's Circulation Element. The City requests that the EIR evaluate cumulative impacts using the City's most current TransCAD travel demand model.

Utilities and Service Systems:

The EIR should include wastewater projections for the 1,475 student beds proposed as part of the Student Housing South project as well as any increased staff or food service uses to be provided at the campus to serve these students. The EIR should also include wastewater projections cumulative growth under the announced future enrollment increase of 4,000-5,000 students. The City uses 105 gallon per day for projecting wastewater flow volumes for multi-family units which may be a suitable rate to use for projecting wastewater flows for this type of housing.

The City's Utilities Department is currently preparing an updated Water Master Plan, including a hydraulic model of the City's water distribution system. This information may be useful in evaluating fire flow.

Thank you again for the opportunity to provide comments. Please contact should you have any questions regarding these comments or would find a meeting with City staff helpful to clarify any areas that should be analyzed in the EIR.

Sincerely yours,

Derek Johnson
Community Development Director

CC: Mayor and Council
Katie Lichtig, City Manager
Carrie Mattingly, Utilities Director
Daryl Grigsby, Public Works Director
Garret Olson, Fire Chief
Shelly Stanwyck, Parks and Recreation Director
Steve Gesell, Police Chief
Ron DeCarli, Executive Director, San Luis Obispo County Association of Governments
Kami Griffin, Assistant Planning Director, County of San Luis Obispo

\\chstore4\team\community development\correspondence\calpoly\calpolyhousingsouthnop.docx

Residents for Quality Neighborhoods
P.O. Box 12604 • San Luis Obispo, CA 93406

October 21, 2013

SWCA Environmental Consultants
1422 Monterey Street, Suite C200
San Luis Obispo, CA 93401

SUBJECT: Input for Cal Poly Student Housing South Project

Residents for Quality Neighborhoods (RQN) is pleased to have been asked to attend the scoping meeting and provide input for this project. Hearing that the project is intended for current enrollment was a pleasant outcome of attending the meeting.

We are highly supportive of Cal Poly's decision to house an additional 1475 students; however, we have some concerns about the project's proposed location at the corner of Grand Avenue and Slack Street and, because of that location and its proximity to residential neighborhoods, the general design of the project and the loss of on-campus parking. Our concerns include:

1. Residents along Slack Street are heavily impacted by students who live on campus and use the berm/hillside between the selected parking lot and Slack Street as their access into the city via the residential neighborhood below. Concentration of 1475 students at the south end of the parking lot could exacerbate that already significant problem.

Request sites toward the western part of Cal Poly be considered in order to minimize additional adverse impacts to the neighborhoods south of the university. Further request consideration of placing some type of aesthetically pleasing barrier to preclude use of this area for access/egress.

2. Proposed placement of the housing at the south end of the site and the parking facility at the interior of the site would seem to place the major portion of post-construction noise, light and visual impacts of the multi-story housing on the adjacent neighborhoods, further adversely affecting the livability of these residents' homes.

Request evaluation of the ability to mitigate the negative impacts of the housing portion of the project versus the ability to mitigate the negative impacts of the parking portion of the project, especially at night. Further request consideration of relocating the housing portion to the interior of the site.

3. Without a scale drawing of the proposal and views from nearby neighborhoods, it is difficult to determine the impact on residents, if any, from shading, overlook, views of the daytime and nighttime sky and reflection from exterior materials. Additional set-back and mitigation measures may be needed to mitigate negative impacts.

Request further consideration of these impacts to include the visibility of lights from hallways and rooms during nighttime hours along with consideration of relocating housing to the northern part of the site.

4. Reference lighting for safety and ambience, with the majority of our members being unfamiliar with the meaning of various phrases used in EIR preparation, like “minimization of spillover” and “will not substantially alter” may hold a different meaning until they see the result. Also, it is unclear if shielding and downcasting of light are meant to apply to neighboring residents or only to the campus community.

Request consideration be given to further analysis of the placement and shielding of lighting for safety and ambience as an environmental impact which may affect neighboring city residents.

5. The addition of 1475 beds concomitant with the reduction in parking spaces from 1327 spaces to 300 - 500 spaces may place an additional burden on residential neighborhoods that do not have parking districts. It is, currently, not uncommon for students, and possibly staff and faculty, to drive to a residential neighborhood and bike, walk or take transit to the campus.

Request the Transportation Impact Analysis being prepared take into account the current amount of spillover onto residential streets when assessing needed capacity within the existing parking system on campus.

6. Per conversations with students under 21, few entertainment opportunities exist for them in the downtown. Students living on campus regularly look for entertainment opportunities at houses or apartment complexes in, primarily, nearby neighborhoods. The prevalence of alcohol off-campus is certainly a factor, but seemingly not the only factor for students looking for something to do.

Are there on-campus recreational facilities that include gathering places and provide sodas and snacks, that are open until about 3:00 am, and will they be easily accessible to residents of the new housing facility?

7. It was unclear from the draft EIR report if the Transportation Impact Analysis would include analysis of the campus circulation system. If so, request the circulation assessment include:

a. If the circulation system directs students onto roads for ingress and egress from the university for all modes of transportation.

b. If the circulation system includes or the circulation plan considers pathways that direct students to on-campus entertainment/activity sites.

On behalf of the members of RQN, thank you for the opportunity to provide these comments and questions.

Sincerely,

Sandra Rowley

Sandra Rowley
Chairperson, RQN

From: rcholc [rcholc@gateway.net] RQN
Sent: Tuesday, June 01, 1999 11:52 AM 2001
To: epjustesen@rrm-design.com
Subject: Final

NEIGHBORHOOD RELATIONS TASK FORCE

RECOMMENDATIONS

In recognition that Cal Poly is an "ongoing" entity in San Luis Obispo: new development, changes, and other activities of the University should address community concerns using the following principles as they relate to Neighborhood Relations.

1.

FOR PLANNING NEW DEVELOPMENT ON CAMPUS

GUIDING PRINCIPLES:

Because there are established residential neighborhoods in the City of San Luis Obispo, and because new developments on campus may negatively impact these established, residential neighborhoods:

- **It shall be a guiding principle that negative impacts of new development, and/or re-development such as: noise, glare, traffic and parking shall not be borne by residents of the established residential neighborhoods of San Luis Obispo.**
- **New development on campus shall be designed to eliminate impacts on established neighborhoods, rather than to create designs that generate ongoing conflicts between the University and residential neighborhoods.**

SUPPORTING PLANNING AND POLICY PRINCIPLES: *

1. There shall be a new, ongoing process by which representatives of residential neighborhoods, neighborhood associations, and the

University regularly discuss issues which may impact University/neighborhood relations. Existing University, City and Public Advisory Committees should be continued. (*Rationale: Direct, regular communication between representatives of residential neighborhoods, neighborhood associations, and the University is the basis for positive University/neighborhood relations.)*

2. Early in the process of conceptualizing and proposing new development on campus, any possible impacts on the established residential neighborhoods shall be identified through a cooperative effort between the University and those neighborhoods possibly impacted. (*Rationale: Historically, neighborhoods have been key in identifying possible impacts to*

   neighborhoods. The earlier that the neighborhoods are involved in the process the more possibilities there will be for positive, successful solutions.)

3. The University’s Environmental Impact Report (EIR) for new developments shall focus on the possible negative impacts on the existing residential neighborhoods.

4. The University and the affected neighbors shall work together to reach agreements on specific ways that potential impacts can be avoided. Agreements should list and memorialize specific design aspects, operational conditions, and meaningful enforcement methods.

5. Design aspects and agreements with neighborhoods, which are for the purpose of eliminating or mitigating impacts of campus developments, shall be rigorously enforced by the University. To eliminate ongoing conflicts between the University and established residential neighborhoods, the University shall be proactive in enforcing its agreements, rather than reactive and complaint-driven.

6. The University should coordinate its neighborhood relations efforts among its various departments so that responsibility for operational issues, agreement enforcement, communications with neighborhoods, and other issues affecting neighborhoods are coordinated.

7. It should be recognized that large, new developments on campus which are dependant on both the student population **and** a large commercial draw from non-student populations, may have significantly larger impacts on residential neighborhoods than those developments which depend upon the student population alone. Developments with a commercial component may also require proportionately larger efforts and costs to eliminate negative impacts on established residential neighborhoods.

8. The University should develop or maintain adequate natural or physical buffers between established residential neighborhoods and existing and future developments on the campus to avoid negative impacts.

FOR CONSIDERING INCREASED ENROLLMENT

-

GUIDING PRINCIPLES:

Because Cal Poly is a residential campus of more than 6000 acres adjacent to one relatively small city of approximately 45,000 people:

- **It shall be a guiding principle that negative impacts resulting from increased enrollment such as: traffic, parking problems, overcrowding, noise, deterioration of residential properties and increased rental housing costs for all, shall not be borne by the residents of the established residential neighborhoods of San Luis Obispo**.

-

SUPPORTING PLANNING AND POLICY PRINCIPLES: *

1. There is an existing shortage of affordable, desirable housing on the campus. This should be corrected. When the University further increases enrollment, there must be a corresponding increase of affordable, desirable housing on the campus to accommodate that increase. (The university’s goal of having only 25% of its students living on campus, as stated in the DEPAC "more" enrollment on campus scenario, is very inadequate).

2. The University should provide the location for a Greek Row on campus where Greek activities can take place.

3. The University should research the local feasibility of programs which have been successful at other universities, such as; multi-generation housing on campus, on-campus living for first time freshmen, and the development of a transitional living plan.

4. The University should strive to develop a social and physical environment on campus that is attractive to students and faculty that promotes on campus living and a sense of community.

5. To reduce traffic problems on and near the campus, the University shall continue to contribute to the City's transit services and encourage increased use of these services. Circulation systems on the campus should be improved with particular focus on alternative forms of transportation, campus transit systems, bicycling and walking.

6. New parking on the campus shall not impact established residential neighborhoods.

7. The University should work proactively with the City and residential neighborhood associations to review existing "good neighbor" guidelines, develop additional guidelines where necessary, educate students about these guidelines, and enforce and implement these guidelines on an ongoing basis.

8. The University should make existing campus educational activities more accessible to the residents of San Luis Obispo.

9. The University should provide funding to help the City communicate with landlords and absentee owners regarding property upkeep, tenant relations, and identify and correct violations of overcrowding, noise, and other neighborhood enhancement ordinances.

10. The University shall better integrate neighborhood issues throughout the Master Plan and related documents, including the enrollment scenarios.

As this is "the primary conduit for participation" by neighborhoods, and there is no neighborhood representative on the Master Plan Committee

(see background materials), we appreciate this opportunity to offer a more complete task force recommendation. We would also appreciate the opportunity for a neighborhood representative from this committee, to attend at least one meeting of the University's Master Plan Committee for the purpose of providing background and answering questions about these recommendations.

Dated: May 24, 1999

*__Task Force Charge__: "To suggest broad policy or planning principles regarding the assigned topics to help guide the development of the administrative draft of the Master Plan". (Cal Poly Master Plan.)

Cydney

From:	Bill Henry
To:	Nicole Carter
Cc:	Shawna Scott
Subject:	Fwd: Cal Poly dorm (San Luis Obispo)
Date:	Saturday, October 19, 2013 3:41:25 PM
Attachments:	Cal Poly dorm alternateresidencehall location.jpg

---

Hi Nicole,

The email below is for you, it was mistakenly sent to Phoenix.

Bill

Sent from my iPhone

Begin forwarded message:

> **From:** Ken Houser <Khouser@swca.com>
> **Date:** October 19, 2013 at 5:16:19 AM HST
> **To:** Bill Henry <bhenry@swca.com>
> **Subject: Fwd: Cal Poly dorm (San Luis Obispo)**
>
> FYI. Not sure what this is about or why I got it.
> Ken
>
> Sent from iPhone.
>
> Begin forwarded message:
>
> **From:** "Jan Marx" <janmarx@stanfordalumni.org>
> **To:** "Info-Phoenix" <Info-Phoenix@swca.com>, "Johnson, Derek" <djohnson@slocity.org>
> **Subject: Cal Poly dorm (San Luis Obispo)**
>
> Hello,
>
> I am commenting as a long time resident of the Alta Vista neighborhood adjacent to Cal Poly, and not in my capacity as Mayor of the city of San Luis Obispo.
>
> I have not received any response to my earlier email asking you to correct the EIS to reflect that the city of San Luis Obispo and not CAL FIRE is responsible for fire protection of the core campus and residences.
>
> I would also like to have the EIR (EIS) include the fact that the immediate neighborhood in the Alta Vista and Monterey Heights is well established and consists of about half permanent, long term owner occupied homes. The draft characterizes the neighborhood as being primarily students, which misstates the facts.

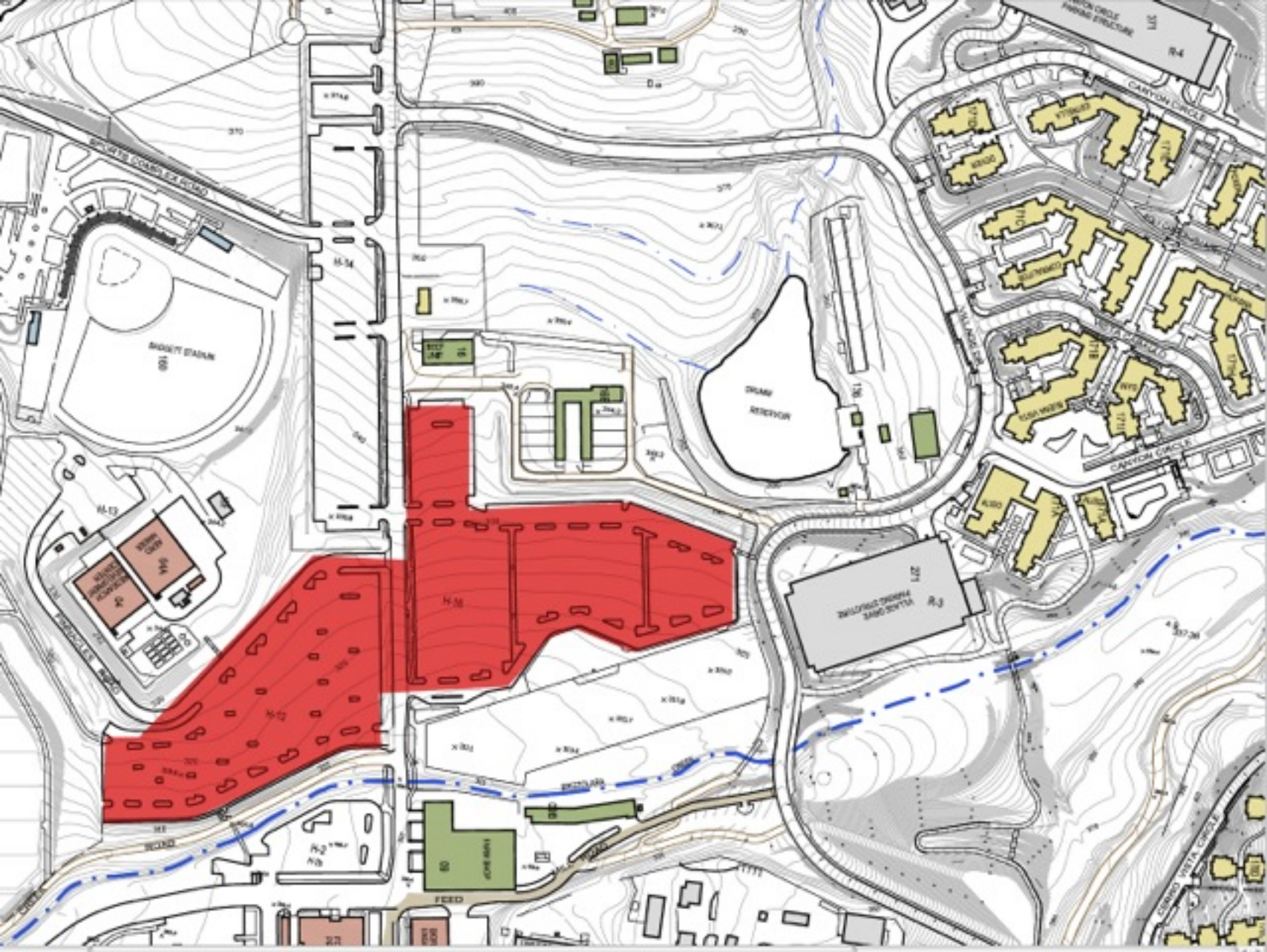
The impact of locating the new dorm near Grand and Slack on the surrounding neighborhoods needs to be analyzed. Things like noise, increased vehicular, pedestrian and bicycle traffic and air pollution come to mind. Although this may not be an environmental impact you can analyze, please understand that housing 1500 18 year old in easy walking distance from the fraternity/party zone on Hathway will vastly increase the number of underage people drinking and partying in our vicinity.

The neighborhood would be far less impacted by a dorm location tucked further away from the entrance to Cal Poly. Attached is an alternate site that I request also be analyzed. It is presently a surface parking lot.

Please include my comments and respond to them.

Thank you,
Jan Marx, 265 Albert Drive San Luis Obispo CA. 805 541-2716





RUGBY STADIUM
DRUM RESERVOIR
CANYON CIRCLE
CANYON CIRCLE
VILLAGE DRIVE
VILLAGE DRIVE
R-4
R-3
H-12
H-13
H-14
FEED

SWCA

San Luis Obispo Office

1422 Monterey Street, Suite C200

San Luis Obispo, California, 93401

Date: October 22, 2013

To: Nicole Carter, on behalf of California State Board of Trustees and California Polytechnic State University

From: Sharon G. Whitney, PhD, Professor Emerita (Tennessee Technological University), resident at 216 Albert Drive, San Luis Obispo, California, 93405.

Project: California Polytechnic State University, San Luis Obispo Student Housing South Project

On November 8, 2013, I attended the pre-EIR scoping meeting held on campus at Building 70. I attended as a member of the Residents for Quality Neighborhoods (RQN), and as an individual resident.

I support the letter you have received on behalf of RQN. Please regard my letter as a supplemental individual submission to your proposed EIR scope.

I am concerned that during construction of the South Housing Project there will be a significant impact on the health and vitality of neighborhood trees and other vegetation caused emissions into the air by various vehicles and construction machinery. I would like to see the EIR address this impact. I saw nothing in the proposed EIR that addresses it or mitigates it.

The courtesy of a reply to my letter and its request would be appreciated.

Sincerely,

Sharon G. Whitney, PhD

APPENDIX B.
MASTER PLAN MITIGATION

Topic	Mitigation Measures Incorporated from the Master Plan	Notes
Aesthetics	All exterior lighting associated with the proposed Master Plan shall be hooded. No unobstructed beam of light shall be directed toward sensitive uses (e.g., Brizzolara Creek, Drumm Reservoir, environmental and Horticultural Sciences (EHS), and neighborhoods). The use of reflective materials in all structures shall be minimized (e.g., metal roofing, expanses of reflective glass on west-facing walls).	
Aesthetics	**Parking Structures.** All interior lighting associated with proposed parking structures shall be directed internally with lamp "cut-off shields. Unobstructed beams of light shall not be directed toward land uses outside the structures and shall not interfere with vehicular traffic on nearby streets. Examples of specifications for minimizing light and glare include the following: • All lights must be shielded to avoid glare and light spill-over onto adjacent areas and onto public right-of-way areas; • Landscape illumination should be done with low level, unobtrusive fixtures; • Parking structure lighting shall be designed to provide the minimum safe lighting levels. Per IES standards, this is 6 foot-candles (fc) maintained throughout internal to the structure, and 1 fc minimum on the roof; • The use of reflective materials on the exterior of all structures shall be minimized; • Internal lightwells will be provided to maximize the amount of natural light; • Light fixtures will include a vertical component to create an even distribution of light; • Solid rails shall be included around the perimeter to block light spillage from headlights on cars within the structure; and, • All roof light fixtures shall be located on the interior columns to keep light from spilling out on to adjacent areas, and will include "cut-off" shields.	

Topic	Mitigation Measures Incorporated from the Master Plan	Notes
Air Quality	The University shall consult with the APCD prior to the project to determine the applicability of the following: A. Employ measures to avoid the creation of dust and air pollution. B. Unpaved areas shall be wetted down, to eliminate dust formation, a minimum of twice a day or as needed to prevent air borne dust from leaving the site. When wind velocity exceeds 15 mph, the site shall be watered down more frequently. C. Store all volatile liquids, including fuels or solvents, in closed containers. D. No open burning of debris, lumber or other scrap will be permitted. E. Properly maintain equipment to reduce gaseous pollutant emissions. F. Exposed areas, new driveways, and sidewalks shall be seeded, treated with soil binders, or paved as soon as possible. G. Cover stockpiles of soil, sand and other loose materials. H. Cover trucks hauling soil, debris or other loose materials. I. Sweep project area streets at least once daily. J. All PM10 mitigation measures required must be included on grading and building plans. In addition, the contractor or builder shall designate a person or persons to monitor the dust control program, and to order increased watering, when necessary, to prevent transport of dust off site. Their duties shall include holiday and weekend periods when work may not be progress. The name and telephone number of the monitor shall be provided to the APCD prior to the start of work at the site. K. The Contractor shall maintain continuous control of dust resulting from construction operations. Particular care must be paid to door openings to prevent construction dust and debris from entering adjacent areas. L. If airborne dust is leaving the site or becoming a nuisance, the Contractor shall water exposed areas.	Project-specific mitigation is included in the document which refines the "Equipment Emission Control" portion of the Master Plan mitigation

Topic	Mitigation Measures Incorporated from the Master Plan	Notes
	M. Water down the project site, access routes, and lay down areas proactively to ensure dust does not become a nuisance. N. The campus reserves the right to request watering of the site whenever dust complaints are received. O. During construction, the amount of disturbed area shall be minimized. P. Onsite vehicle speeds shall be reduced to 15 mph or less. Q. Exposed ground areas that are left exposed after project completion shall be sown with a fast-germinating native grass seed and watered until vegetation is established. R. After clearing, grading, earth moving, or excavating is completed, the entire area of disturbed soil shall be treated immediately by watering or revegetating or spreading soil binders or jute netting to minimize dust generation until the area is paved or otherwise developed so that dust generation will be minimized. S. All roadways, driveways, and sidewalks associated with construction activities shall be paved as soon as possible. In addition, building and other pads shall be laid as soon as possible after grading, unless seeding or soil binders are used. **Equipment Emission Control** To the extent feasible, the applicant shall utilize newer construction equipment (manufactured after 1996) that produces fewer emissions, especially for the highest emitting pieces of diesel-fired heavy equipment. In any case, all equipment shall be properly tuned and maintained. Additional measures that would reduce construction-related emissions include: • The project proponent shall require that all off-road and portable diesel-powered equipment including but not limited to bulldozers, graders, cranes, loaders, scrapers, backhoes, generator sets, compressors, auxiliary power units, shall be fueled exclusively with ARB certified diesel fuel. • The University shall consult with the APCD prior to each phase…specifically regarding diesel particulate emissions, and determine how many diesel oxidation catalysts, catalyzed diesel particulate filters or other District	

Topic	Mitigation Measures Incorporated from the Master Plan	Notes
	approved emission reduction retrofit devices are required to meet desired reductions in diesel particulate emissions.	
Geology	**Landslide.** Mitigation measures would need to be developed on the basis of site-specific study of the landslide. The general degree of required mitigation would depend on the findings, which could range from: 1) finding that the existing landslide is relatively stable and therefore no significant mitigation is needed; to 2) the existing landslide is marginally stable and will require extensive strengthening and/or subsurface drainage improvements to provide adequate factors of safety for design and construction. This EIR therefore recommends that such a study be performed to estimate the factor of safety of the existing landslide for existing static and earthquake loading conditions, and to evaluate what impact the proposed site improvements could have on the stability of the landslide. The study will specify mitigation measures for any site improvements that are needed.	Geotechnical study confirms lack of landslide features affecting this project
Noise	Cal Poly shall apply the following during construction: **Cal Poly Standard Requirements** A. The requirements of the Article are in addition to those of Article 4.02 of the Contract General Conditions. B. Maximum noise levels within 1,000 feet of any classroom, laboratory, residence, business, adjacent buildings, or other populated area; noise levels for trenchers, pavers, graders and trucks shall not exceed 90 dBA at 50 feet as measured under the noisiest operating conditions. For all other equipment, noise levels shall not exceed 85 dBA at 50 feet. C. Equipment: equip jackhammers with exhaust mufflers and steel muffling sleeves. Air compressors should be of a quiet type such as a "whisperized" compressor. Compressor hoods shall be closed while equipment is in operation. Use electrically powered rather than gasoline or diesel powered forklifts. Provide portable noise barriers around jack hammering, and barriers constructed of 3/4-inch plywood lined with 1-inch thick fiberglass on the work side. D. Operations: keep noisy equipment as far as possible from noise-sensitive site boundaries. Machines should not be left idling. Use electric power in lieu of internal combustion engine power wherever possible. Maintain equipment properly to reduce noise from excessive	

Topic	Mitigation Measures Incorporated from the Master Plan	Notes
	vibration, faulty mufflers, or other sources. All engines shall have properly functioning mufflers. E. Scheduling: schedule noisy operations so as to minimize their duration at any given location, and to minimize disruption to the adjoining users. Notify the Trustees and the Architect in advance of performing work creating unusual noise and schedule such work at times mutually agreeable. F. Do not play radios, tape recorders, televisions, and other similar items at construction site. G. When work occurs in or near occupied buildings, the Contractor is cautioned to keep noise associated with any activities to a minimum. If excessively noisy operations that disrupt academic activities are anticipated, they must be scheduled after normal work hours. H. All work in the area of the residence halls will be restricted to 10:00 a.m. to 10:00 p.m., seven days per week, throughout the year. No work will be allowed in the residence hall areas during the finals week. University reserves the right to stop construction work, including but not limited to noisy work, during the following events: Spring and Winter Commencement, Open House, Finals Week, residence hall move-in, or at other times that may be identified by the University. University reserves the right to stop noisy work at any time when said work disrupts classes or other planned events. In addition to these standard measures, the following measures are recommended: • A haul route plan shall be prepared for review and approval by the University which designates hall routes as far as possible from sensitive receptors. • Stockpiling and vehicle staging areas shall be located as far as practical from occupied structures. • Whenever practical, the noisiest construction operations shall be scheduled to occur together in the construction program to avoid continuous periods of noise generation. Scheduling of noisier construction activities shall also take advantage of summer sessions and other times when classes are not in session.	

Topic	Mitigation Measures Incorporated from the Master Plan	Notes
	• Project construction activities that generate noise in excess of 60 dB at the project site boundary shall be limited to the hours of 7 a.m. to 6 p.m. **Pile Driver Use.** If possible, the use of pile drivers shall be minimized in construction. Alternative techniques that produce less noise, such as drilled or bored piles, shall be considered.	
Safety	**Circulation Plan.** Where vehicle and pedestrian routes and residential areas conflict with construction activities, a circulation plan will be developed, which will include warning signs and detours, as well as efforts to minimize noise in residential areas.	

APPENDIX C.
AIR QUALITY
BACKGROUND INFORMATION

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Technical Memorandum

To: **Nicole Carter**, SWCA Environmental Consultants

From: Daniel Whitley, SWCA

Date: October 31, 2013

e: **California Polytechnic State University, San uis Obispo Student Housing South Air uality Impact Assessment (Pro ect No. 25999)**

This technical memorandum details an air quality impact assessment and the estimated emissions from the construction and operation of facilities to house approximately 1,475 beds of freshman housing for California Polytechnic State University, San Luis Obispo, located at 1 Grand Avenue, San Luis Obispo, in San Luis Obispo County, California (hereinafter referred to as the project). The project is proposed to be located at the present location of the G-1 and G-4 parking lots on campus, on a total of approximately 12 acres. The project is anticipated to consist of several three- to five-story towers on approximately 8 acres of the site. The latest version of CalEEMod (Version 2013.2.2; last updated October 2, 2013) was used to estimate construction and operational emissions.

Using the CalEEMod model, values for the quarterly unmitigated maximum emissions are presented and compared to the SLO County APCD Quarterly Tier 1 Threshold in Table 1. Unmitigated maximum construction daily emission impacts are compared to SLO County APCD Daily Thresholds in Table 2.

Table 1. Comparison of Ma imum Unmitigated Construction mission Impacts to APCD uarterly Thresholds

	Quarterly Maximum Emissions (tons/quarter)		
	ROG + NO_X [a]	DPM [b]	Fugitive PM_{10}, Dust [c]
Project Emissions [d]	2.59	0.08	0.33
Quarterly Tier 1 Threshold [e]	2.5	0.13	2.5
Project Construction Emissions Exceed Threshold?	**Yes**	**No**	**No**

[a] Summation of individual ROG and NO_X outputs.

[b] Used exhaust $PM_{2.5}$ emissions as proxy for DPM emissions.

[c] Used total PM_{10} (aggregated exhaust and fugitive PM_{10} emissions).

[d] Used unmitigated annual CalEEMod emissions output. Divided annual values into 4 quarters for construction years in 2015 and 2016 (12 months of construction each year); divided annual values by 2 quarters for construction year in 2017 (7 months of construction). Highest of all quarterly emissions were used.

[e] Emission thresholds taken from "CEQA Air Quality Handbook: A Guide for Assessing the Air Quality Impacts for Projects Subject to CEQA Review," SLO County APCD, April 2012. Emission thresholds listed are for Quarterly Tier 1 thresholds.

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Table 2. Comparison of Ma imum Unmitigated Construction mission Impacts to APCD Daily Thresholds

	Quarterly Maximum Emissions (pounds/day)	
	ROG + NO_X [a]	DPM [b]
Project Emissions [c]	277.97	4.58
Daily Threshold [d]	137	7.00
Project Construction Emissions Exceed Threshold?	**Yes**	**No**

[a] Summation of individual ROG and NO_X outputs.

[b] Used exhaust $PM_{2.5}$ emissions as proxy for DPM emissions.

[c] Used unmitigated annual CalEEMod emissions output. Divided annual values into 4 quarters for construction years in 2015 and 2016 (12 months of construction each year); divided annual values by 2 quarters for construction year in 2017 (7 months of construction). Highest of all quarterly emissions were used.

[d] Emission thresholds taken from "CEQA Air Quality Handbook: A Guide for Assessing the Air Quality Impacts for Projects Subject to CEQA Review," SLO County APCD, April 2012. Emission thresholds listed are for daily thresholds.

Operational emissions impacts compared to the SLO County APCD Yearly Thresholds are presented in Table 3. A comparison between operational emission impacts and SLO County APCD Daily Thresholds can be found in Table 4.

Table 3. Comparison of Unmitigated Operational mission Impacts to S O County APCD early Thresholds

	Yearly Threshold (tons/year) [a]	
	ROG + NO_X [b]	Fugitive PM_{10}, Dust [c]
Project Emissions [d]	5.49	0.87
Yearly Threshold [e]	25	25
Yearly Operational Emissions Exceed Threshold?	**No**	**No**

[a] There is no yearly threshold for DPM or CO.

[b] Summation of individual ROG and NO_X outputs.

[c] Used total PM_{10} (aggregated exhaust and fugitive PM_{10} emissions).

[d] Used unmitigated winter CalEEMod emissions output.

[e] Emission thresholds taken from "CEQA Air Quality Handbook: A Guide for Assessing the Air Quality Impacts for Projects Subject to CEQA Review," SLO County APCD, April 2012.

Table 4. Comparison of Unmitigated Operational mission Impacts to S O County APCD Daily Thresholds

	Daily Threshold (lb/day)			
	ROG + NO_X [a]	DPM [b]	Fugitive PM_{10}, Dust [c]	CO
Project Emissions [d]	30.60	0.55	4.93	94.11
Daily Threshold [e]	25	1.25	25	550
Daily Operational Emissions Exceed Threshold?	**Yes**	**No**	**No**	**No**

[a] Summation of individual ROG and NO_X outputs.

[b] Used exhaust $PM_{2.5}$ emissions as proxy for DPM emissions.

[c] Used total PM_{10} (aggregated exhaust and fugitive PM_{10} emissions).

[d] Used unmitigated winter CalEEMod emissions output.

[e] Emission thresholds taken from "CEQA Air Quality Handbook: A Guide for Assessing the Air Quality Impacts for Projects Subject to CEQA Review," SLO County APCD, April 2012.

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In addition to the pollutants above, greenhouse gases are required to be compared to the applicable thresholds. The amount of CO_2e in MT per service population per year is presented in Table 5.

Table 5. Comparison of Unmitigated CO_2e mission Impacts to S O County APCD Significance Thresholds

	CO_2e [a]
Project Emissions (Amortized Construction and Operational) [b]	2,715.66
MT CO_2e Annual Threshold	1,150
CO_2e Emissions Exceed Threshold?	**Yes**
MT CO_2e per Service Population per Year [c]	1.84
MT CO_2e per Service Population per Year Threshold [d]	4.9
CO_2e Emissions Exceed Threshold?	**No**

[a] Project emissions are the sum of the amortized construction CO_2e emissions and operational CO_2e emissions.
[b] CO_2e emissions include emissions of CO_2, CH_4, N_2O, HFC, CFC, and F_6S.
[c] The service population is assumed to be 1,475 people.
[d] Emission thresholds taken from "CEQA Air Quality Handbook: A Guide for Assessing the Air Quality Impacts for Projects Subject to CEQA Review," SLO County APCD, April 2012.

While the sum of the project's amortized construction emissions plus operational-related GHG emissions are greater than 1,150 MT/yr of CO_2e and therefore are above the significance threshold, the amount of CO_2e per service population per year is well below the threshold of 4.9 MT/yr of CO_2e. Based on the population density of the residential development (i.e., student dorm room housing), the threshold based on CO_2e per service population is a more representative metric by which to evaluate the proposed project.

The project's unmitigated construction emissions are expected to exceed the Quarterly Tier 1 significance levels for the sum of ROG and NO_X. Unmitigated operational emissions are not expected to exceed the operational thresholds. Appropriate mitigation measures should be taken as recommended or required to bring the ROG and NO_X unmitigated construction emissions below the SLO County APCD significance levels.

The assumptions used for input into the CalEEMod program are discussed below. Assumed mitigation measures input into the model are presented as well:

- **Project Characteristics** – Used default values (San Luis Obispo County) for wind speed, precipitation, climate zone, and land use; selected "urban" land use setting. The operational year of the project was assumed to be 2018. While the project has several potential power options for the project, the conservative assumption was used that power would be provided from the local utility provider (Pacific Gas & Electric).
- **Land Use** – Assumed approximately 12 acres of total disturbed area with four distinct land use type.
    - Selected "Residential" for type and "Apartment Mid Rise" sub-type of land use.
        - The number of dwelling units (738) is the number of beds (1,475) divided by the smallest number of beds per dwelling unit (2).
        - The building acreage is 8.5 acres – this includes both the footprint of the residential buildings and the surrounding landscaping.
        - The gross square footage (450,000 sq ft) is from project specifications.

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        - The population is assumed to equal the number of beds (1,475).
    - Selected "Parking" for type and "Parking Lot" sub-type of land use to account for approximately 94,000 square feet of "hardscape." This includes both asphalt paved parking and drive areas, as well as various other hardscaping on-site.
    - Selected "Parking" for type and "Enclosed Parking Structure with Elevator" sub-type of land use to account for possible construction of a 300-500 space parking structure.
        - The default square footage for 500 parking lots of 200,000 sq ft was used.
        - The lot acreage was set to 1.2 acres from program default (4.5 acres), based on the expected building footprint.
    - Selected "Retail" for type and "Convenience Market 24 Hours" for sub-type of land use to account for an approximately 5,000 square foot retail space to be located within the proposed parking structure.
- **Construction Phase** – Used 6 construction phases. CalEEMod program defaults for anticipated construction schedule were used for all phases with the exception of the building construction phase, where the total number of days was extended from program default of 300 days to 570 days to reflect actual anticipated construction schedule of approximately 31 months.
    - Construction was modeled to begin 1/1/2015 and end 7/26/2017. All phases are assumed to work 5 days per week.
        - Demolition Phase starts 1/1/2015 and ends 1/28/2015 for a total of 20 days.
        - Site Preparation Phase starts 1/29/2015 and ends 2/11/2015 for a total of 10 days.
        - Grading Phase starts 2/12/2015 and ends 3/25/2015 for a total of 30 days.
        - Building Construction Phase starts 3/26/2015 and ends 5/31/2017 for a total of 570 days.
        - Paving starts 6/1/2017 and ends 6/28/2017 for a total of 20 days.
        - Architectural Coating Phase starts 6/29/2017 and ends 7/26/2017 for a total of 20 days.
    - Off-Road Equipment – The following equipment was assumed (hours/day (hr/day) of operation, horsepower (HP), and load factor (LF) for individual pieces of equipment in parenthesis. CalEEMod program defaults were used for all construction equipment, usage, horsepower, and load factors by construction phase.
        - Demolition:
            - One (1) "concrete/industrial saws" (8 hr/day, 81 HP, 0.73 LF);
            - Three (3) "excavators" (8 hr/day, 162 HP, 0.38 LF);
            - Two (2) "rubber tired dozers" (8 hr/day, 255 HP, 0.40 LF);
        - Site Preparation Phase:
            - Three (3) "rubber tired dozers" (8 hr/day, 255 HP, 0.40 LF);
            - Four (4) "tractors/loaders/backhoes" (8 hr/day, 97 HP, 0.37 LF);
        - Grading Phase:
            - Two (2) "excavators" (8 hr/day, 162 HP, 0.38 LF);
            - One (1) "grader" (8hr/day, 174 HP, 0.41 LF);
            - One (1) "rubber tired dozer" (8hr/day, 255 HP, 0.40 LF);
            - Two (2) "scrappers" (8 hr/day, 361 HP, 0.48 LF);
            - Two (2) "tractors/loaders/backhoes" (8hr/day, 97 HP, 0.37 LF);
        - Building Construction Phase:
            - One (1) "crane" (7hr/day, 226 HP, 0.29 LF);

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- Three (3) "forklifts" (8hr/day, 89 HP, 0.20 LF);
- One (1) "generator set" (8hr/day, 84 HP, 0.74 LF);
- Three (3) "tractors/loaders/backhoes" (7hr/day, 97 HP, 0.37 LF);
- One (1) "welder" (8hr/day, 46 HP, 0.45 LF);

▪ Paving Phase:
- Two (2) "pavers" (8 hr/day, 125 HP, 0.42 LF);
- Two (2) "paving equipment (8 hr/day, 130 HP, 0.36 LF);
- Two (2) "rollers" (8 hr/day, 80 HP, 0.38 LF).

▪ Architectural Coating Phase:
- One (1) "air compressor" (6 hr/day, 78 hp, 0.48 LF);

o Dust from Material Movement – There is no dust from material movement assumed during demolition or site preparation. During grading, an assumed 98,000 cubic yards (based on project assumptions) of material are exported from the site in total, including any demolition material from demolition of the currently existing site parking lots.
o Trips and VMT – One-way haul trip distance of 10 miles was used based on the distance to nearest landfill of approximately 7 miles (changed from CalEEMod program default of 20 miles). Defaults were used for all remaining trips and trip distances.
o On-road Fugitive Dust – All defaults were used.
o Demolition – No data was entered. Emissions from demolition of currently existing parking areas are accounted for in the material hauling. No buildings currently exist on-site.
o Architectural Coatings – A VOC limit of 50 g/L was used for "Residential Interior VOC (g/L)" and "Residential Exterior VOC (g/L)".[1] A VOC limit of 100 g/L was used for "Non-residential Interior VOC (g/L)" and "Non-residential Exterior VOC (g/L)."[2]

- **Operational Phase**
  - o Mobile – All defaults were used except for the daily trip rate. A daily trip rate of 1.1 (0.550 per occupant multiplied by an estimate of two occupants per room) was used to model Weekday, Saturday, and Sunday trip rates for the residential development, which is the rate used in the project's traffic analysis. The rate uses the trip generation rate from the Master Plan in conjunction with a commute reduction to arrive at the number of trips generated by the project. This takes into account any off-campus trips that freshman may take, while recognizing that freshman have a lower rate of auto access than the upperclassmen on campus. The small (approximately 5,000 sq ft) retail space was assumed to draw predominantly foot-traffic from the nearby residential areas (i.e., student dorms). Therefore, it was assumed that no vehicle traffic would be generated from the retail space and the CalEEMod default traffic values were changed to zero.
  - o Consumer Products – Default emission factor of 2.14×10^{-5} lb ROG/sq ft/yr was adjusted to 1.30×10^{-5} lb ROG/sq ft/yr. Adjustment was made to account for difference in square footage of residential and commercial building (455,000 sq ft) versus total development

[1] Value used is the lowest identified California regulatory limit in both "Flat" and "Nonflat" coatings category from "Summary of Architectural Coating Rules in California." California Environmental Protection Agency Air Resource Board, August 16, 2011. http://www.arb.ca.gov/coatings/arch/voclimits.htm. Accessed 8/20/2013.

[2] Value used is the lowest identified California regulatory limit in "Concrete/Masonry Sealers" category from "Summary of Architectural Coating Rules in California." California Environmental Protection Agency Air Resource Board, August 16, 2011. http://www.arb.ca.gov/coatings/arch/voclimits.htm. Accessed 8/20/2013.

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area (749,000 sq ft), which includes the 94,000 sq ft of hardscapes and the 200,000 sq ft enclosed parking structure (455,000/749,000 = 0.607; 0.607 x 2.14 x 10^{-5} = 1.30 x 10^{-5}).

- Area – A VOC limit of 50 g/L was used for "Residential Interior VOC (g/L)" and "Residential Exterior VOC (g/L)". A VOC limit of 100 g/L was used for "Non-residential Interior VOC (g/L)" and "Non-residential Exterior VOC (g/L)." See "architectural coatings" in "construction" section above for explanation.
- Energy – All defaults were used.
- Water and Wastewater – All defaults were used.
- Solid Waste – All defaults were used.

- **Vegetation** – Approximately 221,044 sq ft (approximately 5.1 acres) of the site would be converted from the currently existing parking lot to greenscapes. The CalEEMod defaults for CO_2e from conversion to "grassland" were used as inputs. While some trees would be planted from the project, some existing trees in the current parking lot would be removed; therefore, it was assumed that the net amount of trees would remain largely unchanged.
- **Mitigation**
  - Construction – Because the sum of ROG and NO_X exceed their combined quarterly significance level, mitigation is required. All equipment was mitigated with Tier 3 engines.
  - Operational – The mitigation measures discussed in the "Operational Phase" bullet points were utilized (e.g., low VOC content architectural coatings). Additional mitigation measures associated with project commitments to reduce water usage include the following:
    - A 20% indoor water usage reeducation;
    - A 50% outdoor (i.e., irrigation) water usage reduction.

    These mitigation measures are baseline requirements for the LEED certification being sought for the project – other mitigation measures will also likely be employed that would further reduce project emissions.

The sum of ROG and NO_X mitigated construction emissions are below the Quarterly Tier 1 Threshold of 2.5 tons/quarter. When emissions were modeled with the proposed mitigation measures discussed above, APCD thresholds for ROG+NO_x were not exceeded. Table 6 presents the sum of ROG and NO_X for the mitigated construction emission impacts.

Table 6. Comparison of Mitigated O and NO Construction mission Impacts to APCD uarterly Thresholds

	Quarterly Maximum Emissions (tons/quarter)
	ROG + NO_X [a]
Project Emissions	2.14
Quarterly Tier 1 Threshold [b]	2.5
Project Construction Emissions Exceed Threshold?	**No**

[a] Summation of individual ROG and NO_X outputs.

[b] Emission thresholds taken from "CEQA Air Quality Handbook: A Guide for Assessing the Air Quality Impacts for Projects Subject to CEQA Review," SLO County APCD, April 2012. Emission thresholds listed are for Quarterly Tier 1.

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Construction emissions could still exceed the daily APCD thresholds for ROG+NO_x despite the proposed mitigation measures, with a maximum estimated potential emissions of 265.46 lb/d ROG+NO_x compared to an APCD threshold 137 lb/d. These emissions are primarily from VOCs associated with the architectural coatings phase of the proposed project, which account for 237.11 lb/d of the modeled maximum of 265.46 lb/d ROG+NO_x. Since the lowest residential and non-residential VOC emitting architectural coatings of 50 g/L and 100 g/L, respectively, are already proposed as mitigation measures herein, the only mitigation measure to further lower maximum daily emissions would be to extend the time period over which the application of such coatings would take place. Currently, based on CalEEMod defaults, it is assumed that approximately 20 days would be required to apply the architectural coatings – extending the time period to 40 days would therefore approximately halve maximum daily VOC (and hence ROG+NO_x) emissions from the project (although overall emissions would not decrease, and would even marginally increase from emitting activities such as from increased commuting). However, the daily maximum emissions is a conservative value that is highly variable and that is primarily used for projects that last less than 90 days in duration; the quarterly emissions value provides a more representative estimate of emissions, and project construction emissions are predicated to be well the APCD threshold value for all pollutants on a quarterly and annual basis.

Project operational emissions are predicted to exceed the daily APCD operational thresholds for ROG+NO_x and for CO_2e total annual emissions even with proposed mitigation measures. The proposed project would be replacing an already existing 1,300 space parking lot; therefore, operational emissions would largely be off-setting existing emission sources from the site that are likely higher than those proposed from the project. Additionally, the proposed project is not adding to the overall student capacity for the University; therefore, any operational emissions from the proposed project would also be off-setting emissions from already existing sources located in other areas of campus and/or off-campus rather than representing new emission sources.

APP NDI A

Calculations and Cal Mod Files

California Polytechnic State University, San uis Obispo: Student Housing South
mission Calculations
Construction
10/31/2013

Unmitigated Construction missions by ear and uarter [1]

	O	NO	DPM [2]	Fugitive PM_{10} [3]	O	NO	DPM [2]	Fugitive PM_{10} [3]
	(tons/year)				*(tons/quarter) [4,5]*			
2015	9.16		0.33	1.33	2.29		0.08	0.33
2016	6.76		0.26	1.18	1.69		0.07	0.30
2017	5.18		0.11	0.50	**2.59**		0.06	0.25
			Quarterly Tier 1 Thresholds [6]		*2.50*		*0.13*	*2.50*

Note: Bolded values exceed quarterly Tier 1 Thresholds

[1] From CalEEMod Output File (CalEEMod, Version 2013.2.2)

[2] Used exhaust $PM_{2.5}$.

[3] Used PM_{10} total.

[4] Quarterly emissions for 2015 and 2016 calculated by dividing annual emissions by 4 quarters (12 months each year of construction activity).

[5] Quarterly emissions for 2017 calculated by dividing annual emissions by 2 quarters (7 months construction activity).

[6] From table 2-1 of "CEQA Air Quality Handbook," SLOC County APCD, 2012.

Ma imum Unmitigated Daily Construction missions by ea

	O	NO	DPM [2]
	(pounds/day)		
2015	**177.10**		4.58
2016	52.11		2.03
2017	**277.97**		1.83
Daily Threshold [3]	137.00		7.00

Note: From winter daily totals.

Note: Bolded values exceed Daily Thresholds

[1] From CalEEMod Output File (CalEEMod, Version 2013.2.2)

[2] Used exhaust $PM_{2.5}$.

[3] From table 2-1 of "CEQA Air Quality Handbook," SLOC County APCD, 2012.

Mitigated Construction missions by ear and uarter [1]

	O	NO	DPM [1]	Fugitive PM_{10} [2]	O	NO	DPM [1]	Fugitive PM_{10} [2]
	(tons/year)				*(tons/quarter) [3,4]*			
2015	5.90		0.16	1.14	1.48		0.04	0.29
2016	4.53		0.14	1.04	1.13		0.04	0.26
2017	4.27		0.06	0.45	2.14		0.03	0.23
			Quarterly Tier 1 Thresholds [6]		*2.50*		*0.13*	*2.50*

[1] From CalEEMod Output File (CalEEMod, Version 2013.2.2)

[2] Used exhaust $PM_{2.5}$.

[3] Used PM_{10} total.

[4] Quarterly emissions for 2015 and 2016 calculated by dividing annual emissions by 4 quarters (12 months each year of construction activity).

[5] Quarterly emissions for 2017 calculated by dividing annual emissions by 2 quarters (7 months construction activity).

[6] From table 2-1 of "CEQA Air Quality Handbook," SLOC County APCD, 2012.

Ma imum Mitigated Daily Construction missions by ear [1]

	O	NO	DPM [2]
	(pounds/day)		
2015	122.57		2.40
2016	35.04		1.08
2017	**265.46**		1.06
Daily Threshold [3]	137.00		7.00

Note: From winter daily totals.

Note: Bolded values exceed Daily Thresholds

[1] From CalEEMod Output File (CalEEMod, Version 2013.2.2)

[2] Used exhaust $PM_{2.5}$.

[3] From table 2-1 of "CEQA Air Quality Handbook," SLOC County APCD, 2012.

California Polytechnic State University, San uis Obispo: Student Housing South
Preliminary mission Calculations
Operational

10/31/2013

Daily Operational Emissions (pounds/day) [1]

	O NO	DPM [2]	Fugitive PM_{10} [3]	CO
Unmitigated	**30.60**	0.55	4.93	94.11
Mitigated	**26.72**	0.55	4.93	94.11
Daily Threshold [4]	25.00	1.25	25.00	550.00

Note: Bolded values exceed Daily Thresholds

Note: From winter daily totals.

[1] *From CalEEMod Output File (CalEEMod, Version 2013.2.2)*

[2] *Used the maximum exhaust $PM_{2.5}$.*

[3] *Used the maximum PM_{10} total.*

[4] *From table 3-2 of "CEQA Air Quality Handbook," SLOC County APCD, 2012.*

Yearly Operational Emissions (tons/year) [1]

	O NO	Fugitive PM_{10} [2]
Unmitigated	5.49	0.87
Mitigated	4.78	0.87
Annual Threshold [3]	25.00	25.00

Note: From operational total (annual).

[1] *From CalEEMod Output File (CalEEMod, Version 2013.2.2)*

[2] *Used the maximum PM_{10} total.*

[3] *From table 3-2 of "CEQA Air Quality Handbook," SLOC County APCD, 2012.*

MT CO2e per Service Population per Year [1]
(includes amortized construction and operational emissions impacts)

Description	Value
Service population, people	1,475
Construction CO2e, MT/project	3,204.03
Project life, years	50
Amortized Construction CO2e, MT/year construction	64.08
Operational CO2, MT/year	2,651.58
Total construction and operational, MT/year	**2,715.66**
MT CO2e per service population per year	1.84
Thresholds	
Annual CO2e per year (MT CO2e/year)	1,150.00
Exceeds Thresholds?	Yes
Annual CO2e per service population per year (MT CO2e/SP/year)	4.90
Exceeds Thresholds?	No

Note: All CO2e values are mitigated values

[1] *From CalEEMod Output File (CalEEMod, Version 2013.2.2)*

California Polytechnic University, San Luis Obispo: Student Housing South

San Luis Obispo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	500.00	Space	1.20	200,000.00	0
Parking Lot	94.00	1000sqft	2.16	94,000.00	0
Apartments Mid Rise	738.00	Dwelling Unit	8.50	450,000.00	1475
Convenience Market (24 Hour)	5.00	1000sqft	0.11	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Please see text.

Construction Phase - Please see text.

Grading -

Architectural Coating - Please see text.

Vehicle Trips - Please see text.

Consumer Products - Please see text.

Area Coating - Please see text.

Land Use Change -

Construction Off-road Equipment Mitigation - Please see text.

Area Mitigation - Please see text.

Water Mitigation -

Trips and VMT - Please see text.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	50
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	50
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	300.00	570.00
tblConsumerProducts	ROG_EF	2.14E-05	1.3E-05
tblGrading	MaterialExported	0.00	98,000.00
tblLandUse	LandUseSquareFeet	738,000.00	450,000.00
tblLandUse	LotAcreage	4.50	1.20

tblLandUse	LotAcreage	19.42	8.50
tblLandUse	Population	2,111.00	1,475.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblTripsAndVMT	HaulingTripLength	20.00	10.00
tblVehicleTrips	ST_TR	7.16	1.10
tblVehicleTrips	ST_TR	863.10	0.00
tblVehicleTrips	SU_TR	6.07	1.10
tblVehicleTrips	SU_TR	758.45	0.00
tblVehicleTrips	WD_TR	6.59	1.10
tblVehicleTrips	WD_TR	737.99	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					
2015	1.2062	7.9493	11.5792	0.0160	0.9788	0.3514	1.3302	0.3057	0.3278	0.6335	0.0000	1,373.5845	1,373.5845	0.1443	0.0000	1,376.6155
2016	1.0513	5.7066	10.3062	0.0156	0.8986	0.2825	1.1811	0.2403	0.2648	0.5052	0.0000	1,275.6473	1,275.6473	0.1228	0.0000	1,278.2252
2017	2.7875	2.3945	4.1016	6.8700e-003	0.3859	0.1187	0.5045	0.1032	0.1111	0.2143	0.0000	548.0235	548.0235	0.0555	0.0000	549.1885
Total	**5.0449**	**16.0503**	**25.9871**	**0.0385**	**2.2632**	**0.7526**	**3.0158**	**0.6493**	**0.7038**	**1.3530**	**0.0000**	**3,197.2553**	**3,197.2553**	**0.3226**	**0.0000**	**3,204.0292**

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					
2015	0.7698	5.1336	11.0882	0.0160	0.9788	0.1658	1.1445	0.3057	0.1623	0.4681	0.0000	1,373.5841	1,373.5841	0.1443	0.0000	1,376.6150
2016	0.6943	3.8362	10.2161	0.0156	0.8986	0.1434	1.0420	0.2403	0.1413	0.3816	0.0000	1,275.6469	1,275.6469	0.1228	0.0000	1,278.2248
2017	2.6399	1.6334	4.1063	6.8700e-003	0.3859	0.0650	0.4509	0.1032	0.0642	0.1674	0.0000	548.0233	548.0233	0.0555	0.0000	549.1883
Total	**4.1040**	**10.6032**	**25.4106**	**0.0385**	**2.2632**	**0.3742**	**2.6374**	**0.6493**	**0.3678**	**1.0170**	**0.0000**	**3,197.2543**	**3,197.2543**	**0.3226**	**0.0000**	**3,204.0282**

	ROG	NOx	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	**18.65**	**33.94**	**2.22**	**0.00**	**0.00**	**50.28**	**12.55**	**0.00**	**47.74**	**24.83**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.0346	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725
Energy	0.0324	0.2770	0.1181	1.7700e-003		0.0224	0.0224		0.0224	0.0224	0.0000	1,511.0935	1,511.0935	0.0600	0.0170	1,517.6280
Mobile	0.5586	1.4720	5.5753	0.0111	0.7767	0.0175	0.7942	0.2082	0.0161	0.2243	0.0000	835.3562	835.3562	0.0350	0.0000	836.0904
Waste						0.0000	0.0000		0.0000	0.0000	71.9623	0.0000	71.9623	4.2529	0.0000	161.2722
Water						0.0000	0.0000		0.0000	0.0000	15.3722	107.3687	122.7409	1.5837	0.0383	167.8677
Total	**3.6256**	**1.8665**	**15.8209**	**0.0134**	**0.7767**	**0.0952**	**0.8718**	**0.2082**	**0.0938**	**0.3019**	**87.3346**	**2,470.2483**	**2,557.5828**	**5.9478**	**0.0553**	**2,699.6307**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.3270	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725
Energy	0.0324	0.2770	0.1181	1.7700e-003		0.0224	0.0224		0.0224	0.0224	0.0000	1,511.0935	1,511.0935	0.0600	0.0170	1,517.6280
Mobile	0.5586	1.4720	5.5753	0.0111	0.7767	0.0175	0.7942	0.2082	0.0161	0.2243	0.0000	835.3562	835.3562	0.0350	0.0000	836.0904
Waste						0.0000	0.0000		0.0000	0.0000	71.9623	0.0000	71.9623	4.2529	0.0000	161.2722
Water						0.0000	0.0000		0.0000	0.0000	12.2978	71.4698	83.7676	1.2663	0.0305	119.8134
Total	**2.9180**	**1.8665**	**15.8209**	**0.0134**	**0.7767**	**0.0952**	**0.8718**	**0.2082**	**0.0938**	**0.3019**	**84.2601**	**2,434.3493**	**2,518.6095**	**5.6304**	**0.0475**	**2,651.5765**

	ROG	NOx	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	**19.52**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**1.45**	**1.52**	**5.34**	**14.10**	**1.78**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
Vegetation Land Change	21.9810
Total	**21.9810**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2015	1/28/2015	5	20	
2	Site Preparation	Site Preparation	1/29/2015	2/11/2015	5	10	
3	Grading	Grading	2/12/2015	3/25/2015	5	30	
4	Building Construction	Building Construction	3/26/2015	5/31/2017	5	570	
5	Paving	Paving	6/1/2017	6/28/2017	5	20	
6	Architectural Coating	Architectural Coating	6/29/2017	7/26/2017	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 911,250; Residential Outdoor: 303,750; Non-Residential Indoor: 311,730; Non-Residential Outdoor: 103,910 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	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
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	12,250.00	13.00	5.00	10.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	656.00	128.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	131.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Demolition - 2015

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	0.0451	0.4836	0.3607	4.0000e-004		0.0245	0.0245		0.0229	0.0229	0.0000	37.4413	37.4413	0.0102	0.0000	37.6544
Total	**0.0451**	**0.4836**	**0.3607**	**4.0000e-004**		**0.0245**	**0.0245**		**0.0229**	**0.0229**	**0.0000**	**37.4413**	**37.4413**	**0.0102**	**0.0000**	**37.6544**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-004	1.2300e-003	0.0111	2.0000e-005	1.4400e-003	1.0000e-005	1.4600e-003	3.8000e-004	1.0000e-005	4.0000e-004	0.0000	1.2772	1.2772	8.0000e-005	0.0000	1.2790
Total	**8.0000e-004**	**1.2300e-003**	**0.0111**	**2.0000e-005**	**1.4400e-003**	**1.0000e-005**	**1.4600e-003**	**3.8000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**1.2772**	**1.2772**	**8.0000e-005**	**0.0000**	**1.2790**

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	9.4800e-003	0.1876	0.2527	4.0000e-004		8.8200e-003	8.8200e-003		8.8200e-003	8.8200e-003	0.0000	37.4412	37.4412	0.0102	0.0000	37.6544
Total	**9.4800e-003**	**0.1876**	**0.2527**	**4.0000e-004**		**8.8200e-003**	**8.8200e-003**		**8.8200e-003**	**8.8200e-003**	**0.0000**	**37.4412**	**37.4412**	**0.0102**	**0.0000**	**37.6544**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-004	1.2300e-003	0.0111	2.0000e-005	1.4400e-003	1.0000e-005	1.4600e-003	3.8000e-004	1.0000e-005	4.0000e-004	0.0000	1.2772	1.2772	8.0000e-005	0.0000	1.2790
Total	**8.0000e-004**	**1.2300e-003**	**0.0111**	**2.0000e-005**	**1.4400e-003**	**1.0000e-005**	**1.4600e-003**	**3.8000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**1.2772**	**1.2772**	**8.0000e-005**	**0.0000**	**1.2790**

3.3 Site Preparation - 2015

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0263	0.2845	0.2132	2.0000e-004		0.0154	0.0154		0.0142	0.0142	0.0000	18.6506	18.6506	5.5700e-003	0.0000	18.7675
Total	**0.0263**	**0.2845**	**0.2132**	**2.0000e-004**	**0.0903**	**0.0154**	**0.1058**	**0.0497**	**0.0142**	**0.0639**	**0.0000**	**18.6506**	**18.6506**	**5.5700e-003**	**0.0000**	**18.7675**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	7.4000e-004	6.6600e-003	1.0000e-005	8.7000e-004	1.0000e-005	8.7000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.7663	0.7663	5.0000e-005	0.0000	0.7674
Total	**4.8000e-004**	**7.4000e-004**	**6.6600e-003**	**1.0000e-005**	**8.7000e-004**	**1.0000e-005**	**8.7000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7663**	**0.7663**	**5.0000e-005**	**0.0000**	**0.7674**

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.7600e-003	0.0973	0.1170	2.0000e-004		4.8100e-003	4.8100e-003		4.8100e-003	4.8100e-003	0.0000	18.6505	18.6505	5.5700e-003	0.0000	18.7675
Total	**4.7600e-003**	**0.0973**	**0.1170**	**2.0000e-004**	**0.0903**	**4.8100e-003**	**0.0951**	**0.0497**	**4.8100e-003**	**0.0545**	**0.0000**	**18.6505**	**18.6505**	**5.5700e-003**	**0.0000**	**18.7675**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	7.4000e-004	6.6600e-003	1.0000e-005	8.7000e-004	1.0000e-005	8.7000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.7663	0.7663	5.0000e-005	0.0000	0.7674
Total	**4.8000e-004**	**7.4000e-004**	**6.6600e-003**	**1.0000e-005**	**8.7000e-004**	**1.0000e-005**	**8.7000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7663**	**0.7663**	**5.0000e-005**	**0.0000**	**0.7674**

3.4 Grading - 2015

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					0.1391	0.0000	0.1391	0.0553	0.0000	0.0553	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1016	1.1857	0.7626	9.3000e-004		0.0570	0.0570		0.0525	0.0525	0.0000	88.2633	88.2633	0.0264	0.0000	88.8167
Total	**0.1016**	**1.1857**	**0.7626**	**9.3000e-004**	**0.1391**	**0.0570**	**0.1962**	**0.0553**	**0.0525**	**0.1078**	**0.0000**	**88.2633**	**88.2633**	**0.0264**	**0.0000**	**88.8167**

3.4 Grading - 2015

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	0.1314	1.2330	1.4780	2.3800e-003	0.0521	0.0175	0.0696	0.0143	0.0161	0.0304	0.0000	218.1672	218.1672	1.9400e-003	0.0000	218.2079
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	1.6000e-003	2.4500e-003	0.0222	3.0000e-005	2.8900e-003	3.0000e-005	2.9100e-003	7.7000e-004	2.0000e-005	7.9000e-004	0.0000	2.5544	2.5544	1.7000e-004	0.0000	2.5579
Total	**0.1330**	**1.2354**	**1.5002**	**2.4100e-003**	**0.0550**	**0.0175**	**0.0725**	**0.0151**	**0.0161**	**0.0312**	**0.0000**	**220.7216**	**220.7216**	**2.1100e-003**	**0.0000**	**220.7658**

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					0.1391	0.0000	0.1391	0.0553	0.0000	0.0553	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0227	0.4467	0.5692	9.3000e-004		0.0199	0.0199		0.0199	0.0199	0.0000	88.2632	88.2632	0.0264	0.0000	88.8166
Total	**0.0227**	**0.4467**	**0.5692**	**9.3000e-004**	**0.1391**	**0.0199**	**0.1590**	**0.0553**	**0.0199**	**0.0752**	**0.0000**	**88.2632**	**88.2632**	**0.0264**	**0.0000**	**88.8166**

3.4 Grading - 2015

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	0.1314	1.2330	1.4780	2.3800e-003	0.0521	0.0175	0.0696	0.0143	0.0161	0.0304	0.0000	218.1672	218.1672	1.9400e-003	0.0000	218.2079
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	1.6000e-003	2.4500e-003	0.0222	3.0000e-005	2.8900e-003	3.0000e-005	2.9100e-003	7.7000e-004	2.0000e-005	7.9000e-004	0.0000	2.5544	2.5544	1.7000e-004	0.0000	2.5579
Total	**0.1330**	**1.2354**	**1.5002**	**2.4100e-003**	**0.0550**	**0.0175**	**0.0725**	**0.0151**	**0.0161**	**0.0312**	**0.0000**	**220.7216**	**220.7216**	**2.1100e-003**	**0.0000**	**220.7658**

3.5 Building Construction - 2015

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	0.3677	3.0180	1.8838	2.7000e-003		0.2127	0.2127		0.2000	0.2000	0.0000	245.2143	245.2143	0.0615	0.0000	246.5063
Total	**0.3677**	**3.0180**	**1.8838**	**2.7000e-003**		**0.2127**	**0.2127**		**0.2000**	**0.2000**	**0.0000**	**245.2143**	**245.2143**	**0.0615**	**0.0000**	**246.5063**

3.5 Building Construction - 2015

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	0.1788	1.2007	1.9648	2.1900e-003	0.0573	0.0186	0.0759	0.0164	0.0171	0.0335	0.0000	199.8891	199.8891	1.9400e-003	0.0000	199.9299
Worker	0.3523	0.5394	4.8761	7.1700e-003	0.6347	5.5800e-003	0.6403	0.1687	5.0200e-003	0.1737	0.0000	561.3609	561.3609	0.0366	0.0000	562.1286
Total	**0.5311**	**1.7401**	**6.8410**	**9.3600e-003**	**0.6920**	**0.0242**	**0.7162**	**0.1851**	**0.0221**	**0.2072**	**0.0000**	**761.2499**	**761.2499**	**0.0385**	**0.0000**	**762.0585**

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	0.0675	1.4245	1.7905	2.7000e-003		0.0906	0.0906		0.0906	0.0906	0.0000	245.2140	245.2140	0.0615	0.0000	246.5060
Total	**0.0675**	**1.4245**	**1.7905**	**2.7000e-003**		**0.0906**	**0.0906**		**0.0906**	**0.0906**	**0.0000**	**245.2140**	**245.2140**	**0.0615**	**0.0000**	**246.5060**

3.5 Building Construction - 2015

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	0.1788	1.2007	1.9648	2.1900e-003	0.0573	0.0186	0.0759	0.0164	0.0171	0.0335	0.0000	199.8891	199.8891	1.9400e-003	0.0000	199.9299
Worker	0.3523	0.5394	4.8761	7.1700e-003	0.6347	5.5800e-003	0.6403	0.1687	5.0200e-003	0.1737	0.0000	561.3609	561.3609	0.0366	0.0000	562.1286
Total	**0.5311**	**1.7401**	**6.8410**	**9.3600e-003**	**0.6920**	**0.0242**	**0.7162**	**0.1851**	**0.0221**	**0.2072**	**0.0000**	**761.2499**	**761.2499**	**0.0385**	**0.0000**	**762.0585**

3.5 Building Construction - 2016

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	0.4445	3.7201	2.4151	3.5000e-003		0.2567	0.2567		0.2412	0.2412	0.0000	316.0104	316.0104	0.0784	0.0000	317.6563
Total	**0.4445**	**3.7201**	**2.4151**	**3.5000e-003**		**0.2567**	**0.2567**		**0.2412**	**0.2412**	**0.0000**	**316.0104**	**316.0104**	**0.0784**	**0.0000**	**317.6563**

3.5 Building Construction - 2016

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	0.2175	1.3749	2.4427	2.8400e-003	0.0744	0.0191	0.0935	0.0213	0.0176	0.0389	0.0000	256.7584	256.7584	2.1900e-003	0.0000	256.8044
Worker	0.3892	0.6116	5.4485	9.2900e-003	0.8242	6.6400e-003	0.8308	0.2190	6.0200e-003	0.2250	0.0000	702.8785	702.8785	0.0422	0.0000	703.7645
Total	**0.6068**	**1.9865**	**7.8911**	**0.0121**	**0.8986**	**0.0258**	**0.9243**	**0.2403**	**0.0236**	**0.2639**	**0.0000**	**959.6368**	**959.6368**	**0.0444**	**0.0000**	**960.5689**

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	0.0876	1.8497	2.3249	3.5000e-003		0.1177	0.1177		0.1177	0.1177	0.0000	316.0101	316.0101	0.0784	0.0000	317.6560
Total	**0.0876**	**1.8497**	**2.3249**	**3.5000e-003**		**0.1177**	**0.1177**		**0.1177**	**0.1177**	**0.0000**	**316.0101**	**316.0101**	**0.0784**	**0.0000**	**317.6560**

3.5 Building Construction - 2016

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	0.2175	1.3749	2.4427	2.8400e-003	0.0744	0.0191	0.0935	0.0213	0.0176	0.0389	0.0000	256.7584	256.7584	2.1900e-003	0.0000	256.8044
Worker	0.3892	0.6116	5.4485	9.2900e-003	0.8242	6.6400e-003	0.8308	0.2190	6.0200e-003	0.2250	0.0000	702.8785	702.8785	0.0422	0.0000	703.7645
Total	**0.6068**	**1.9865**	**7.8911**	**0.0121**	**0.8986**	**0.0258**	**0.9243**	**0.2403**	**0.0236**	**0.2639**	**0.0000**	**959.6368**	**959.6368**	**0.0444**	**0.0000**	**960.5689**

3.5 Building Construction - 2017

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	0.1675	1.4259	0.9790	1.4500e-003		0.0962	0.0962		0.0903	0.0903	0.0000	129.3187	129.3187	0.0318	0.0000	129.9871
Total	**0.1675**	**1.4259**	**0.9790**	**1.4500e-003**		**0.0962**	**0.0962**		**0.0903**	**0.0903**	**0.0000**	**129.3187**	**129.3187**	**0.0318**	**0.0000**	**129.9871**

3.5 Building Construction - 2017

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	0.0825	0.5139	0.9488	1.1700e-003	0.0308	6.7000e-003	0.0375	8.8200e-003	6.1600e-003	0.0150	0.0000	104.4699	104.4699	8.5000e-004	0.0000	104.4877
Worker	0.1355	0.2208	1.9284	3.8400e-003	0.3410	2.5500e-003	0.3436	0.0906	2.3300e-003	0.0930	0.0000	279.4698	279.4698	0.0156	0.0000	279.7964
Total	**0.2180**	**0.7346**	**2.8772**	**5.0100e-003**	**0.3718**	**9.2500e-003**	**0.3811**	**0.0995**	**8.4900e-003**	**0.1079**	**0.0000**	**383.9397**	**383.9397**	**0.0164**	**0.0000**	**384.2841**

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	0.0363	0.7654	0.9620	1.4500e-003		0.0487	0.0487		0.0487	0.0487	0.0000	129.3186	129.3186	0.0318	0.0000	129.9869
Total	**0.0363**	**0.7654**	**0.9620**	**1.4500e-003**		**0.0487**	**0.0487**		**0.0487**	**0.0487**	**0.0000**	**129.3186**	**129.3186**	**0.0318**	**0.0000**	**129.9869**

3.5 Building Construction - 2017

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	0.0825	0.5139	0.9488	1.1700e-003	0.0308	6.7000e-003	0.0375	8.8200e-003	6.1600e-003	0.0150	0.0000	104.4699	104.4699	8.5000e-004	0.0000	104.4877
Worker	0.1355	0.2208	1.9284	3.8400e-003	0.3410	2.5500e-003	0.3436	0.0906	2.3300e-003	0.0930	0.0000	279.4698	279.4698	0.0156	0.0000	279.7964
Total	**0.2180**	**0.7346**	**2.8772**	**5.0100e-003**	**0.3718**	**9.2500e-003**	**0.3811**	**0.0995**	**8.4900e-003**	**0.1079**	**0.0000**	**383.9397**	**383.9397**	**0.0164**	**0.0000**	**384.2841**

3.6 Paving - 2017

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	0.0191	0.2030	0.1473	2.2000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8266
Paving	2.8300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0219**	**0.2030**	**0.1473**	**2.2000e-004**		**0.0114**	**0.0114**		**0.0105**	**0.0105**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8266**

3.6 Paving - 2017

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	5.7000e-004	9.3000e-004	8.1700e-003	2.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1834	1.1834	7.0000e-005	0.0000	1.1848
Total	**5.7000e-004**	**9.3000e-004**	**8.1700e-003**	**2.0000e-005**	**1.4400e-003**	**1.0000e-005**	**1.4500e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1834**	**1.1834**	**7.0000e-005**	**0.0000**	**1.1848**

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	5.4900e-003	0.1106	0.1693	2.2000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8265
Paving	2.8300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3200e-003**	**0.1106**	**0.1693**	**2.2000e-004**		**5.9800e-003**	**5.9800e-003**		**5.9800e-003**	**5.9800e-003**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8265**

3.6 Paving - 2017

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	5.7000e-004	9.3000e-004	8.1700e-003	2.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1834	1.1834	7.0000e-005	0.0000	1.1848
Total	**5.7000e-004**	**9.3000e-004**	**8.1700e-003**	**2.0000e-005**	**1.4400e-003**	**1.0000e-005**	**1.4500e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1834**	**1.1834**	**7.0000e-005**	**0.0000**	**1.1848**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.3711					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3200e-003	0.0219	0.0187	3.0000e-005		1.7300e-003	1.7300e-003		1.7300e-003	1.7300e-003	0.0000	2.5533	2.5533	2.7000e-004	0.0000	2.5589
Total	**2.3745**	**0.0219**	**0.0187**	**3.0000e-005**		**1.7300e-003**	**1.7300e-003**		**1.7300e-003**	**1.7300e-003**	**0.0000**	**2.5533**	**2.5533**	**2.7000e-004**	**0.0000**	**2.5589**

3.7 Architectural Coating - 2017

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	5.0100e-003	8.1600e-003	0.0713	1.4000e-004	0.0126	9.0000e-005	0.0127	3.3500e-003	9.0000e-005	3.4400e-003	0.0000	10.3350	10.3350	5.8000e-004	0.0000	10.3470
Total	**5.0100e-003**	**8.1600e-003**	**0.0713**	**1.4000e-004**	**0.0126**	**9.0000e-005**	**0.0127**	**3.3500e-003**	**9.0000e-005**	**3.4400e-003**	**0.0000**	**10.3350**	**10.3350**	**5.8000e-004**	**0.0000**	**10.3470**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.3711					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.9000e-004	0.0136	0.0183	3.0000e-005		9.5000e-004	9.5000e-004		9.5000e-004	9.5000e-004	0.0000	2.5533	2.5533	2.7000e-004	0.0000	2.5589
Total	**2.3717**	**0.0136**	**0.0183**	**3.0000e-005**		**9.5000e-004**	**9.5000e-004**		**9.5000e-004**	**9.5000e-004**	**0.0000**	**2.5533**	**2.5533**	**2.7000e-004**	**0.0000**	**2.5589**

3.7 Architectural Coating - 2017

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	5.0100e-003	8.1600e-003	0.0713	1.4000e-004	0.0126	9.0000e-005	0.0127	3.3500e-003	9.0000e-005	3.4400e-003	0.0000	10.3350	10.3350	5.8000e-004	0.0000	10.3470
Total	**5.0100e-003**	**8.1600e-003**	**0.0713**	**1.4000e-004**	**0.0126**	**9.0000e-005**	**0.0127**	**3.3500e-003**	**9.0000e-005**	**3.4400e-003**	**0.0000**	**10.3350**	**10.3350**	**5.8000e-004**	**0.0000**	**10.3470**

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	0.5586	1.4720	5.5753	0.0111	0.7767	0.0175	0.7942	0.2082	0.0161	0.2243	0.0000	835.3562	835.3562	0.0350	0.0000	836.0904
Unmitigated	0.5586	1.4720	5.5753	0.0111	0.7767	0.0175	0.7942	0.2082	0.0161	0.2243	0.0000	835.3562	835.3562	0.0350	0.0000	836.0904

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	811.80	811.80	811.80	2,063,236	2,063,236
Convenience Market (24 Hour)	0.00	0.00	0.00		
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	811.80	811.80	811.80	2,063,236	2,063,236

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	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Convenience Market (24 Hour)	13.00	5.00	5.00	0.90	80.10	19.00	24	15	61
Enclosed Parking with Elevator	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0
Parking Lot	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.455853	0.042261	0.214795	0.150173	0.067787	0.009860	0.017887	0.023366	0.002328	0.001394	0.008768	0.000846	0.004683

4.4 Fleet Mix

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	1,190.3432	1,190.3432	0.0538	0.0111	1,194.9256
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,190.3432	1,190.3432	0.0538	0.0111	1,194.9256
NaturalGas Mitigated	0.0324	0.2770	0.1181	1.7700e-003		0.0224	0.0224		0.0224	0.0224	0.0000	320.7503	320.7503	6.1500e-003	5.8800e-003	322.7023
NaturalGas Unmitigated	0.0324	0.2770	0.1181	1.7700e-003		0.0224	0.0224		0.0224	0.0224	0.0000	320.7503	320.7503	6.1500e-003	5.8800e-003	322.7023

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					
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
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
Apartments Mid Rise	5.99818e+006	0.0323	0.2764	0.1176	1.7600e-003		0.0224	0.0224		0.0224	0.0224	0.0000	320.0859	320.0859	6.1300e-003	5.8700e-003	322.0339
Convenience Market (24 Hour)	12450	7.0000e-005	6.1000e-004	5.1000e-004	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6644	0.6644	1.0000e-005	1.0000e-005	0.6684
Total		**0.0324**	**0.2770**	**0.1181**	**1.7600e-003**		**0.0224**	**0.0224**		**0.0224**	**0.0224**	**0.0000**	**320.7503**	**320.7503**	**6.1400e-003**	**5.8800e-003**	**322.7023**

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					
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
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
Apartments Mid Rise	5.99818e+006	0.0323	0.2764	0.1176	1.7600e-003		0.0224	0.0224		0.0224	0.0224	0.0000	320.0859	320.0859	6.1300e-003	5.8700e-003	322.0339
Convenience Market (24 Hour)	12450	7.0000e-005	6.1000e-004	5.1000e-004	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6644	0.6644	1.0000e-005	1.0000e-005	0.6684
Total		**0.0324**	**0.2770**	**0.1181**	**1.7600e-003**		**0.0224**	**0.0224**		**0.0224**	**0.0224**	**0.0000**	**320.7503**	**320.7503**	**6.1400e-003**	**5.8800e-003**	**322.7023**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	2.6026e +006	757.1266	0.0342	7.0800e-003	760.0413
Convenience Market (24 Hour)	58450	17.0038	7.7000e-004	1.6000e-004	17.0692
Enclosed Parking with Elevator	1.348e +006	392.1487	0.0177	3.6700e-003	393.6583
Parking Lot	82720	24.0642	1.0900e-003	2.3000e-004	24.1568
Total		**1,190.3432**	**0.0538**	**0.0111**	**1,194.9256**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	2.6026e+006	757.1266	0.0342	7.0800e-003	760.0413
Convenience Market (24 Hour)	58450	17.0038	7.7000e-004	1.6000e-004	17.0692
Enclosed Parking with Elevator	1.348e+006	392.1487	0.0177	3.6700e-003	393.6583
Parking Lot	82720	24.0642	1.0900e-003	2.3000e-004	24.1568
Total		**1,190.3432**	**0.0538**	**0.0111**	**1,194.9256**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.3270	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725
Unmitigated	3.0346	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725

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	0.9448					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.7770					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	0.3129	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725
Total	**3.0346**	**0.1175**	**10.1275**	**5.3000e-004**		**0.0553**	**0.0553**		**0.0553**	**0.0553**	**0.0000**	**16.4299**	**16.4299**	**0.0163**	**0.0000**	**16.7725**

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	0.2371					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.7770					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	0.3129	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725
Total	**2.3270**	**0.1175**	**10.1275**	**5.3000e-004**		**0.0553**	**0.0553**		**0.0553**	**0.0553**	**0.0000**	**16.4299**	**16.4299**	**0.0163**	**0.0000**	**16.7725**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	83.7676	1.2663	0.0305	119.8134
Unmitigated	122.7409	1.5837	0.0383	167.8677

7.2 Water by Land Use

Unmitigated

	Indoor/ Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	48.0837 / 30.3136	121.8093	1.5716	0.0380	166.5911
Convenience Market (24 Hour)	0.370363 / 0.226996	0.9316	0.0121	2.9000e-004	1.2765
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**122.7409**	**1.5837**	**0.0383**	**167.8677**

7.2 Water by Land Use

Mitigated

	Indoor/ Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	38.4669 / 15.1568	83.1306	1.2567	0.0303	118.9009
Convenience Market (24 Hour)	0.29629 / 0.113498	0.6370	9.6800e-003	2.3000e-004	0.9125
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**83.7676**	**1.2663**	**0.0305**	**119.8134**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	71.9623	4.2529	0.0000	161.2722
Unmitigated	71.9623	4.2529	0.0000	161.2722

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	339.48	68.9114	4.0726	0.0000	154.4348
Convenience Market (24 Hour)	15.03	3.0510	0.1803	0.0000	6.8374
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**71.9623**	**4.2529**	**0.0000**	**161.2722**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	339.48	68.9114	4.0726	0.0000	154.4348
Convenience Market (24 Hour)	15.03	3.0510	0.1803	0.0000	6.8374
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**71.9623**	**4.2529**	**0.0000**	**161.2722**

9.0 Operational Offroad

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

10.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	21.9810	0.0000	0.0000	21.9810

10.1 Vegetation Land Change

Vegetation Type

	Initial/ Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Grassland	0 / 5.1	21.9810	0.0000	0.0000	21.9810
Total		**21.9810**	**0.0000**	**0.0000**	**21.9810**

California Polytechnic University, San Luis Obispo: Student Housing South

San Luis Obispo County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	500.00	Space	1.20	200,000.00	0
Parking Lot	94.00	1000sqft	2.16	94,000.00	0
Apartments Mid Rise	738.00	Dwelling Unit	8.50	450,000.00	1475
Convenience Market (24 Hour)	5.00	1000sqft	0.11	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Please see text.

Construction Phase - Please see text.

Grading -

Architectural Coating - Please see text.

Vehicle Trips - Please see text.

Consumer Products - Please see text.

Area Coating - Please see text.

Land Use Change -

Construction Off-road Equipment Mitigation - Please see text.

Area Mitigation - Please see text.

Water Mitigation -

Trips and VMT - Please see text.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	50
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	50
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	300.00	570.00
tblConsumerProducts	ROG_EF	2.14E-05	1.3E-05
tblGrading	MaterialExported	0.00	98,000.00
tblLandUse	LandUseSquareFeet	738,000.00	450,000.00
tblLandUse	LotAcreage	4.50	1.20

tblLandUse	LotAcreage	19.42	8.50
tblLandUse	Population	2,111.00	1,475.00
tblProjectCharacteristics	OperationalYear	2014	2018
tblTripsAndVMT	HaulingTripLength	20.00	10.00
tblVehicleTrips	ST_TR	7.16	1.10
tblVehicleTrips	ST_TR	863.10	0.00
tblVehicleTrips	SU_TR	6.07	1.10
tblVehicleTrips	SU_TR	758.45	0.00
tblVehicleTrips	WD_TR	6.59	1.10
tblVehicleTrips	WD_TR	737.99	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	16.3584	160.7379	163.2334	0.2221	18.2442	4.9763	21.3340	9.9779	4.5776	12.8205	0.0000	22,662.8927	22,662.8927	2.0929	0.0000	22,706.8433
2016	8.4109	43.7012	82.2508	0.1192	7.0682	2.1663	9.2346	1.8865	2.0307	3.9171	0.0000	10,714.1069	10,714.1069	1.0373	0.0000	10,735.8895
2017	237.9800	39.9850	74.4209	0.1190	7.0683	1.9538	9.0221	1.8865	1.8314	3.7179	0.0000	10,418.0680	10,418.0680	0.9848	0.0000	10,438.7485
Total	**262.7493**	**244.4241**	**319.9051**	**0.4602**	**32.3808**	**9.0964**	**39.5907**	**13.7509**	**8.4396**	**20.4555**	**0.0000**	**43,795.0676**	**43,795.0676**	**4.1149**	**0.0000**	**43,881.4813**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	11.0961	111.4710	150.3367	0.2221	18.2442	2.4975	19.2068	9.9779	2.4029	10.9403	0.0000	22,662.8927	22,662.8927	2.0929	0.0000	22,706.8433
2016	5.6759	29.3690	81.5597	0.1192	7.0682	1.1005	8.1688	1.8865	1.0838	2.9703	0.0000	10,714.1069	10,714.1069	1.0373	0.0000	10,735.8895
2017	237.7071	27.7535	74.1074	0.1190	7.0683	1.0741	8.1425	1.8865	1.0600	2.9465	0.0000	10,418.0680	10,418.0680	0.9848	0.0000	10,438.7485
Total	**254.4791**	**168.5935**	**306.0038**	**0.4602**	**32.3808**	**4.6722**	**35.5180**	**13.7509**	**4.5467**	**16.8570**	**0.0000**	**43,795.0676**	**43,795.0676**	**4.1149**	**0.0000**	**43,881.4813**

	ROG	NOx	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	3.15	31.02	4.35	0.00	0.00	48.64	10.29	0.00	46.13	17.59	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	16.8098	0.7123	61.3785	3.2200e-003		0.3349	0.3349		0.3349	0.3349	0.0000	109.7627	109.7627	0.1090	0.0000	112.0519
Energy	0.1776	1.5178	0.6473	9.6900e-003		0.1227	0.1227		0.1227	0.1227		1,937.3517	1,937.3517	0.0371	0.0355	1,949.1421
Mobile	3.2724	8.1054	32.0868	0.0606	4.3803	0.0966	4.4769	1.1714	0.0889	1.2603		5,034.0361	5,034.0361	0.2121		5,038.4902
Total	**20.2598**	**10.3355**	**94.1126**	**0.0735**	**4.3803**	**0.5542**	**4.9345**	**1.1714**	**0.5465**	**1.7179**	**0.0000**	**7,081.1505**	**7,081.1505**	**0.3582**	**0.0355**	**7,099.6841**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	12.9323	0.7123	61.3785	3.2200e-003		0.3349	0.3349		0.3349	0.3349	0.0000	109.7627	109.7627	0.1090	0.0000	112.0519
Energy	0.1776	1.5178	0.6473	9.6900e-003		0.1227	0.1227		0.1227	0.1227		1,937.3517	1,937.3517	0.0371	0.0355	1,949.1421
Mobile	3.2724	8.1054	32.0868	0.0606	4.3803	0.0966	4.4769	1.1714	0.0889	1.2603		5,034.0361	5,034.0361	0.2121		5,038.4902
Total	**16.3823**	**10.3355**	**94.1126**	**0.0735**	**4.3803**	**0.5542**	**4.9345**	**1.1714**	**0.5465**	**1.7179**	**0.0000**	**7,081.1505**	**7,081.1505**	**0.3582**	**0.0355**	**7,099.6841**

	ROG	NOx	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	19.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2015	1/28/2015	5	20	
2	Site Preparation	Site Preparation	1/29/2015	2/11/2015	5	10	
3	Grading	Grading	2/12/2015	3/25/2015	5	30	
4	Building Construction	Building Construction	3/26/2015	5/31/2017	5	570	
5	Paving	Paving	6/1/2017	6/28/2017	5	20	
6	Architectural Coating	Architectural Coating	6/29/2017	7/26/2017	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 911,250; Residential Outdoor: 303,750; Non-Residential Indoor: 311,730; Non-Residential Outdoor: 103,910 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	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
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	12,250.00	13.00	5.00	10.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	656.00	128.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	131.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858		4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**		**2.4508**	**2.4508**		**2.2858**	**2.2858**		**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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
Worker	0.0856	0.1248	1.1327	1.6200e-003	0.1483	1.2700e-003	0.1496	0.0393	1.1400e-003	0.0405		139.6650	139.6650	9.1700e-003		139.8576
Total	**0.0856**	**0.1248**	**1.1327**	**1.6200e-003**	**0.1483**	**1.2700e-003**	**0.1496**	**0.0393**	**1.1400e-003**	**0.0405**		**139.6650**	**139.6650**	**9.1700e-003**		**139.8576**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9478	18.7614	25.2649	0.0399		0.8817	0.8817		0.8817	0.8817	0.0000	4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**0.9478**	**18.7614**	**25.2649**	**0.0399**		**0.8817**	**0.8817**		**0.8817**	**0.8817**	**0.0000**	**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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
Worker	0.0856	0.1248	1.1327	1.6200e-003	0.1483	1.2700e-003	0.1496	0.0393	1.1400e-003	0.0405		139.6650	139.6650	9.1700e-003		139.8576
Total	**0.0856**	**0.1248**	**1.1327**	**1.6200e-003**	**0.1483**	**1.2700e-003**	**0.1496**	**0.0393**	**1.1400e-003**	**0.0405**		**139.6650**	**139.6650**	**9.1700e-003**		**139.8576**

3.3 Site Preparation - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412		4,111.7444	4,111.7444	1.2275		4,137.5225
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**		**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5225**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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
Worker	0.1027	0.1497	1.3592	1.9400e-003	0.1780	1.5200e-003	0.1795	0.0472	1.3700e-003	0.0486		167.5980	167.5980	0.0110		167.8291
Total	**0.1027**	**0.1497**	**1.3592**	**1.9400e-003**	**0.1780**	**1.5200e-003**	**0.1795**	**0.0472**	**1.3700e-003**	**0.0486**		**167.5980**	**167.5980**	**0.0110**		**167.8291**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	0.9515	19.4584	23.4003	0.0391		0.9611	0.9611		0.9611	0.9611	0.0000	4,111.7444	4,111.7444	1.2275		4,137.5224
Total	**0.9515**	**19.4584**	**23.4003**	**0.0391**	**18.0663**	**0.9611**	**19.0273**	**9.9307**	**0.9611**	**10.8918**	**0.0000**	**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5224**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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
Worker	0.1027	0.1497	1.3592	1.9400e-003	0.1780	1.5200e-003	0.1795	0.0472	1.3700e-003	0.0486		167.5980	167.5980	0.0110		167.8291
Total	**0.1027**	**0.1497**	**1.3592**	**1.9400e-003**	**0.1780**	**1.5200e-003**	**0.1795**	**0.0472**	**1.3700e-003**	**0.0486**		**167.5980**	**167.5980**	**0.0110**		**167.8291**

3.4 Grading - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2746	0.0000	9.2746	3.6876	0.0000	3.6876			0.0000			0.0000
Off-Road	6.7751	79.0467	50.8400	0.0618		3.8022	3.8022		3.4980	3.4980		6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**6.7751**	**79.0467**	**50.8400**	**0.0618**	**9.2746**	**3.8022**	**13.0768**	**3.6876**	**3.4980**	**7.1856**		**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

3.4 Grading - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.4692	81.5249	110.8833	0.1582	3.5552	1.1724	4.7276	0.9732	1.0780	2.0512		15,990.4294	15,990.4294	0.1442		15,993.4585
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
Worker	0.1141	0.1664	1.5102	2.1600e-003	0.1977	1.6900e-003	0.1994	0.0524	1.5200e-003	0.0540		186.2200	186.2200	0.0122		186.4767
Total	**9.5833**	**81.6913**	**112.3935**	**0.1603**	**3.7529**	**1.1741**	**4.9270**	**1.0256**	**1.0796**	**2.1052**		**16,176.6494**	**16,176.6494**	**0.1565**		**16,179.9353**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.2746	0.0000	9.2746	3.6876	0.0000	3.6876			0.0000			0.0000
Off-Road	1.5128	29.7798	37.9432	0.0618		1.3234	1.3234		1.3234	1.3234	0.0000	6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**1.5128**	**29.7798**	**37.9432**	**0.0618**	**9.2746**	**1.3234**	**10.5980**	**3.6876**	**1.3234**	**5.0109**	**0.0000**	**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

3.4 Grading - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	9.4692	81.5249	110.8833	0.1582	3.5552	1.1724	4.7276	0.9732	1.0780	2.0512		15,990.4294	15,990.4294	0.1442		15,993.4585
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
Worker	0.1141	0.1664	1.5102	2.1600e-003	0.1977	1.6900e-003	0.1994	0.0524	1.5200e-003	0.0540		186.2200	186.2200	0.0122		186.4767
Total	**9.5833**	**81.6913**	**112.3935**	**0.1603**	**3.7529**	**1.1741**	**4.9270**	**1.0256**	**1.0796**	**2.1052**		**16,176.6494**	**16,176.6494**	**0.1565**		**16,179.9353**

3.5 Building Construction - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

3.5 Building Construction - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.9405	11.8253	22.1263	0.0217	0.5829	0.1871	0.7699	0.1664	0.1720	0.3384		2,178.8284	2,178.8284	0.0217		2,179.2840
Worker	3.7427	5.4564	49.5344	0.0708	6.4853	0.0555	6.5408	1.7200	0.0499	1.7700		6,108.0165	6,108.0165	0.4010		6,116.4369
Total	**5.6833**	**17.2816**	**71.6607**	**0.0925**	**7.0682**	**0.2426**	**7.3107**	**1.8864**	**0.2219**	**2.1083**		**8,286.8449**	**8,286.8449**	**0.4227**		**8,295.7209**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6712	14.1741	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**0.6712**	**14.1741**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

3.5 Building Construction - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.9405	11.8253	22.1263	0.0217	0.5829	0.1871	0.7699	0.1664	0.1720	0.3384		2,178.8284	2,178.8284	0.0217		2,179.2840
Worker	3.7427	5.4564	49.5344	0.0708	6.4853	0.0555	6.5408	1.7200	0.0499	1.7700		6,108.0165	6,108.0165	0.4010		6,116.4369
Total	**5.6833**	**17.2816**	**71.6607**	**0.0925**	**7.0682**	**0.2426**	**7.3107**	**1.8864**	**0.2219**	**2.1083**		**8,286.8449**	**8,286.8449**	**0.4227**		**8,295.7209**

3.5 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.4062	28.5063	18.5066	0.0268		1.9674	1.9674		1.8485	1.8485		2,669.2864	2,669.2864	0.6620		2,683.1890
Total	**3.4062**	**28.5063**	**18.5066**	**0.0268**		**1.9674**	**1.9674**		**1.8485**	**1.8485**		**2,669.2864**	**2,669.2864**	**0.6620**		**2,683.1890**

3.5 Building Construction - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.8205	10.4293	21.2260	0.0217	0.5829	0.1481	0.7310	0.1664	0.1361	0.3025		2,155.2592	2,155.2592	0.0189		2,155.6552
Worker	3.1842	4.7655	42.5181	0.0707	6.4853	0.0509	6.5362	1.7200	0.0461	1.7662		5,889.5613	5,889.5613	0.3564		5,897.0454
Total	**5.0047**	**15.1948**	**63.7441**	**0.0923**	**7.0682**	**0.1989**	**7.2672**	**1.8865**	**0.1822**	**2.0687**		**8,044.8205**	**8,044.8205**	**0.3752**		**8,052.7005**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6712	14.1741	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,669.2864	2,669.2864	0.6620		2,683.1890
Total	**0.6712**	**14.1741**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,669.2864**	**2,669.2864**	**0.6620**		**2,683.1890**

3.5 Building Construction - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.8205	10.4293	21.2260	0.0217	0.5829	0.1481	0.7310	0.1664	0.1361	0.3025		2,155.2592	2,155.2592	0.0189		2,155.6552
Worker	3.1842	4.7655	42.5181	0.0707	6.4853	0.0509	6.5362	1.7200	0.0461	1.7662		5,889.5613	5,889.5613	0.3564		5,897.0454
Total	**5.0047**	**15.1948**	**63.7441**	**0.0923**	**7.0682**	**0.1989**	**7.2672**	**1.8865**	**0.1822**	**2.0687**		**8,044.8205**	**8,044.8205**	**0.3752**		**8,052.7005**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**		**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6649	9.4213	20.0403	0.0216	0.5830	0.1253	0.7083	0.1665	0.1152	0.2817		2,119.2042	2,119.2042	0.0177		2,119.5752
Worker	2.6788	4.1580	36.2515	0.0705	6.4853	0.0473	6.5326	1.7200	0.0432	1.7632		5,659.0585	5,659.0585	0.3174		5,665.7243
Total	**4.3437**	**13.5794**	**56.2918**	**0.0922**	**7.0683**	**0.1726**	**7.2409**	**1.8865**	**0.1584**	**2.0449**		**7,778.2627**	**7,778.2627**	**0.3351**		**7,785.2995**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6712	14.1741	17.8156	0.0268		0.9016	0.9016		0.9016	0.9016	0.0000	2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**0.6712**	**14.1741**	**17.8156**	**0.0268**		**0.9016**	**0.9016**		**0.9016**	**0.9016**	**0.0000**	**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	1.6649	9.4213	20.0403	0.0216	0.5830	0.1253	0.7083	0.1665	0.1152	0.2817		2,119.2042	2,119.2042	0.0177		2,119.5752
Worker	2.6788	4.1580	36.2515	0.0705	6.4853	0.0473	6.5326	1.7200	0.0432	1.7632		5,659.0585	5,659.0585	0.3174		5,665.7243
Total	**4.3437**	**13.5794**	**56.2918**	**0.0922**	**7.0683**	**0.1726**	**7.2409**	**1.8865**	**0.1584**	**2.0449**		**7,778.2627**	**7,778.2627**	**0.3351**		**7,785.2995**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473		2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.2830					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.1903**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**		**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

3.6 Paving - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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
Worker	0.0613	0.0951	0.8289	1.6100e-003	0.1483	1.0800e-003	0.1494	0.0393	9.9000e-004	0.0403		129.3992	129.3992	7.2600e-003		129.5516
Total	**0.0613**	**0.0951**	**0.8289**	**1.6100e-003**	**0.1483**	**1.0800e-003**	**0.1494**	**0.0393**	**9.9000e-004**	**0.0403**		**129.3992**	**129.3992**	**7.2600e-003**		**129.5516**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5490	11.0645	16.9276	0.0223		0.5982	0.5982		0.5982	0.5982	0.0000	2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.2830					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8320**	**11.0645**	**16.9276**	**0.0223**		**0.5982**	**0.5982**		**0.5982**	**0.5982**	**0.0000**	**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

3.6 Paving - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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
Worker	0.0613	0.0951	0.8289	1.6100e-003	0.1483	1.0800e-003	0.1494	0.0393	9.9000e-004	0.0403		129.3992	129.3992	7.2600e-003		129.5516
Total	**0.0613**	**0.0951**	**0.8289**	**1.6100e-003**	**0.1483**	**1.0800e-003**	**0.1494**	**0.0393**	**9.9000e-004**	**0.0403**		**129.3992**	**129.3992**	**7.2600e-003**		**129.5516**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	237.1127					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**237.4450**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

3.7 Architectural Coating - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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
Worker	0.5350	0.8303	7.2393	0.0141	1.2951	9.4400e-003	1.3045	0.3435	8.6300e-003	0.3521		1,130.0864	1,130.0864	0.0634		1,131.4175
Total	**0.5350**	**0.8303**	**7.2393**	**0.0141**	**1.2951**	**9.4400e-003**	**1.3045**	**0.3435**	**8.6300e-003**	**0.3521**		**1,130.0864**	**1,130.0864**	**0.0634**		**1,131.4175**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	237.1127					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**237.1721**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

3.7 Architectural Coating - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	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
Worker	0.5350	0.8303	7.2393	0.0141	1.2951	9.4400e-003	1.3045	0.3435	8.6300e-003	0.3521		1,130.0864	1,130.0864	0.0634		1,131.4175
Total	**0.5350**	**0.8303**	**7.2393**	**0.0141**	**1.2951**	**9.4400e-003**	**1.3045**	**0.3435**	**8.6300e-003**	**0.3521**		**1,130.0864**	**1,130.0864**	**0.0634**		**1,131.4175**

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	lb/day										lb/day					
Mitigated	3.2724	8.1054	32.0868	0.0606	4.3803	0.0966	4.4769	1.1714	0.0889	1.2603		5,034.0361	5,034.0361	0.2121		5,038.4902
Unmitigated	3.2724	8.1054	32.0868	0.0606	4.3803	0.0966	4.4769	1.1714	0.0889	1.2603		5,034.0361	5,034.0361	0.2121		5,038.4902

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	811.80	811.80	811.80	2,063,236	2,063,236
Convenience Market (24 Hour)	0.00	0.00	0.00		
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	811.80	811.80	811.80	2,063,236	2,063,236

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	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Convenience Market (24 Hour)	13.00	5.00	5.00	0.90	80.10	19.00	24	15	61
Enclosed Parking with Elevator	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0
Parking Lot	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.455853	0.042261	0.214795	0.150173	0.067787	0.009860	0.017887	0.023366	0.002328	0.001394	0.008768	0.000846	0.004683

5.0 Energy Detail

4.4 Fleet Mix

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	lb/day										lb/day					
NaturalGas Mitigated	0.1776	1.5178	0.6473	9.6900e-003		0.1227	0.1227		0.1227	0.1227		1,937.3517	1,937.3517	0.0371	0.0355	1,949.1421
NaturalGas Unmitigated	0.1776	1.5178	0.6473	9.6900e-003		0.1227	0.1227		0.1227	0.1227		1,937.3517	1,937.3517	0.0371	0.0355	1,949.1421

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Convenience Market (24 Hour)	34.1096	3.7000e-004	3.3400e-003	2.8100e-003	2.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004		4.0129	4.0129	8.0000e-005	7.0000e-005	4.0373
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
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
Apartments Mid Rise	16433.4	0.1772	1.5145	0.6445	9.6700e-003		0.1224	0.1224		0.1224	0.1224		1,933.3388	1,933.3388	0.0371	0.0354	1,945.1048
Total		**0.1776**	**1.5178**	**0.6473**	**9.6900e-003**		**0.1227**	**0.1227**		**0.1227**	**0.1227**		**1,937.3517**	**1,937.3517**	**0.0371**	**0.0355**	**1,949.1421**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
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
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
Apartments Mid Rise	16.4334	0.1772	1.5145	0.6445	9.6700e-003		0.1224	0.1224		0.1224	0.1224		1,933.3388	1,933.3388	0.0371	0.0354	1,945.1048
Convenience Market (24 Hour)	0.0341096	3.7000e-004	3.3400e-003	2.8100e-003	2.0000e-005		2.5000e-004	2.5000e-004		2.5000e-004	2.5000e-004		4.0129	4.0129	8.0000e-005	7.0000e-005	4.0373
Total		**0.1776**	**1.5178**	**0.6473**	**9.6900e-003**		**0.1227**	**0.1227**		**0.1227**	**0.1227**		**1,937.3517**	**1,937.3517**	**0.0371**	**0.0355**	**1,949.1421**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	12.9323	0.7123	61.3785	3.2200e-003		0.3349	0.3349		0.3349	0.3349	0.0000	109.7627	109.7627	0.1090	0.0000	112.0519
Unmitigated	16.8098	0.7123	61.3785	3.2200e-003		0.3349	0.3349		0.3349	0.3349	0.0000	109.7627	109.7627	0.1090	0.0000	112.0519

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.1767					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	9.7370					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	1.8961	0.7123	61.3785	3.2200e-003		0.3349	0.3349		0.3349	0.3349		109.7627	109.7627	0.1090		112.0519
Total	**16.8098**	**0.7123**	**61.3785**	**3.2200e-003**		**0.3349**	**0.3349**		**0.3349**	**0.3349**	**0.0000**	**109.7627**	**109.7627**	**0.1090**	**0.0000**	**112.0519**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.2993					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	9.7370					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	1.8961	0.7123	61.3785	3.2200e-003		0.3349	0.3349		0.3349	0.3349		109.7627	109.7627	0.1090		112.0519
Total	**12.9323**	**0.7123**	**61.3785**	**3.2200e-003**		**0.3349**	**0.3349**		**0.3349**	**0.3349**	**0.0000**	**109.7627**	**109.7627**	**0.1090**	**0.0000**	**112.0519**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Vegetation

Earth Systems Pacific

4378 Old Santa Fe Road
San Luis Obispo, CA 93401-8116

(805) 544-3276 • FAX (805) 544-1786
E-mail: esp@earthsys.com

July 23, 2013

FILE NO.: SL-16805-SD

Mr. Joel Neel
Cal Poly University, Facilities and Capital Projects
1 Grand Avenue, Building 70
San Luis Obispo, California 93407

PROJECT: CAL POLY STUDENT HOUSING SOUTH PROJECT
GRAND AVENUE AT PACHECO WAY
SAN LUIS OBISPO, CALIFORNIA

SUBJECT: Geologic Evaluation for Naturally Occurring Asbestos

REFS: Hall, C.A., and Prior, S., 1975, *Geologic Map of the Cayucos-San Luis Obispo Region, California*, USGS Miscellaneous Field Studies Map MF-686.

Dear Mr. Neel:

In accordance with your request, this letter has been prepared to address the potential for the presence of naturally occurring asbestos on the above project site. Our evaluation consisted of a review of the referenced geologic map to determine the geologic units underlying the site, and review of logs of eight exploratory borings drilled at the site by this firm in June 2013 for a pending soils engineering investigation.

Our review of the referenced geologic map indicates that the site is underlain by bedrock of the Franciscan mélange. This unit is described in the referenced map as a "mélange (mixture) of graywacke, pervasively sheared and in large part composed of greenish-black claystone...".

Boring logs for the soils engineering investigation indicate that the site is underlain by graywacke sandstone and minor amounts of shale. Sandstone and shale are not asbestos-bearing geologic rock units, and therefore the potential for asbestos to be encountered during site construction operations is considered to be remote. Asbestos-bearing rock units in the Central Coast normally comprise serpentinite, ultramafic rock units consisting of olivine-hornblende and some schist rock units; none of these rock types were encountered while drilling at the site.

If you have any questions, or if we can be of further assistance, please do not hesitate to contact the undersigned at your convenience.

Sincerely,

Earth Systems Pacific



Timothy Conroy, CEG 1698
Principal Geologist

Doc. No.: 1307-127.LTR/nf

California Polytechnic State University, San uis Obispo: Student Housing South
2017 Pro ected mission Comparison: Normal Schedule vs. tended Schedule
Construction
11/6/2013

Unmitigated Construction missions Comparison for 2017 by ear and uarter [1]

	O	NO	DPM [2]	Fugitive PM_{10} [3]	O	NO	DPM [2]	Fugitive PM_{10} [3]
	(tons/year)				*(tons/quarter) [4]*			
Normal Schedule [5]	5.18		0.11	0.50	**2.59**		0.06	0.25
Extended Scehdule [6]	5.20		0.12	0.52	**2.60**		0.06	0.26
% change	*0.30*		*6.93*	*3.03*	*0.30*		*6.93*	*3.03*
			Quarterly Tier 1 Thresholds [7]		***2.50***		***0.13***	***2.50***

Ma imum Unmitigated Daily Construction missions Comparison for 2017 [1]

	O	NO	DPM [2]
	(pounds/day)		
Normal Schedule [5]	**277.97**		1.83
Extended Scehdule [6]	**148.45**		1.83
% change	*-46.59*		*0.00*
Daily Threshold [7]	***137.00***		***7.00***

Mitigated Construction missions Comparison for 2017 by ear and uarter [1]

	O	NO	DPM [2]	Fugitive PM_{10} [3]	O	NO	DPM [2]	Fugitive PM_{10} [3]
	(tons/year)				*(tons/quarter) [4]*			
Normal Schedule [5]	4.27		0.06	0.45	2.14		0.03	0.23
Extended Scehdule [6]	4.29		0.06	0.47	2.14		0.03	0.23
% change	*0.37*		*0.16*	*3.37*	*0.37*		*0.16*	*3.37*
			Quarterly Tier 1 Thresholds [7]		***2.50***		***0.13***	***2.50***

Ma imum Mitigated Daily Construction missions Comparison for 2017 [1]

	O	NO	DPM [2]
	(pounds/day)		
Normal Schedule [5]	**265.46**		1.06
Extended Scehdule [6]	136.09		1.06
% change	*-48.73*		*0.00*
Daily Threshold [7]	***137.00***		***7.00***

Note: Bolded values exceed quarterly Tier 1 Thresholds

[1] From CalEEMod Output Files (CalEEMod, Version 2013.2.2)

[2] Used exhaust $PM_{2.5}$.

[3] Used PM_{10} total.

[4] Quarterly emissions for 2017 calculated by dividing annual emissions by 2 quarters for both normal and extended schedule.

[5] Normal schedule assumes 20 days of architectural coating phase length and 6 hr/d equipment usage

[6] Extended schedule assumes 44 days of architectural coating phase length and 2.7 hr/d equipment usage

[7] From table 2-1 of "CEQA Air Quality Handbook," SLOC County APCD, 2012.

ProjectName	LocationScope	EMFAC_ID	WindSpeed	PrecipitationFrequency	ClimateZone	UrbanizationLevel	OperationalYear	UtilityCompany	CO2IntensityFactor	CH4IntensityFactor	N2OIntensityFactor	TotalPopulation	TotalLotAcreage	UsingHistoricalEnergyUseData
California Polytechnic University, San Luis Obispo: Student Housing South	C	SLO	3.2	44	4	Urban	2018	PG&E	641.35	0.029	0.006	1475	11.97	0

PollutantSelection	PollutantFullName	PollutantName
1	Reactive Organic Gases (ROG)	ROG
1	Nitrogen Oxides (NOx)	NOX
1	Carbon Monoxide (CO)	CO
1	Sulfur Dioxide (SO2)	SO2
1	Particulate Matter 10um (PM10)	PM10
1	Particulate Matter 2.5um (PM2.5)	PM2_5
1	Fugitive PM10um (PM10)	PM10_FUG
1	Fugitive PM2.5um (PM2.5)	PM25_FUG
1	Biogenic Carbon Dioxide (CO2)	CO2_BIO
1	Non-Biogenic Carbon Dioxide (CO2)	CO2_NBIO
1	Carbon Dioxide (CO2)	CO2
1	Methane (CH4)	CH4
1	Nitrous Oxide (N2O)	N2O
1	CO2 Equivalent GHGs (CO2e)	CO2E

tblLandUse

LandUseType	LandUseSubType	LandUseUnitAmount	LandUseSizeMetric	LotAcreage	LandUseSquareFeet	Population
Parking	Enclosed Parking with Elevator	500	Space	1.2	200000	0
Parking	Parking Lot	94	1000sqft	2.16	94000	0
Residential	Apartments Mid Rise	738	Dwelling Unit	8.5	450000	1475
Retail	Convenience Market (24 Hour)	5	1000sqft	0.11	5000	0

tblConstructionPhase

PhaseNumber	PhaseName	PhaseType	PhaseStartDate	PhaseEndDate	NumDaysWeek	NumDays	PhaseDescription
1	Demolition	Demolition	2015/01/01	2015/01/28	5	20	
2	Site Preparation	Site Preparation	2015/01/29	2015/02/11	5	10	
3	Grading	Grading	2015/02/12	2015/03/25	5	30	
4	Building Construction	Building Construction	2015/03/26	2017/05/31	5	570	
5	Paving	Paving	2017/06/01	2017/06/28	5	20	
6	Architectural Coating	Architectural Coating	2017/06/29	2017/08/29	5	44	

PhaseName	OffRoadEquipmentType	OffRoadEquipmentUnitAmount	UsageHours	HorsePower	LoadFactor
Demolition	Concrete/Industrial Saws	1	8	81	0.73
Demolition	Excavators	3	8	162	0.38
Demolition	Rubber Tired Dozers	2	8	255	0.4
Site Preparation	Rubber Tired Dozers	3	8	255	0.4
Site Preparation	Tractors/Loaders/Backhoes	4	8	97	0.37
Grading	Excavators	2	8	162	0.38
Grading	Graders	1	8	174	0.41
Grading	Rubber Tired Dozers	1	8	255	0.4
Grading	Scrapers	2	8	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8	97	0.37
Building Construction	Cranes	1	7	226	0.29
Building Construction	Forklifts	3	8	89	0.2
Building Construction	Generator Sets	1	8	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7	97	0.37
Building Construction	Welders	1	8	46	0.45
Paving	Pavers	2	8	125	0.42
Paving	Paving Equipment	2	8	130	0.36
Paving	Rollers	2	8	80	0.38
Architectural Coating	Air Compressors	1	2.7	78	0.48

PhaseName	WorkerTripNumber	VendorTripNumber	HaulingTripNumber	WorkerTripLength	VendorTripLength	HaulingTripLength	WorkerVehicleClass	VendorVehicleClass	HaulingVehicleClass
Demolition	15	0	0	13	5	20	LD_Mix	HDT_Mix	HHDT
Site Preparation	18	0	0	13	5	20	LD_Mix	HDT_Mix	HHDT
Grading	20	0	12250	13	5	10	LD_Mix	HDT_Mix	HHDT
Building Construction	656	128	0	13	5	20	LD_Mix	HDT_Mix	HHDT
Paving	15	0	0	13	5	20	LD_Mix	HDT_Mix	HHDT
Architectural Coating	131	0	0	13	5	20	LD_Mix	HDT_Mix	HHDT

PhaseName	WorkerPercentPave	VendorPercentPave	HaulingPercentPave	RoadSiltLoading	MaterialSiltContent	MaterialMoistureContent	AverageVehicleWeight	MeanVehicleSpeed
Demolition	100	100	100	0.1	8.5	0.5	2.4	40
Site Preparation	100	100	100	0.1	8.5	0.5	2.4	40
Grading	100	100	100	0.1	8.5	0.5	2.4	40
Building Construction	100	100	100	0.1	8.5	0.5	2.4	40
Paving	100	100	100	0.1	8.5	0.5	2.4	40
Architectural Coating	100	100	100	0.1	8.5	0.5	2.4	40

PhaseName	DemolitionSizeMetric	DemolitionUnitAmount
Demolition		

PhaseName	MaterialImported	MaterialExported	GradingSizeMetric	ImportExportPhased	MeanVehicleSpeed	AcresOfGrading	MaterialMoistureContentBulldozing	MaterialMoistureContentTruckLoading	MaterialSiltContent
Site Preparation	0	0		0	7.1	0	7.9	12	6.9
Grading	0	98000	Cubic Yards	0	7.1	75	7.9	12	6.9

PhaseName	ArchitecturalCoatingStartDate	ArchitecturalCoatingEndDate	EF_Residential_Interior	ConstArea_Residential_Interior	EF_Residential_Exterior	ConstArea_Residential_Exterior	EF_Nonresidential_Interior	ConstArea_Nonresidential_Interior	EF_Nonresidential_Exterior	ConstArea_Nonresidential_Exterior
Architectural Coating	1900/01/01	2040/12/31	50	911250	50	303750	100	311730	100	103910

ParkingLotAcreage

VehicleTripsLandUseSubType	VehicleTripsLandUseSizeMetric	WD_TR	ST_TR	SU_TR	HW_TL	HS_TL	HO_TL	CC_TL	CW_TL	CNW_TL	PR_TP	DV_TP	PB_TP	HW_TTP	HS_TTP	HO_TTP	CC_TTP	CW_TTP	CNW_TTP
Apartments Mid Rise	Dwelling Unit	1.1	1.1	1.1	13	5	5	0	0	0	86	11	3	35.8	21	43.2	0	0	0
Convenience Market (24 Hour)	1000sqft	0	0	0	0	0	0	5	13	5	24	15	61	0	0	0	80.1	0.9	19
Enclosed Parking with Elevator	Space	0	0	0	0	0	0	5	13	5	0	0	0	0	0	0	0	0	0
Parking Lot	1000sqft	0	0	0	0	0	0	5	13	5	0	0	0	0	0	0	0	0	0

Season	EmissionType	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
A	FleetMix	0.455853	0.042261	0.214795	0.150173	0.067787	0.00986	0.017887	0.023366	0.002328	0.001394	0.008768	0.000846	0.004683
A	CH4_IDLEX	0	0	0	0	0.001052	0.000707	0.007757	0.024199	0.01965	0	0	0.004322	0
A	CH4_RUNEX	0.010626	0.018864	0.016175	0.026152	0.018971	0.011044	0.007132	0.010188	0.002687	0	0	0.004768	0
A	CH4_STREX	0.009318	0.018416	0.01569	0.029656	0.018677	0.007224	0	0	0	0	0	0	0
A	CO_IDLEX	0	0	0	0	0.156165	0.111445	1.857624	2.879361	2.475334	0	0	0.991359	0
A	CO_RUNEX	0.946283	2.146066	1.516276	2.241837	1.787521	1.064209	0.997091	1.189455	1.605655	3.327569	26.027957	3.953799	3.040201
A	CO_STREX	2.22037	4.409537	3.652224	6.121554	4.072691	1.384341	20.920788	83.955563	12.403553	7.186403	10.849737	40.780978	8.333966
A	CO2_NBIO_IDLEX	0	0	0	0	8.672206	9.668834	588.687922	548.546854	554.845666	0	0	563.28811	0
A	CO2_NBIO_RUNEX	242.497575	297.174111	356.656918	471.340545	711.191417	587.084595	1041.899996	1625.958458	1044.808203	2012.904494	147.36725	1035.071545	725.059712
A	CO2_NBIO_STREX	56.50345	68.962153	82.367363	108.66961	31.300688	14.783612	54.662106	59.164334	34.333317	30.802889	40.973771	119.785625	28.421712
A	NOX_IDLEX	0	0	0	0	0.088688	0.151599	5.858266	4.72323	5.298662	0	0	7.746167	0
A	NOX_RUNEX	0.108528	0.247667	0.228432	0.376076	1.805419	2.495152	3.076107	5.458488	3.127881	11.008502	1.270782	7.162295	1.800765
A	NOX_STREX	0.144714	0.253853	0.326252	0.612795	0.972323	0.425437	1.791881	5.742655	1.580314	0.923042	0.315901	3.521324	0.792366
A	PM10_IDLEX	0	0	0	0	0.000957	0.001617	0.022159	0.014073	0.010253	0	0	0.014633	0
A	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.055261	0.076699	0.116478	0.059594	0.088597	0.663857	0.036749	0.504719	0.05292
A	PM10_PMTW	0.008	0.008	0.008	0.008	0.009866	0.011048	0.011408	0.034679	0.010216	0.008	0.008	0.010644	0.008691
A	PM10_RUNEX	0.001805	0.002743	0.001997	0.00216	0.021398	0.031045	0.073006	0.077179	0.03551	0.200445	0.000452	0.043024	0.032598
A	PM10_STREX	0.003322	0.004133	0.003581	0.003924	0.000957	0.000346	0.003043	0.005095	0.000814	0.000384	0.001429	0.004235	0.000991
A	PM25_IDLEX	0	0	0	0	0.00088	0.001488	0.020387	0.012947	0.009433	0	0	0.013462	0
A	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.023683	0.032871	0.049919	0.02554	0.03797	0.28451	0.01575	0.216308	0.02268
A	PM25_PMTW	0.002	0.002	0.002	0.002	0.002466	0.002762	0.002852	0.00867	0.002554	0.002	0.002	0.002661	0.002173
A	PM25_RUNEX	0.001664	0.002512	0.001845	0.001989	0.019695	0.02856	0.067163	0.071004	0.03267	0.184412	0.000371	0.039595	0.029989
A	PM25_STREX	0.003069	0.003798	0.003314	0.003622	0.000883	0.000313	0.002633	0.004285	0.000737	0.000357	0.001152	0.00393	0.000896
A	ROG_DIURN	0.037158	0.080428	0.060265	0.07416	0.001875	0.00061	0.002753	0.003408	0.000723	0.002757	0.618439	0.026038	0.844031
A	ROG_HTSK	0.115179	0.213302	0.165422	0.225041	0.072564	0.026707	0.130235	0.241586	0.027474	0.065579	0.400227	0.262102	0.072887
A	ROG_IDLEX	0	0	0	0	0.024219	0.015961	0.167015	0.520996	0.423065	0	0	0.093058	0
A	ROG_RESTL	0.029976	0.060518	0.048153	0.062573	0.001014	0.000358	0.001503	0.002162	0.000373	0.001774	0.301691	0.009875	0.333823
A	ROG_RUNEX	0.025639	0.068871	0.041894	0.067614	0.182166	0.154656	0.178817	0.227023	0.162617	0.636539	2.664131	0.331726	0.131633
A	ROG_RUNLS	0.266539	0.747381	0.565321	0.731952	0.532641	0.168899	0.576236	1.259775	0.28389	0.514846	1.489599	2.370021	2.006649
A	ROG_STREX	0.16384	0.322701	0.277476	0.522978	0.330426	0.12659	1.279763	4.143242	0.718223	0.614622	2.277365	2.346535	0.451477
A	SO2_IDLEX	0	0	0	0	0.000093	0.000101	0.006007	0.005597	0.005661	0	0	0.005748	0
A	SO2_RUNEX	0.00325	0.003783	0.004438	0.005641	0.00751	0.0061	0.010684	0.016595	0.010817	0.020651	0.002068	0.010738	0.007699
A	SO2_STREX	0.000772	0.000929	0.001069	0.001377	0.000409	0.000184	0.000952	0.00208	0.000584	0.000461	0.00068	0.001993	0.000448
A	TOG_DIURN	0.037158	0.080428	0.060265	0.07416	0.001875	0.00061	0.002753	0.003408	0.000723	0.002757	0.618439	0.026038	0.844031
A	TOG_HTSK	0.115179	0.213302	0.165422	0.225041	0.072564	0.026707	0.130235	0.241586	0.027474	0.065579	0.400227	0.262102	0.072887
A	TOG_IDLEX	0	0	0	0	0.025918	0.017398	0.190134	0.593114	0.481627	0	0	0.10594	0
A	TOG_RESTL	0.029976	0.060518	0.048153	0.062573	0.001014	0.000358	0.001503	0.002162	0.000373	0.001774	0.301691	0.009875	0.333823
A	TOG_RUNEX	0.036693	0.088808	0.058735	0.094811	0.210861	0.178502	0.204631	0.258304	0.190408	0.712595	2.91588	0.38026	0.160859
A	TOG_RUNLS	0.266539	0.747381	0.565321	0.731952	0.532641	0.168899	0.576236	1.259775	0.28389	0.514846	1.489599	2.370021	2.006649
A	TOG_STREX	0.175012	0.344766	0.296306	0.55855	0.352841	0.135246	1.369419	4.432604	0.767115	0.656226	2.446686	2.505375	0.482393
S	FleetMix	0.455853	0.042261	0.214795	0.150173	0.067787	0.00986	0.017887	0.023366	0.002328	0.001394	0.008768	0.000846	0.004683
S	CH4_IDLEX	0	0	0	0	0.001052	0.000707	0.007311	0.022805	0.018519	0	0	0.004073	0
S	CH4_RUNEX	0.010626	0.018864	0.016175	0.026152	0.018971	0.011044	0.007132	0.010188	0.002687	0	0	0.004768	0
S	CH4_STREX	0.009318	0.018416	0.01569	0.029656	0.018677	0.007224	0	0	0	0	0	0	0
S	CO_IDLEX	0	0	0	0	0.156165	0.111445	1.349826	2.092263	1.79868	0	0	0.720362	0

Season	EmissionType	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
S	CO_RUNEX	1.013943	2.250751	1.618381	2.375455	1.820692	1.065815	1.001093	1.192882	1.636797	3.373951	24.296336	4.057782	3.110557
S	CO_STREX	1.679726	3.349484	2.761802	4.650431	3.038486	1.051001	15.619054	62.678486	9.248108	5.649694	9.15458	33.679603	6.02495
S	CO2_NBIO_IDLEX	0	0	0	0	8.672206	9.668834	623.662826	581.136912	587.809947	0	0	596.75397	0
S	CO2_NBIO_RUNEX	252.719209	308.998946	371.222061	490.463435	711.19144	587.084603	1041.899993	1625.958458	1044.808192	2012.904494	147.36726	1035.071564	725.059698
S	CO2_NBIO_STREX	56.50345	68.962153	82.367368	108.66961	31.300688	14.783612	54.662104	59.164335	34.333317	30.802889	40.973771	119.785627	28.421712
S	NOX_IDLEX	0	0	0	0	0.088688	0.151599	6.046713	4.875166	5.469109	0	0	7.995345	0
S	NOX_RUNEX	0.097572	0.221118	0.204349	0.3371	1.736078	2.413692	2.96758	5.282464	2.998258	10.63443	1.145724	6.873321	1.703516
S	NOX_STREX	0.132386	0.23218	0.298391	0.560517	0.919619	0.402339	1.693287	5.424789	1.493081	0.872739	0.295841	3.313271	0.748461
S	PM10_IDLEX	0	0	0	0	0.000957	0.001617	0.018681	0.011863	0.008644	0	0	0.012335	0
S	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.055261	0.076699	0.116478	0.059594	0.088597	0.663857	0.036749	0.504719	0.05292
S	PM10_PMTW	0.008	0.008	0.008	0.008	0.009866	0.011048	0.011408	0.034679	0.010216	0.008	0.008	0.010644	0.008691
S	PM10_RUNEX	0.001805	0.002743	0.001997	0.00216	0.021398	0.031045	0.073006	0.077179	0.03551	0.200445	0.000452	0.043024	0.032598
S	PM10_STREX	0.003322	0.004133	0.003581	0.003924	0.000957	0.000346	0.003043	0.005095	0.000814	0.000384	0.001429	0.004235	0.000991
S	PM25_IDLEX	0	0	0	0	0.00088	0.001488	0.017186	0.010914	0.007952	0	0	0.011348	0
S	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.023683	0.032871	0.049919	0.02554	0.03797	0.28451	0.01575	0.216308	0.02268
S	PM25_PMTW	0.002	0.002	0.002	0.002	0.002466	0.002762	0.002852	0.00867	0.002554	0.002	0.002	0.002661	0.002173
S	PM25_RUNEX	0.001664	0.002512	0.001845	0.001989	0.019695	0.02856	0.067163	0.071004	0.03267	0.184412	0.000371	0.039595	0.029989
S	PM25_STREX	0.003069	0.003798	0.003314	0.003622	0.000883	0.000313	0.002633	0.004285	0.000737	0.000357	0.001152	0.00393	0.000896
S	ROG_DIURN	0.066108	0.144587	0.107488	0.130731	0.003352	0.001082	0.005068	0.006437	0.001259	0.004761	1.229999	0.046026	1.48329
S	ROG_HTSK	0.119196	0.2226	0.172835	0.23391	0.075202	0.027633	0.13318	0.241912	0.028017	0.067042	0.454382	0.261029	0.072459
S	ROG_IDLEX	0	0	0	0	0.024219	0.015961	0.157396	0.49099	0.398699	0	0	0.087699	0
S	ROG_RESTL	0.052707	0.107373	0.084747	0.10918	0.001735	0.000611	0.002673	0.003983	0.000619	0.002801	0.649278	0.016591	0.543055
S	ROG_RUNEX	0.026335	0.069607	0.0435	0.07016	0.185166	0.154901	0.17933	0.227213	0.164633	0.647537	2.563113	0.339376	0.134367
S	ROG_RUNLS	0.247409	0.670572	0.508614	0.660376	0.507974	0.160887	0.550937	1.215222	0.273048	0.45932	1.331974	2.040352	1.938393
S	ROG_STREX	0.133071	0.262343	0.226301	0.427855	0.278706	0.107248	1.039744	3.301435	0.603515	0.532027	1.91829	2.099333	0.363928
S	SO2_IDLEX	0	0	0	0	0.000093	0.000101	0.006364	0.00593	0.005998	0	0	0.006089	0
S	SO2_RUNEX	0.003389	0.003936	0.004621	0.005872	0.007511	0.0061	0.010685	0.016596	0.010818	0.020652	0.002038	0.010739	0.0077
S	SO2_STREX	0.000762	0.000911	0.001053	0.001351	0.000391	0.000178	0.000862	0.00172	0.000531	0.000434	0.000642	0.001874	0.000409
S	TOG_DIURN	0.066108	0.144587	0.107488	0.130731	0.003352	0.001082	0.005068	0.006437	0.001259	0.004761	1.229999	0.046026	1.48329
S	TOG_HTSK	0.119196	0.2226	0.172835	0.23391	0.075202	0.027633	0.13318	0.241912	0.028017	0.067042	0.454382	0.261029	0.072459
S	TOG_IDLEX	0	0	0	0	0.025918	0.017398	0.179183	0.558954	0.453888	0	0	0.099838	0
S	TOG_RESTL	0.052707	0.107373	0.084747	0.10918	0.001735	0.000611	0.002673	0.003983	0.000619	0.002801	0.649278	0.016591	0.543055
S	TOG_RUNEX	0.037927	0.090195	0.06109	0.098294	0.214213	0.178846	0.20521	0.258506	0.192655	0.724258	2.809559	0.388417	0.164024
S	TOG_RUNLS	0.247409	0.670572	0.508614	0.660376	0.507974	0.160887	0.550937	1.215222	0.273048	0.45932	1.331974	2.040352	1.938393
S	TOG_STREX	0.142146	0.280284	0.241659	0.456958	0.297609	0.114574	1.112453	3.531757	0.644577	0.568041	2.060657	2.24144	0.388834
W	FleetMix	0.455853	0.042261	0.214795	0.150173	0.067787	0.00986	0.017887	0.023366	0.002328	0.001394	0.008768	0.000846	0.004683
W	CH4_IDLEX	0	0	0	0	0.001052	0.000707	0.008374	0.026124	0.021213	0	0	0.004666	0
W	CH4_RUNEX	0.010626	0.018864	0.016175	0.026152	0.018971	0.011044	0.007132	0.010188	0.002687	0	0	0.004768	0
W	CH4_STREX	0.009318	0.018416	0.01569	0.029656	0.018677	0.007224	0	0	0	0	0	0	0
W	CO_IDLEX	0	0	0	0	0.156165	0.111445	2.558869	3.966307	3.409761	0	0	1.365593	0
W	CO_RUNEX	0.937864	2.14176	1.501623	2.231135	1.77038	1.064514	0.996563	1.187972	1.589561	3.303978	27.222905	3.902115	3.008894
W	CO_STREX	2.483262	4.926103	4.085166	6.837586	4.664228	1.57594	23.979195	96.272748	14.215861	7.998229	11.782156	44.478722	9.659882
W	CO2_NBIO_IDLEX	0	0	0	0	8.672206	9.668834	540.389244	503.541536	509.323564	0	0	517.07335	0
W	CO2_NBIO_RUNEX	240.462332	294.819637	353.756863	467.532943	711.19144	587.084603	1041.899993	1625.958458	1044.808192	2012.904494	147.36726	1035.071564	725.059698
W	CO2_NBIO_STREX	56.50345	68.962153	82.367368	108.66961	31.300688	14.783612	54.662104	59.164335	34.333317	30.802889	40.973771	119.785627	28.421712
W	NOX_IDLEX	0	0	0	0	0.088688	0.151599	5.598028	4.513414	5.063284	0	0	7.402065	0

Season	EmissionType	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
W	NOX_RUNEX	0.110075	0.251543	0.231976	0.381683	1.791894	2.473301	3.048581	5.411998	3.106044	10.905593	1.27914	7.11634	1.793233
W	NOX_STREX	0.150683	0.264353	0.339729	0.638097	1.002873	0.43884	1.848162	5.924125	1.629747	0.949918	0.32663	3.619346	0.817254
W	PM10_IDLEX	0	0	0	0	0.000957	0.001617	0.026964	0.017124	0.012476	0	0	0.017805	0
W	PM10_PMBW	0.03675	0.03675	0.03675	0.03675	0.055261	0.076699	0.116478	0.059594	0.088597	0.663857	0.036749	0.504719	0.05292
W	PM10_PMTW	0.008	0.008	0.008	0.008	0.009866	0.011048	0.011408	0.034679	0.010216	0.008	0.008	0.010644	0.008691
W	PM10_RUNEX	0.001805	0.002743	0.001997	0.00216	0.021398	0.031045	0.073006	0.077179	0.03551	0.200445	0.000452	0.043024	0.032598
W	PM10_STREX	0.003322	0.004133	0.003581	0.003924	0.000957	0.000346	0.003043	0.005095	0.000814	0.000384	0.001429	0.004235	0.000991
W	PM25_IDLEX	0	0	0	0	0.00088	0.001488	0.024807	0.015754	0.011478	0	0	0.016381	0
W	PM25_PMBW	0.01575	0.01575	0.01575	0.01575	0.023683	0.032871	0.049919	0.02554	0.03797	0.28451	0.01575	0.216308	0.02268
W	PM25_PMTW	0.002	0.002	0.002	0.002	0.002466	0.002762	0.002852	0.00867	0.002554	0.002	0.002	0.002661	0.002173
W	PM25_RUNEX	0.001664	0.002512	0.001845	0.001989	0.019695	0.02856	0.067163	0.071004	0.03267	0.184412	0.000371	0.039595	0.029989
W	PM25_STREX	0.003069	0.003798	0.003314	0.003622	0.000883	0.000313	0.002633	0.004285	0.000737	0.000357	0.001152	0.00393	0.000896
W	ROG_DIURN	0.028613	0.061822	0.046328	0.057427	0.001364	0.000448	0.001955	0.002406	0.000548	0.002238	0.453472	0.019883	0.634462
W	ROG_HTSK	0.125505	0.236395	0.180757	0.242623	0.085515	0.030714	0.155922	0.295878	0.029292	0.076854	0.507226	0.303092	0.09333
W	ROG_IDLEX	0	0	0	0	0.024219	0.015961	0.180298	0.562433	0.456713	0	0	0.100459	0
W	ROG_RESTL	0.022521	0.045233	0.03618	0.047196	0.000797	0.000281	0.001169	0.001658	0.000298	0.001407	0.20324	0.007892	0.271732
W	ROG_RUNEX	0.025691	0.069429	0.041685	0.067346	0.18055	0.154543	0.17857	0.226926	0.161535	0.631017	2.724054	0.327902	0.130287
W	ROG_RUNLS	0.304051	0.899361	0.677016	0.872998	0.584765	0.185859	0.633633	1.370217	0.307321	0.621687	1.796625	2.964701	2.140691
W	ROG_STREX	0.17899	0.35251	0.302578	0.56966	0.360141	0.137761	1.418957	4.630555	0.784153	0.658809	2.475428	2.471085	0.501972
W	SO2_IDLEX	0	0	0	0	0.000093	0.000101	0.005514	0.005138	0.005197	0	0	0.005276	0
W	SO2_RUNEX	0.003223	0.003753	0.004402	0.005595	0.00751	0.0061	0.010684	0.016595	0.010817	0.02065	0.002089	0.010737	0.007698
W	SO2_STREX	0.000776	0.000938	0.001077	0.001389	0.000419	0.000187	0.001005	0.002289	0.000614	0.000475	0.000701	0.002055	0.000471
W	TOG_DIURN	0.028613	0.061822	0.046328	0.057427	0.001364	0.000448	0.001955	0.002406	0.000548	0.002238	0.453472	0.019883	0.634462
W	TOG_HTSK	0.125505	0.236395	0.180757	0.242623	0.085515	0.030714	0.155922	0.295878	0.029292	0.076854	0.507226	0.303092	0.09333
W	TOG_IDLEX	0	0	0	0	0.025918	0.017398	0.205256	0.640287	0.519933	0	0	0.114365	0
W	TOG_RESTL	0.022521	0.045233	0.03618	0.047196	0.000797	0.000281	0.001169	0.001658	0.000298	0.001407	0.20324	0.007892	0.271732
W	TOG_RUNEX	0.036605	0.089219	0.058329	0.094296	0.209053	0.178336	0.20435	0.258201	0.189202	0.706738	2.978946	0.376183	0.159287
W	TOG_RUNLS	0.304051	0.899361	0.677016	0.872998	0.584765	0.185859	0.633633	1.370217	0.307321	0.621687	1.796625	2.964701	2.140691
W	TOG_STREX	0.191195	0.376615	0.323112	0.608409	0.384575	0.147184	1.518457	4.954149	0.837548	0.703405	2.659649	2.638357	0.536358

RoadPercentPave	RoadSiltLoading	MaterialSiltContent	MaterialMoistureContent	MobileAverageVehicleWeight	MeanVehicleSpeed
100	0.1	4.3	0.5	2.4	40

WoodstovesLandUseSubType	NumberConventional	NumberCatalytic	NumberNoncatalytic	NumberPellet	WoodstoveDayYear	WoodstoveWoodMass
Apartments Mid Rise	0	0	0	0	60	2016.5

FireplacesLandUseSubType	NumberWood	NumberGas	NumberPropane	NumberNoFireplace	FireplaceHourDay	FireplaceDayYear	FireplaceWoodMass
Apartments Mid Rise	0	0	0	0	0	0	0

ROG_EF

0.000013

Area_EF_Residential_Interior	Area_Residential_Interior	Area_EF_Residential_Exterior	Area_Residential_Exterior	Area_EF_Nonresidential_Interior	Area_Nonresidential_Interior	Area_EF_Nonresidential_Exterior	Area_Nonresidential_Exterior	ReapplicationRatePercent
250	911250	250	303750	250	311730	250	103910	10

NumberSnowDays	NumberSummerDays
0	330

EnergyUseLandUseSubType	T24E	NT24E	LightingElect	T24NG	NT24NG
Apartments Mid Rise	226.57	2558.55	741.44	6391.64	1735.98
Convenience Market (24 Hour)	3.37	2.68	5.64	2.49	0
Enclosed Parking with Elevator	3.92	0.19	2.63	0	0
Parking Lot	0	0	0.88	0	0

WaterLandUseSubType	WaterLandUseSizeMetric	IndoorWaterUseRate	OutdoorWaterUseRate	ElectricityIntensityFactorToSupply	ElectricityIntensityFactorToTreat	ElectricityIntensityFactorToDistribute	ElectricityIntensityFactorForWastewaterTreatment	SepticTankPercent	AerobicPercent	AnaerobicandFacultativeLagoonsPercent	AnaDigestCombDigestGasPercent	AnaDigestCogenCombDigestGasPercent
Apartments Mid Rise	Dwelling Unit	48083670.91	30313618.62	2117	111	1272	1911	10.33	87.46	2.21	100	0
Convenience Market (24 Hour)	1000sqft	370362.61	226996.44	2117	111	1272	1911	10.33	87.46	2.21	100	0
Enclosed Parking with Elevator	Space	0	0	2117	111	1272	1911	10.33	87.46	2.21	100	0
Parking Lot	1000sqft	0	0	2117	111	1272	1911	10.33	87.46	2.21	100	0

SolidWasteLandUseSubType	SolidWasteLandUseSizeMetric	SolidWasteGenerationRate	LandfillNoGasCapture	LandfillCaptureGasFlare	LandfillCaptureGasEnergyRecovery
Apartments Mid Rise	Dwelling Unit	339.48	6	94	0
Convenience Market (24 Hour)	1000sqft	15.03	6	94	0
Enclosed Parking with Elevator	Space	0	6	94	0
Parking Lot	1000sqft	0	6	94	0

VegetationLandUseType	VegetationLandUseSubType	AcresBegin	AcresEnd	CO2peracre
Grassland	Grassland	0	5.1	4.31

BroadSpeciesClass	NumberOfNewTrees	CO2perTree

ConstMitigationEquipmentType	FuelType	Tier	NumberOfEquipmentMitigated	TotalNumberOfEquipmentMitigated	DPF	OxidationCatalyst
Air Compressors	Diesel	Tier 3	1	1	No Change	0
Concrete/Industrial Saws	Diesel	Tier 3	1	1	No Change	0
Cranes	Diesel	Tier 3	1	1	No Change	0
Excavators	Diesel	Tier 3	5	5	No Change	0
Forklifts	Diesel	Tier 3	3	3	No Change	0
Generator Sets	Diesel	Tier 3	1	1	No Change	0
Graders	Diesel	Tier 3	1	1	No Change	0
Pavers	Diesel	Tier 3	2	2	No Change	0
Paving Equipment	Diesel	Tier 3	2	2	No Change	0
Rollers	Diesel	Tier 3	2	2	No Change	0
Rubber Tired Dozers	Diesel	Tier 3	6	6	No Change	0
Scrapers	Diesel	Tier 3	2	2	No Change	0
Tractors/Loaders/Backhoes	Diesel	Tier 3	9	9	No Change	0
Welders	Diesel	Tier 3	1	1	No Change	0

SoilStabilizerCheck	SoilStabilizerPM10PercentReduction	SoilStabilizerPM25PercentReduction	ReplaceGroundCoverCheck	ReplaceGroundCoverPM10PercentReduction	ReplaceGroundCoverPM25PercentReduction	WaterExposedAreaCheck	WaterExposedAreaFrequency	WaterExposedAreaPM10PercentReduction	WaterExposedAreaPM25PercentReduction	WaterUnpavedRoadMoistureContentCheck	WaterUnpavedRoadVehicleSpeedCheck	WaterUnpavedRoadMoistureContent	WaterUnpavedRoadVehicleSpeed	CleanPavedRoadPercentReduction
0	0	0	0	0	0	0		0	0	0	0	0	0	0

ProjectSetting	IncreaseDensityCheck
	IncreaseDensityDUPerAcre
	IncreaseDensityJobPerAcre
	IncreaseDiversityCheck
	ImproveWalkabilityDesignCheck
	ImproveWalkabilityDesignIntersections
	ImproveDestinationAccessibilityCheck
	ImproveDestinationAccessibilityDistance
	IncreaseTransitAccessibilityCheck
	IncreaseTransitAccessibilityDistance
	IntegrateBelowMarketRateHousingCheck
	IntegrateBelowMarketRateHousingDU
	ImprovePedestrianNetworkCheck
	ImprovePedestrianNetworkSelection
	ProvideTrafficCalmingMeasuresCheck
	ProvideTrafficCalmingMeasuresPercentStreet
	ProvideTrafficCalmingMeasuresPercentIntersection
	ImplementNEVNetworkCheck
	ImplementNEVNetworkNumber
	LimitParkingSupplyCheck
	LimitParkingSupplySpacePercentReduction
	UnbundleParkingCostCheck
	UnbundleParkingCostCost
	OnStreetMarketPricingCheck
	OnStreetMarketPricingPricePercentIncrease
	ProvideBRTSystemCheck
	ProvideBRTSystemPercentBRT
	ExpandTransitNetworkCheck
	ExpandTransitNetworkTransitCoveragePercentIncrease
	IncreaseTransitFrequencyCheck
	IncreaseTransitFrequencyImplementationLevel
	IncreaseTransitFrequencyHeadwaysPercentReduction

ImplementTripReductionProgramCheck	ImplementTripReductionProgramPercentEmployee	ImplementTripReductionProgramType	TransitSubsidyCheck	TransitSubsidyPercentEmployee	TransitSubsidyDailySubsidyAmount	ImplementEmployeeParkingCashOutCheck	ImplementEmployeeParkingCashOutPercentEmployee	WorkplaceParkingChargeCheck	WorkplaceParkingChargePercentEmployee	WorkplaceParkingChargeCost	EncourageTelecommutingCheck	EncourageTelecommutingPercentEmployee9_80	EncourageTelecommutingPercentEmployee4_40	EncourageTelecommutingPercentEmployee1_5days	MarketCommuteTripReductionOptionCheck	MarketCommuteTripReductionOptionPercentEmployee	EmployeeVanpoolCheck	EmployeeVanpoolPercentEmployee	EmployeeVanpoolPercentModeShare	ProvideRideSharingProgramCheck	ProvideRideSharingProgramPercentEmployee	ImplementSchoolBusProgramCheck	ImplementSchoolBusProgramPercentFamilyUsing
0			0			0		0			0				0		0		2	0		0	

LandscapeLawnmowerCheck	LandscapeLawnmowerPercentElectric	LandscapeLeafblowerCheck	LandscapeLeafblowerPercentElectric	LandscapeChainsawCheck	LandscapeChainsawPercentElectric	UseLowVOCPaintResidentialInteriorCheck	UseLowVOCPaintResidentialInteriorValue	UseLowVOCPaintResidentialExteriorCheck	UseLowVOCPaintResidentialExteriorValue	UseLowVOCPaintNonresidentialInteriorCheck	UseLowVOCPaintNonresidentialInteriorValue	UseLowVOCPaintNonresidentialExteriorCheck	UseLowVOCPaintNonresidentialExteriorValue	HearthOnlyNaturalGasHearthCheck	NoHearthCheck	UseLowVOCCleaningSuppliesCheck
	0	0	0	0	0	0	1	50	1	50	1	100	1	100	0	0	0

ExceedTitle24Check	ExceedTitle24CheckPercentImprovement
	InstallHighEfficiencyLightingCheck
	InstallHighEfficiencyLightingPercentEnergyReduction
	OnSiteRenewableEnergyCheck
	KwhGeneratedCheck
	KwhGenerated
	PercentOfElectricityUseGeneratedCheck
	PercentOfElectricityUseGenerated

ApplianceType	ApplianceLandUseSubType	PercentImprovement
ClothWasher		30
DishWasher		15
Fan		50
Refrigerator		15

ApplyWaterConservationStrategyCheck	ApplyWaterConservationStrategyPercentReductionIndoor	ApplyWaterConservationStrategyPercentReductionOutdoor	UseReclaimedWaterCheck	PercentOutdoorReclaimedWaterUse	PercentIndoorReclaimedWaterUse	UseGreyWaterCheck	PercentOutdoorGreyWaterUse	PercentIndoorGreyWaterUse	InstallLowFlowBathroomFaucetCheck	PercentReductionInFlowBathroomFaucet	InstallLowFlowKitchenFaucetCheck	PercentReductionInFlowKitchenFaucet	InstallLowFlowToiletCheck	PercentReductionInFlowToilet	InstallLowFlowShowerCheck	PercentReductionInFlowShower	TurfReductionCheck	TurfReductionTurfArea	TurfReductionPercentReduction	UseWaterEfficientIrrigationSystemCheck	UseWaterEfficientIrrigationSystemPercentReduction	WaterEfficientLandscapeCheck	MAWA	ETWU
1	20	50	0	0	0	0	0	0	0	32	0	18	0	20	0	20	0	0	0	0	6.1	0	0	0

InstituteRecyclingAndCompostingServicesCheck	InstituteRecyclingAndCompostingServicesWastePercentReduction

OperOffRoadEquipmentType	OperOffRoadEquipmentNumber	OperHoursPerDay	OperDaysPerYear	OperHorsePower	OperLoadFactor	OperFuelType

SubModuleID	PhaseName	Season	Remarks
1			
3			Please see text.
4			Please see text.
5	Architectural Coating		Please see text.
6			Please see text.
9			
10			Please see text.
12			Please see text.
17			Please see text.
18			Please see text.
23			
25			Please see text.
29			Please see text.
32			

California Polytechnic University, San Luis Obispo: Student Housing South

San Luis Obispo County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	500.00	Space	1.20	200,000.00	0
Parking Lot	94.00	1000sqft	2.16	94,000.00	0
Apartments Mid Rise	738.00	Dwelling Unit	8.50	450,000.00	1475
Convenience Market (24 Hour)	5.00	1000sqft	0.11	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Please see text.

Construction Phase - Please see text.

Trips and VMT - Please see text.

Grading -

Architectural Coating - Please see text.

Vehicle Trips - Please see text.

Consumer Products - Please see text.

Area Coating - Please see text.

Land Use Change -

Construction Off-road Equipment Mitigation - Please see text.

Area Mitigation - Please see text.

Water Mitigation -

Off-road Equipment - Please see text.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	250	100
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	250	50
tblAreaMitigation	UseLowVOCPaintResidentialInteriorValue	250	50
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	20.00	44.00
tblConstructionPhase	NumDays	300.00	570.00
tblConsumerProducts	ROG_EF	2.14E-05	1.3E-05
tblGrading	MaterialExported	0.00	98,000.00

tblLandUse	LandUseSquareFeet	738,000.00	450,000.00
tblLandUse	LotAcreage	4.50	1.20
tblLandUse	LotAcreage	19.42	8.50
tblLandUse	Population	2,111.00	1,475.00
tblOffRoadEquipment	UsageHours	6.00	2.70
tblProjectCharacteristics	OperationalYear	2014	2018
tblTripsAndVMT	HaulingTripLength	20.00	10.00
tblVehicleTrips	ST_TR	7.16	1.10
tblVehicleTrips	ST_TR	863.10	0.00
tblVehicleTrips	SU_TR	6.07	1.10
tblVehicleTrips	SU_TR	758.45	0.00
tblVehicleTrips	WD_TR	6.59	1.10
tblVehicleTrips	WD_TR	737.99	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					
2015	1.2062	7.9493	11.5792	0.0160	0.9788	0.3514	1.3302	0.3057	0.3278	0.6335	0.0000	1,373.5845	1,373.5845	0.1443	0.0000	1,376.6155
2016	1.0513	5.7066	10.3062	0.0156	0.8986	0.2825	1.1811	0.2403	0.2648	0.5052	0.0000	1,275.6473	1,275.6473	0.1228	0.0000	1,278.2252
2017	2.7934	2.4040	4.1870	7.0400e-003	0.4010	0.1188	0.5198	0.1072	0.1112	0.2184	0.0000	560.3999	560.3999	0.0562	0.0000	561.5793
Total	**5.0509**	**16.0599**	**26.0725**	**0.0387**	**2.2783**	**0.7527**	**3.0310**	**0.6533**	**0.7039**	**1.3571**	**0.0000**	**3,209.6317**	**3,209.6317**	**0.3233**	**0.0000**	**3,216.4200**

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					
2015	0.7698	5.1336	11.0882	0.0160	0.9788	0.1658	1.1445	0.3057	0.1623	0.4681	0.0000	1,373.5841	1,373.5841	0.1443	0.0000	1,376.6150
2016	0.6943	3.8362	10.2161	0.0156	0.8986	0.1434	1.0420	0.2403	0.1413	0.3816	0.0000	1,275.6469	1,275.6469	0.1228	0.0000	1,278.2248
2017	2.6459	1.6430	4.1917	7.0400e-003	0.4010	0.0651	0.4661	0.1072	0.0643	0.1715	0.0000	560.3997	560.3997	0.0562	0.0000	561.5792
Total	**4.1100**	**10.6129**	**25.4959**	**0.0387**	**2.2783**	**0.3743**	**2.6526**	**0.6533**	**0.3679**	**1.0212**	**0.0000**	**3,209.6307**	**3,209.6307**	**0.3233**	**0.0000**	**3,216.4190**

	ROG	NOx	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	**18.63**	**33.92**	**2.21**	**0.00**	**0.00**	**50.27**	**12.48**	**0.00**	**47.73**	**24.76**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	3.0346	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725
Energy	0.0324	0.2770	0.1181	1.7700e-003		0.0224	0.0224		0.0224	0.0224	0.0000	1,511.0935	1,511.0935	0.0600	0.0170	1,517.6280
Mobile	0.5586	1.4720	5.5753	0.0111	0.7767	0.0175	0.7942	0.2082	0.0161	0.2243	0.0000	835.3562	835.3562	0.0350	0.0000	836.0904
Waste						0.0000	0.0000		0.0000	0.0000	71.9623	0.0000	71.9623	4.2529	0.0000	161.2722
Water						0.0000	0.0000		0.0000	0.0000	15.3722	107.3687	122.7409	1.5837	0.0383	167.8677
Total	**3.6256**	**1.8665**	**15.8209**	**0.0134**	**0.7767**	**0.0952**	**0.8718**	**0.2082**	**0.0938**	**0.3019**	**87.3346**	**2,470.2483**	**2,557.5828**	**5.9478**	**0.0553**	**2,699.6307**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	2.3270	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725
Energy	0.0324	0.2770	0.1181	1.7700e-003		0.0224	0.0224		0.0224	0.0224	0.0000	1,511.0935	1,511.0935	0.0600	0.0170	1,517.6280
Mobile	0.5586	1.4720	5.5753	0.0111	0.7767	0.0175	0.7942	0.2082	0.0161	0.2243	0.0000	835.3562	835.3562	0.0350	0.0000	836.0904
Waste						0.0000	0.0000		0.0000	0.0000	71.9623	0.0000	71.9623	4.2529	0.0000	161.2722
Water						0.0000	0.0000		0.0000	0.0000	12.2978	71.4698	83.7676	1.2663	0.0305	119.8134
Total	**2.9180**	**1.8665**	**15.8209**	**0.0134**	**0.7767**	**0.0952**	**0.8718**	**0.2082**	**0.0938**	**0.3019**	**84.2601**	**2,434.3493**	**2,518.6095**	**5.6304**	**0.0475**	**2,651.5765**

	ROG	NOx	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	**19.52**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.52**	**1.45**	**1.52**	**5.34**	**14.10**	**1.78**

2.3 Vegetation

Vegetation

	CO2e
Category	MT
Vegetation Land Change	21.9810
Total	**21.9810**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2015	1/28/2015	5	20	
2	Site Preparation	Site Preparation	1/29/2015	2/11/2015	5	10	
3	Grading	Grading	2/12/2015	3/25/2015	5	30	
4	Building Construction	Building Construction	3/26/2015	5/31/2017	5	570	
5	Paving	Paving	6/1/2017	6/28/2017	5	20	
6	Architectural Coating	Architectural Coating	6/29/2017	8/29/2017	5	44	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 0

Residential Indoor: 911,250; Residential Outdoor: 303,750; Non-Residential Indoor: 311,730; Non-Residential Outdoor: 103,910 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	2.70	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
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	12,250.00	13.00	5.00	10.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	656.00	128.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	131.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Demolition - 2015

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	0.0451	0.4836	0.3607	4.0000e-004		0.0245	0.0245		0.0229	0.0229	0.0000	37.4413	37.4413	0.0102	0.0000	37.6544
Total	**0.0451**	**0.4836**	**0.3607**	**4.0000e-004**		**0.0245**	**0.0245**		**0.0229**	**0.0229**	**0.0000**	**37.4413**	**37.4413**	**0.0102**	**0.0000**	**37.6544**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-004	1.2300e-003	0.0111	2.0000e-005	1.4400e-003	1.0000e-005	1.4600e-003	3.8000e-004	1.0000e-005	4.0000e-004	0.0000	1.2772	1.2772	8.0000e-005	0.0000	1.2790
Total	**8.0000e-004**	**1.2300e-003**	**0.0111**	**2.0000e-005**	**1.4400e-003**	**1.0000e-005**	**1.4600e-003**	**3.8000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**1.2772**	**1.2772**	**8.0000e-005**	**0.0000**	**1.2790**

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	9.4800e-003	0.1876	0.2527	4.0000e-004		8.8200e-003	8.8200e-003		8.8200e-003	8.8200e-003	0.0000	37.4412	37.4412	0.0102	0.0000	37.6544
Total	**9.4800e-003**	**0.1876**	**0.2527**	**4.0000e-004**		**8.8200e-003**	**8.8200e-003**		**8.8200e-003**	**8.8200e-003**	**0.0000**	**37.4412**	**37.4412**	**0.0102**	**0.0000**	**37.6544**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-004	1.2300e-003	0.0111	2.0000e-005	1.4400e-003	1.0000e-005	1.4600e-003	3.8000e-004	1.0000e-005	4.0000e-004	0.0000	1.2772	1.2772	8.0000e-005	0.0000	1.2790
Total	**8.0000e-004**	**1.2300e-003**	**0.0111**	**2.0000e-005**	**1.4400e-003**	**1.0000e-005**	**1.4600e-003**	**3.8000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**1.2772**	**1.2772**	**8.0000e-005**	**0.0000**	**1.2790**

3.3 Site Preparation - 2015

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0263	0.2845	0.2132	2.0000e-004		0.0154	0.0154		0.0142	0.0142	0.0000	18.6506	18.6506	5.5700e-003	0.0000	18.7675
Total	**0.0263**	**0.2845**	**0.2132**	**2.0000e-004**	**0.0903**	**0.0154**	**0.1058**	**0.0497**	**0.0142**	**0.0639**	**0.0000**	**18.6506**	**18.6506**	**5.5700e-003**	**0.0000**	**18.7675**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	7.4000e-004	6.6600e-003	1.0000e-005	8.7000e-004	1.0000e-005	8.7000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.7663	0.7663	5.0000e-005	0.0000	0.7674
Total	**4.8000e-004**	**7.4000e-004**	**6.6600e-003**	**1.0000e-005**	**8.7000e-004**	**1.0000e-005**	**8.7000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7663**	**0.7663**	**5.0000e-005**	**0.0000**	**0.7674**

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.7600e-003	0.0973	0.1170	2.0000e-004		4.8100e-003	4.8100e-003		4.8100e-003	4.8100e-003	0.0000	18.6505	18.6505	5.5700e-003	0.0000	18.7675
Total	**4.7600e-003**	**0.0973**	**0.1170**	**2.0000e-004**	**0.0903**	**4.8100e-003**	**0.0951**	**0.0497**	**4.8100e-003**	**0.0545**	**0.0000**	**18.6505**	**18.6505**	**5.5700e-003**	**0.0000**	**18.7675**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	7.4000e-004	6.6600e-003	1.0000e-005	8.7000e-004	1.0000e-005	8.7000e-004	2.3000e-004	1.0000e-005	2.4000e-004	0.0000	0.7663	0.7663	5.0000e-005	0.0000	0.7674
Total	**4.8000e-004**	**7.4000e-004**	**6.6600e-003**	**1.0000e-005**	**8.7000e-004**	**1.0000e-005**	**8.7000e-004**	**2.3000e-004**	**1.0000e-005**	**2.4000e-004**	**0.0000**	**0.7663**	**0.7663**	**5.0000e-005**	**0.0000**	**0.7674**

3.4 Grading - 2015

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					0.1391	0.0000	0.1391	0.0553	0.0000	0.0553	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1016	1.1857	0.7626	9.3000e-004		0.0570	0.0570		0.0525	0.0525	0.0000	88.2633	88.2633	0.0264	0.0000	88.8167
Total	**0.1016**	**1.1857**	**0.7626**	**9.3000e-004**	**0.1391**	**0.0570**	**0.1962**	**0.0553**	**0.0525**	**0.1078**	**0.0000**	**88.2633**	**88.2633**	**0.0264**	**0.0000**	**88.8167**

3.4 Grading - 2015

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	0.1314	1.2330	1.4780	2.3800e-003	0.0521	0.0175	0.0696	0.0143	0.0161	0.0304	0.0000	218.1672	218.1672	1.9400e-003	0.0000	218.2079
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	1.6000e-003	2.4500e-003	0.0222	3.0000e-005	2.8900e-003	3.0000e-005	2.9100e-003	7.7000e-004	2.0000e-005	7.9000e-004	0.0000	2.5544	2.5544	1.7000e-004	0.0000	2.5579
Total	**0.1330**	**1.2354**	**1.5002**	**2.4100e-003**	**0.0550**	**0.0175**	**0.0725**	**0.0151**	**0.0161**	**0.0312**	**0.0000**	**220.7216**	**220.7216**	**2.1100e-003**	**0.0000**	**220.7658**

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					0.1391	0.0000	0.1391	0.0553	0.0000	0.0553	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0227	0.4467	0.5692	9.3000e-004		0.0199	0.0199		0.0199	0.0199	0.0000	88.2632	88.2632	0.0264	0.0000	88.8166
Total	**0.0227**	**0.4467**	**0.5692**	**9.3000e-004**	**0.1391**	**0.0199**	**0.1590**	**0.0553**	**0.0199**	**0.0752**	**0.0000**	**88.2632**	**88.2632**	**0.0264**	**0.0000**	**88.8166**

3.4 Grading - 2015

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	0.1314	1.2330	1.4780	2.3800e-003	0.0521	0.0175	0.0696	0.0143	0.0161	0.0304	0.0000	218.1672	218.1672	1.9400e-003	0.0000	218.2079
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	1.6000e-003	2.4500e-003	0.0222	3.0000e-005	2.8900e-003	3.0000e-005	2.9100e-003	7.7000e-004	2.0000e-005	7.9000e-004	0.0000	2.5544	2.5544	1.7000e-004	0.0000	2.5579
Total	**0.1330**	**1.2354**	**1.5002**	**2.4100e-003**	**0.0550**	**0.0175**	**0.0725**	**0.0151**	**0.0161**	**0.0312**	**0.0000**	**220.7216**	**220.7216**	**2.1100e-003**	**0.0000**	**220.7658**

3.5 Building Construction - 2015

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	0.3677	3.0180	1.8838	2.7000e-003		0.2127	0.2127		0.2000	0.2000	0.0000	245.2143	245.2143	0.0615	0.0000	246.5063
Total	**0.3677**	**3.0180**	**1.8838**	**2.7000e-003**		**0.2127**	**0.2127**		**0.2000**	**0.2000**	**0.0000**	**245.2143**	**245.2143**	**0.0615**	**0.0000**	**246.5063**

3.5 Building Construction - 2015

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	0.1788	1.2007	1.9648	2.1900e-003	0.0573	0.0186	0.0759	0.0164	0.0171	0.0335	0.0000	199.8891	199.8891	1.9400e-003	0.0000	199.9299
Worker	0.3523	0.5394	4.8761	7.1700e-003	0.6347	5.5800e-003	0.6403	0.1687	5.0200e-003	0.1737	0.0000	561.3609	561.3609	0.0366	0.0000	562.1286
Total	**0.5311**	**1.7401**	**6.8410**	**9.3600e-003**	**0.6920**	**0.0242**	**0.7162**	**0.1851**	**0.0221**	**0.2072**	**0.0000**	**761.2499**	**761.2499**	**0.0385**	**0.0000**	**762.0585**

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	0.0675	1.4245	1.7905	2.7000e-003		0.0906	0.0906		0.0906	0.0906	0.0000	245.2140	245.2140	0.0615	0.0000	246.5060
Total	**0.0675**	**1.4245**	**1.7905**	**2.7000e-003**		**0.0906**	**0.0906**		**0.0906**	**0.0906**	**0.0000**	**245.2140**	**245.2140**	**0.0615**	**0.0000**	**246.5060**

3.5 Building Construction - 2015

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	0.1788	1.2007	1.9648	2.1900e-003	0.0573	0.0186	0.0759	0.0164	0.0171	0.0335	0.0000	199.8891	199.8891	1.9400e-003	0.0000	199.9299
Worker	0.3523	0.5394	4.8761	7.1700e-003	0.6347	5.5800e-003	0.6403	0.1687	5.0200e-003	0.1737	0.0000	561.3609	561.3609	0.0366	0.0000	562.1286
Total	**0.5311**	**1.7401**	**6.8410**	**9.3600e-003**	**0.6920**	**0.0242**	**0.7162**	**0.1851**	**0.0221**	**0.2072**	**0.0000**	**761.2499**	**761.2499**	**0.0385**	**0.0000**	**762.0585**

3.5 Building Construction - 2016

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	0.4445	3.7201	2.4151	3.5000e-003		0.2567	0.2567		0.2412	0.2412	0.0000	316.0104	316.0104	0.0784	0.0000	317.6563
Total	**0.4445**	**3.7201**	**2.4151**	**3.5000e-003**		**0.2567**	**0.2567**		**0.2412**	**0.2412**	**0.0000**	**316.0104**	**316.0104**	**0.0784**	**0.0000**	**317.6563**

3.5 Building Construction - 2016

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	0.2175	1.3749	2.4427	2.8400e-003	0.0744	0.0191	0.0935	0.0213	0.0176	0.0389	0.0000	256.7584	256.7584	2.1900e-003	0.0000	256.8044
Worker	0.3892	0.6116	5.4485	9.2900e-003	0.8242	6.6400e-003	0.8308	0.2190	6.0200e-003	0.2250	0.0000	702.8785	702.8785	0.0422	0.0000	703.7645
Total	**0.6068**	**1.9865**	**7.8911**	**0.0121**	**0.8986**	**0.0258**	**0.9243**	**0.2403**	**0.0236**	**0.2639**	**0.0000**	**959.6368**	**959.6368**	**0.0444**	**0.0000**	**960.5689**

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	0.0876	1.8497	2.3249	3.5000e-003		0.1177	0.1177		0.1177	0.1177	0.0000	316.0101	316.0101	0.0784	0.0000	317.6560
Total	**0.0876**	**1.8497**	**2.3249**	**3.5000e-003**		**0.1177**	**0.1177**		**0.1177**	**0.1177**	**0.0000**	**316.0101**	**316.0101**	**0.0784**	**0.0000**	**317.6560**

3.5 Building Construction - 2016

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	0.2175	1.3749	2.4427	2.8400e-003	0.0744	0.0191	0.0935	0.0213	0.0176	0.0389	0.0000	256.7584	256.7584	2.1900e-003	0.0000	256.8044
Worker	0.3892	0.6116	5.4485	9.2900e-003	0.8242	6.6400e-003	0.8308	0.2190	6.0200e-003	0.2250	0.0000	702.8785	702.8785	0.0422	0.0000	703.7645
Total	**0.6068**	**1.9865**	**7.8911**	**0.0121**	**0.8986**	**0.0258**	**0.9243**	**0.2403**	**0.0236**	**0.2639**	**0.0000**	**959.6368**	**959.6368**	**0.0444**	**0.0000**	**960.5689**

3.5 Building Construction - 2017

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	0.1675	1.4259	0.9790	1.4500e-003		0.0962	0.0962		0.0903	0.0903	0.0000	129.3187	129.3187	0.0318	0.0000	129.9871
Total	**0.1675**	**1.4259**	**0.9790**	**1.4500e-003**		**0.0962**	**0.0962**		**0.0903**	**0.0903**	**0.0000**	**129.3187**	**129.3187**	**0.0318**	**0.0000**	**129.9871**

3.5 Building Construction - 2017

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	0.0825	0.5139	0.9488	1.1700e-003	0.0308	6.7000e-003	0.0375	8.8200e-003	6.1600e-003	0.0150	0.0000	104.4699	104.4699	8.5000e-004	0.0000	104.4877
Worker	0.1355	0.2208	1.9284	3.8400e-003	0.3410	2.5500e-003	0.3436	0.0906	2.3300e-003	0.0930	0.0000	279.4698	279.4698	0.0156	0.0000	279.7964
Total	**0.2180**	**0.7346**	**2.8772**	**5.0100e-003**	**0.3718**	**9.2500e-003**	**0.3811**	**0.0995**	**8.4900e-003**	**0.1079**	**0.0000**	**383.9397**	**383.9397**	**0.0164**	**0.0000**	**384.2841**

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	0.0363	0.7654	0.9620	1.4500e-003		0.0487	0.0487		0.0487	0.0487	0.0000	129.3186	129.3186	0.0318	0.0000	129.9869
Total	**0.0363**	**0.7654**	**0.9620**	**1.4500e-003**		**0.0487**	**0.0487**		**0.0487**	**0.0487**	**0.0000**	**129.3186**	**129.3186**	**0.0318**	**0.0000**	**129.9869**

3.5 Building Construction - 2017

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	0.0825	0.5139	0.9488	1.1700e-003	0.0308	6.7000e-003	0.0375	8.8200e-003	6.1600e-003	0.0150	0.0000	104.4699	104.4699	8.5000e-004	0.0000	104.4877
Worker	0.1355	0.2208	1.9284	3.8400e-003	0.3410	2.5500e-003	0.3436	0.0906	2.3300e-003	0.0930	0.0000	279.4698	279.4698	0.0156	0.0000	279.7964
Total	**0.2180**	**0.7346**	**2.8772**	**5.0100e-003**	**0.3718**	**9.2500e-003**	**0.3811**	**0.0995**	**8.4900e-003**	**0.1079**	**0.0000**	**383.9397**	**383.9397**	**0.0164**	**0.0000**	**384.2841**

3.6 Paving - 2017

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	0.0191	0.2030	0.1473	2.2000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8266
Paving	2.8300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0219**	**0.2030**	**0.1473**	**2.2000e-004**		**0.0114**	**0.0114**		**0.0105**	**0.0105**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8266**

3.6 Paving - 2017

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	5.7000e-004	9.3000e-004	8.1700e-003	2.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1834	1.1834	7.0000e-005	0.0000	1.1848
Total	**5.7000e-004**	**9.3000e-004**	**8.1700e-003**	**2.0000e-005**	**1.4400e-003**	**1.0000e-005**	**1.4500e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1834**	**1.1834**	**7.0000e-005**	**0.0000**	**1.1848**

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	5.4900e-003	0.1106	0.1693	2.2000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8265
Paving	2.8300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.3200e-003**	**0.1106**	**0.1693**	**2.2000e-004**		**5.9800e-003**	**5.9800e-003**		**5.9800e-003**	**5.9800e-003**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8265**

3.6 Paving - 2017

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	5.7000e-004	9.3000e-004	8.1700e-003	2.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1834	1.1834	7.0000e-005	0.0000	1.1848
Total	**5.7000e-004**	**9.3000e-004**	**8.1700e-003**	**2.0000e-005**	**1.4400e-003**	**1.0000e-005**	**1.4500e-003**	**3.8000e-004**	**1.0000e-005**	**3.9000e-004**	**0.0000**	**1.1834**	**1.1834**	**7.0000e-005**	**0.0000**	**1.1848**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.3711					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2900e-003	0.0216	0.0185	3.0000e-005		1.7200e-003	1.7200e-003		1.7200e-003	1.7200e-003	0.0000	2.5277	2.5277	2.7000e-004	0.0000	2.5333
Total	**2.3744**	**0.0216**	**0.0185**	**3.0000e-005**		**1.7200e-003**	**1.7200e-003**		**1.7200e-003**	**1.7200e-003**	**0.0000**	**2.5277**	**2.5277**	**2.7000e-004**	**0.0000**	**2.5333**

3.7 Architectural Coating - 2017

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	0.0110	0.0180	0.1569	3.1000e-004	0.0278	2.1000e-004	0.0280	7.3700e-003	1.9000e-004	7.5600e-003	0.0000	22.7369	22.7369	1.2700e-003	0.0000	22.7635
Total	**0.0110**	**0.0180**	**0.1569**	**3.1000e-004**	**0.0278**	**2.1000e-004**	**0.0280**	**7.3700e-003**	**1.9000e-004**	**7.5600e-003**	**0.0000**	**22.7369**	**22.7369**	**1.2700e-003**	**0.0000**	**22.7635**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.3711					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.9000e-004	0.0134	0.0181	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5277	2.5277	2.7000e-004	0.0000	2.5333
Total	**2.3717**	**0.0134**	**0.0181**	**3.0000e-005**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.5277**	**2.5277**	**2.7000e-004**	**0.0000**	**2.5333**

3.7 Architectural Coating - 2017

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	0.0110	0.0180	0.1569	3.1000e-004	0.0278	2.1000e-004	0.0280	7.3700e-003	1.9000e-004	7.5600e-003	0.0000	22.7369	22.7369	1.2700e-003	0.0000	22.7635
Total	**0.0110**	**0.0180**	**0.1569**	**3.1000e-004**	**0.0278**	**2.1000e-004**	**0.0280**	**7.3700e-003**	**1.9000e-004**	**7.5600e-003**	**0.0000**	**22.7369**	**22.7369**	**1.2700e-003**	**0.0000**	**22.7635**

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	0.5586	1.4720	5.5753	0.0111	0.7767	0.0175	0.7942	0.2082	0.0161	0.2243	0.0000	835.3562	835.3562	0.0350	0.0000	836.0904
Unmitigated	0.5586	1.4720	5.5753	0.0111	0.7767	0.0175	0.7942	0.2082	0.0161	0.2243	0.0000	835.3562	835.3562	0.0350	0.0000	836.0904

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	811.80	811.80	811.80	2,063,236	2,063,236
Convenience Market (24 Hour)	0.00	0.00	0.00		
Enclosed Parking with Elevator	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	811.80	811.80	811.80	2,063,236	2,063,236

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	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Convenience Market (24 Hour)	13.00	5.00	5.00	0.90	80.10	19.00	24	15	61
Enclosed Parking with Elevator	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0
Parking Lot	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.455853	0.042261	0.214795	0.150173	0.067787	0.009860	0.017887	0.023366	0.002328	0.001394	0.008768	0.000846	0.004683

5.0 Energy Detail

4.4 Fleet Mix

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	1,190.3432	1,190.3432	0.0538	0.0111	1,194.9256
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,190.3432	1,190.3432	0.0538	0.0111	1,194.9256
NaturalGas Mitigated	0.0324	0.2770	0.1181	1.7700e-003		0.0224	0.0224		0.0224	0.0224	0.0000	320.7503	320.7503	6.1500e-003	5.8800e-003	322.7023
NaturalGas Unmitigated	0.0324	0.2770	0.1181	1.7700e-003		0.0224	0.0224		0.0224	0.0224	0.0000	320.7503	320.7503	6.1500e-003	5.8800e-003	322.7023

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					
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
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
Apartments Mid Rise	5.99818e+006	0.0323	0.2764	0.1176	1.7600e-003		0.0224	0.0224		0.0224	0.0224	0.0000	320.0859	320.0859	6.1300e-003	5.8700e-003	322.0339
Convenience Market (24 Hour)	12450	7.0000e-005	6.1000e-004	5.1000e-004	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6644	0.6644	1.0000e-005	1.0000e-005	0.6684
Total		**0.0324**	**0.2770**	**0.1181**	**1.7600e-003**		**0.0224**	**0.0224**		**0.0224**	**0.0224**	**0.0000**	**320.7503**	**320.7503**	**6.1400e-003**	**5.8800e-003**	**322.7023**

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					
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
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
Apartments Mid Rise	5.99818e+006	0.0323	0.2764	0.1176	1.7600e-003		0.0224	0.0224		0.0224	0.0224	0.0000	320.0859	320.0859	6.1300e-003	5.8700e-003	322.0339
Convenience Market (24 Hour)	12450	7.0000e-005	6.1000e-004	5.1000e-004	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.6644	0.6644	1.0000e-005	1.0000e-005	0.6684
Total		**0.0324**	**0.2770**	**0.1181**	**1.7600e-003**		**0.0224**	**0.0224**		**0.0224**	**0.0224**	**0.0000**	**320.7503**	**320.7503**	**6.1400e-003**	**5.8800e-003**	**322.7023**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	2.6026e +006	757.1266	0.0342	7.0800e-003	760.0413
Convenience Market (24 Hour)	58450	17.0038	7.7000e-004	1.6000e-004	17.0692
Enclosed Parking with Elevator	1.348e +006	392.1487	0.0177	3.6700e-003	393.6583
Parking Lot	82720	24.0642	1.0900e-003	2.3000e-004	24.1568
Total		**1,190.3432**	**0.0538**	**0.0111**	**1,194.9256**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	2.6026e +006	757.1266	0.0342	7.0800e-003	760.0413
Convenience Market (24 Hour)	58450	17.0038	7.7000e-004	1.6000e-004	17.0692
Enclosed Parking with Elevator	1.348e +006	392.1487	0.0177	3.6700e-003	393.6583
Parking Lot	82720	24.0642	1.0900e-003	2.3000e-004	24.1568
Total		**1,190.3432**	**0.0538**	**0.0111**	**1,194.9256**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.3270	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725
Unmitigated	3.0346	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725

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	0.9448					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.7770					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	0.3129	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725
Total	**3.0346**	**0.1175**	**10.1275**	**5.3000e-004**		**0.0553**	**0.0553**		**0.0553**	**0.0553**	**0.0000**	**16.4299**	**16.4299**	**0.0163**	**0.0000**	**16.7725**

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	0.2371					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.7770					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	0.3129	0.1175	10.1275	5.3000e-004		0.0553	0.0553		0.0553	0.0553	0.0000	16.4299	16.4299	0.0163	0.0000	16.7725
Total	**2.3270**	**0.1175**	**10.1275**	**5.3000e-004**		**0.0553**	**0.0553**		**0.0553**	**0.0553**	**0.0000**	**16.4299**	**16.4299**	**0.0163**	**0.0000**	**16.7725**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	83.7676	1.2663	0.0305	119.8134
Unmitigated	122.7409	1.5837	0.0383	167.8677

7.2 Water by Land Use

Unmitigated

	Indoor/ Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	48.0837 / 30.3136	121.8093	1.5716	0.0380	166.5911
Convenience Market (24 Hour)	0.370363 / 0.226996	0.9316	0.0121	2.9000e-004	1.2765
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**122.7409**	**1.5837**	**0.0383**	**167.8677**

7.2 Water by Land Use

Mitigated

	Indoor/ Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	38.4669 / 15.1568	83.1306	1.2567	0.0303	118.9009
Convenience Market (24 Hour)	0.29629 / 0.113498	0.6370	9.6800e-003	2.3000e-004	0.9125
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**83.7676**	**1.2663**	**0.0305**	**119.8134**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	71.9623	4.2529	0.0000	161.2722
Unmitigated	71.9623	4.2529	0.0000	161.2722

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	339.48	68.9114	4.0726	0.0000	154.4348
Convenience Market (24 Hour)	15.03	3.0510	0.1803	0.0000	6.8374
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**71.9623**	**4.2529**	**0.0000**	**161.2722**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	339.48	68.9114	4.0726	0.0000	154.4348
Convenience Market (24 Hour)	15.03	3.0510	0.1803	0.0000	6.8374
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**71.9623**	**4.2529**	**0.0000**	**161.2722**

9.0 Operational Offroad

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

10.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	21.9810	0.0000	0.0000	21.9810

10.1 Vegetation Land Change

Vegetation Type

	Initial/ Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Grassland	0 / 5.1	21.9810	0.0000	0.0000	21.9810
Total		**21.9810**	**0.0000**	**0.0000**	**21.9810**

Table 3-5: Mitigation Measures

LAND USE Residential (R) Commercial (C) Industrial (I)	Measure Type	MITIGATION MEASURE	POLLUTANT REDUCED Ozone (O) Particulate (P) Diesel Particulate Matter (DPM) Greenhouse Gas (GHG)
R, C, I	Site design, Transportation	Improve job / housing balance opportunities within communities.	O, P, GHG
R, C, I	Site design	Orient buildings toward streets with automobile parking in the rear to promote a pedestrian-friendly environment.	O, P, GHG
R, C, I	Site design	Provide a pedestrian-friendly and interconnected streetscape to make walking more convenient, comfortable and safe (including appropriate signalization and signage).	O, P, GHG
R, C, I	Site design	Provide good access to/from the development for pedestrians, bicyclists, and transit users.	O, P, GHG
R, C, I	Site design	Incorporate outdoor electrical outlets to encourage the use of electric appliances and tools.	O, P, GHG
R, C, I	Site design	Provide shade tree planting in parking lots to reduce evaporative emissions from parked vehicles. Design should provide 50% tree coverage within 10 years of construction using low ROG emitting, low maintenance native drought resistant trees.[3]	O P GHG
R, C, I	Site design	Pave and maintain the roads and parking areas	P
R, C, I	Site design	Driveway design standards (e.g., speed bumps, curved driveway) for self-enforcing of reduced speed limits for unpaved driveways.	P
R, C, I	Site design	Use of an APCD-approved suppressant on private unpaved roads leading to the site, unpaved driveways and parking areas; applied at a rate and frequency that ensures compliance with APCD Rule 401, visible emissions and ensures offsite nuisance impacts do not occur.	P
R, C	Site design	Development is within 1/4 mile of transit centers and transit corridors.	O, P, GHG
R, C	Site design	Design and build compact communities in the urban core to prevent sprawl.	O, P, GHG
R, C	Site design	Increase density within the urban core and urban reserve lines.	O, P, GHG
R, C	Site design	For projects adjacent to high-volume roadways or railroad idling zones, design project to include provide effective buffer zone between the source and the receptor.	DPM
R, C	Site design	For projects adjacent to high-volume roadways, plant vegetation[4] between receptor and roadway.	DPM, P
R	Site design	No residential wood burning appliances.	O, P, GHG
R, C, I	Site design, Transportation	Incorporate traffic calming modifications to project roads, such as narrower streets, speed platforms, bulb-outs and intersection designs that reduce vehicles speeds and encourage pedestrian and bicycle travel.	O, P, GHG
R, C, I	Site design, Transportation	Increase number of connected bicycle routes/lanes in the vicinity of the project.	O, P, GHG
R, C, I	Site design, Transportation	Provide easements or land dedications and construct bikeways and pedestrian walkways.	O, P, GHG
R, C, I	Site design, Transportation	Link cul-de-sacs and dead-end streets to encourage pedestrian and bicycle travel to adjacent land uses.	O, P, GHG
R, C, I	Site design, Transportation	Project is located within one-half mile of a 'Park and Ride' lot or project installs a 'Park and Ride' lot with bike lockers in a location of need defined by SLOCOG.	O, P, GHG
C, I	Site design, Transportation	Provide onsite housing for employees.	O, P, GHG

3 Trees must be maintained for life of project
4 Certain types of vegetation provide maximum effectiveness. Vegetation must be maintained over the life of the project.

LAND USE Residential (R) Commercial (C) Industrial (I)	Measure Type	MITIGATION MEASURE	POLLUTANT REDUCED Ozone (O) Particulate (P) Diesel Particulate Matter (DPM) Greenhouse Gas (GHG)
C, I	Site design, Transportation	Implement on-site circulation design elements in parking lots to reduce vehicle queuing and improve the pedestrian environment.	O, P, GHG
C, I	Site design, Transportation	Provide employee lockers and showers. One shower and 5 lockers for every 25 employees are recommended.	O, P, GHG
C, I	Site design, Transportation	Parking space reduction to promote bicycle, walking and transit use.	O, P, GHG
R	Site design	Tract maps resulting in parcels of one-half acre or les shall orient at least 75% of all lot lines to create easy due south orientation of future structures.	GHG
R	Site design	Trusses for south-facing portions of roofs shall be designed to handle dead weight loads of standard solar-heated water and photovoltaic panels. Roof design shall include sufficient south-facing roof surface, based on structures size and use, to accommodate adequate solar panels. For south facing roof pitches, the closest standard roof pitch to the ideal average solar exposure shall be used.	O, GHG
R, C, I	Energy efficiency	Increase the building energy rating by 20% above Title 24 requirements. Measures used to reach the 20% rating cannot be double counted.	O, GHG
R, C, I	Energy efficiency	Plant drought tolerant, native shade trees along southern exposures of buildings to reduce energy used to cool buildings in summer.[5]	O, GHG
R, C, I	Energy efficiency	Utilize green building materials (materials which are resource efficient, recycled, and sustainable) available locally if possible.	O, DPM, GHG
R, C, I	Energy efficiency	Install high efficiency heating and cooling systems.	O GHG
R, C, I	Energy efficiency	Orient 75 percent or more of homes and/or buildings to be aligned north / south to reduce energy used to cool buildings in summer.	O GHG
R, C, I	Energy efficiency	Design building to include roof overhangs that are sufficient to block the high summer sun, but not the lower winter sun, from penetrating south facing windows (passive solar design).	O, GHG
R, C, I	Energy efficiency	Utilize high efficiency gas or solar water heaters.	O, P, GHG
R, C, I	Energy efficiency	Utilize built-in energy efficient appliances (i.e. Energy Star®).	O, P GHG
R, C, I	Energy efficiency	Utilize double-paned windows.	O, P, GHG
R, C, I	Energy efficiency	Utilize low energy street lights (i.e. sodium).	O, P, GHG
R, C, I	Energy efficiency	Utilize energy efficient interior lighting.	O, P, GHG
R, C, I	Energy efficiency	Utilize low energy traffic signals (i.e. light emitting diode).	O, P, GHG
R, C, I	Energy efficiency	Install door sweeps and weather stripping (if more efficient doors and windows are not available).	O, P, GHG
R, C, I	Energy efficiency	Install energy-reducing programmable thermostats.	O, P, GHG
R, C, I	Energy efficiency	Participate in and implement available energy-efficient rebate programs including air conditioning, gas heating, refrigeration, and lighting programs.	O, P, GHG

5 Trees must be maintained for the life of the project

LAND USE Residential (R) Commercial (C) Industrial (I)	Measure Type	MITIGATION MEASURE	POLLUTANT REDUCED Ozone (O) Particulate (P) Diesel Particulate Matter (DPM) Greenhouse Gas (GHG)
R, C, I	Energy efficiency	Use roofing material with a solar reflectance values meeting the EPA/DOE Energy Star® rating to reduce summer cooling needs.	O, P, GHG
R, C, I	Energy efficiency	Utilize onsite renewable energy systems (e.g., solar, wind, geothermal, low-impact hydro, biomass and bio-gas).	O, P, GHG
R, C, I	Energy efficiency	Eliminate high water consumption landscape (e.g., plants and lawns) in residential design. Use native plants that do not require watering and are low ROG emitting.	O, GHG
R, C, I	Energy efficiency	Provide and require the use of battery powered or electric landscape maintenance equipment for new development.	O, GHG
C, I	Energy efficiency	Use clean engine technologies (e.g., alternative fuel, electrification) engines that are not subject to regulations.	O, DPM, GHG
R, C, I	Transportation	Provide and maintain a kiosk displaying transportation information in a prominent area accessible to employees and patrons.	O, P, GHG
R, C, I	Transportation	Develop recreational facility (e.g., parks, gym, pool, etc.) within one-quarter of a mile from site.	O, P, GHG
R, C, I	Transportation	If the project is located on an established transit route, provide improved public transit amenities (i.e., covered transit turnouts, direct pedestrian access, covered bench, smart signage, route information displays, lighting etc.).	O, P, GHG
R, C, I	Transportation	Project provides a display case or kiosk displaying transportation information in a prominent area accessible to employees or residents.	O, P, GHG
R, C, I	Transportation	Provide electrical charging station for electric vehicles.	O, P, GHG
R, C, I	Transportation	Provide neighborhood electric vehicles / car share program for the development.	O, P, GHG
R, C, I	Transportation	Provide bicycle-share program for development.	O, P, GHG
R, C, I	Transportation	Provide preferential parking / no parking fee for alternative fueled vehicles or vanpools.	O, P, GHG
R, C, I	Transportation	Provide bicycle lockers for existing 'Park and Ride' lots where absent or insufficient.	O, P, GHG
R C I	Transportation	Provide vanpool, shuttle, mini bus service (alternative fueled preferred).	O, P, DPM, GHG
C, I	Transportation	Provide secure on-site bicycle indoor storage, lockers, or racks.	O, P, GHG
C, I	Transportation	For large developments, provide day care facility on site.	O, P, GHG
C, I	Transportation	Provide on-site bicycle parking both short term (racks) and long term (lockers, or a locked room with standard racks and access limited to bicyclist only) to meet peak season maximum demand. One bike rack space per 10 vehicle/employee space is recommended.	O, P, GHG
C, I	Transportation	On-site eating, refrigeration and food vending facilities	O, P, GHG
C, I	Transportation	Implement a Transportation Choice Program to reduce employee commute trips. The applicant shall work with Rideshare for free consulting services on how to start and maintain a program.	O, P, GHG
C, I	Transportation	Provide incentives (e.g., bus pass, "Lucky Bucks", etc.) to employees to carpool/vanpool, take public transportation, telecommute, walk bike, etc.	O, P, GHG
C, I	Transportation	Implement compressed work schedules (i.e., 9–80s or 4–10s).	O, P, GHG
C, I	Transportation	Implement a telecommuting program.	O, P, GHG
C, I	Transportation	Implement a lunchtime shuttle to reduce single occupant vehicle trips.	O, P, GHG

LAND USE Residential (R) Commercial (C) Industrial (I)	Measure Type	MITIGATION MEASURE	POLLUTANT REDUCED Ozone (O) Particulate (P) Diesel Particulate Matter (DPM) Greenhouse Gas (GHG)
C, I	Transportation	Include teleconferencing capabilities, such as web cams or satellite linkage, which will allow employees to attend meetings remotely without requiring them to travel out of the area.	O, P, DPM, GHG
C, I	Transportation	If the development is or contains a grocery store or large retail facility, provide customers home delivery service in clean fueled vehicles	O, P, DPM, GHG
C, I	Transportation	At community event centers (i.e., amphitheaters, theaters, and stadiums) provide valet bicycle parking.	O, P, GHG
C, I	Transportation	Implement a "No Idling" program for heavy-duty diesel vehicles, which includes signage, citations, etc.	DPM, GHG
C, I	Transportation	Develop satellite work sites.	O, GHG
C, I	Transportation	Require the installation of electrical hookups at loading docks and the connection of trucks equipped with electrical hookups to eliminate the need to operate diesel-powered TRUs at the loading docks.	DPM, GHG
C, I	Transportation	If not required by other regulations (ARB's on-road or off-road diesel), restrict operation to trucks with 2007 model year engines or newer trucks.	O, DPM, GHG
C, I	Transportation	If not required by other regulations (ARB's on-road or off-road diesel), require or provide incentives to use diesel particulate filters for truck engines.	DPM
R	Transportation	Provide storage space in garage for bicycle and bicycle trailers, or covered racks / lockers to service the residential units.	O, P, GHG
R	Transportation	Provide free-access telework terminals and/or wi-fi access in multi-family projects.	O, P, GHG
C	Transportation	Develop core commercial areas within 1/4 to 1/2 miles of residential housing or industrial areas.	O, P, GHG

3.8.3 Off-Site Mitigation

Operational phase emissions from large development projects that cannot be adequately mitigated with on-site mitigation measures alone will require off-site mitigation in order to reduce air quality impacts to a level of insignificance if emissions cannot be adequately mitigated with on-site mitigation measures alone. Whenever off-site mitigation measures are deemed necessary, it is important that the developer, lead agency and APCD work together to develop and implement the measures to ensure successful outcome. This work should begin at least six months prior to issuance of occupancy permits for the project.

The first step in determining whether off-site mitigation is required is to compare the estimated operational phase emissions to the APCD significance thresholds. If the sum of ROG + NO_x emissions exceeds 25 tons/year, off-site mitigation will be required. Off-site mitigation may also be required for development projects were emissions exceed the 25 lb/day threshold. Examples of projects potentially subject to off-site mitigation include rural subdivisions, drive-through facilities and commercial development located far from the urban core.

If off-site mitigation is required, potential off-site mitigation measures may be proposed and implemented by the project proponent following APCD approval of the appropriateness and effectiveness of the proposed measure(s). Alternatively, the project proponent can pay a mitigation fee based on the amount

APPENDIX D.
GEOLOGY AND SOILS
BACKGROUND INFORMATION

SOILS ENGINEERING REPORT
STUDENT HOUSING SOUTH
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
SAN LUIS OBISPO, CALIFORNIA

July 19, 2013

Prepared for

California Polytechnic State University
Facilities Planning and Capital Projects

Prepared by

Earth Systems Pacific
4378 Old Santa Fe Road
San Luis Obispo, CA 93401

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Earth Systems Pacific

4378 Old Santa Fe Road
San Luis Obispo, CA 93401-8116

(805) 544-3276 • FAX (805) 544-1786
E-mail: esp@earthsys.com

July 19, 2013

FILE NO.: SL-16805-SD

Mr. Joel Neel
Facilities Planning and Capital Projects, Bldg. 70
California Polytechnic State University
San Luis Obispo, CA 93407

PROJECT: STUDENT HOUSING SOUTH
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
SAN LUIS OBISPO, CALIFORNIA

SUBJECT: Soils Engineering Report

REF: Proposal for a Geotechnical Engineering Investigation, Grand Avenue and Slack Street Housing Project, California Polytechnic State University, San Luis Obispo, California, by Earth Systems Pacific, Doc. No. 1304-105.PRP, dated April 19, 2013

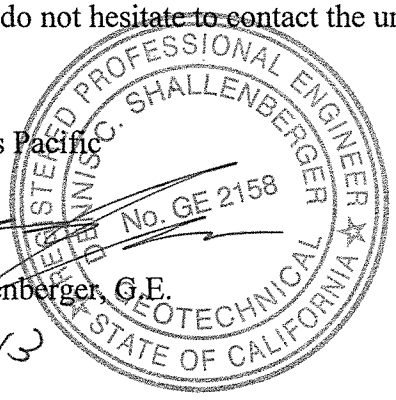
Dear Mr. Neel:

In accordance with your authorization of the referenced proposal, this soils engineering report has been prepared for use in the development of plans and specifications for the Student Housing South Project at California Polytechnic State University, San Luis Obispo, California. Preliminary geotechnical engineering recommendations for site preparation, grading, utility trenches, foundations, interior slabs-on-grade and exterior flatwork, retaining walls, HMA pavement sections, drainage and maintenance, and observation and testing are presented herein. Two bound copies and one electronic copy of the report are furnished for your use.

We appreciate the opportunity to have provided professional services for this project and look forward to working with the University in the future. If there are any questions concerning this report, please do not hesitate to contact the undersigned.

Sincerely,

Earth Systems Pacific



Dennis Shallenberger, G.E.

7/19/13

Doc. No.: 1307-097.SER/sr

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1.0 INTRODUCTION AND SITE SETTING

The construction of a new student housing complex is proposed for the campus of California Polytechnic State University (Cal Poly), San Luis Obispo. The new facility is planned to house approximately 1,400 students and will be located in an area that is currently a large, asphalt concrete (AC) parking lot. While development of the site is only at the conceptual stage at this time, we understand that five to six multi-story residential buildings are planned. It is assumed that they will be of steel stud construction with slabs-on-grade. A separate parking structure may be built, or some of the buildings may have first and/or second level parking. Some of the buildings may have a level that extends entirely or partially below grade.

For the purposes of this report, maximum isolated loads of 150 kips (dead plus live load), and maximum loads on continuous footings of 3 klf (dead plus live load) have been assumed for all structures except the parking structure. For the parking structure, maximum isolated loads of 350 kips (dead plus live load), and maximum loads on continuous footings of 3 klf (dead plus live load) have been assumed. Retaining walls, attached to or forming part of the buildings are likely, as are independent site retaining walls. At this time, it is unknown whether retention basins or other LID/BMP features will be incorporated into the project.

The approximately 9-acre site is bounded by Grand Avenue to the east and northeast, Pacheco Street to the west, Slack Street to the south, and by the entrance to the Performing Arts Center parking structure to the north. Directions as described in this report reference "Project North" as shown on the Boring Location Map in Appendix A. From Grand Avenue to the west edge of the existing parking lot, there is approximately 20 to 25 feet of relief. Farther west, from the edge of the existing parking lot to Pacheco Way, there is a descending slope approximately 5 to 7 feet high. Beyond Pacheco Way, another approximately 7–foot slope descends to the track and athletic field.

Across Grand Avenue to the east are two significant drainages that flow out of the hills and through housing complexes in that area. It appears that these drainages crossed the southerly third of the subject site before it was graded into a parking lot. They have since been culverted or re-routed.

For the purposes of this report, it is assumed that the buildings will be sited to accommodate the existing site topography. Due to the sloping topography, however, cuts and fills on the order of 5 to 7 feet are likely to be necessary. Where buildings will have partially below grade levels, retained cuts of up to 12 feet have been assumed. Other improvements will likely involve underground utilities, hot mix asphalt (HMA) parking lots, pedestrian and vehicle Portland Cement Concrete (PCC) flatwork, and landscaping.

2.0 SCOPE OF SERVICES

The scope of work for the soils engineering report included review of existing soils and geologic reports that this firm has prepared for nearby projects on the Cal Poly campus, review of a geotechnical engineering report by Fugro West, Inc. (1997) that addressed approximately the northern third of the subject site, review of air photo and published geologic information pertinent to the site, a site reconnaissance, subsurface exploration, laboratory analysis of soil samples, geotechnical analysis of the data, and the preparation of this report. The analysis and recommendations were based, in part, upon verbal information provided by the client. No site, structural, or grading plans, or conceptual drawings of any type were available at the time this report was prepared.

This report and preliminary geotechnical recommendations are intended to comply with the considerations of Sections 1803.1 through 1803.6 and J104.3 of the 2010 California Building Code (CBC) and common geotechnical engineering practice in this area under similar conditions at this time. The test procedures were accomplished in general conformance with the standards noted, as modified by common geotechnical engineering practice in this area under similar conditions at this time.

Preliminary geotechnical engineering recommendations for site preparation, grading, utility trenches, foundations, interior slabs-on-grade and exterior flatwork, retaining walls, HMA pavement sections, drainage and maintenance, and observation and testing are presented herein. As there are many geotechnical issues yet to be resolved, the soils engineer should be retained to provide consultation as the design progresses, and to review project plans as they near completion to assist in verifying that pertinent geotechnical issues have been addressed and to aid in conformance with the intent of this report. It is our intent that this report be used exclusively by the client to form the geotechnical basis of the design of the project and in the preparation of plans and specifications. Application beyond this intent is strictly at the user's risk.

This report does not address issues in the domain of contractors such as, but not limited to, site safety, loss of volume due to stripping of the site, shrinkage of soils during compaction, excavatability, dewatering, shoring, temporary slope angles, construction means and methods, etc. Analyses of the soil for lead or mold potential, man-made asbestos, radioisotopes, hydrocarbons, or chemical properties, including corrosivity, are beyond the scope of this report. A report addressing the potential for naturally-occurring asbestos is being presented under separate cover. Ancillary features such as temporary access roads, fences, flag and light poles, signage, drainage infiltration systems and basins, and nonstructural fills are not within our scope and are also not addressed.

In the event that there are any changes in the nature, design, or location of improvements, or if any assumptions used in the preparation of this report prove to be incorrect, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report verified or modified in writing by the soils engineer. The criteria presented in this report are considered preliminary until such time as the grading plan has been developed, building locations and floor elevations have been determined, plans have been reviewed by the soils engineer, any peer review or review by any jurisdiction has been completed, conditions are observed by the soils engineer in the field during construction, and the recommendations have been verified as appropriate, or modified in writing by the soils engineer.

3.0 FIELD INVESTIGATION

To assess subsurface conditions and retrieve soil samples, eight borings were drilled at the site on June 19, 2013. The borings were drilled to a maximum depth of 21.5 feet. The approximate locations of the borings are shown on the Boring Location Map in Appendix A. A Mobile Drill rig, Model B-53, equipped with a 6-inch outside diameter hollow stem auger and an automatic trip hammer for sampling, was used to drill the borings. As the borings were drilled, soil samples were retrieved using a ring-lined barrel sampler (ASTM D 3550-01/07, with shoe similar to D 2937-04) and Standard Penetration Tests were conducted at selected depths (ASTM D 1586-11). Bulk soil samples were also obtained from the auger cuttings.

Soils encountered in the borings were categorized and logged in general accordance with the Unified Soil Classification System and ASTM D 2488-09a. Where rock was encountered, its properties were described based upon observation of ring and/or Standard Penetration Test samples, observation of the auger cuttings, the effort required to drill into the rock, and the effort required to drive samplers into the rock. Logs of the borings are presented in Appendix A, along with a boring log legend. In reviewing the boring logs and legend, the reader should recognize that the legend is intended as a guideline only, and there are a number of conditions that may

influence the soil and bedrock characteristics as observed during drilling. These include, but are not limited to, the presence of cobbles or boulders, cementation, variations in soil moisture, presence of groundwater, and other factors. Consequently, the logger must exercise judgment in interpreting soil and bedrock characteristics, possibly resulting in descriptions that vary somewhat from the legend.

4.0 LABORATORY ANALYSIS

Ring samples were tested for unit weight and moisture (ASTM D 2937-10, as modified for ring liners). Two bulk samples were tested for maximum density and optimum moisture content (ASTM D 1557-12); two bulk samples were also tested for expansion index (ASTM D 4829-11). A direct shear test (ASTM D 3080/D 3080M-11, modified for consolidated, undrained conditions) was conducted on one of the bulk soil samples after it was remolded to approximately 90 percent of maximum dry density. A ring sample was tested for unconfined compressive strength (ASTM D 2166-06) and a bulk sample was tested to determine its R-value, or resistance to deformation under repeated loading (ASTM D 2844-07el). The laboratory test results are presented in Appendix B

5.0 GENERAL SUBSURFACE PROFILE

Beneath the AC and aggregate base of the parking lot, fill soil was encountered in seven of the eight borings. No fill was observed in Boring 5. The fill comprised sandy lean clay, clayey sand and clayey sand with gravel. Where encountered, the depth of the fill ranged from 3.5 to 14 feet below the existing ground surface. Conditions in the fill ranged from loose to medium dense or stiff. In most of the borings, the fill was underlain by alluvium. The alluvium consisted of sandy lean clay and sandy fat clay. The color of the alluvium was gray/dark gray to brown/dark brown; conditions were stiff to very stiff. Sandstone, shale and claystone bedrock of the Franciscan Mélange was encountered in all of the borings at depths ranging from 6 to 18.5 feet. The bedrock was typically weathered and fractured, and its condition was logged as very soft to hard. Typically the auger could be advanced to the planned termination of each boring; however, in Borings 3 and 8, practical refusal to auger advancement occurred at depths of 7 feet and 17.5 feet, respectively.

It should be noted that the descriptions of bedrock must span a much wider range of density and strength characteristics than soil, and are relative to other *bedrock* strata. For example, fractured and weathered bedrock may be described as "soft", yet it will be considerably harder than almost any type of soil. Conversely, a clay soil may be described as "stiff", however it will not be nearly as hard as even "soft" bedrock.

At the time of drilling, the soils and bedrock were slightly moist to moist condition. No subsurface water was encountered in any of the borings.

6.0 CONCLUSIONS

In our opinion, the site is suitable, from a soils engineering standpoint, for the proposed housing project provided that the recommendations presented herein are implemented in the design and construction. The primary concerns from a soils engineering standpoint are the presence of fill soil within the site, the presence of soil and bedrock across the site, the variable consistencies of the soil and bedrock across the site, and soil expansiveness.

With the exception of Boring 5, fill soils were found in all of the locations drilled. The fill probably dates to the original grading of the existing parking lot more than five decades ago. At that time standards for fill placement were not as stringent as they are today and, to our knowledge, there are no records documenting the proper placement or compaction of the fill. Therefore, the fill should considered to be "undocumented" and should not be relied upon for support of foundations or other improvements in its current condition. Removal in its entirety is recommended in building areas and limited fill recompaction is recommended for other areas. Foundations for an individual structure may generally bear in recompacted fill soil or in bedrock, but not a combination of the two; the parking structure should bear in bedrock.

The concept for grading of the site is currently unknown, but it will probably involve cut and fill. Native materials encountered in the borings included both clay soils, and sandstone and claystone bedrock. The clay soils are undoubtedly far more compressible than is the bedrock. If the foundation of a building were to span from soil to bedrock a potential for differential settlement would be created. Differential settlement occurs when an improvement spans areas with different compression characteristics. To mitigate the potential for differential settlement, the site should be graded such that the minimum depth of fill within any part of a building area is within reasonable proportion to the maximum fill depth. This may necessitate overexcavation of cut areas and replacement of the removed soil as structural fill. The ratio of minimum fill depth vs. maximum fill depth will depend upon foundation type; specific grading criteria for individual structures are provided in the "Grading" section of this report.

As no building layout, finish floor elevations, or grading concept is available at this time, we are unable to give specific guidance as to where foundations bearing in bedrock might be a better alternative than foundations bearing in compacted fill. In siting the buildings and establishing finish floor elevations, the depth to the bedrock should be considered. Probably, buildings on the northern two-thirds of the site could be founded in recompacted soil if they will have relatively

shallow foundations or will sit in an area of fill. If foundations in this area of the site are to be deeper or if the building will be constructed in an area of cut, foundations in bedrock may be a better option. On the southern third of the site, foundations in recompacted soil will likely be the better option, however, deep earthwork will be necessary to remove the existing fill, recompact the native soil, and replace the fill to pad grade. Lower (i.e. below grade) floor levels in this area might allow foundations to economically bear in the bedrock with minimal re-working of the soil. The soil engineer should be retained to review the foundation depths with respect to the depth to the bedrock. In some situations, drilling of additional borings may be recommended to further define the bedrock profile.

Expansion index tests yielded values of 63 and 77. These values indicate that the soils tested are moderately expansive. Expansive soils tend to swell with increases in soil moisture and shrink as soil moisture decreases; the upper 2 to 3 feet of soil is the zone most affected by these seasonal soil moisture fluctuations. The volume changes that the soils undergo in this cyclical pattern can stress and damage foundations and slabs-on-grade if precautionary measures are not incorporated in the design and construction operations. Use of deeper footings in combination with preserving or augmenting the soil moisture, and use of a layer of nonexpansive material beneath slabs are recommended to reduce the potential for damage related to expansive soils.

The recommendations for mitigation of expansive soils, as described above, reflect methods that have been used in this geographical area for some time. There are a number of other options available, including caissons and grade beams, post-tensioned slab foundations, conventionally reinforced mat foundations, and deep nonexpansive pads. These types of solutions, however, are expected to not be as practical or as cost-effective for this project as the method discussed previously and, therefore, are not addressed in this report. The economics of these options may, however, change with time, or specific solutions may be applicable for specific situations at the subject site. If discussion of other options is desired, the soils engineer can be retained for additional consultation.

Given the slope along the west side of the site, it is likely that foundations for buildings or site walls may encroach near a descending fill slope. When a foundation, particularly one that carries sustained lateral loads such as the foundation of a retaining wall, sits near a descending slope, it tends to settle and move laterally toward the slope unless a sufficient depth and distance back from the slope is maintained. Deepening of the footing or other measures may be necessary to ensure stability of the footing. The soils engineer should review situations where footings will lie within 10 feet of a descending slope.

An R-value test performed on a sample of sandy lean clay resulted in a value of 4. This result indicates that the soil has a very low resistance to the types of loads imposed by traffic. Pavement sections based upon an R-value of 4 are presented later in this report. Depending upon the soils actually present at the subgrade elevation following rough grading, re-testing of the R-value may be warranted and HMA sections adjusted accordingly.

Bedrock of the Franciscan Mélange was encountered in the borings at depths of 6 to 18.5 feet and the native soils were found to be cohesive clays; fill soils will be removed from the building area and recompacted. All of these factors significantly reduce the potential for liquefaction. Consequently, in our opinion the potential for liquefaction to affect this site is nil.

Free subsurface water was not encountered in any of the borings. The borings were, however, drilled in the summer of a very dry year. Consequently, subsurface water may be present in other years or wetter seasons. If present, it will probably be either perched atop the bedrock surface or will be seeping through cracks and joints within the bedrock. It could also be present in the areas where the bedrock is deeper and surface drainages previously crossed the site (i.e. generally south of Borings 4 and 5). If encountered, it is anticipated to be of a volume that will be a nuisance during construction, but where a minor localized dewatering effort will allow it to be controlled. Another construction issue could be excavation of the bedrock, the hardness of which was found to vary widely across the site. In some cases, it was soft enough to probably be excavated with difficulty by backhoes, but easily with large excavators. In other places it was harder and excavators may dig it with difficulty, or hydraulic breakers or large dozers may be necessary to rip and excavate the bedrock. In 1997, Fugro West, LLC, prepared a geotechnical report that addressed the northern part of this site for a project that was then proposed. At that time they conducted a seismic shear wave velocity study of the soil and bedrock. They found shear wave velocities ranging from 2,000 to 2,500 feet per second (fps) in the overlying soil, and from 8,800 to 11,200 fps in the underlying bedrock. These values indicate that the bedrock will typically be hard and difficult to excavate. See that report for additional information on this study.

7.0 PRELIMINARY SOILS ENGINEERING RECOMMENDATIONS

These recommendations are applicable for the improvements as discussed in the "Introduction and Site Setting" section of this report. They should be re-evaluated at such time as the grading plan has been developed, building locations and floor elevations have been determined, and structural loads are known. If any improvements not previously noted are included, the soils engineer should be contacted for revised recommendations.

In developing these recommendations, it was assumed that irrigated landscaping that will keep the soils at relatively uniform, year-round moisture will be installed for a zone of at least 5 feet around the perimeter of retaining walls, buildings, exterior flatwork, *and* on all slopes. If drought tolerant vegetation or xeroscaping is planned, or if the zones described above are allowed to dry out for any other reason, these recommendations may require modification.

Unless otherwise noted, the following definitions are used in the recommendations presented below:

- **Building Area:** The area within and extending a minimum of 5 feet beyond the perimeter foundations of a building. It includes the areas of any retaining wall foundations, flatwork, and covered walkways, etc., which are rigidly connected to a building and are expected to perform in a manner similar to it.
- **Wall Foundation Area:** The area from the heel to a minimum of 2 feet beyond the toe of the foundation for site retaining wall; the footprint of the foundation for screen walls.
- **Flatwork Area:** The areas within and extending a minimum of 1 foot beyond the limits of the flatwork.
- **HMA Area:** The area within and extending a minimum of 1 foot beyond the limits of the HMA.
- **Grading Area:** The entire area to be graded, including all building areas, site retaining wall and screen wall foundation areas, flatwork areas, HMA areas, and areas where fill will be placed or other surface improvements constructed.
- **Pad Grade:** The elevation of the building pad as shown on the grading plan; if no elevation is shown on the grading plan, the elevation to which the grading contractor typically will place compacted fill in the building area. Does not include any sand or gravel layer specified for protection of slabs from subsurface moisture.
- **Existing Grade:** The elevation that existed as of the date of this report.
- **Scarified:** Plowed or ripped in two orthogonal directions to a depth of not less than 12 inches.
- **Moisture Conditioned:** Soil moisture content adjusted to optimum moisture content, or just above, prior to application of compactive effort.
- **Compacted / Recompacted:** Soils placed in level lifts not exceeding 8 inches in loose thickness and compacted to a minimum of 90 percent of maximum dry density. The standard tests used to establish maximum dry density and field density are ASTM D 1557-12 and ASTM D 6938-10, respectively, or other methods acceptable to the soils engineer and jurisdiction.

Site Preparation

1. The ground surface in the grading area should be prepared for grading by removing all vegetation, large roots, debris, existing improvements, asphalt concrete, and other deleterious materials. *In the building areas all existing fill should also be removed.* Existing utility lines that will not be serving the new buildings should be either removed or properly abandoned. The appropriate method of utility abandonment will depend upon the type and depth of the utility. Recommendations for abandonment can be made as necessary.

2. Voids created by the removal of materials or utilities described above and extending below the recommended depth of overexcavation should be called to the attention of the soils engineer. No fill should be placed unless the underlying soil has been observed by the soils engineer.

Grading

1. In building areas where foundations will bear in entirely bedrock, the grade existing following site preparation should be overexcavated to a minimum depth of 18 inches below bottom-of-slab elevation. The resulting surface should scarified, moisture conditioned, and recompacted. Where *in situ* bedrock is encountered, the depth of overexcavation may be reduced to 12 inches below bottom-of-slab elevation. The bedrock surface need not be scarified, however it should be moisture conditioned and recompacted. If any fill will be required to reach pad grade, the maximum depth of the fill should be no greater than 2 times the minimum depth of the fill. Additional overexcavation may be necessary to comply with this recommendation. The upper 18 inches below bottom-of-slab elevation (12 inches where bedrock is present) should consist exclusively of nonexpansive soil.

2. In building areas where foundations will bear entirely in compacted fill, the grade existing following site preparation should be cut into approximately evenly spaced horizontal benches that are a minimum of 25 feet wide. The highest bench should be a minimum of 2 feet below bottom-of-footing elevation. Elevations of the benches should also be established such that the maximum depth of the fill to pad grade will be no greater than 1.3 times the minimum depth of the fill to pad grade. The upper 18 inches below bottom-of-slab elevation should consist exclusively of nonexpansive soil.

3. In wall foundation areas, where bedrock is exposed at the bottom-of-foundation elevation, no remedial earthwork is considered necessary. If bedrock is not exposed, the foundation area should be overexcavated to a minimum depth of 2 feet below the bottom-of-foundation elevation, not including any keyway. The exposed soil surfaces should be scarified, moisture conditioned, and recompacted. If a wall foundation will span from bearing in compacted soil to bearing in bedrock, a construction joint should be placed in the wall at the transition point.

4. Following site preparation, areas to be paved with HMA should be excavated to subgrade elevation. The resulting surface should be scarified, moisture conditioned, and recompacted *to a minimum of 95 percent of maximum dry density*. If fill is required to reach subgrade elevation, the prepared soil surface should be scarified, moisture conditioned, and recompacted *to a minimum of 90 percent of maximum dry density* prior to placement of fill. Fill should then be placed and compacted to *90 percent of maximum dry density*; the upper 12 inches of the subgrade should be compacted *to a minimum of 95 percent of maximum dry density*. Subgrade and aggregate base should be firm and unyielding when proofrolled with heavy, rubber-tired grading equipment prior to continuing construction.

5. Following site preparation, exterior flatwork areas should be overexcavated to allow for placement of nonexpansive material beneath the flatwork. The soil surface exposed by overexcavation should be scarified, moisture conditioned, and recompacted prior to placement of the nonexpansive material. If fill is required to reach the elevation of the bottom of the nonexpansive layer, the prepared soil surface should be scarified, moisture conditioned, and recompacted prior to placement of fill. Nonexpansive material is described below; for thickness criteria for the nonexpansive material, please see the "Interior Slabs-on-Grade and Exterior Flatwork" section of this report.

6. In the remainder of the grading areas, the prepared soil surface should be scarified, moisture conditioned, and recompacted. Moisture conditioned fill should be placed and properly compacted to grade.

7. Voids created by dislodging rocks and/or debris during scarification should be backfilled and recompacted, and the dislodged materials should be removed from the work area.

8. Within building areas, the removed soil or similar imported soils may be used as moisture conditioned and properly compacted fill up to 18 inches below bottom-of-slab elevation. In exterior flatwork areas, the removed soil or similar imported soils may be used as

moisture conditioned and properly compacted fill up to the elevation where nonexpansive soil will be placed, as discussed in the "Interior Slabs-on-Grade and Exterior Flatwork" section of this report.

9. Outside of building and exterior flatwork areas, the removed soil and similar imported soils may be used as moisture conditioned and properly compacted fill up to subgrade or finish grade, as appropriate.

10. Where fill will be placed on slopes that exceed a 10 percent ratio (horizontal to vertical), the prepared surface should first be excavated into benches cut into firm soil or bedrock. Where fill will be placed on slopes that exceed a 20 percent ratio, a keyway should be constructed at the toe of the fill. The keyway should penetrate a minimum of 2 feet into firm soil or bedrock, as recommended by the soils engineer during construction. Benches and keyways should be a minimum of 10 feet wide and should be essentially flat. A drain should be placed at the back of all keyways and benches. Typical bench and keyway, and back drain details are included in Appendix D.

11. In landscape areas, the soil type, compaction, and/or any amendments should be in accordance with the requirements of the landscape architect. The depth of landscape soil adjacent to foundations should be reviewed by the soil engineer; foundation depths may require adjustment due to any uncompacted landscape soil within 5 feet of the foundation.

12. The upper 18 inches (12 inches where bedrock is present) of material in building areas should be nonexpansive. Nonexpansive materials are defined as materials that fall in the GW, GP, GM, GC, SP, SW, SC and SM categories per ASTM D 2487-11, and that have an expansion index of 10 or less (ASTM D 4829-11). Proposed nonexpansive materials should be reviewed by the soils engineer before being brought to the site, and on an intermittent basis during placement. The clean sand layer and/or aggregate base layer described in the "Interior Slab-on-Grade and Exterior Flatwork" section of this report (if utilized) is considered to be part of the minimum recommended depth of nonexpansive material, not in addition to it.

13. Materials used as fill should be cleaned of all debris and any rocks larger than 3 inches in maximum dimension. When fill material includes rocks, the rocks should be placed in a sufficient soil matrix to ensure that voids caused by nesting of the rocks will not occur and that the fill can be properly compacted.

14. If the soils are overly moist so that they become unstable, or if the minimum recommended compaction cannot be readily achieved, drying the soil to near optimum moisture content may be necessary. Placement of gravel layers or geotextiles may also be necessary to help stabilize unstable soils. Additional overexcavation may also be recommended to correct unstable conditions or if soft or loose conditions are encountered during grading.

15. The recommended soil moisture content should be maintained throughout construction and throughout the life of the project. Failure to maintain the soil moisture content can result in cracks and disturbance, which are an indication of degradation of the soil's compaction. If cracks are allowed to develop, or if soils near improvements such as foundations, flatwork, pavement, curbs, etc. are otherwise disturbed, damage to those improvements may result. Soils that have cracked or are otherwise disturbed should be removed, moisture conditioned, and compacted.

Utility Trenches

1. Utility trenches adjacent to foundations should not be excavated within the zone of foundation influence, as shown in Typical Detail A in Appendix C.

2. Utilities that must pass beneath a foundation should be placed with properly compacted utility trench backfill and the foundation should be designed to span the trench.

3. A select, noncorrosive, granular, easily compacted material should be used as bedding and shading immediately around utilities, and as backfill to pad grade within building, exterior flatwork, and HMA areas. The site soil, similar imported soil, or additional select import may be used for trench backfill above the bedding and shading, in trenches that lie in areas where settlement of the backfill would not be detrimental. Site soils and similar clayey soils will be more difficult to compact than imported nonexpansive trench backfill.

4. In general, trench backfill should be compacted a minimum of 90 percent of maximum dry density. A minimum of 95 percent of maximum dry density should be obtained in the upper foot of subgrade and in all aggregate base. Prior to applying compactive effort, soils should be moisture conditioned. Trench backfill should be placed in level lifts not exceeding 6 inches in loose thickness and compacted to the minimums recommended above.

5. Compaction of trench backfill by jetting or flooding is not recommended. However, to aid in *encasing* utility conduits, particularly corrugated drain pipes, and multiple, closely-spaced conduits in a single trench in the bedding and shading material, jetting or flooding may be useful. Flooding or jetting should only be attempted with extreme caution, and any jetting operation should be subject to review by the soils engineer.

6. Long-term settlement of properly compacted imported sand or gravel trench backfill should be assumed to be about 0.25 to 0.5 percent of the depth of the backfill. Where trenches are backfilled with site soils, the anticipated settlement would be about two to three times that of sand or gravel backfill. Improvements that are constructed over or near trenches should be designed to accommodate the potential for settlement.

7. The recommendations of this section are minimums only, and may be superseded by the architect/engineer based upon soil corrosivity, the recommendations of pipe manufacturers or utility companies, or the requirements of the governing jurisdiction.

Foundations

1. Generally, each individual building may be founded on either footings bearing in bedrock or in compacted fill, but not a combination of the two. The appropriate grading program, as described above, should be accomplished in each building area. The parking structure should be founded exclusively in bedrock unless individually evaluated by the soils engineer.

2. For foundations bearing in bedrock, conventional continuous and spread footings should penetrate a minimum of 12 inches into sound bedrock. Spread footings should be a minimum of 2 feet square. Minimum overall footing depths should be 18 inches below the lowest grade within 5 feet of the footing.

3. For foundations bearing in compacted fill, conventional continuous and spread footings should penetrate a minimum of 21 below the lowest grade within 5 feet of the footing if 1 or 2 stories are to be supported, and a minimum of 24 inches for 3 or more stories. Spread footings should be a minimum of 2 feet square.

4. Footings should not be constructed within 5 feet of any slope that descends steeper than 20 percent. In some cases, a greater setback may be warranted. The soils engineer should evaluate, on an individual basis, any footing that will be constructed within 10 feet of a descending slope.

5. Typically, all spread footings bearing in compacted fill should be interconnected on at least two sides to the continuous footings. Interconnection should be by grade beams that are the same depth as the footings they connect, to create a foundation system that acts as an integral unit. Spread footings for lightly-loaded canopies, shade structures, or for other features where differential movement can be accommodated by structural or architectural means, need not be interconnected by grade beams. Spread footings bearing in bedrock need not be interconnected.

6. All footings and grade beams should be reinforced in accordance with the requirements of the architect/engineer. Minimum continuous footing and grade beam reinforcement should consist of two No. 5 rebar, one at the top and one at the bottom.

7. Typically, footings bearing in bedrock may be designed using maximum allowable bearing capacities of 3,000 psf dead load and 4,500 dead plus live loads. Using these values, settlement is expected to be minimal. If the depth to bedrock becomes excessive, lean concrete may be placed in excavations for footings subject only to sustained vertical loads to extend the footings into the bedrock. The structural footing should be cast atop the lean concrete surface. Lean concrete should not be used beneath retaining wall footings or other footings subject to sustained lateral loads. Specification of the lean concrete mix, vibration criteria, etc. is left to the architect/engineer.

8. Where heavier loads are planned, increased bearing capacity may be realized by deeper penetration into the bedrock. For footings extending a minimum depth of 2 feet into sound rock, maximum allowable bearing capacities of 5,000 psf dead load and 7,500 psf dead plus live load may be used. With a minimum penetration of 3 feet into sound rock, design may be based upon maximum allowable bearing capacities of 7,000 psf dead load and 10,500 psf dead plus live loads. Using these criteria, maximum settlement and differential settlement under static conditions are expected to be on the order of 1/2 inch.

9. If the higher allowable bearing capacities associated with deeper penetration into rock are used, the use of lean concrete to extend the footings into the bedrock is *not* appropriate; only structural concrete should be used.

10. Footings bearing in compacted fill may be designed using a maximum allowable bearing capacity of 2,000 psf dead load and 3,500 psf dead plus live loads. Using these criteria, maximum settlement and differential settlement under static conditions are expected to be on the order of 3/4 inch and 1/2 inch in 25 feet, respectively.

11. Allowable bearing capacities may be increased by one-third when transient loads such as wind or seismicity are included. Foundations may be designed using the following seismic parameters which are based, in part, on a latitude of 35.298 degrees north, and a longitude of 120.655 degrees west, as taken from the Google Earth web site.

For buildings on approximately the northern two-thirds of site (generally north of line from Boring 4 to Boring 5 on the appended Boring Location Map) and buildings that will have a lower finish floor that is a minimum of 7 feet below existing grade:

Site Classification (CBC Table 1613.5.2)	B
Mapped Spectral Accelerations	
0.2 second period - S_S	1.26g
1.0 second period – S_1	0.473g
Design Response Spectral Acceleration	
0.2 second period - S_{DS}	0.839g
1.0 second period – S_{D1}	0.316g

For buildings on approximately the southern one-third of site (generally south of line from Boring 4 to Boring 5 on the appended Boring Location Map), except those having a lower finish floor that is a minimum of 7 feet below existing grade:

Site Classification (CBC Table 1613.5.2)	C
Mapped Spectral Accelerations	
0.2 second period - S_S	1.26g
1.0 second period – S_1	0.473g
Design Response Spectral Acceleration	
0.2 second period - S_{DS}	0.839g
1.0 second period – S_{D1}	0.418g

12. Lateral loads may be resisted by friction and by passive resistance of the soil and bedrock acting on foundations. Lateral capacity is based on the assumption that backfill adjacent to foundations is properly compacted. A passive equivalent fluid pressure of 300 pcf and a coefficient of friction of 0.35 for soil may be used in design; for bedrock, a passive equivalent fluid pressure of 500 pcf and a coefficient of friction of 0.45 may be used.

13. Foundation excavations should be observed by the soils engineer during excavation, and prior to placing of reinforcing steel. Soils in foundation excavations should be lightly moistened and no desiccation cracks should be present prior to concrete placement.

Interior Slabs-on-Grade and Exterior Flatwork

Interior Slabs-on-Grade

1. Conventional capacity interior slabs-on-grade should have a minimum thickness of 4 full inches. Heavy capacity interior and exterior slabs-on-grade should have a minimum thickness of 6 full inches.

2. Heavy capacity interior slabs bearing on any type of compacted nonexpansive soil may be designed using a modulus of subgrade reaction (k_{30}) value of 200 psi/inch (pci). If a minimum of 18 inches of aggregate base (conforming to the 2010 Caltrans Standard Specifications, Section 26), is used below heavy capacity slabs, the design may be based on a modulus of subgrade reaction (k_{30}) value of 350 psi/inch. Aggregate base used below heavy capacity slabs should be compacted *to a minimum of 95 percent of maximum dry density*. If the option for a higher subgrade modulus is utilized, any layer of clean sand specified for the protection of a vapor retarder (as described below) should be no thicker than 2 inches or the subgrade modulus may be compromised.

3. Reinforcement size, placement, and dowels for interior slabs-on-grade should be as directed by the architect/engineer. Minimum conventional capacity interior slab reinforcement should consist of No. 3 rebar placed at 24 inches on-center each way. Minimum heavy capacity interior and exterior slab reinforcement should consist of No. 4 rebar placed at 18 inches on-center each way. At a minimum, slabs-on-grade should be connected to footings and grade beams with dowels lapped to the slab rebar and matching the rebar size and spacing.

4. Due to the current use of impermeable floor coverings, water-soluble flooring adhesives, and the speed at which buildings are now constructed, moisture vapor transmission through interior slabs is a much more common problem than in past years. Where moisture vapor transmitted from the underlying soil would be undesirable, the slabs should be protected from subsurface moisture vapor. A number of options for vapor protection are discussed below; however, the means of vapor protection, including the type and thickness of the vapor retarder, if specified, are left to the discretion of the architect/engineer.

5. Where specified, vapor retarders should conform to ASTM Standard E 1745-11. This standard specifies properties for three performance classes; Class A, B and C. The appropriate class should be selected based on the sensitivity of floor coverings to moisture intrusion and the potential for damage to the vapor retarder during placement of slab reinforcement and concrete.

6. Several recent studies, including those of American Concrete Institute (ACI) Committees 302 and 306, have concluded that excess water above the vapor retarder increases the potential for moisture damage to floor coverings and could increase the potential for mold growth or other microbial contamination. The studies also concluded that it is preferable to eliminate the typical sand layer beneath the slab and place the slab concrete in direct contact with a Class A vapor retarder, particularly during wet weather construction. However, placing the concrete directly on the vapor retarder requires special attention to using the proper vapor retarder, a very low water-cement ratio in the concrete mix, and special finishing and curing techniques.

7. Probably the next most effective option would be the use of vapor-inhibiting admixtures in the slab concrete mix and/or application of a sealer to the surface of the slab. This would also require special concrete mixes and placement procedures, depending upon the recommendations of the admixture or sealer manufacturer.

8. Another option that may be a reasonable compromise between effectiveness and cost considerations is the use of a subslab vapor retarder protected by a sand layer. If a Class A vapor retarder is specified, the retarder can be placed directly on the nonexpansive soil. The retarder should be covered with a minimum 2 inches of *clean* sand. If a less durable vapor retarder is specified (i.e. ASTM E 1745-11, Class B or C), a minimum of 4 inches of clean sand should be provided, and the retarder should be placed in the center of the clean sand layer. Clean sand is defined as a well or poorly graded sand (ASTM D 2487-11) of which less than 3 percent passes the No. 200 sieve.

9. Regardless of the underslab vapor retarder selected, proper installation of the retarder per ASTM E 1643-11 is critical for optimum performance. Where utilized, the vapor retarder should be placed a minimum of 1 inch above the flow line of the drainage path surrounding the structures, or 1 inch above the area drain grates if area drains are used to collect runoff around the structures. Where a slab will abut a retaining wall, the vapor retarder should lie a minimum of 2 inches above the elevation of the retaining wall drain invert. All seams should be properly lapped, and all seams and utility penetrations properly sealed in accordance with the vapor retarder manufacturer's recommendations.

10. If the sand is used between the vapor retarder and the slab, it should be moistened only as necessary to promote concrete curing; saturation of the sand should be avoided, as the excess moisture would be on top of the vapor retarder, potentially resulting in vapor transmission through the slab for months or years.

11. Positive drainage away from the building should be maintained; see the "Drainage and Maintenance" section of this report for additional discussion of this issue. If water is allowed to pond near the structure, it may seep into the ground and migrate laterally through cracks or utility penetrations in the foundation, ultimately gaining access above the vapor retarder.

Exterior Flatwork

1. Exterior pedestrian flatwork should have a minimum thickness of 4 full inches. Minimum reinforcement for exterior pedestrian flatwork should consist of No. 3 rebar placed at 24 inches on-center each way.

2. Heavy capacity exterior flatwork, such as transformer pads and vehicular PCC pavement, bearing on compacted site or similar imported soils may be designed using a modulus of subgrade reaction (k_{30}) value of 150 psi/inch. If a minimum of 12 inches of aggregate base (conforming to the 2010 Caltrans Standard Specifications, Section 26), is used below heavy capacity flatwork, the design may be based on a modulus of subgrade reaction (k_{30}) value of 300 psi/inch. Aggregate base used below heavy capacity flatwwork should be compacted *to a minimum of 95 percent of maximum dry density.*

3. In conventional construction, it is common to use 4 to 6 inches of sand beneath exterior flatwork. Due to the expansive soils on this site, there is a high risk of movement and damage to such flatwork if conventional measures are used. Heaving and cracking are likely to occur. This movement could be reduced by the placement of additional nonexpansive material beneath the flatwork. If the performance of the flatwork is intended to be similar to the structure, then at least 18 inches of nonexpansive material should be provided below it. If it is acceptable for the flatwork to experience movement, the thickness of the nonexpansive soil can be reduced. Under all flatwork, however, the thicker the nonexpansive layer, the better the expansive soil protection.

4. Another measure that can be taken to reduce the risk of movement of flatwork due to expansive soils is to provide thickened edges or grade beams around the perimeters of the flatwork. If the performance of the flatwork is intended to be similar to the structure, the thickened edges or grade beams could be up to 24 inches deep. If it is acceptable for the flatwork to experience movement, then the thickened edges or grade beams can be reduced. At a minimum, any thickened edge or grade beam should be reinforced by two No. 4 rebar, one at the top and one at the bottom.

5. The degree to which exterior flatwork is protected from expansive soil damage is left to the discretion of the owner and/or architect/engineer.

6. Exterior pedestrian flatwork should be constructed with frequent joints to allow articulation as the flatwork moves in response to seasonal soil moisture variations.

7. Exterior flatwork at doorways, and at other areas where maintaining the elevation of the flatwork is desired, should be doweled to the perimeter foundation or other improvements, at a minimum, by dowels lapped to the flatwork rebar and matching the size and spacing of the rebar in the slab. In other areas, the flatwork may be doweled to the foundation or the flatwork may be allowed to "float free," at the discretion of the architect/engineer. Flatwork that is intended to float free should be separated from foundations by a felt joint or other means. All flatwork should be set back from the top of any descending slope a minimum of 3 feet to the firm slope face. Loose, landscape or other disturbed soil on the slope face should not be considered in measuring the setback.

Slabs-on-Grade and Exterior Flatwork - General

1. To reduce shrinkage cracks in slabs-on-grade, the concrete aggregates should be of appropriate size and proportion, the water/cement ratio should be low, the concrete should be properly placed and finished, contraction joints should be installed, and the concrete should be properly cured. This is particularly applicable to slabs that will be cast directly upon a vapor retarder and those that will be protected from transmission of vapor by use of admixtures or surface sealers. Concrete materials, placement, and curing specifications should be at the direction of the architect/engineer.

Retaining Walls

1. Foundations for retaining walls rigidly attached to or forming part of a structure should be supported by either sound bedrock or soils that have been recompacted in the same manner as for the building.

2. Sitework retaining walls that are not rigidly attached to any structure may be founded either in soil or in bedrock. Where walls will bear in soil, the foundation area should be overexcavated and recompacted as described in the "Grading" section of this report. Foundation excavations should be observed by the soils engineer prior to placing reinforcing steel in the excavations.

3. Retaining wall foundations bearing in bedrock should penetrate into the bedrock a minimum of 12 inches (not including any keyway). Retaining wall foundations bearing in compacted soil should have a minimum depth of 21 inches (not including any keyway) below the lowest grade within 5 feet of the toe of the foundation.

4. If a wall foundation will span from bearing in compacted soil to bearing in bedrock, a construction joint should be placed in the wall at the transition point.

5. The following allowable bearing capacities may be used in retaining wall foundation design:

Soil	2,500 psf
In situ bedrock	3,500 psf

6. Table 1610.1 of the CBC does not allow fat clay (CH) soils such as some of those found on this site to be used for retaining wall backfill; other site soils, or sand or gravel backfill, should be used exclusively. If sand or gravel backfill is specified exclusively above a 1:1 plane from the bottom of the wall to 1 foot from the top of the backfill, the following parameters may be used in the design:

Active equivalent fluid pressure	35 pcf
At-rest equivalent fluid pressure	55 pcf

7. If there will be insufficient space behind the wall to ensure that all clay soils are removed from above a 1:1 plane, or if clayey site soils (other than fat clay soils) are to be used as backfill, the design of the walls should be based upon the influence of the clay soils and the following parameters may be used:

Active equivalent fluid pressure	55 pcf
At-rest equivalent fluid pressure	70 pcf

8. The above pressures are applicable to a retained surface that is horizontal at the top of the wall. Walls having a retained surface that slopes upward from the top of the wall should be designed for an additional equivalent fluid pressure of 1 pcf for the active case and 1.5 pcf for the at-rest case, for every degree of slope inclination.

9. In calculating resistance to sliding, the following parameters may be used:

Passive equivalent fluid pressure, soil	300 pcf
Passive equivalent fluid pressure, bedrock	500 pcf
Friction coefficient, soil	0.35
Friction coefficient, bedrock	0.45

10. Chapter 18 of the 2010 CBC identifies the need for determining earthquake loads on buried structures and retaining walls. Such criteria are typically developed based upon information developed by Mononobe and Matsuo (1929) and Okabe (1926), as modified by Seed and Whitman (1970). This methodology has been the accepted geotechnical standard for development of seismic parameters for retaining wall design for over 35 years. In October, 2010, a professional paper was published in the Journal of Geotechnical and Environmental Engineering that has challenged this generally accepted view. The paper, entitled "Seismic Earth Pressures on Cantilever Retaining Structures" was authored by Linda Al Atik, Ph.D. and Nicholas Sitar, Ph.D. of the University of California at Berkeley. The paper was also presented, in association with several prominent structural and geotechnical engineers, at the Structural Engineering Association of California (SEAOC) 2010 Convention. In their research, the paper's authors were able to model gravitational forces through the use of centrifuge modeling at U.C. Davis, an element that was lacking in previous studies. Among other findings, they concluded that the effects of seismic soil loading on retaining walls are negligible for peak ground acceleration (PGA) of less than about 0.4g. In addition, they concluded that walls less than 12 feet in height did not need to be designed for seismic pressures as long as they are designed with the typical static factor of safety of 1.5 against sliding and overturning. Using the S_{DS} value presented above the previous section, and dividing it by 2.5 as allowed by CBC Section 1803.5.12.2, the PGA at the site was found to be less than 0.4g and the site walls are anticipated to be 12 feet or less in height. Therefore, in our opinion the findings of Atik and Sitar apply to the project at this point and design of retaining walls for seismic soil loading is not considered necessary, assuming a typical static factor of safety of 1.5 against sliding and overturning is utilized.

11. Footings should not bear in retaining wall backfill unless the wall has been specifically designed to accept the surcharge of the footings, and the backfill consists of *crushed* gravel or soil that has been compacted using heavy (not hand-operated) earth moving equipment. If crushed gravel is utilized, it should be separated from adjacent soil by a permeable synthetic filter fabric, conforming to Caltrans Standard Specification 88-1.02B (Class C). Alternately, footings may be designed as grade beams to span across the backfill zone.

12. No surcharges are taken into consideration in the values presented above. The maximum toe pressures are *allowable* values; no factors of safety, load factors or other factors have been applied to the remaining values. With the exception of the maximum toe pressures, these values will require application of appropriate factors of safety, load factors, and/or other factors as deemed appropriate by the architect/engineer.

13. The upper foot of backfill should consist of clay soil, except in areas where slabs, pavement, or flatwork will abut the top of the wall. In such cases, the gravel should extend to the nonexpansive material, aggregate base, or other material, as appropriate.

14. Long-term settlement of properly compacted imported sand or gravel retaining wall backfill should be assumed to be about 0.25 to 0.5 percent of the depth of the backfill; long-term settlement of clayey sand or lean clay site soil retaining wall backfill should be assumed to be about 0.75 to 1.5 percent of the depth of the backfill. Improvements that are constructed near the tops of retaining walls should be designed to accommodate the potential for settlement.

15. All retaining walls should be drained with perforated pipe encased in a free-draining gravel blanket. The pipe should be placed perforations downward, and should discharge in a nonerosive manner away from foundations and other improvements. The gravel blanket should have a width of approximately 1 foot and should extend upward to approximately 1 foot from the top of the wall backfill. The upper foot should be backfilled with native soil, except in areas where slabs, pavement, or flatwork will abut the top of the wall. In such cases, the gravel should extend to the nonexpansive material, aggregate base, or other material, as appropriate. To reduce infiltration of the soil into the gravel, a permeable synthetic fabric conforming to Caltrans Standard Specification 88-1.02B (Class C), should be placed between the two. Manufactured synthetic drains, such as Miradrain or Enkadrain are acceptable alternatives to the use of gravel, provided that they are installed in accordance with the recommendations of the manufacturer.

16. Walls facing areas where moisture transmission through the wall would be undesirable should be *thoroughly* waterproofed in accordance with the specifications of the architect/engineer.

17. The architect/engineer should bear in mind that retaining walls by their nature are flexible structures, and that surface treatments on walls often crack. Where walls are to be plastered or otherwise have a finish applied, the flexibility should be considered in determining the suitability of the surfacing material, spacing of horizontal and vertical

control joints, etc. The flexibility should also be considered where a retaining wall will abut or be connected to a rigid structure, and where the geometry of the wall is such that its flexibility will vary along its length.

18. It is assumed that retaining wall heights will not exceed 12 feet.

HMA Pavement Sections

The following HMA pavement sections are based upon an assumed R-value, or resistance to deformation under repeated loading, of 4. The pavement sections are also based on assumed Traffic Indices (TIs) of 4.5 through 8.0. Determination of the appropriate TI for specific areas of the project is left to others. The HMA sections were calculated in accordance with the method presented in the "Highway Design Manual" (Caltrans, 2012). The calculated HMA and aggregate base thicknesses are for compacted material. Normal Caltrans construction tolerances should apply.

R-value	Traffic Index	HMA	Aggregate Base
4	4.5	2.50"	9.5"
4	5.0	2.75"	10.5"
4	5.5	3.00"	12.0"
4	6.0	3.25"	13.5"
4	6.5	3.75"	14.5"
4	7.0	4.00"	16.0"
4	7.5	4.25"	17.5"
4	8.0	4.50"	19.0"

1. Aggregate base should conform to the requirements of Section 26 of the 2010 Caltrans Standard Specifications.

2. See the Grading section for general earthwork recommendations pertaining to HMA areas. The upper 12 inches of subgrade and all aggregate base should be compacted to a minimum of *95 percent of maximum dry density*. Subgrade and aggregate base should be firm and unyielding when proofrolled with heavy, rubber-tired grading equipment prior to continuing construction.

3. Finished pavement surfaces should be sloped to freely drain toward appropriate drainage facilities. Water should not be allowed to stand or pond on or adjacent to pavement or other improvements as it could infiltrate into the base and/or subgrade, causing premature pavement deterioration.

4. To reduce migration of surface drainage into the subgrade, maintenance of pavement areas is critical. Any cracks that develop in the pavement should be promptly sealed. Rodents should be aggressively controlled near pavement areas, and shoulders should be maintained to provide sheet flow away from the edges of the pavement.

Drainage and Maintenance

1. Unpaved ground surfaces should be *graded during construction,* and per Section 1804.3 of the CBC, *finish graded* to direct surface runoff away from foundations and other improvements at a minimum 5 percent grade for a minimum distance of 10 feet. Where this is not practicable due to other improvements, etc., swales with improved surfaces, area drains, or other drainage facilities, should be used to collect and discharge runoff.

2. All eaves of the structures should be fitted with roof gutters. Runoff from flatwork, roof gutters, downspouts, planter drains, area drains, etc. should discharge a minimum of 5 feet from foundations. Discharge should be in a nonerosive manner away from foundations and other improvements in accordance with the requirements of the governing agencies. Erosion protection should be placed at all discharge points unless the discharge is to a pavement surface.

3. To reduce the potential for planter drainage gaining access to subslab areas, any raised planter boxes adjacent to foundations should be installed with drains and sealed sides and bottoms. Drains should also be provided for areas adjacent to structures that would not otherwise freely drain.

4. The site soils are erodible; stabilization of soils disturbed during construction by vegetation or other means *during* and *following* construction, is essential to reduce erosion damage. Care should be taken to establish and maintain vegetation. The landscaping should be planned and installed to maintain the surface drainage recommended above. Surface drainage should also be maintained during construction.

5. Maintenance of drainage and other improvements is critical to the long-term stability of the site and the integrity of the structures. Site improvements should be inspected and maintained on a regular basis.

6. All exterior drains and their outlets should be cleaned and repaired as necessary to maintain free-flowing conditions. Vegetation and erosion matting (if utilized) should be maintained or augmented as needed. Irrigation systems should be adjusted so that soils around structures are maintained at a relatively uniform year-round moisture content, and are neither over-watered nor allowed to dry and desiccate.

7. The soil moisture recommended in the "Grading" section should be maintained throughout the life of the project. Failure to maintain the soil moisture content can result in cracks and disturbance, which are an indication of degradation of the soil's compaction. If cracks are allowed to develop, or if soils near improvements such as foundations, flatwork, pavement, curbs, etc. are otherwise disturbed, damage to those improvements may result. Soils that have cracked or are otherwise disturbed should be removed, moisture conditioned, and compacted.

8. To reduce the potential for disruption of drainage patterns and undermining of structures, flatwork, pavements, fill areas, etc., all rodent activity should be aggressively controlled.

Observation and Testing

1. It must be recognized that the recommendations contained in this report are based on a limited number of borings and rely on continuity of the subsurface conditions encountered.

2. It is assumed that the soils engineer will be retained to provide consultation during the design phase, to interpret this report and subsequent addenda during construction, and to provide construction monitoring in the form of testing and observation.

3. If the soils are overly moist so that they become unstable, of if the recommended compaction cannot be readily achieved, overexcavation of the soils, drying of the soils in-place, or the use of gravel or geo-synthetic stabilizers may be necessary. The soils engineer should be contacted for recommendations.

4. At a minimum, the soils engineer should be retained to provide:
    - Consultation and design review as the design progresses
    - Review of final grading and foundation plans and details
    - Professional observation during grading, foundation excavation, and trench backfill
    - Oversight of compaction testing during utility trench backfill
    - Oversight of Special Inspection during grading

5. Special inspection of grading and backfill should be provided as per Section 1704.7 and Table 1704.7 of the CBC. The soil special inspector should be under the direction of the soils engineer. At a minimum, the following items should be inspected and/or tested by the soil special inspector:

   - Stripping and clearing of vegetation and debris
   - Removal of existing fill in the building areas
   - Overexcavation, scarification, moisture conditioning, and recompaction
   - Fill placement, moisture conditioning, and compaction
   - Foundation excavations for buildings, walls and other structures
   - Utility trench backfill
   - Retaining wall drains and backfill
   - Pavement area subgrade and aggregate base

6. A program of quality assurance should be developed prior to beginning construction. At a minimum, the program should include all geotechnical items shown on the testing and inspection schedule of the approved plans. It should also include any additional inspection items required by the engineer and/or the governing jurisdiction. These items should be discussed at a preconstruction meeting among a representative of the owner, the soils engineer, special inspector, the project inspector, the architect/engineer, and contractors. The soils engineer should be notified at least 48 hours prior to beginning grading operations.

7. Locations and frequency of compaction tests should be as per the recommendation of the soils engineer at the time of construction. The recommended test location and frequency may be subject to modification by the soils engineer, based upon soil and moisture conditions encountered, size and type of equipment used by the contractor, the general trend of the results of compaction tests, or other factors.

8. If Earth Systems Pacific is not retained to provide construction observation and testing services, it shall not be responsible for the interpretation of the information by others or any consequences arising there from.

8.0 CLOSURE

This report is valid for the conditions, as they exist at this time for the type of project described herein. Our intent was to perform the investigation in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project under similar conditions at this time. No representation, warranty, or guarantee is either expressed or implied. This report is intended for the exclusive use by the client as discussed in the "Scope of Services" section. Application beyond the stated intent is strictly at the user's risk.

If changes with respect to project type or location become necessary, if items not addressed in this report are incorporated into plans, or if any of the assumptions used in the preparation of this report are not correct, the soils engineer shall be notified for modifications to this report. The soils engineer should be retained in the design process to provide geotechnical guidance as the design progresses. Any items not specifically addressed in this report shall comply with the CBC and the requirements of the governing jurisdiction.

The preliminary recommendations of this soils report are based upon the geotechnical conditions encountered at the site, and may be augmented by additional requirements of the architect/engineer, or by additional recommendations provided by the soils engineer based on conditions exposed at the time of construction.

This document, the data, conclusions, and recommendations contained herein are the property of Earth Systems Pacific. This report shall be used in its entirety, with no individual sections reproduced or used out of context. Copies may be made only by Earth Systems Pacific, the client, and the client's authorized agents for use exclusively on the subject project. Any other use is subject to federal copyright laws and the written approval of Earth Systems Pacific.

Thank you for this opportunity to have been of service. If you have any questions, please feel free to contact this office at your convenience.

End of Text

APPENDIX A

Boring Location Map
Boring Log Legend
Boring Logs



LEGEND

8 Boring Location (Approx.)

Project True

NOT TO SCALE

Base Map Image from Google Earth, 2013

BORING LOCATION MAP

STUDENT HOUSING SOUTH

California Polytechnic State University
San Luis Obispo, California

Earth Systems Pacific
4378 Old Santa Fe Road
San Luis Obispo, CA 93401-8116
(805) 544-3276 • FAX (805) 544-1786
E-mail: esp@earthsys.com

July 17, 2013 QF SL-16805-SD

CAL POLY STUDENT HOUSING SOUTH--071713Borings

Earth Systems Pacific

BORING LOG LEGEND

SAMPLE / SUBSURFACE WATER SYMBOLS	GRAPH. SYMBOL
CALIFORNIA MODIFIED	
STANDARD PENETRATION TEST (SPT)	
SHELBY TUBE	
BULK	
SUBSURFACE WATER DURING DRILLING	
SUBSURFACE WATER AFTER DRILLING	

SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS	GROUP SYMBOL	TYPICAL DESCRIPTIONS	GRAPH. SYMBOL
COARSE GRAINED SOILS (MORE THAN HALF OF MATERIAL IS TESTED OR JUDGED TO BE LARGER THAN #200 SIEVE SIZE)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
	GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	
	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, NON-PLASTIC FINES	
	GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, PLASTIC FINES	
	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
	SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	
	SM	SILTY SANDS, SAND-SILT MIXTURES, NON-PLASTIC FINES	
	SC	CLAYEY SANDS, SAND-CLAY MIXTURES, PLASTIC FINES	
FINE GRAINED SOILS (HALF OR MORE OF MATERIAL IS TESTED OR JUDGED TO BE SMALLER THAN #200 SIEVE SIZE)	ML	INORGANIC SILTS AND VERY FINE SANDS, SILTY, CLAYEY FINE SANDS, CLAYEY SILTS WITH SLIGHT PLASTICITY	
	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY, SILTY SOILS, ELASTIC SILTS	
	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
	PT	PEAT AND OTHER HIGHLY ORGANIC SOILS	

OBSERVED MOISTURE CONDITION

DRY	SLIGHTLY MOIST	MOIST	VERY MOIST	WET
LITTLE/NO MOISTURE	JUDGED BELOW OPTIMUM	JUDGED ABOUT OPTIMUM	JUDGED OVER OPTIMUM	SATURATED

TYPICAL CONSISTENCY

COARSE GRAINED SOILS			FINE GRAINED SOILS		
BLOWS/FOOT		DESCRIPTIVE TERM	BLOWS/FOOT		DESCRIPTIVE TERM
SPT	CA SAMPLER		SPT	CA SAMPLER	
0-10	0-16	LOOSE	0-2	0-3	VERY SOFT
11-30	17-50	MEDIUM DENSE	3-4	4-7	SOFT
31-50	51-83	DENSE	5-8	8-13	MEDIUM STIFF
OVER 50	OVER 83	VERY DENSE	9-15	14-25	STIFF
			16-30	26-50	VERY STIFF
			OVER 30	OVER 50	HARD

GRAIN SIZES

U.S. STANDARD SERIES SIEVE				CLEAR SQUARE SIEVE OPENING		
# 200	# 40	# 10	# 4	3/4"	3"	12"

SILT & CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

TYPICAL ROCK HARDNESS

MAJOR DIVISIONS	TYPICAL DESCRIPTIONS
EXTREMELY HARD	CORE, FRAGMENT, OR EXPOSURE CANNOT BE SCRATCHED WITH KNIFE OR SHARP PICK; CAN ONLY BE CHIPPED WITH REPEATED HEAVY HAMMER BLOWS
VERY HARD	CANNOT BE SCRATCHED WITH KNIFE OR SHARP PICK; CORE OR FRAGMENT BREAKS WITH REPEATED HEAVY HAMMER BLOWS
HARD	CAN BE SCRATCHED WITH KNIFE OR SHARP PICK WITH DIFFICULTY (HEAVY PRESSURE); HEAVY HAMMER BLOW REQUIRED TO BREAK SPECIMEN
MODERATELY HARD	CAN BE GROOVED 1/16 INCH DEEP BY KNIFE OR SHARP PICK WITH MODERATE OR HEAVY PRESSURE; CORE OR FRAGMENT BREAKS WITH LIGHT HAMMER BLOW OR HEAVY MANUAL PRESSURE
SOFT	CAN BE GROOVED OR GOUGED EASILY BY KNIFE OR SHARP PICK WITH LIGHT PRESSURE, CAN BE SCRATCHED WITH FINGERNAIL; BREAKS WITH LIGHT TO MODERATE MANUAL PRESSURE
VERY SOFT	CAN BE READILY INDENTED, GROOVED OR GOUGED WITH FINGERNAIL, OR CARVED WITH KNIFE; BREAKS WITH LIGHT MANUAL PRESSURE

TYPICAL ROCK WEATHERING

MAJOR DIVISIONS	TYPICAL DESCRIPTIONS
FRESH	NO DISCOLORATION, NOT OXIDIZED
SLIGHTLY WEATHERED	DISCOLORATION OR OXIDATION IS LIMITED TO SURFACE OF, OR SHORT DISTANCE FROM; SOME FRACTURES PRESENT; FELDSPAR CRYSTALS ARE DULL
MODERATELY WEATHERED	DISCOLORATION OR OXIDATION EXTENDS FROM FRACTURES, USUALLY THROUGHOUT; Fe-Mg MINERALS ARE "RUSTY"; FELDSPAR CRYSTALS ARE "CLOUDY"
INTENSELY WEATHERED	DISCOLORATION OR OXIDATION THROUGHOUT; FELDSPAR AND Fe-Mg MINERALS ARE ALTERED TO CLAY TO SOME EXTENT OR CHEMICAL ALTERATION PRODUCES IN SITU DISAGGREGATION
DECOMPOSED	DISCOLORATION OR OXIDATION THROUGHOUT, BUT RESISTANT MINERALS SUCH AS QUARTZ MAY BE UNALTERED; FELDSPAR AND Fe-Mg MINERALS ARE COMPLETELY ALTERED TO CLAY

drafting/masters/Boring Log Legend091608.dwg

Earth Systems Pacific

Boring No. 1
PAGE 1 OF 1

LOGGED BY: R. Wagner
DRILL RIG: Mobile B-53 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem Auger Surface Elev.: 401' +/-

JOB NO.: SL-16805-SD
DATE: 6/19/13

STUDENT HOUSING SOUTH
California Polytechnic State University
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			4.0" AC over 5.5" REDROCK BASE					
2	CL		SANDY LEAN CLAY: gray, stiff, moist, trace coarse gravel (Fill)	1.0–3.0	○			3
3				2.0–3.5	■	110.0	15.5	7 9
4	CL		SANDY LEAN CLAY: dark gray, stiff, moist (Alluvium)					3
5				5.0–6.5	■	103.4	18.4	8 18
6			CLAYSTONE: dark olive gray, very soft, moist, weathered, sheared, friable (Franciscan Melange)					
10			soft	10.0–11.5	●			10 18 21
11								
12			End of Boring @ 11.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 2
PAGE 1 OF 1

LOGGED BY: R. Wagner
DRILL RIG: Mobile B-53 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem Auger Surface Elev.: 381' +/-
JOB NO.: SL-16805-SD
DATE: 6/19/13

STUDENT HOUSING SOUTH
California Polytechnic State University
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			4.75" AC over 7.5" REDROCK BASE					
2	CL		SANDY LEAN CLAY: olive/brown mottled, stiff, moist, trace fine to coarse gravel (Fill)	2.0–3.5	■	118.1	10.6	6, 8, 7
4	CL		SANDY LEAN CLAY: gray, stiff, moist (Alluvium)	5.0–6.5	■	109.0	18.3	3, 7, 9
7			brown	5.0–8.0	○			
10			SANDSTONE: olive brown, very soft, moist, weathered, fractured, caliche stains (Franciscan Melange)	10.0–11.5	■	129.3	8.4	6, 22, 50/5.5"
13			soft					
15			moderately hard	15.0–15.5	●			50/3"
17			End of Boring @ 15.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 3
PAGE 1 OF 1

LOGGED BY: R. Wagner
DRILL RIG: Mobile B-53 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem Auger
Surface Elev.: 397' +/-
JOB NO.: SL-16805-SD
DATE: 6/19/13

STUDENT HOUSING SOUTH
California Polytechnic State University
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			3.0" AC over 7.0" AGGREGATE BASE					
1	SC		CLAYEY SAND WITH GRAVEL: olive brown, loose, slightly moist, coarse gravel (Fill)	2.0–3.5	Ring	108.8	3.0	2 5 6
5				5.0–6.0	Ring	93.4	8.0	15 50/4"
6			SANDSTONE: light brown, moderately hard, slightly moist (Franciscan Melange)	6.5–7.0	SPT			50/3"
7			End of Boring @ 7.0' due to refusal No subsurface water encountered					

LEGEND: Ring Sample; Grab Sample; Shelby Tube Sample; SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 4
PAGE 1 OF 1

LOGGED BY: R. Wagner
DRILL RIG: Mobile B-53 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem Auger
Surface Elev.: 380' +/-
JOB NO.: SL-16805-SD
DATE: 6/19/13

STUDENT HOUSING SOUTH
California Polytechnic State University
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			2.5" AC over 7.0" AGGREGATE BASE					
1	SC		CLAYEY SAND WITH GRAVEL: olive gray, loose, slightly moist, coarse gravel (Fill)					
3				3.0–4.5	■	121.6	9.9	3 5 9
8			SANDSTONE: olive brown, very soft, slightly moist, very weathered					
10				10.0–11.5	■	122.9	10.7	7 14 43
14			soft					
15				15.0–16.0	●			37 50/2"
16			moderately hard					
17			End of Boring @ 16.0' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 5
PAGE 1 OF 1

LOGGED BY: R. Wagner
DRILL RIG: Mobile B-53 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem Auger
Surface Elev.: 408' +/-
JOB NO.: SL-16805-SD
DATE: 6/19/13

STUDENT HOUSING SOUTH
California Polytechnic State University
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			2.5" AC over 8.5" REDROCK BASE					
1	CH		SANDY FAT CLAY: dark brown, stiff, moist (Alluvium)					
2								
3								
4				2.0–5.0	○			
5			very stiff	5.0–6.5	■	113.7	17.4	4 9 14
6								
7								
8								
9			SANDSTONE: olive brown, very soft, moist (Franciscan Melange)					
10				10.0–11.5	■	116.0	14.5	3 13 19
11								
12			SHALE: gray, very soft, moist					
13								
14			SANDSTONE: brown, moderately hard, slightly moist					
15				15.0–15.5	●			50/6"
16			End of Boring @ 15.5' No subsurface water encountered					
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 6
PAGE 1 OF 1

LOGGED BY: R. Wagner
DRILL RIG: Mobile B-53 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem Auger
Surface Elev.: 393' +/-
JOB NO.: SL-16805-SD
DATE: 6/19/13

STUDENT HOUSING SOUTH
California Polytechnic State University
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			2.75" AC over 3.5" REDROCK BASE					
2	SC		CLAYEY SAND WITH GRAVEL: olive gray, medium dense, moist, fine to coarse gravel (Fill)	1.0–4.0	○			
3				2.0–3.5	■	105.2	10.6	3, 7, 11
5				5.0–6.5	■	127.3	5.2	5, 11, 11
8	CL		SANDY LEAN CLAY: dark gray, stiff, moist (Alluvium)					
10				10.0–11.5	●			3, 5, 8
15			SANDSTONE: olive brown, moderately hard, slightly moist	15.0–15.5	●			50/6"
16			End of Boring @ 15.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 7
PAGE 1 OF 1

LOGGED BY: R. Wagner
DRILL RIG: Mobile B-53 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem Auger
Surface Elev.: 380' +/-
JOB NO.: SL-16805-SD
DATE: 6/19/13

STUDENT HOUSING SOUTH
California Polytechnic State University
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			3.0" AC over 4.75" REDROCK BASE					
1	SC		CLAYEY SAND: brown/gray mottled, medium dense, moist, some fine to coarse gravel (Fill)					
2								
3				3.0–4.5	Ring	123.1	8.3	3, 8, 12
4								
5			increasing gravel content					
6								
7								
8								
9								
10				10.0–11.5	Ring	122.9	10.1	8, 8, 11
11								
12								
13								
14	CH		SANDY FAT CLAY: dark brown, stiff, moist (Alluvium)					
15				15.0–16.5	SPT			3, 3, 5
16								
17								
18								
19			SANDSTONE: light brown, very soft, moist, very weathered (Franciscan Melange)					
20				20–21.5	SPT			9, 10, 26
21								
22			End of Boring @ 21.5'					
23			No subsurface water encountered					
24								
25								
26								

LEGEND: Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 8
PAGE 1 OF 1

LOGGED BY: R. Wagner
DRILL RIG: Mobile B-53 with Automatic Hammer
AUGER TYPE: 6" Hollow Stem Auger Surface Elev.: 384' +/-

JOB NO.: SL-16805-SD
DATE: 6/19/13

STUDENT HOUSING SOUTH
California Polytechnic State University
San Luis Obispo, California

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0			3.5" AC over 7.0" REDROCK BASE					
1–4	SC		CLAYEY SAND: olive brown/gray mottled, medium dense, moist, some coarse gravel (Fill)	3.0–4.5	Ring	121.4	9.1	5, 9, 4
5–8	CH		SANDY FAT CLAY: dark brown, stiff, moist (Alluvium)					
8–13	CL		SANDY LEAN CLAY: brown, stiff, moist	10.0–11.5	Ring	109.9	16.1	2, 6, 9
14–16			SANDSTONE: olive brown, very soft, moist, severely weathered	15.0–16.5	SPT			4, 16, 33
17			moderately hard	17.0–17.5	SPT			50/4"
18			End of Boring @ 17.5' due to refusal No subsurface water encountered					

LEGEND: Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

APPENDIX B

Laboratory Test Results

Student Housing South SL-16805-SD

BULK DENSITY TEST RESULTS

ASTM D 2937-10 (modified for ring liners)

July 1, 2013

BORING NO.	DEPTH feet	MOISTURE CONTENT, %	WET DENSITY, pcf	DRY DENSITY, pcf
1	3.0 - 3.5	15.5	127.1	110.0
1	6.0 - 6.5	18.4	122.5	103.4
2	3.0 - 3.5	10.6	130.6	118.1
2	6.0 - 6.5	18.3	129.0	109.0
2	11.0 - 11.5	8.4	140.1	129.3
3	3.0 - 3.5	3.0	112.0	108.8
3	5.5 - 6.0	8.0	100.9	93.4
4	4.0 - 4.5	9.9	133.7	121.6
4	11.0 - 11.5	10.7	136.0	122.9
5	6.0 - 6.5	17.4	133.4	113.7
5	11.0 - 11.5	14.5	132.8	116.0
6	3.0 - 3.5	10.6	116.3	105.2
6	6.0 - 6.5	5.2	133.9	127.3
7	4.0 - 4.5	8.3	133.3	123.1
7	11.0 - 11.5	10.1	135.4	122.9
8	4.0 - 4.5	9.1	132.4	121.4
8	11.0 - 11.5	16.1	127.6	109.9

EXPANSION INDEX TEST RESULTS

ASTM D 4829-11

BORING NO.	DEPTH feet	EXPANSION INDEX
1	1.0 - 3.0	63
5	2.0 - 5.0	77

Student Housing South SL-16805-SD

UNCONFINED COMPRESSION ON COHESIVE SOIL

ASTM D 2166-06

July 1, 2013

Boring #5 @ 6.0 - 6.5'
Sandy Fat Clay (CH)
Ring Sample
COMPRESSIVE STRENGTH: 55 psi (7,969 psf)

Dry Density: 113.7 pcf
Moisture Content: 17.4%
Degree Saturation: 100%
Specific Gravity: 2.65 (assumed)
H/D Ratio: 2.11

TIME (MINUTES)	DEFORM, in (X 1000)	AXIAL STRAIN	AREA (SQ. IN.)	APPLIED LOAD (LBS)	STRENGTH (PSI)	STRENGTH (PSF)
0.5	31	0.0062	4.46	79	18	2,552
1.0	60	0.0120	4.48	147	33	4,721
1.5	90	0.0180	4.51	185	41	5,905
2.0	116	0.0232	4.54	207	46	6,572
2.5	145	0.0290	4.56	219	48	6,912
3.0	172	0.0344	4.59	229	50	7,187
3.5	201	0.0402	4.62	237	51	7,394
4.0	229	0.0458	4.64	242	52	7,506
4.5	257	0.0514	4.67	247	53	7,616
5.0	286	0.0572	4.70	254	54	7,784
5.5	315	0.0630	4.73	257	54	7,827
6.0	346	0.0692	4.76	260	55	7,866
6.5	375	0.0750	4.79	264	55	7,938
7.0	401	0.0802	4.82	265	55	7,923
7.5	427	0.0854	4.84	267	55	7,938
8.0	460	0.0920	4.88	270	55	7,969
8.5	485	0.0970	4.91	270	55	7,925
9.0	512	0.1024	4.94	270	55	7,878
9.5	540	0.1080	4.97	270	54	7,828
10.0	570	0.1140	5.00	270	54	7,776

Student Housing South SL-16805-SD

DIRECT SHEAR

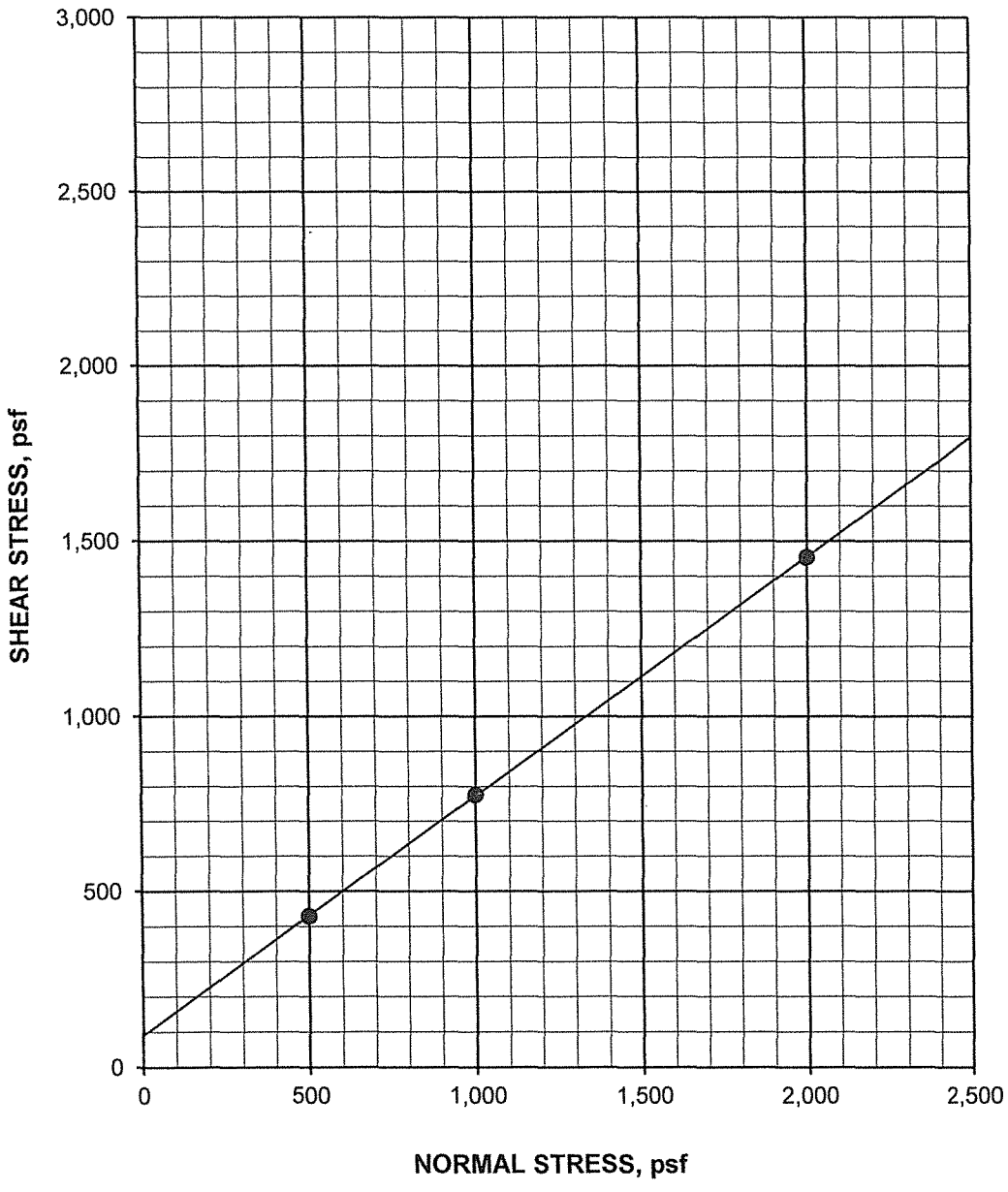
ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

July 1, 2013

Boring #6 @ 1.0 - 4.0'
Clayey Sand with Gravel (SC)
Compacted to 90% RC, saturated

INITIAL DRY DENSITY: 116.2 pcf
INITIAL MOISTURE CONTENT: 10.9 %
PEAK SHEAR ANGLE (Ø): 34°
COHESION (C): 90 psf

SHEAR vs. NORMAL STRESS



DIRECT SHEAR continued

ASTM D 3080/D3080M-11 (modified for consolidated, undrained conditions)

Boring #6 @ 1.0 - 4.0'

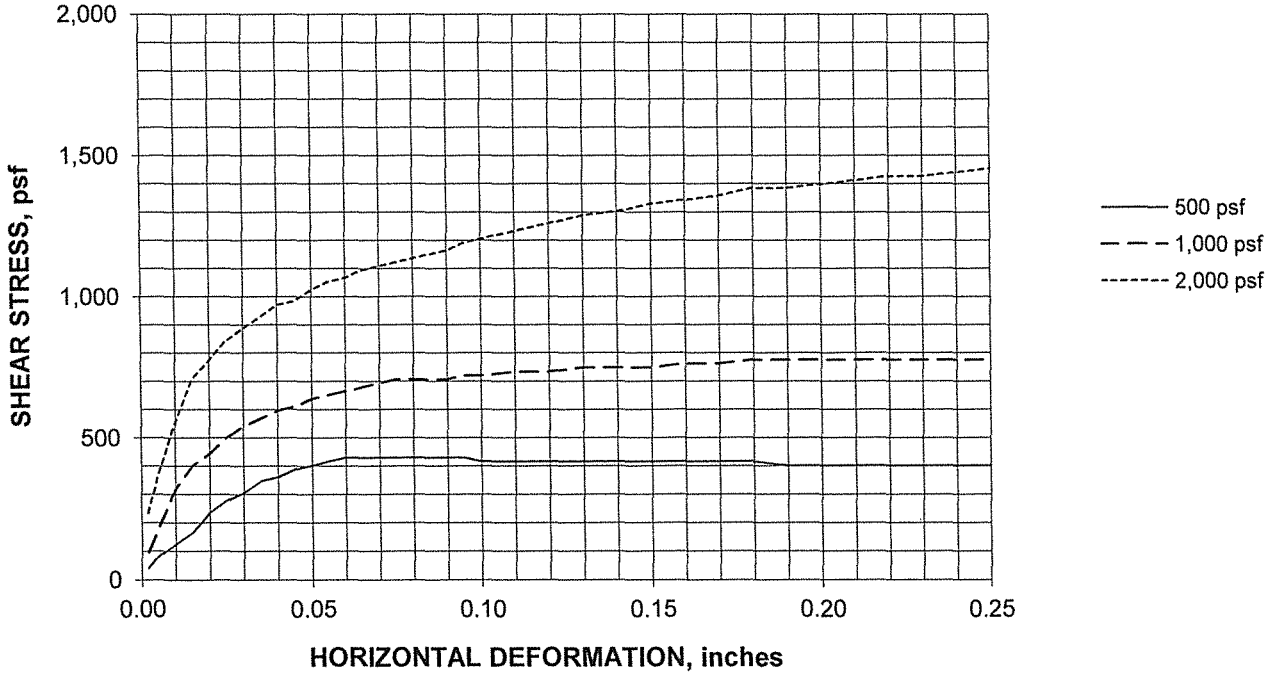
July 1, 2013

Clayey Sand with Gravel (SC)

Compacted to 90% RC, saturated

SPECIFIC GRAVITY: 2.70 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	10.9	10.9	10.9	10.9
DRY DENSITY, pcf	116.2	116.2	116.2	116.2
SATURATION, %	65.5	65.5	65.5	65.5
VOID RATIO	0.450	0.450	0.450	0.450
DIAMETER, inches	2.375	2.375	2.375	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	18.7	18.7	19.2	
DRY DENSITY, pcf	116.9	119.3	123.3	
SATURATION, %	100.0	100.0	100.0	
VOID RATIO	0.441	0.412	0.367	
HEIGHT, inches	0.99	0.97	0.94	



Student Housing South SL-16805-SD

MOISTURE-DENSITY COMPACTION TEST

ASTM D 1557-12

PROCEDURE USED: A

PREPARATION METHOD: Moist

RAMMER TYPE: Mechanical

SPECIFIC GRAVITY: 2.70 (assumed)

July 1, 2013

Boring #5 @ 2.0 - 5.0'

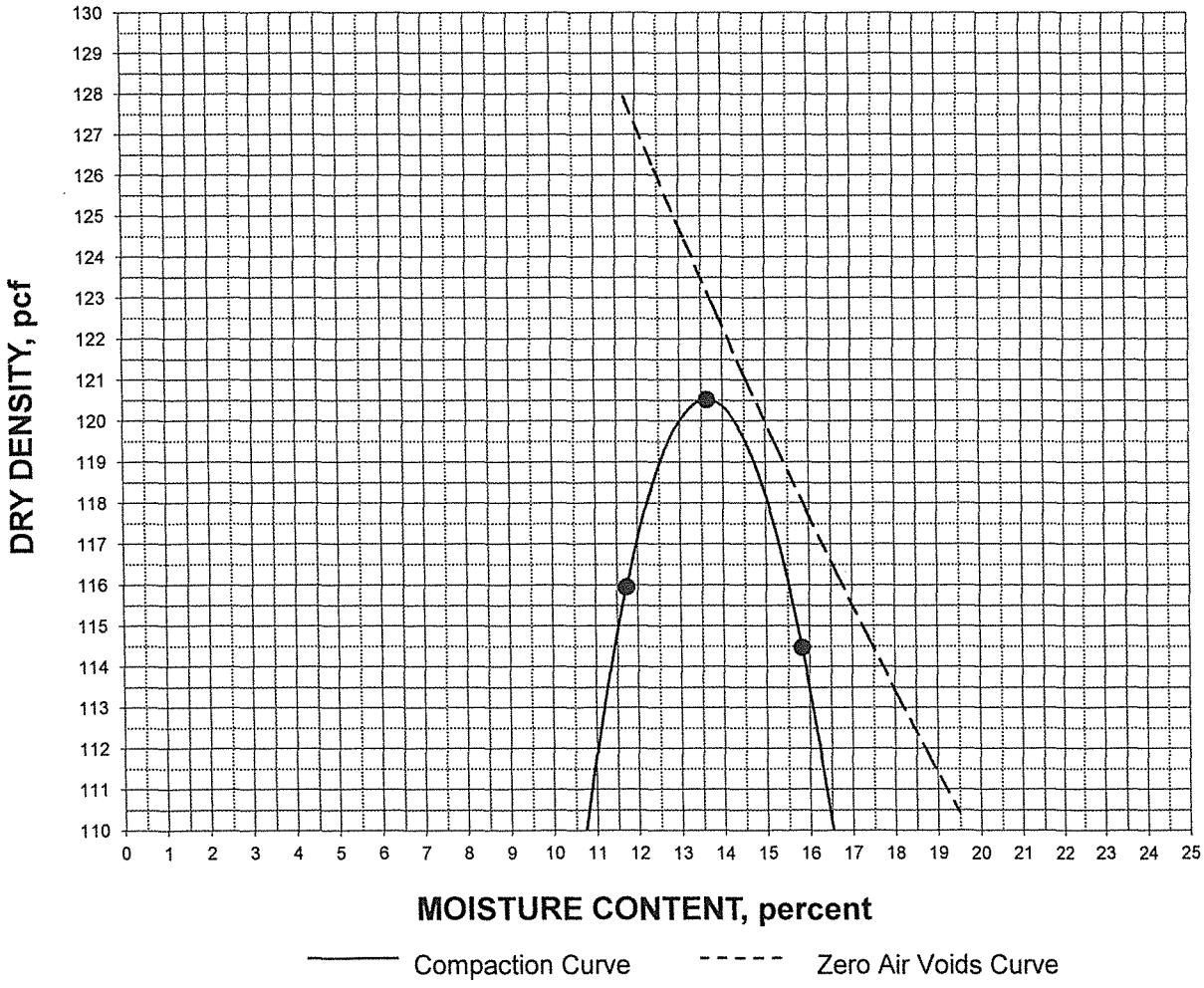
Dark Brown Sandy Lean Clay (CL)

SIEVE DATA:

Sieve Size	% Retained (Cumulative)
3/4"	0
3/8"	0
#4	0

MAXIMUM DRY DENSITY: 120.5 pcf

OPTIMUM MOISTURE: 13.6%



Student Housing South SL-16805-SD

MOISTURE-DENSITY COMPACTION TEST

ASTM D 1557-12

PROCEDURE USED: B

PREPARATION METHOD: Moist

RAMMER TYPE: Mechanical

SPECIFIC GRAVITY: 2.70 (assumed)

July 1, 2013

Boring #6 @ 1.0 - 4.0'

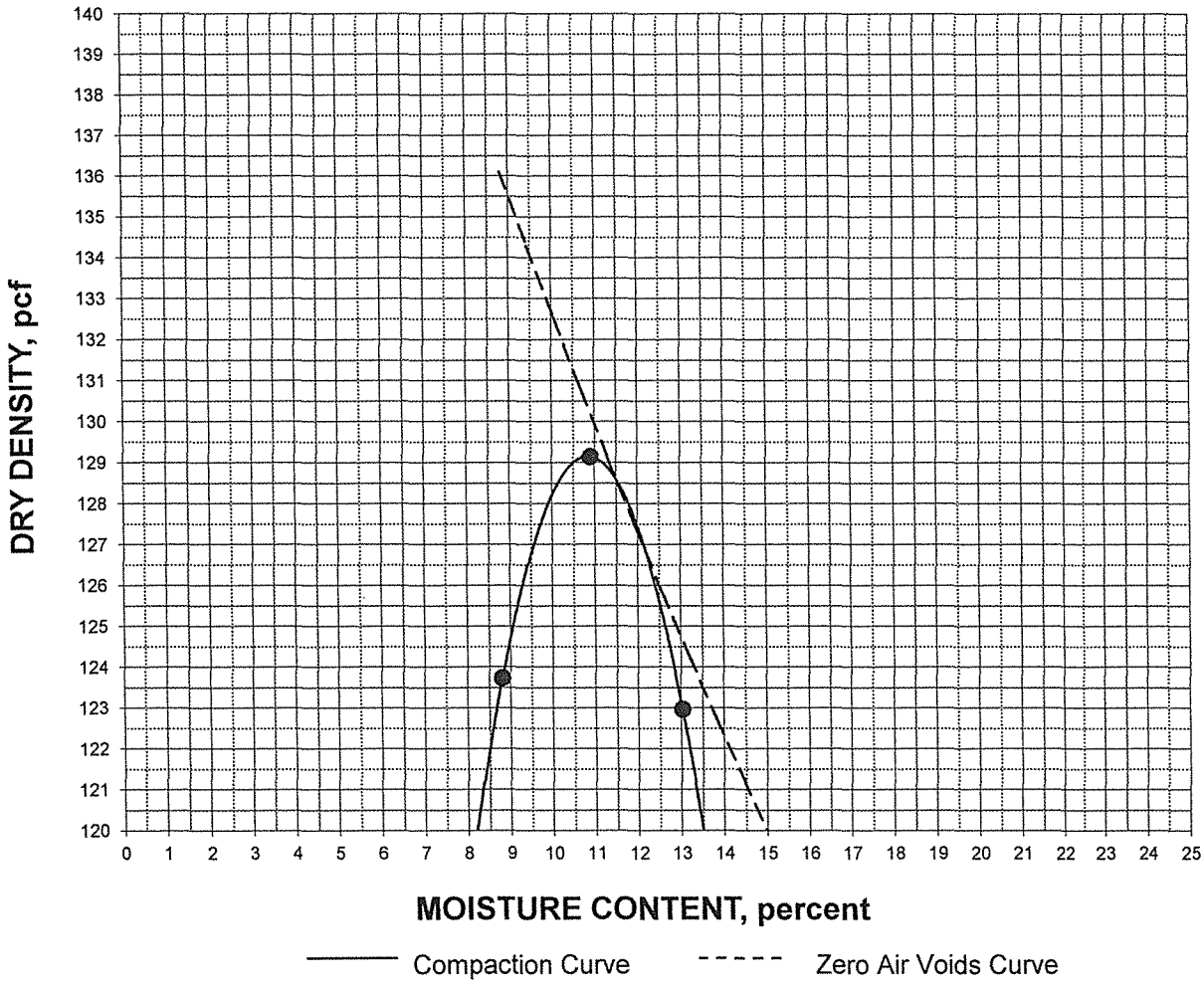
Olive Gray Clayey Sand with Gravel (SC)

SIEVE DATA:

Sieve Size	% Retained (Cumulative)
3/4"	1
3/8"	8
#4	17

MAXIMUM DRY DENSITY: 129.1 pcf

OPTIMUM MOISTURE: 10.9%



Student Housing South

SL-16805-SD

RESISTANCE '*R*' VALUE AND EXPANSION PRESSURE

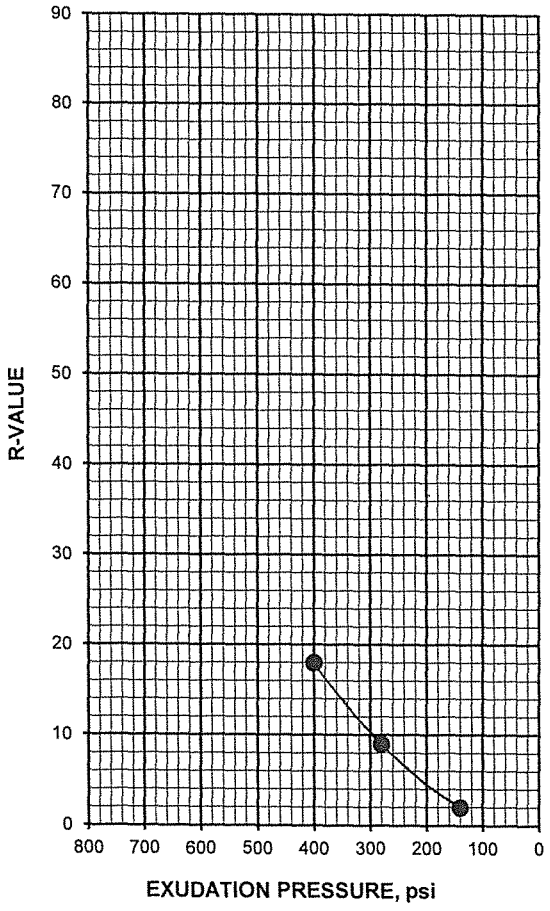
ASTM D 2844-07

July 1, 2013

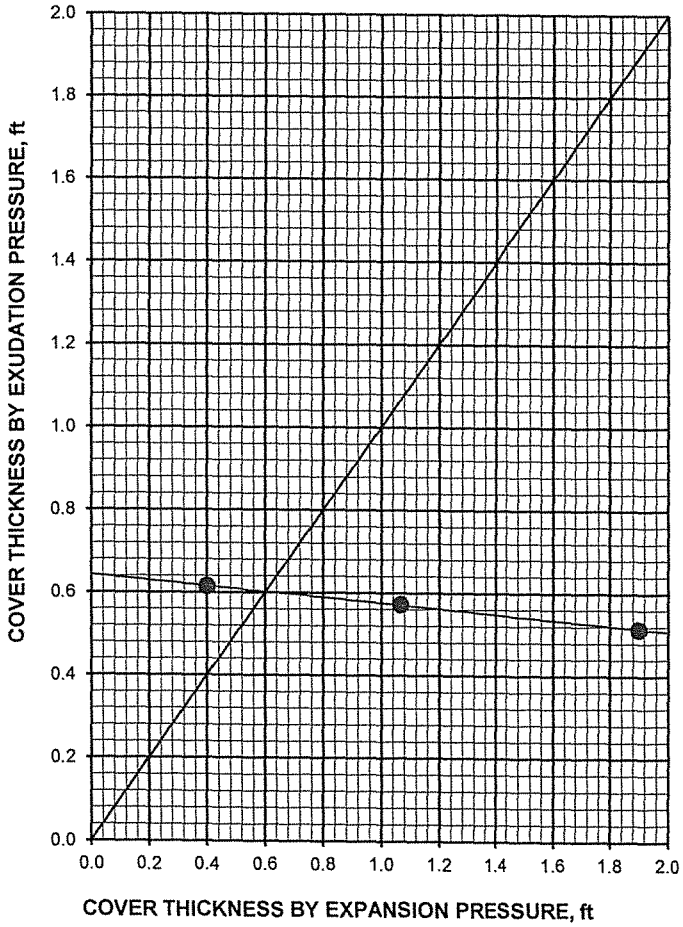
Boring #1 @ 1.0 - 3.0'
Dark Gray Sandy Lean Clay (CL)
Specified Traffic Index: 5.0

Dry Density @ 300 psi Exudation Pressure: 111.6-pcf
%Moisture @ 300 psi Exudation Pressure: 15.9%
R-Value - Exudation Pressure: 10
R-Value - Expansion Pressure: 4
R-Value @ Equilibrium: 4

EXUDATION PRESSURE CHART



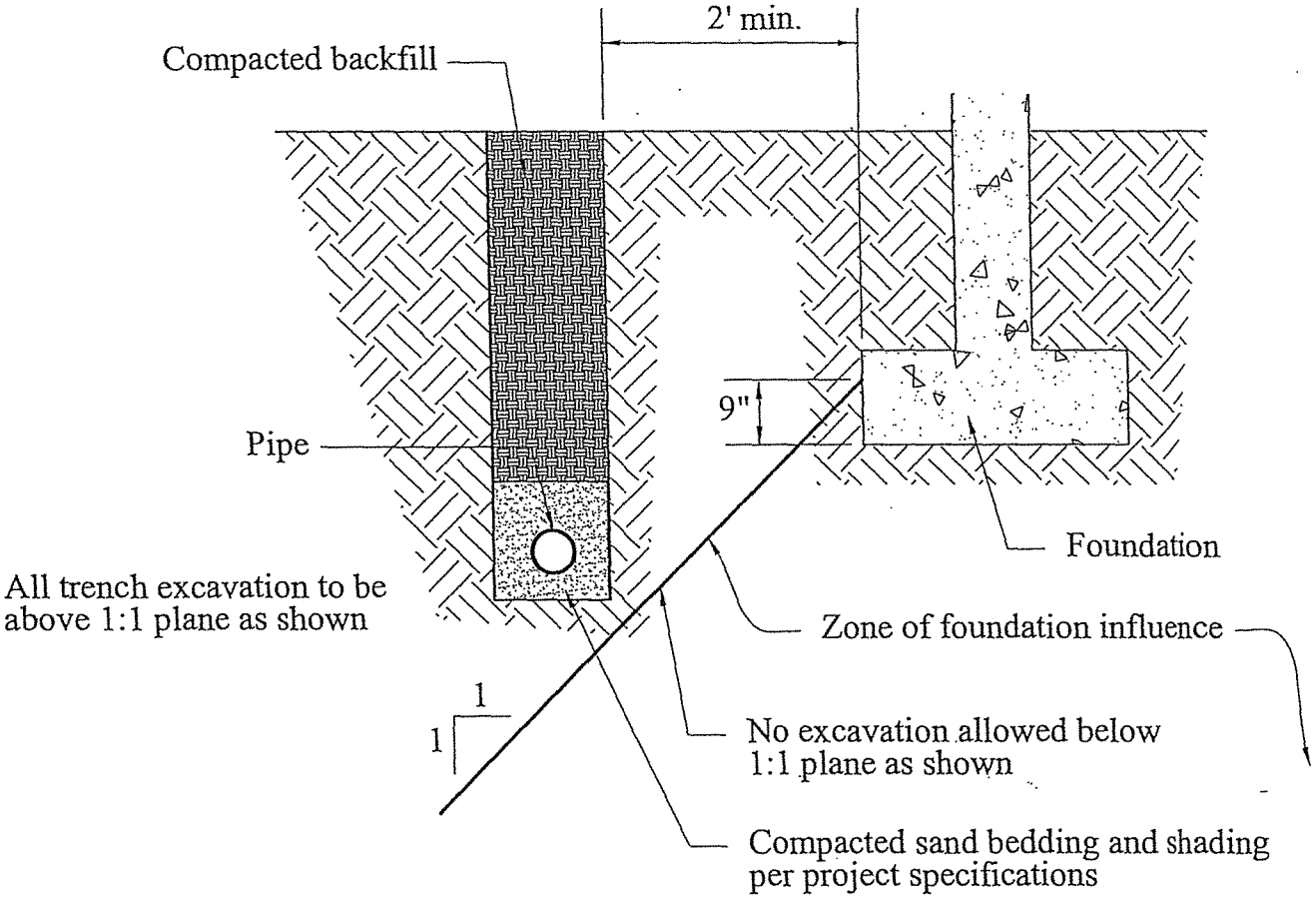
EXPANSION PRESSURE CHART



APPENDIX C

Typical Detail A: Pipe Placed Parallel to Foundation

TYPICAL DETAIL A
PIPE PLACE PARALLEL TO FOUNDATION



SCHEMATIC ONLY
NOT TO SCALE

Earth Systems Pacific

4378 Old Santa Fe Road
San Luis Obispo, CA 93401-8116
(805) 544-3276 • FAX (805) 544-1786
E-mail: esc@earthsys.com

APPENDIX D

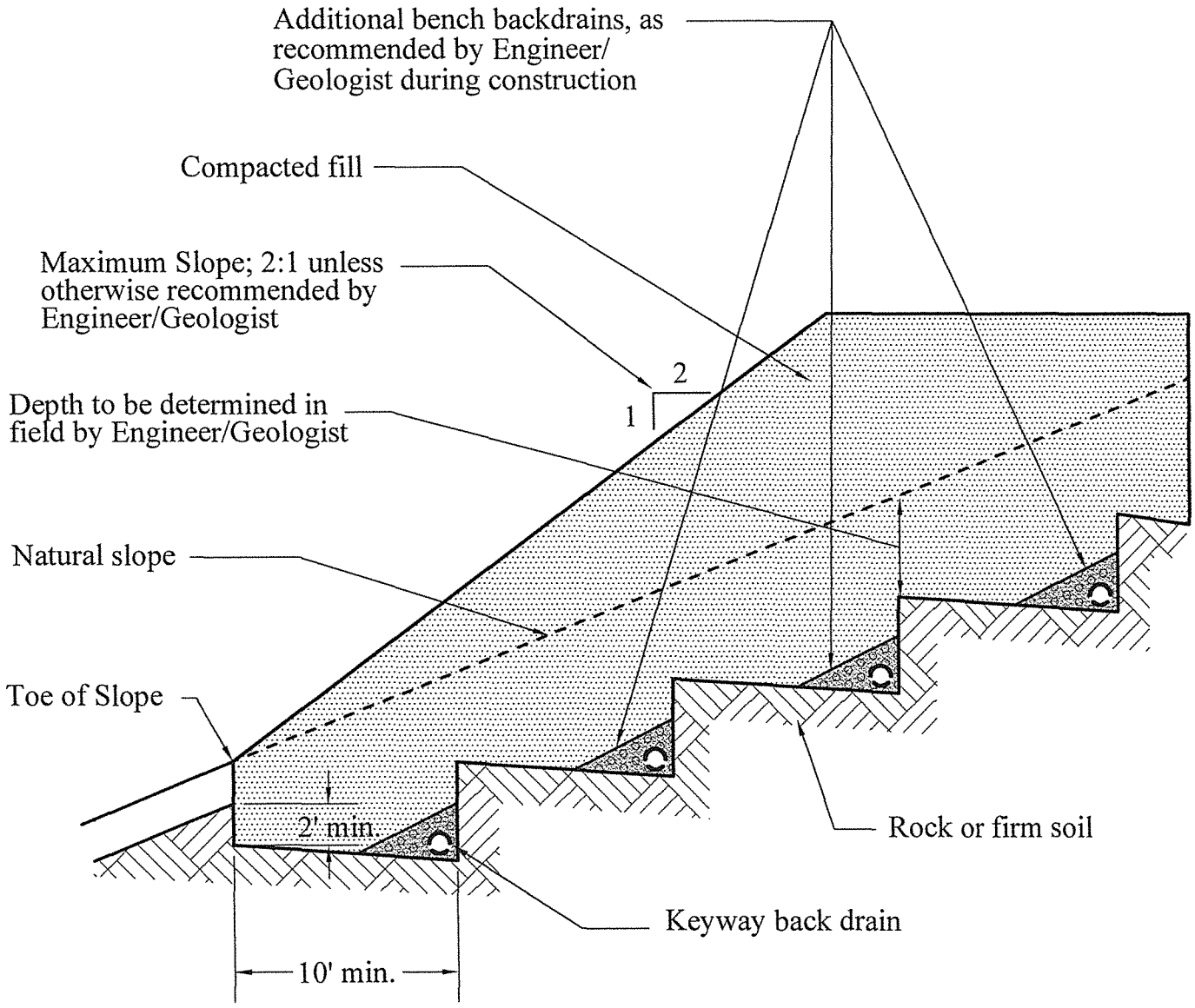
Typical Bench and Keyway Detail

Typical Back Drain Detail

TYPICAL BENCH AND KEYWAY DETAIL

STUDENT HOUSING SOUTH

California Polytechnic State University
San Luis Obispo, California



SCHEMATIC ONLY
NOT TO SCALE

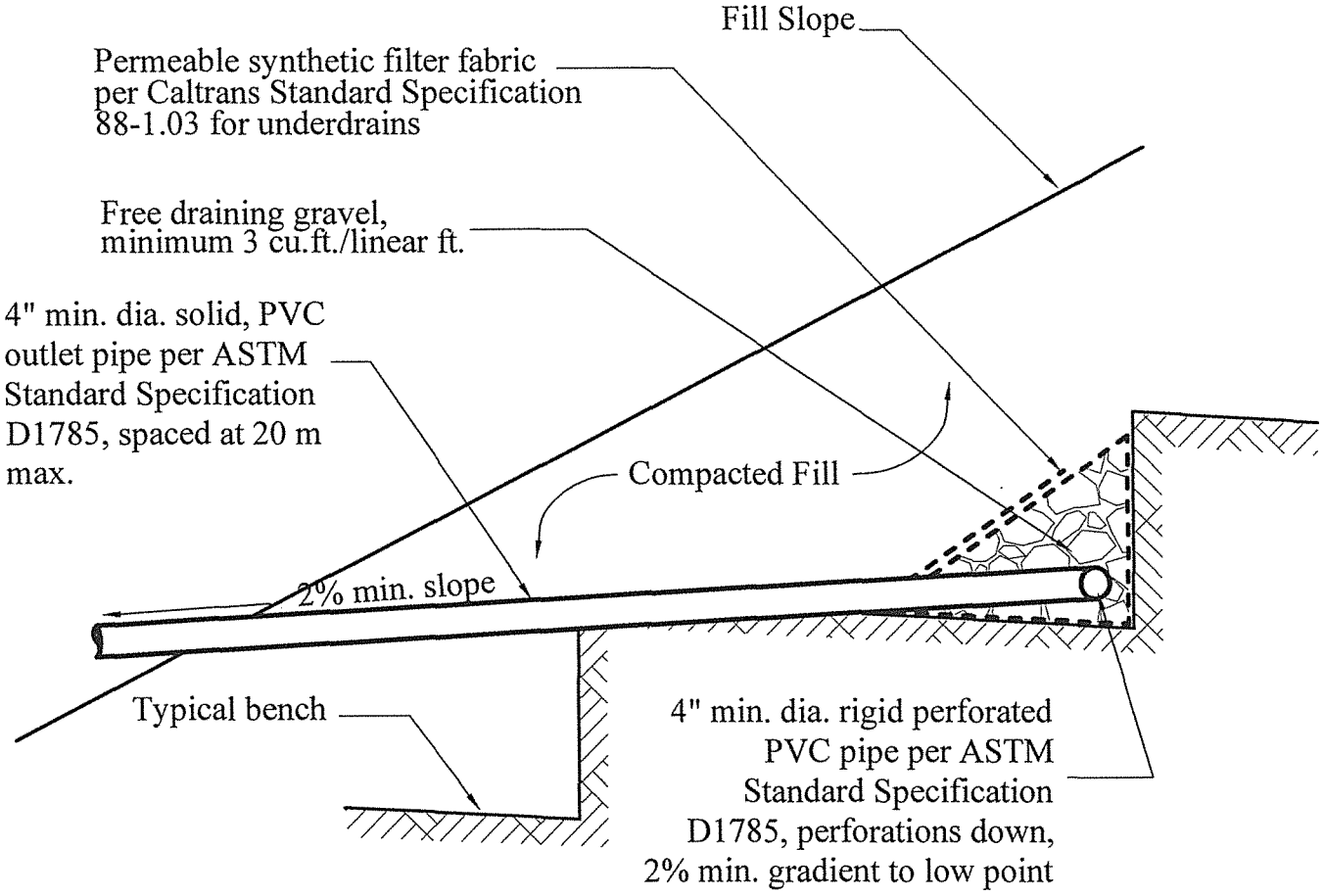
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TYPICAL BACK DRAIN DETAIL

STUDENT HOUSING SOUTH

California Polytechnic State University
San Luis Obispo, California



Note: A prefabricated panel drainage system (Advanedge, Miradrain, etc.) may be substituted for the gravel / pipe system, provided it is installed in accordance with the manufacturer's recommendations

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(805) 544-3276 • FAX (805) 544-1786
E-mail: esp@earthsys.com

SL-16805-SD

APPENDIX E.
NOISE
BACKGROUND INFORMATION

October 28, 2013

AC Martin Partners
444 S. Flower St., Suite 1200
Los Angeles, CA 90071

Attention: Alex MikoLevine

Subject: CalPoly San Luis Obispo Student Housing South
San Luis Obispo, California
Exterior Envelope Acoustical Design

Dear Alex:

Veneklasen Associates (VA) has completed our review of the Student Housing South project located at Grand and Slack Streets on the CalPoly San Luis Obispo campus. This report represents the results of our findings.

1.0 INTRODUCTION

This study was conducted to determine the impact of the exterior noise sources on the Student Housing South project pertaining to compliance with California Building Code and California Green Building Code requirements. VA's scope of work included measuring and reviewing the exterior noise levels impacting the site and determining the method required to lower the exterior sound levels to meet the applicable code requirements. Short-term exterior noise measurements were performed and noise levels were predicted throughout the site. Using the exterior sound levels, interior noise levels were calculated at representative locations to determine the glazing requirements for the project. The results of VA's analysis are presented in this report.

The project reviewed consists of a series of low-rise dormitory buildings as well as a building with a parking garage and non-residential support spaces. The site is bounded by Grand Ave. to the east, Slack St. to the south, Pacheco Way to the west, and a driveway to the north. Grand Ave. is the primary noise source on the site.

2.0 NOISE CRITERIA

State of California Building Code

Per section 1207.11 of the California Building Code (CBC), interior noise levels in habitable rooms shall not exceed 45 dB when measured as a Community Noise Equivalent Level (CNEL) or Day-Night Level (L_{DN}). Habitable rooms include rooms used for living, sleeping, eating, or cooking. This applies to residential occupancy only. Additionally, where the exterior sound level exceeds 60 CNEL or L_{DN}, mechanical ventilation is required.

State of California Green Building Code

Section 5.507.4.2 of the 2010 California Green Building Code, July 2012 revision, stipulates that for buildings exposed to a noise level of 65 dB or more when measured as a 1-hour Equivalent Sound Level (Leq), the building façade, including walls, windows, and roofs, shall provide enough sound insulation so that the interior sound level from exterior sources does not exceed 50 dBA during any hour of operation. This applies to non-residential occupancy only, and does not apply to areas that are not regularly occupied. Therefore, the parking structure is exempt.

3.0 EXTERIOR NOISE MEASUREMENTS

3.1 Noise Measurements

Vehicular movement on Grand Ave. is the dominant exterior sound source affecting the site.

Measurements for the project were completed by Veneklasen Associates (VA) on October 9, 2013 during daytime hours. Bruel & Kjaer Type 2260 sound level meters were located near both Grand Ave. and Slack St. One meter was attached to a light pole, approximately 10' above the ground, on the eastern side of the parking lot. The meter was approximately 45' away from the centerline of Grand Ave. Additional short-term measurements were performed further south on the site, adjacent to both Grand Ave. and Slack St. Figure 1 shows where the measurements were taken. Table 1 provides a summary of the measured hourly sound levels and calculated CNEL values for the loudest day of the survey.

Figure 1 – Measurement Locations



Table 1 –Measured Sound Levels

Measurement Start Time	Exterior Sound Level, Grand Ave. (LA_{eq})	Exterior Sound Level, Slack St. (LA_{eq})
12:15 PM	65	56
1:15 PM	65	--
2:15 PM	64	--
3:15 PM	65	60

The calculated Community Noise Equivalent Level (CNEL) value is 67 at the measurement location along Grand Ave. This location is closer to the street than any of the future buildings.

3.2 Computer Modeling

VA utilized the Traffic Noise Model computer software program developed by the FHWA (Federal Highway Administration) in order to predict traffic noise levels at various locations throughout the site. The purpose of the computer model was to corroborate the calculated CNEL value with traffic count information as well as to determine how the noise environment will change with future building location and geometry.

3.3 Overall Exterior Exposure

Based on our measurements, the computer model, and the project site plan provided by the Client, VA calculated the existing and future hourly Leq noise levels at various locations within the project site. To simplify the analysis and presentation of our results, VA has separated the site into zones based on the sound exposure. VA's sketch "Mechanical Ventilation Zones," dated 10/22/13, outlines the zones and is included at the end of this document. The predicted sound levels for each zone are listed in Table 2, below.

Table 2 – Exterior Noise Levels by Location

Location	Sound Level (CNEL or Hourly L_{eq})
Green Zone	60-62 CNEL
Red Zone	<60 CNEL
Building 1	≤58 dBA L_{eq}

3.4 Exterior Construction

VA understands that the exterior walls for the residential areas consist of glazing with punched windows. The exterior wall construction consists of steel studs with 2 layers of gypsum board, batt insulation in the cavity, and an exterior finish material.

4.0 INTERIOR NOISE CALCULATION

The interior noise level calculations take into account the exterior noise level, the transmission loss of the glazing (including glass, frame, and seals), exterior construction, absorption from the finishes within the space, and noise exposure due to building geometry and acoustic shielding.

4.1 Future Conditions

The CBC requires that the project be designed both for current and future project conditions, designing for noise levels predicted 10 years after the project completion. Traffic noise, which is the primary noise source at the project site, typically increases by 1% per year. Over 10 years, this amounts to an increase just over 10% of traffic volume. This level of increase equates to an increase of 0.4 dB, which does not increase the calculated CNEL values. VA's interior noise calculations for residential areas account for both current and future noise levels.

4.2 Interior Average Noise Level: Residential Areas (CNEL)

VA calculated the interior noise level within representative dormitory rooms given the measured noise environment and the exterior construction described above. The calculations were based on the 50% SD drawings. Table 3 shows the predicted interior CNEL noise levels for the Green Zone

of the building. Since the sound level in the Red Zone is below the building code criteria that requires an acoustical study, there are no requirements for this zone.

4.3 Interior Average Noise Level: Non-Residential Areas (Hourly L_{eq})

Since the exterior noise level at the non-residential occupied spaces does not exceed the 65 dBA threshold, no further analysis is required to determine compliance with the CALGreen building code.

Table 3 – Summary of Calculated Interior and Exterior Noise Levels and Their Acceptability

Location	Future Exterior Noise Level, CNEL/Hourly L_{eq} (dBA)	Interior Noise Level, CNEL/Hourly L_{eq} (dBA)	Interior Noise Level Criteria, CNEL/Hourly L_{eq} (dBA)	Conclusion
Green Zone	60-62 CNEL	43/NA*	45 CNEL/50 dBA	Acceptable
Red Zone	<60 CNEL	No code requirements. STC 29 windows recommended, not required.		Acceptable
Building 1	≤58 dBA L_{eq}	No code requirements. STC 29 windows recommended, not required.		Acceptable

**NA indicated because there are no non-residential areas in this zone.*

5.0 GLAZING REQUIREMENTS

In order to meet the predicted interior noise levels described in Table 3 above, the glazing shall meet the following requirements:

Table 4 – Acoustical Glazing Requirements: Minimum Octave Band Transmission Loss and STC Rating

Zone		Minimum Transmission Loss Octave Band Center Frequency (Hz)						Min. STC Rating
		125	250	500	1000	2000	4000	
Green Zone	Fixed	20	14	25	34	39	31	29
	Operable Window	18	16	25	32	36	30	29
Red Zone	STC 29 windows recommended, not required.							
Building 1	STC 29 windows recommended, not required.							

The transmission loss values in the table above can likely be met with the following glazing assemblies:

1. Green Zone: 1/4" monolithic – 1/2" airspace – 1/4" monolithic

However, it should be noted that an assembly's frame and seals may limit the performance of the overall system. The assemblies given above are provided as a basis of design, but regardless of construction, the octave band transmission loss of the particular system selected must meet the minimum values in Table 4 above. Similarly, it is permissible to use an alternate assembly construction if it meets the transmission loss requirements. *Note that the systems shall not be selected on the basis of STC rating alone.*

Acoustical test reports should be provided for review by the design team to ensure compliance with glazing acoustical performance requirements. The tests shall be performed on the entire assembly, including frame and seals.

6.0 MECHANICAL VENTILATION

The CBC requires mechanical ventilation be provided for any residential units where the exterior sound level exceeds 60 CNEL. All residential living areas within the Green Zone are required to have mechanical ventilation.

7.0 CONCLUSION

The following is a summary of the conclusions within this report.

- With the minimum glazing acoustical performance as indicated in Table 4, the predicted interior sound levels within the project are in compliance with the maximum CNEL criterion of 45 (residential areas) and the maximum hourly L_{eq} criterion of 50 (non-residential areas).
- Glazing shall be selected for each zone according to the minimum octave band transmission loss requirements specified in Table 4. Acoustical test reports shall be provided for the assembly including frame and seals. *Glazing shall not be selected on the basis of STC rating alone.*
- If necessary for structural, fire, or other reasons, it is permissible to increase thickness of the assemblies described in this report, since increasing thickness would result in further reduction in interior sound level.
- Mechanical ventilation is required for all residential living areas within the Green Zone in this project since the exterior noise level exceeds 60 CNEL.

Various noise mitigation methods may be utilized to satisfy the noise criteria described in this report. Alteration of mitigation methods or deviations from the indicated requirements should be reviewed by the acoustical consultant.

We trust this information is satisfactory. If you have any questions or comments regarding this report, please do not hesitate to contact us.

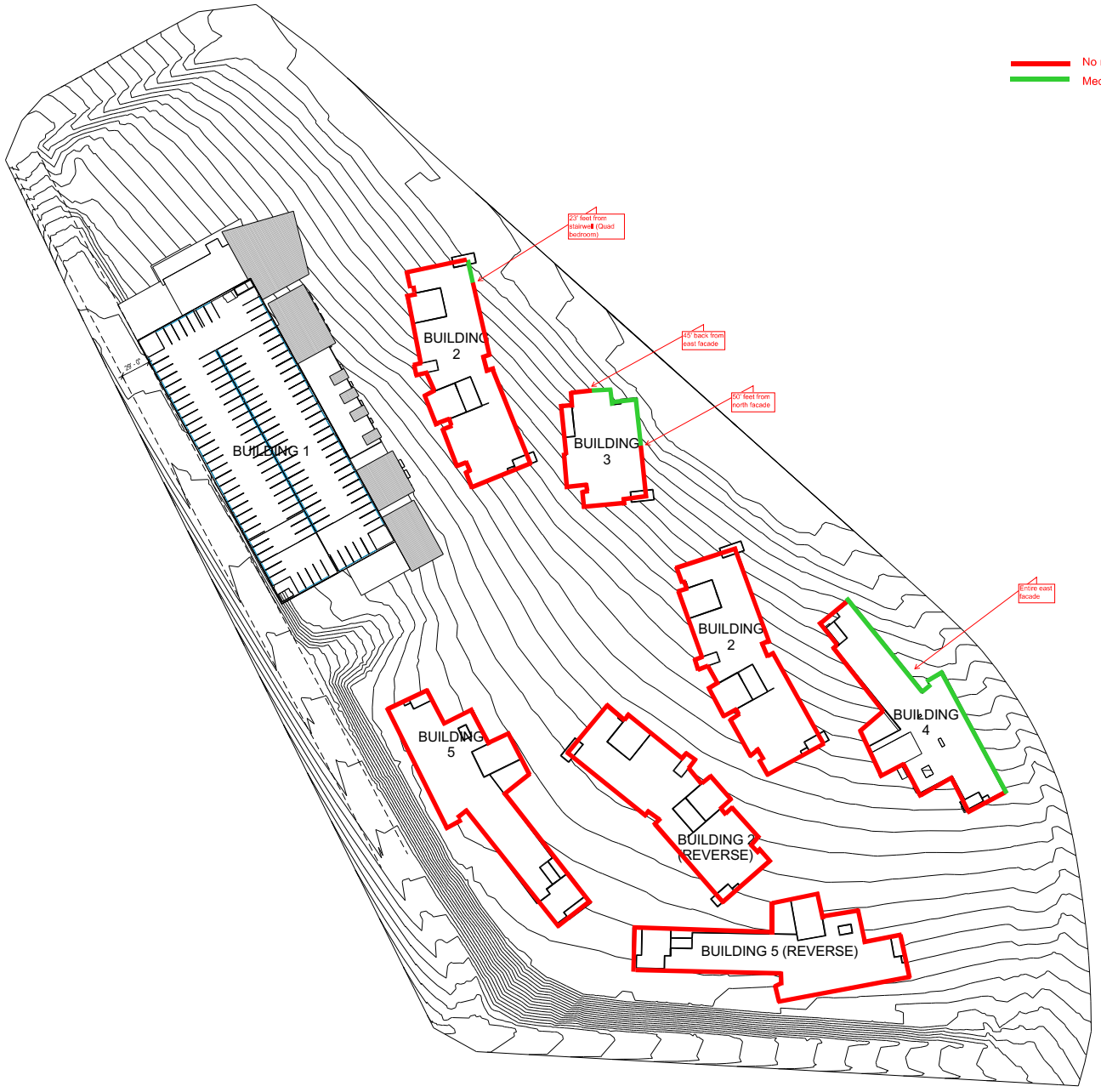
Sincerely,

Veneklasen Associates, Inc.

Samantha Rawlings, *LEED AP BD+C*
Senior Associate

Glossary of Acoustical Terms

Term	Definition
Absorption	A property of material referring to how much sound it absorbs (as opposed to reflecting). In the context of this report, absorption refers to the total quantity of absorption within the receiving space. Absorption is measure in sabins.
A-weighting (dBA)	The sound pressure level in decibels as measured in an A-weighting filter network. The A-weighting de-emphasizes the low frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Community Noise Equivalent Level (CNEL)	A 24-hour average sound level that includes weighting for evening and nighttime sound levels to place greater importance on noise events that occur in the evening and at night. Similar to L_{DN}.
Day-Night Level (L_{DN})	A 24-hour average sound level that includes weighting for nighttime sound levels to place greater importance on noise events that occur at night. Similar to CNEL.
Decibel (dB)	A unit describing the amplitude of sound equivalent to 20 times the logarithm, to the base 10, of the ratio of the pressure of the sound to the reference pressure of 20 μPa. Used to quantify sound pressure levels.
Equivalent Sound Level (Leq)	The average noise level during the stated measurement period.
Sound Pressure Level (SPL)	The amplitude of sound when compared to the reference sound pressure level of 20 μPa. SPL is measured in dB.
Sound Transmission Class (STC)	A single-number metric used to describe the transmission loss performance of a material or assembly across the frequency spectrum. It is intended for use primarily when speech is the noise source.
Transmission Loss (TL)	A measure of the reduction in sound level as a sound wave passes through a material. The higher the transmission loss, the better the material's sound insulating properties.



Veneklasen Associates
Mechanical Ventilation Zones
10/22/13

ac martin
PLANNING
ARCHITECTURE
INTERIOR ARCHITECTURE
RESEARCH

Student Housing South

CAL POLY
SAN LUIS OBISPO

SITE PLAN

A-101

Enter address here | Client Cal Poly San Luis Obispo | w.o. no. 2013311 | issue date: Issue Date | scale: 1" = 40'-0"

APPENDIX F.
TRANSPORTATION AND CIRCULATION BACKGROUND INFORMATION

Cal Poly Student Housing South
Transportation Impact Analysis



Prepared for: **SWCA Environmental Consultants and California Polytechnic State University**

Prepared by: FEHR & PEERS

160 W. Santa Clara Street
Suite 675
San Jose, CA 95113
(408) 278-1700

November 2013

Transportation Impact Analysis

Cal Poly Student Housing South in San Luis Obispo, California

Prepared for:
SWCA Environmental Consultants
and
California Polytechnic State University

November 2013

FEHR PEERS

SJ13-1439

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EXECUTIVE SUMMARY

This report presents the results of the transportation impact analysis (TIA) conducted for the proposed Cal Poly Student Housing South development located in the southeast area of the Cal Poly Campus in San Luis Obispo. The project site is bounded by Slack Street in the south, Pacheco Way in the west, the Grand Avenue Parking Structure Access Road in the north and Grand Avenue in the east. The project is located on the Cal Poly campus, but the project site is adjacent to the City of San Luis Obispo, California. The site is occupied by existing uses:

- Parking lot G-1: general, non-residential parking lot containing 426 spaces
- Parking lot R-2/G-4: residential parking serving the southernmost residential halls and overflow general parking from Lot G-1 consisting of 898 spaces (total)

The proposed project would remove the existing surface parking lots and replace them with freshmen student housing and a 300 space general parking garage. The project will provide 1,475 beds, and units will not have kitchen facilities. No parking replacement for lost general spaces is currently proposed. Overall campus student enrollment is not expected to increase with the construction of the project.

Transportation deficiencies and impacts at seven (7) study intersections were evaluated under guidelines from the California State University Transportation Study Manual, the City of San Luis Obispo and the California Department of Transportation (Caltrans). Roadway system operations were evaluated under the following study scenarios:

- Existing Conditions
- Existing with Project Conditions
- Cumulative without Project Conditions
- Cumulative with Project Conditions

Pedestrian, bicycle and transit facilities, as well as parking supply and demand, were also evaluated.

PROJECT TRAFFIC ESTIMATES

Project-generated vehicle trips were estimated using existing parking lot data and trip rates from the Cal Poly Master Plan (2001). A portion of the existing parking demand would shift to other parking lots on campus, and would use different roadways to reach available parking. The proposed project is estimated

to redistribute five (5) AM peak hour vehicle trips (-12 inbound trips and 17 outbound trips) and 150 PM peak hour vehicle trips (73 inbound trips and 77 outbound trips).

PROJECT IMPACTS

This analysis identifies potentially significant adverse impacts of the proposed project on the surrounding transportation system and recommends measures to mitigate significant impacts for environmental clearance.

INTERSECTION IMPACTS

Intersection impacts were evaluated using impact criteria from the California State University Transportation Study Manual, the City of San Luis Obispo and Caltrans. **Table E-1** provides a summary of intersection impacts and if impacts could be reduced to less-than-significant levels with mitigation measures. Mitigation measures are discussed later in this Executive Summary.

TABLE E-1
INTERSECTION IMPACT SUMMARY

	Intersection	Intersection Potentially Impacted?[1]						Potential Impacts Significant and Unavoidable?
		Existing with Project			Cumulative with Project			
		TSM	SLO	CT	TSM	SLO	CT	
1	Highland Drive/Santa Rosa Street	No	No	No	No	No	**Yes**	***Yes***
2	Foothill Boulevard/Santa Rosa Street	No	No	**Yes**	**Yes**	**Yes**	**Yes**	***Yes***
3	Olive Street/Santa Rosa Street	No	No	No	No	No	No	N/A
4	Walnut Street/Santa Rosa Street	No	No	**Yes**	No	**Yes**	**Yes**	***Yes***
5	Foothill Boulevard/California Boulevard	No	No	No	No	No	No	N/A
6	Taft Street/California Boulevard	No	No	No	No	No	No	N/A
7	US 101 Northbound Ramps/California Boulevard	No	No	**Yes**	No	No	**Yes**	***Yes***

Notes:
1. TSM = CSU TSM guidelines, SLO = City of San Luis Obispo guidelines, CT = Caltrans guidelines
Source: Fehr & Peers, November 2013.

PEDESTRIAN, BICYCLE, AND TRANSIT IMPACTS

Pedestrian and Bicycle Facilities

The proposed project will replace an existing surface parking lot with new student housing buildings. As such, existing or planned bicycle and pedestrian facilities are not expected to be impacted. The Grand Avenue Parking Structure undercrossing may not be wide enough to accommodate the increased in pedestrian and bicycle flow – the pathway may need to be widened in order to adequately accommodate peak bicycle and pedestrian flows. This should be considered part of the site planning process. A sidewalk should be provided along the north side of Slack Street from Grand Avenue to the G-2 parking lot to reduce a pedestrian safety impact to **less-than-significant with mitigation**.

For trips into the local area, a reduction in peak hour trips to campus will ultimately provide for a more comfortable environment for pedestrians and bicyclists, as the number of conflicts during the periods of heaviest travel would be reduced. Bicycle facilities would not be overtaxed with the influx of off-site bicycle trips. Off-site impacts to pedestrians and bicycles are considered **less-than-significant**.

Transit Facilities

The project will generate demand for the transit services and facilities. Overall student enrollment is not expected to increase as part of the project; therefore peak hour transit ridership is not expected to increase. As more students will live on campus, there is a high likelihood that commute transit trips will be reduced similar to the reduction in peak hour automobile commute trips. Therefore impacts to transit are considered **less-than-significant**.

SITE ACCESS AND ON-SITE CIRCULATION

Access to the project site for service vehicles would be provided via driveways on Pacheco Way, Grand Avenue or the access road in front of the Performing Arts Center. For parking on site, access to the structure should be taken as to minimize points of pedestrian-vehicle conflict. An entry/exit to the garage from Pacheco Way would be preferable because it would minimize the number of new conflict points between vehicles, bicycles and pedestrians.

Pedestrian access from the site to other areas of the campus would be via a route across Pacheco Way to the Grand Avenue Parking Structure undercrossing as well as via connections to sidewalks along Grand Avenue. Bicycle parking is available throughout the site, and bicycles will use the Grand Avenue Parking Structure undercrossing and bike lanes along Grand Avenue to connect to other areas of the campus. We recommend sidewalks be provided around the frontage of the project (including providing sidewalks

along Pacheco Way and along the north side of Slack Street from Slack Street to Parking Lot G-2) to facilitate comfortable and efficient pedestrian access from the surrounding area to the project site. Consideration should be given to modifying Grand Avenue to provide a buffered bike lane along the project frontage to facilitate bicycle trips to and from the site and the local street system. We recommend the site also be designed to provide direct access to nearby bus transit stops.

INTERSECTION AND PARKING MITIGATION MEASURES

The potentially significant impacts identified in the analysis are caused by the net addition of project trips to intersections operating at unacceptable levels before the project is constructed. Accordingly, the mitigation measures proposed in this document reduce the number of trips through the study intersections.

Mitigation Measure 1: Replacement of On-Site Parking

The provision of 500 parking spaces on the project site (comprising of 440 general spaces and 60 residential spaces) would reduce the number of net added trips through the study intersections. The 440 general spaces will reduce the general parking redistributed trips to zero. The 60 residential spaces will reduce trips further, and the spaces will also reduce the residential parking supply impact to a less-than-significant with mitigation. However, the replacement of parking alone will not mitigate all intersection impacts to a less-that-significant level. It must be used in conjunction with other mitigation measures to further lessen impacts. The 500 space garage may not be financially feasible, so the impact to residential parking supply is **significant and unavoidable**.

Mitigation Measure 2: Transportation Demand Management and Monitoring Program

A Transportation Demand Management (TDM) and monitoring program can reduce the number of vehicle trips through the impacted study intersections. Cal Poly already has a TDM program, which can be enhanced. Other strategies can also be implemented. The mitigation measure is to develop a TDM and monitoring program upon finalization of the site plan. With the 500 space parking area, the TDM and monitoring program would only need to reduce a small number of trips through the study intersections. An aggressive TDM and monitoring program may reduce the size of the parking replacement on site. Ultimately, a combination of replacement of on-site parking and a TDM and monitoring program would eliminate the net addition of trips to the impacted study intersections, so the impacts at the study intersections would be less-than-significant with mitigation. However, because a TDM and monitoring program has not been fully developed yet, and the 500 space garage may not be feasible, the impacts to off-site intersections are considered **significant and unavoidable**.

Other Mitigation Measures Considered

Other mitigation measures, such as reducing the size of the project, widening impacted intersections and payment of in lieu traffic impact fees were considered as they are typically evaluated for private development projects. Owing to the unique nature of the project (moving students on campus without increasing enrollment) and the location of the project (on State property outside of the City of San Luis Obispo city limits), these mitigation measures do not reduce the intersection impacts which remain **significant and unavoidable**. Reducing the project size by 156 beds would reduce the residential parking supply impact to **less-than-significant after mitigation**, but could exacerbate the intersection impacts.

1. INTRODUCTION

This report presents the results of the Transportation Impact Analysis (TIA) conducted for the proposed student housing development located at the northwest corner of the intersection of Grand Avenue / Slack Street in the City of San Luis Obispo, California. This development is known as the Cal Poly Student Housing South project and is located on Grand Avenue on the California Polytechnic State University (Cal Poly) campus. This chapter discusses the TIA purpose, project study area, analysis scenarios and methods, criteria used to identify significant impacts, and report organization.

PURPOSE

This analysis accomplishes the following:

- Identifies potentially significant adverse impacts of the proposed project on the surrounding transportation system and recommends measures to mitigate significant impacts for environmental clearance.
- Conducts project-specific analyses such as a site design evaluation of on-site circulation and access, and parking evaluation.

The proposed project would remove the existing G-1 and R-2/G-4 parking lots and construct student housing on the site. As originally proposed, all surface parking on site will be removed, and 300 general parking spaces would be replaced as part of the project in a parking garage. The project is proposed to provide 1,475 beds for freshmen students. No increase in student enrollment is proposed as part of the project. **Figure 1** shows the location of the project site, the surrounding transportation network, and study intersections and roadway segments. **Figure 2** shows the conceptual site plan for the project.

This study addresses the project's impacts on the roadway system and evaluation of the project's influence on the adjacent bicycle, pedestrian, and transit network. Project impacts were evaluated following the guidelines of the California State University. While the project is being performed through the University (and therefore is exempt from using local guidelines), project impacts were also evaluated using guidelines from the City of San Luis Obispo and Caltrans (for State facilities).



Figure 1

Project Location and Study Area

Document Path: \\Fpse03\fpse2\Data2\2013Projects\SJ Projects\SJ13_1439\GIS\Fig_1_SJ13_1439_Study_Area.mxd
Date: August, 2013

FEHR PEERS



Figure 2

Site Plan

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Date: November 2013

FEHR PEERS

PROJECT STUDY AREA

STUDY INTERSECTIONS

Project impacts on the study area roadway facilities were determined by measuring the effect project traffic would have on intersection operations during the morning (7:00 to 9:00 AM) and evening (3:00 to 6:00 PM) peak periods. A total of seven (7) intersections, as shown on **Figure 1**, were selected as study locations. These locations (and their associated jurisdictions) include:

1. Highland Drive/Santa Rosa Street (SLO/CT)
2. Foothill Boulevard/Santa Rosa Street (SLO/CT)
3. Olive Street/Santa Rosa Street (SLO/CT)
4. Walnut Street/Santa Rosa Street (SLO/CT)
5. Foothill Boulevard/California Boulevard (SLO)
6. Taft Street/California Boulevard (SLO)*
7. US 101 Northbound Ramps/California Boulevard (SLO/CT)*

*Side-street stop-controlled intersection
SLO = City of San Luis Obispo intersection
CT = Caltrans intersection

The intersections of Grand Avenue/Slack Street, Grand Avenue/Loomis Street-US 101 Southbound on-ramp and Grand Avenue/Abbott Street-US 101 Northbound off-ramp were not included in this study as the project generated trips assigned through these intersections would be negative. See **Chapter 3** for more information.

INTERSECTION ANALYSIS SCENARIOS

The study intersections were evaluated during the morning peak-hour occurring between 7:00 and 9:00 AM and the evening peak-hour occurring between 3:00 and 6:00 PM for the following scenarios:

Scenario 1: *Existing Conditions* – Existing volumes obtained from existing/new traffic counts.

Scenario 2: *Existing with Project Conditions* – Existing volumes plus traffic generated by the proposed project.

Scenario 3: *Cumulative Conditions* – Existing volumes plus traffic generated from approved and pending developments.

Scenario 4: *Cumulative with Project Conditions* – Scenario 3 volumes plus traffic generated by the proposed project.

TRAFFIC ANALYSIS METHODS

The operations of roadway facilities are described with the term level of service ("LOS", a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver). Six levels are defined from LOS A, as the best operating conditions, to LOS F, or the worst operating conditions. LOS E represents "at-capacity" operations. When traffic volumes exceed the intersection capacity, stop-and-go conditions result, and operations are designated as LOS F.

SIGNALIZED INTERSECTIONS

The level of service method identified in the *California State University Transportation Study Manual* (CSU TSM) and the City of San Luis Obispo Traffic Impact Study Preparation Guidelines for signalized intersections is the method described in Chapter 16 of the *2000 Highway Capacity Manual* (HCM) (Special Report 209, Transportation Research Board). This method bases signalized intersection operations on the average vehicular control 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 Synchro 7 analysis software and is correlated to a LOS designation as shown in **Table 1**. The CSU TSM and the City of San Luis Obispo have established a minimum acceptable operating level of LOS D for intersections. Caltrans has established a minimum acceptable operating level of "the cusp of LOS C/D" for intersections. For purposes of this analysis, the minimum acceptable operating level of service for Caltrans is LOS C.

TABLE 1
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 – 20.0

TABLE 1
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 – 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 – 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	55.1 – 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0

Source: Fehr & Peers, November 2013

UNSIGNALIZED INTERSECTIONS

Operations of the unsignalized study intersections (e.g., stop-sign controlled) were evaluated using the methods contained in Chapter 17 of the *2000 HCM* and calculated using the Synchro 7 analysis software. LOS ratings for stop-sign controlled intersections are based on the average control delay expressed in seconds per vehicle. At two-way or side-street-stop controlled intersections, control delay is calculated for each movement, not for the intersection as a whole. For approaches composed of a single lane, control delay is computed as the average of all movements in that lane. Intersection impacts are determined based on the computed control delay and LOS for the worst approach at the intersection. **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections. The LOS standards for unsignalized intersections are equivalent to the signalized intersection standards.

TABLE 2
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle on Worst Approach (Seconds)
A	Little or no delays	≤ 10.0
B	Short traffic delays	10.1 – 15.0
C	Average traffic delays	15.1 – 25.0
D	Long traffic delays	25.1 – 35.0
E	Very long traffic delays	35.1 – 50.0

TABLE 2
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle on Worst Approach (Seconds)
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

Source: Fehr & Peers, November 2013

IMPACT SIGNIFICANCE CRITERIA

The determination of significance for project impacts is based on applicable policies, regulations, goals, and guidelines defined by the California State University (and expressed through the CSU TSM). While the project is exempt from using local guidelines for impact criteria, impact significance determination has also been performed using criteria as defined by adjacent jurisdictions (the City of San Luis Obispo and Caltrans). The impacts of the project were evaluated by comparing the results of the level of service calculations under Existing with Project Conditions and Cumulative with Project Conditions to the results under Existing Conditions and Cumulative without Project Conditions, respectively. The detailed impact criteria for this study are presented below.

INTERSECTIONS - CALIFORNIA STATE UNIVERSITY SYSTEM

Signalized Intersections

Significant impacts at signalized intersections are defined to occur when the addition of project traffic causes one of the following:

- Intersection operations to degrade from an acceptable level (LOS D or better) to an unacceptable level (LOS E or F); or
- Exacerbate unacceptable operations (LOS E or LOS F, up to 119.9 seconds of average control delay) by adding 10 or more peak hour trips and 5 seconds or more of peak hour delay during the same peak hour; or
- Exacerbate unacceptable operations (LOS F, at or over 120.0 seconds of average control delay) by increasing the volume-to-capacity ratio by 0.02 or more.

Unsignalized Intersections

Level of service analysis at unsignalized intersections is generally used to determine the need for modifying intersection control type (i.e., all-way stop or signalization). As part of this evaluation, traffic volumes, delays, and peak hour traffic signal warrants are evaluated to determine if the existing intersection control is appropriate. Significant impacts at signalized intersections are defined to occur when the addition of project traffic triggers both criteria:

Criterion 1: Off-site Traffic Operations

- Intersection operations to degrade from an acceptable level (LOS D or better) to an unacceptable level (LOS E or F); or
- Exacerbate unacceptable operations (LOS E or LOS F, up to 119.9 seconds of average control delay) by adding 10 or more peak hour trips and 5 seconds or more of peak hour delay during the same peak hour; or
- Exacerbate unacceptable operations (LOS F, at or over 120.0 seconds of average control delay) by increasing the volume-to-capacity ratio by 0.02 or more.

Criterion 2: Intersection Traffic Control

- The addition of project traffic causes an all-way stop-controlled or side-street stop controlled intersection to meet Caltrans signal warrant criteria.

Significant impacts are defined to occur when the addition of project traffic degrades operations and the intersection satisfies the peak hour signal warrants from the *California Manual of Uniform Traffic Control Devices (MUTCD)* in the with added project traffic scenario only.

INTERSECTIONS - CITY OF SAN LUIS OBISPO

Signalized Intersections

Significant impacts at signalized City of San Luis Obispo intersections are defined to occur when the addition of project traffic causes one of the following:

- The addition of project traffic causes intersection operations to degrade from an acceptable level (LOS E or better on Downtown arterials, LOS D or better on other streets) to an unacceptable level (LOS F on Downtown arterials, LOS E or F on other streets), or
- Project traffic is added to an intersection operating at unacceptable levels.

Unsignalized Intersections

Significant impacts at unsignalized City of San Luis Obispo intersections are defined to occur when the addition of project traffic causes one of the following:

- The addition of project traffic causes intersection operations to degrade to an unacceptable level and satisfy the peak-hour signal warrant from the MUTCD, or
- The project's access to a major street causes a potential unsafe situation or requires a new traffic signal based on standard warrant criteria.

INTERSECTIONS - CALIFORNIA DEPARTMENT OF TRANSPORTATION

The LOS standard for Caltrans intersections is LOS C. A project triggers a significant impact if the project adds net new trips to an intersection already operating at unacceptable levels.

PEDESTRIAN AND BICYCLE IMPACT CRITERIA

The CSU TSM describes impact criteria to ensure that pedestrian and bicycle facilities are safe and effective for users and that the project does not conflict with existing transportation plans, guidelines, policies, or standards as they relate to non-automotive transportation. Significant impacts to these modes of transportation would occur when:

- A project significantly disrupts existing or planned bicycle facilities or significantly conflicts with applicable non-automotive transportation plans, guidelines, policies or standards.
- A project fails to provide safe pedestrian connections between campus buildings and adjacent streets and transit facilities.
- A project significantly disrupts existing or planned pedestrian facilities or significantly conflicts with applicable non-automotive transportation plans, guidelines, policies or standards.

TRANSIT IMPACT CRITERIA

Significant impacts to transit service would occur if the project or any part of the project:

- Significantly disrupts existing or planned transit facilities and services or significantly conflicts with applicable transit plans, guidelines, policies, or standards.

SITE DESIGN CRITERIA

Significant impacts relating to site design would occur if the project or any part of the project:

- Inhibits emergency vehicle access to facilities on the project site
- Includes design features that present safety hazards to pedestrians, bicyclists or motorists

REPORT ORGANIZATION

This report is divided into the next five chapters as described below:

- **Chapter 2 – Existing Conditions:** describes the transportation system near the project, including the surrounding roadway network, morning and evening peak period driveway and intersection turning movement volumes, existing bicycle, pedestrian, and transit facilities, intersection levels of service, and freeway segment levels of service.
- **Chapter 3 – Existing with Project Conditions:** addresses the Existing with Project Conditions, and discusses project vehicular, pedestrian, bicycle, and transit impacts. The relevant project information, such as the project components and project trip generation, distribution, and assignment, is also discussed in this chapter.
- **Chapter 4 – Cumulative Traffic Conditions:** addresses Year 2035 cumulative conditions, both without and with the project, and discusses cumulative project vehicular impacts.
- **Chapter 5 – Site Access, Circulation and Parking:** describes project access and circulation for all travel modes.
- **Chapter 6 – Mitigation:** addresses mitigation measures to reduce impacts identified in Chapters 3 and 4 to less-than-significant levels.

2. EXISTING CONDITIONS

This section describes the existing conditions of the roadway facilities, pedestrian and bicycle facilities, and transit service in the study area. It also presents existing traffic volumes and operations at the study intersections.

The project site is currently occupied by G-1, G-4 and R-2 general and residential parking lots. The Performing Arts Center and the campus core are located north of the project site. Sierra Madre and Yosemite Halls (freshmen residence halls) are located east of the project site. Those who currently park in the parking lots travel via existing sidewalks and pathways.

EXISTING TRANSPORTATION FACILITIES

EXISTING STREET SYSTEM

Santa Rosa Street (State Route 1), California Boulevard, Grand Avenue and Foothill Boulevard provide regional access to the project site. Highland Drive and Slack Street provide local access to the project site. Descriptions of these roadways are presented below. Figure 1 shows the location of these facilities in relation to the project site.

Santa Rosa Street (State Route 1) is a north-south arterial roadway that runs from downtown San Luis Obispo to the northern edge of the City. From there, the roadway continues as State Route 1 towards Morro Bay and the communities along the North Coast of San Luis Obispo. The facility is located east of the project site and provides access to campus and the project site via Highland Drive. In addition, the route continues south of the study area into downtown San Luis Obispo. Near the project site, the street is a four lane, divided roadway that carries an average daily traffic (ADT) volume of approximately 31,000 vehicles per day.

California Boulevard is a north-south arterial roadway that runs from Highland Drive (on the Cal Poly campus) in the north to San Luis Drive in the south. The facility provides access to the project site via Highland Drive and the Union Pacific Railroad underpass. The roadway terminates at Highland Drive just west of the project site and carries approximately 8,700 vehicles per day just south of the campus boundary.

Grand Avenue is a north-south arterial roadway that runs from Monterey Street in the south into the heart of the Cal Poly campus. The facility provides access to the southeast corner of campus, where most of the

parking on the south side of campus is provided. Near the campus border, Grand Avenue carries approximately 12,500 vehicles per day.

Foothill Boulevard is an east-west arterial roadway that runs from Los Osos Valley Road in the west to the Cal Poly campus boundary in the east (where it terminates at a cul-de-sac). The facility provides access to campus and the project site via Santa Rosa Street and California Boulevard. Between Santa Rosa Street and California Boulevard, Foothill Boulevard carries approximately 16,500 vehicles per day.

Highland Drive is an east-west arterial roadway that runs from the northwest corner of the City of San Luis Obispo in the west to Via Carta on the Cal Poly campus in the east. The roadway connects to Mt. Bishop Road near the project site. Near Via Carta, Highland Drive provides access to the parking lots north of the campus core. East of Santa Rosa Street, Highland Drive carries approximately 7,000 vehicles per day.

Slack Street is an east-west collector roadway that runs from the eastern foothills of San Luis Obispo to Longview Lane in the east. Longview Lane provides access (via Hathway Avenue and Carpenter Street) to Foothill Boulevard via the residential neighborhoods south of campus. At Grand Avenue, Slack Street carries approximately 2,000 vehicles per day.

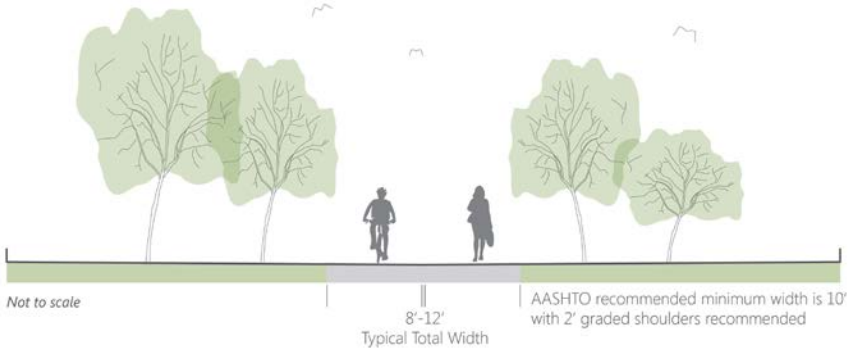
EXISTING PEDESTRIAN FACILITIES

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals. The streets surrounding the project site all have sidewalk on at least one side of the street. Sidewalks are not present along the east side of Pacheco Way or on the north side of Slack Street. There are no marked crosswalks at the Pacheco Way/Slack Street intersection. Marked crosswalks are provided at the Grand Avenue/Slack Street and Grand Avenue/Parking Structure access road intersections. A signalized midblock crossing is also provided about 750 feet north of the Grand Avenue/Slack Street intersection on Grand Avenue.

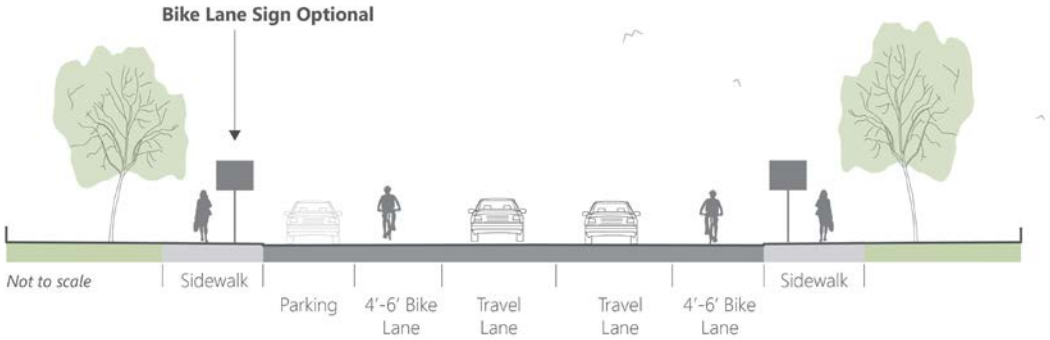
EXISTING BICYCLE FACILITIES

Bikeway planning and design in California typically relies on guidelines and design standards established by California Department of Transportation (Caltrans) in the *Highway Design Manual* (Chapter 1000: Bikeway Planning and Design and other design documents). Bicycle facilities comprise paths (Class I), lanes (Class II), and routes (Class III) as described below and shown on the accompanying figures.

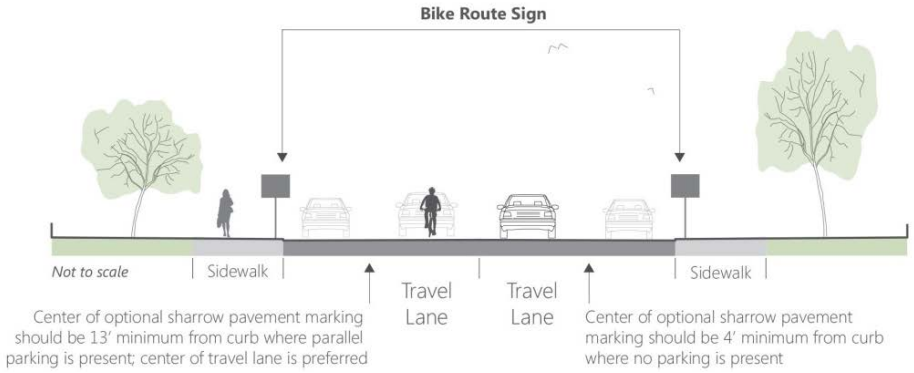
- *Class I Bikeway (Bicycle Path)* provides a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized.



- *Class II Bikeway (Bicycle Lane)* provides a restricted right-of-way and is designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally four to six feet wide. Adjacent vehicle parking and vehicle/pedestrian cross-flow are permitted.



- *Class III Bikeway (Bicycle Route)* provides for a right-of-way designated by signs or pavement markings (sharrows) for shared use with pedestrians or motor vehicles. Sharrows are a type of pavement marking (bike and arrow stencil) placed to guide bicyclists to the best place to ride on the road, avoid car doors, and remind drivers to share the road with cyclists.



Near the project site, Class II bicycle facilities are provided along the length of Grand Avenue. A Class III bicycle facility is provided along Slack Street. A Class I bicycle facility parallels California Boulevard from

Mustang Stadium south to Hathaway Avenue. Class II facilities are also provided along Foothill Boulevard and Santa Rosa Street. However, the high volume of traffic on these roadways discourages bicycle use.

Figure 3 shows nearby existing bicycle facilities in the study area. **Figure 4** presents the existing peak hour bicycle and pedestrian volumes.

EXISTING TRANSIT SERVICE

The project site is served by San Luis Obispo City Transit (SLO Transit) and Regional Transit Authority (RTA) bus lines. The bus lines that serve the project site are summarized in **Table 3**. A map of transit routes is shown as **Figure 5**.

TABLE 3
EXISTING TRANSIT SERVICE SUMMARY

Route	From[1]	To[1]	Distance to Nearest Stop[2]	Weekdays		Weekends	
				Operating Hours	Peak Hour Headway[3] (minutes)	Operating Hours	Headway[3] (minutes)
SLO Transit							
4[4]	Madonna/Los Osos Valley Road	Downtown Transit Center	0.25	6:34 a – 10:44 a	30	8:10 a – 6:05 p	60
5[4]	Downtown Transit Center	Madonna/Los Osos Valley Road	0.20	6:20 a – 7:22 p	30	8:20 a – 6:17 p	60
6a	Cal Poly Kennedy Library	Ramona/ Palomar	0.75	7:16 a – 10:19 p	30	9:10 a – 5:29 p	60
6b	Cal Poly Kennedy Library	Downtown Transit Center	0.25	7:02 a – 10:56 p	30	8:45 a – 5:56 p	60
RTA							
9	Downtown San Luis Obispo	San Miguel	0.25	5:30 a – 9:40 p	30-60	7:01 a – 8:54 p	120 - 180
10[5]	Cal Poly Kennedy Library	Santa Maria	0.75	5:45 a – 6:20 p	30	No weekend service to Cal Poly campus	

Notes:
1. Routes run in both directions, except SLO Transit routes 4 and 5.
2. Distance in miles from nearest stop to center of project site.
3. Headways are defined as the time interval between two transit vehicles traveling in the same direction over the same route.
4. Routes generally follow the same roadways and routes, but run in opposite directions.
5. Cal Poly express service only.

Source: SLO Transit and RTA websites, July 2013.

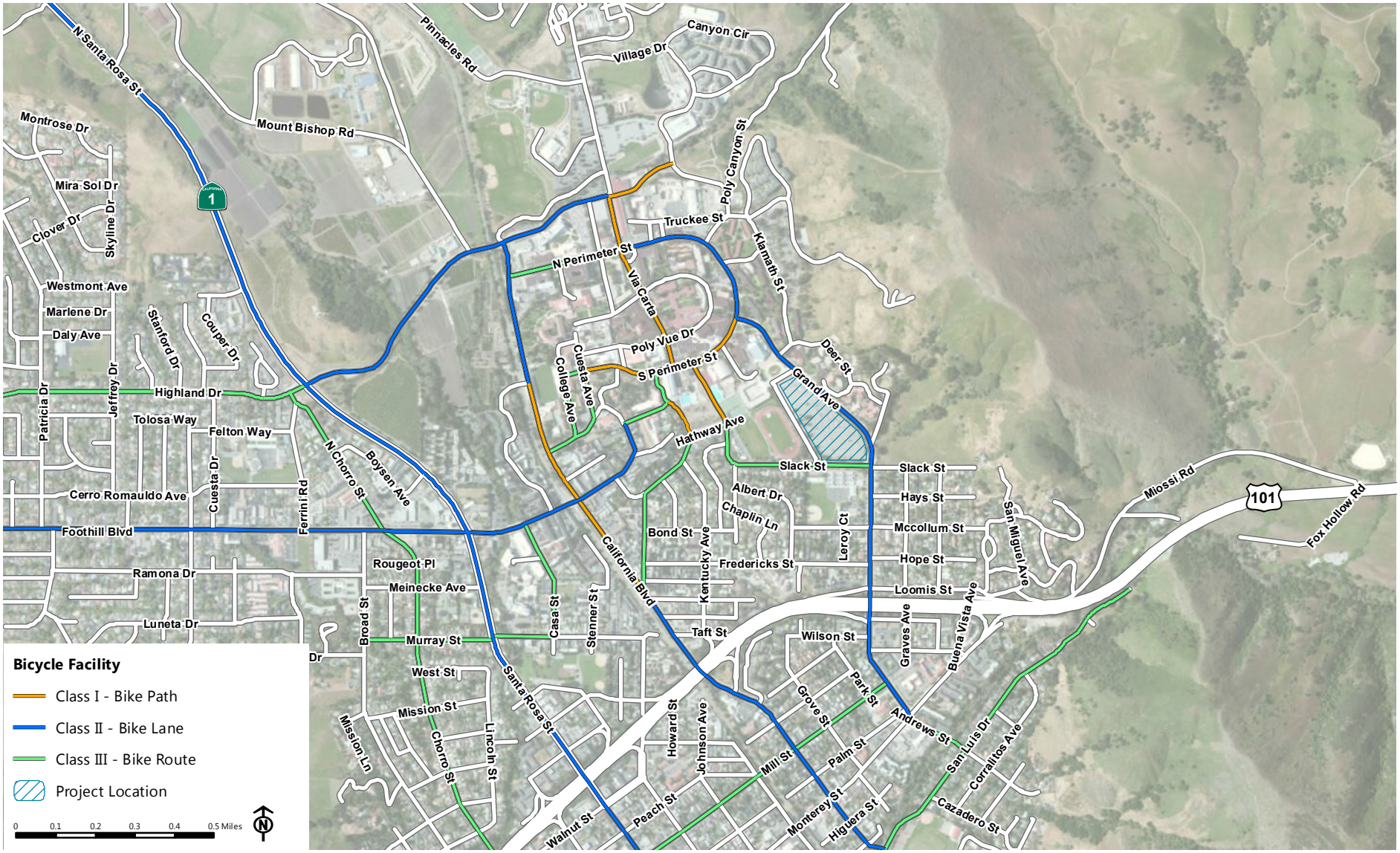
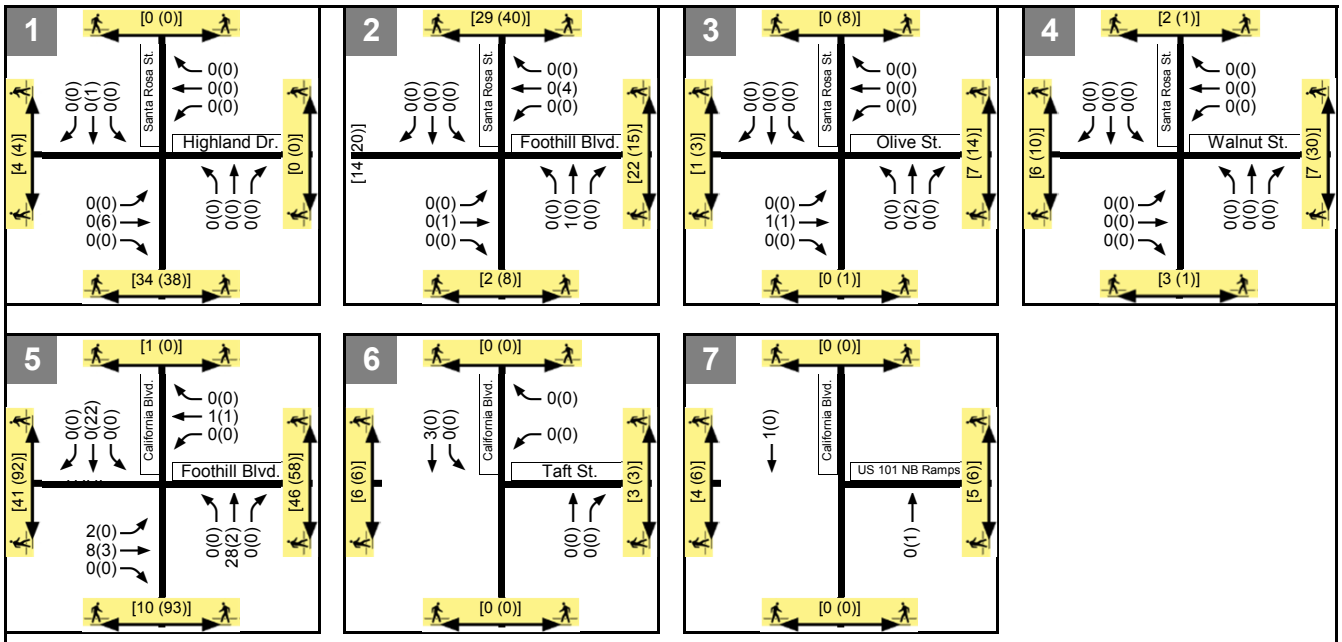


Figure 3

Bicycle Facilities

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Date: August, 2013

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KEY:

XX (YY) = AM (PM) Peak Hour Pedestrian/ Bicycle Volume

= Pedestrian Volume

= Bicycle Volume

Cal Poly Student Housing South

EXISTING PEDESTRIAN AND BICYCLE VOLUMES

FIGURE 4

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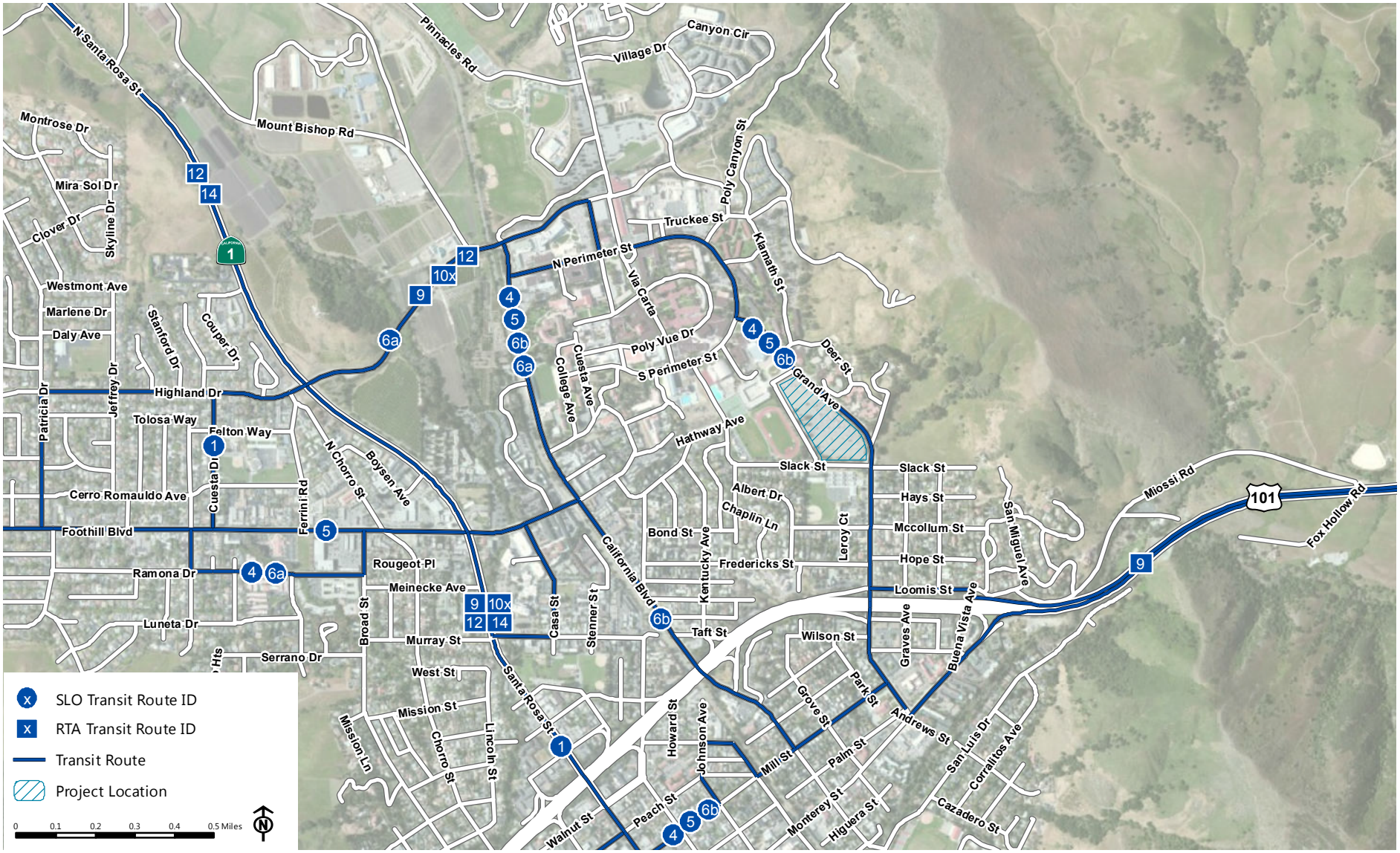


Figure 5

Transit Facilities

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Date: August, 2013

FEHR PEERS

EXISTING ROADWAY SEGMENT COUNT DATA

The City of San Luis Obispo also provided Fehr & Peers with 48-hour roadway count data along Grand Avenue south of McCollum Street. This data allowed for the estimation of the proportional split of inbound and outbound campus traffic during each peak hour. It was also used to estimate the proportion of peak parking demand that travels to campus during the AM and PM peak hours of travel. **Table 4** summarizes these factors and **Appendix A** details the estimation of these factors.

TABLE 4
IN-OUT PERCENTAGES AND PEAK HOUR TRIP FACTORS FROM GRAND AVENUE COUNT

Item	Direction	Value
AM In/Out Split: Calculated (Assumed in Analysis)	Northbound/Inbound Southbound/Outbound	78.8% (75%) 21.2% (25%)
PM In/Out Split: Calculated (Assumed in Analysis)	Northbound/Inbound Southbound/Outbound	34.5% (35%) 65.5% (65%)
Percent of AM Peak Hour Parking Demand that Travels During AM Peak Hour of Travel: Calculated (Assumed in Analysis)	N/A	29.0% (30%)
Percent of PM Peak Hour Parking Demand that Travels During PM Peak Hour of Travel: Calculated (Assumed in Analysis)	N/A	19.2% (20%)

Source: City of San Luis Obispo and Fehr & Peers, July 2013.

EXISTING DRIVEWAY COUNT DATA

Fehr & Peers collected 72-hour driveway count data at the R-1 parking lot in October 2013. This data was used to estimate the proportion of peak freshman parking demand that travels in and out during the peak hour. The R-1 lot is used by freshmen students housed in the Cerro Vista, North Mountain, South Mountain, Yosemite and Sierra Madre Halls. All freshmen are required to purchase a dining plan. However, unlike Student Housing South freshmen, Cerro Vista freshmen are still expected to travel off campus to shop for food because units in Cerro Vista contain kitchens. Therefore, the percentages presented below in **Table 5** are larger that would be expected for Student Housing South. Data for **Table 5** is included in **Appendix B**.

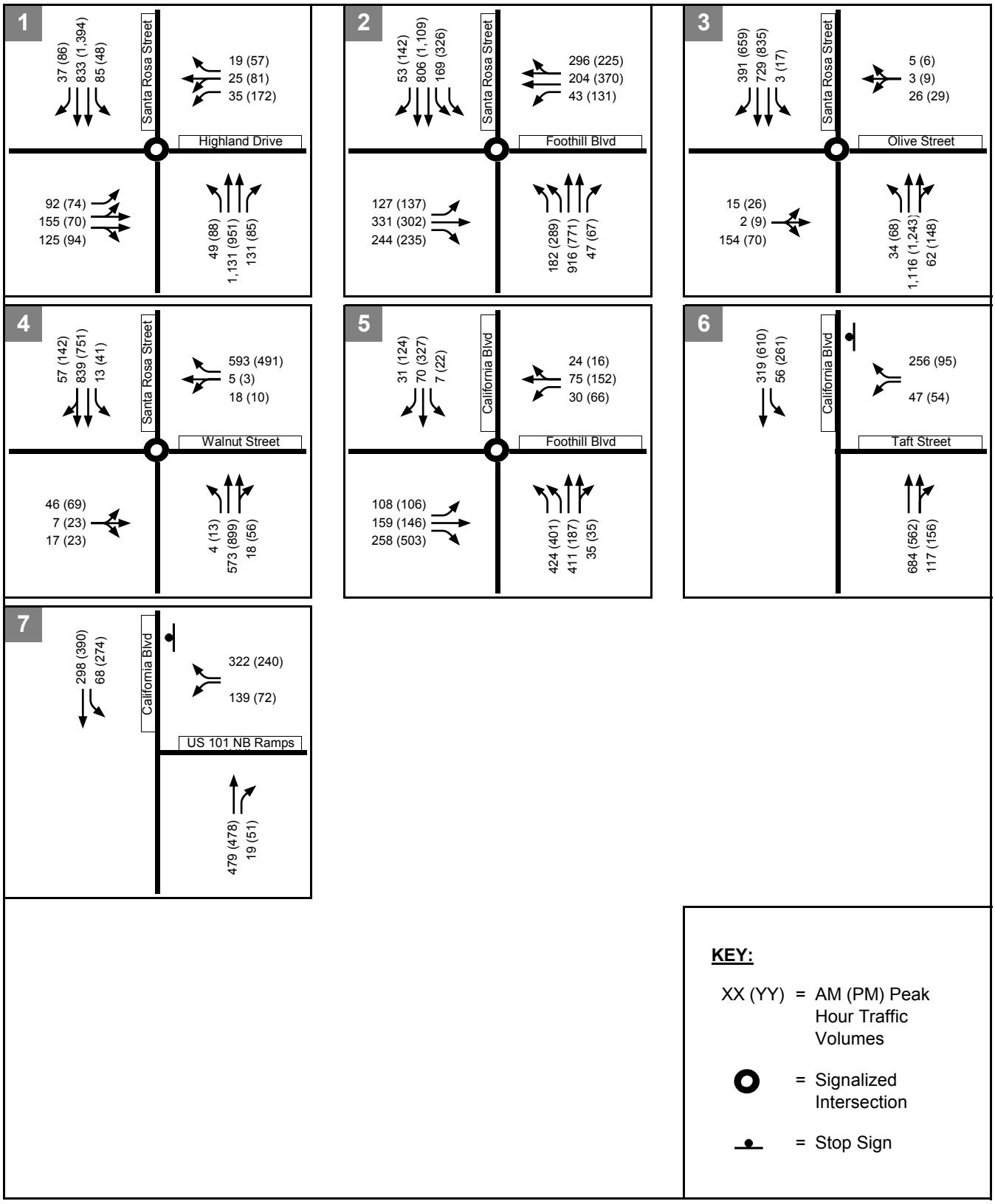
TABLE 5
PEAK HOUR TRIP FACTORS FROM R-1 PARKING LOT COUNT

Item	Direction	Value
Percent of AM Peak Hour Parking Demand that Travels During AM Peak Hour of Travel	Inbound Outbound	2.44% 3.38%
Percent of PM Peak Hour Parking Demand that Travels During PM Peak Hour of Travel	Inbound Outbound	10.23% 12.19%

Source: Fehr & Peers, November 2013.

EXISTING INTERSECTION VOLUMES AND LANE CONFIGURATIONS

The City of San Luis Obispo provided weekday morning (7:00 to 9:00 AM) and evening (3:00 to 6:00 PM) peak period intersection turning movement counts and 72-hour roadway segment counts were conducted at the study locations during May 2012 on clear days with area schools in-session. For the study intersections, the single hour with the highest traffic volumes during the count period was identified. Existing lane configurations and signal controls were obtained through field observations. The peak hour volumes are presented on **Figure 6** along with the existing lane configurations and traffic controls. Detailed traffic count data are contained in **Appendix B**.



Cal Poly Student Housing South

EXISTING PEAK HOUR TRAFFIC VOLUMES, TRAFFIC CONTROL AND LANE CONFIGURATIONS

FIGURE 6

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EXISTING INTERSECTION LEVELS OF SERVICE

Existing intersection lane configurations, signal timings, and peak hour turning movement volumes were used to calculate the levels of service for the key intersections during each peak hour. The results of the LOS analysis using the Synchro 7 software program for Existing Conditions are presented in **Table 6**. **Appendix C** contains the corresponding LOS calculation sheets.

The results of the LOS calculations indicate that the majority of the study intersections operate at acceptable levels of service according to their designated LOS standard (CSU TSM, City of San Luis Obispo, and/or Caltrans). The following four (4) study intersections in or near the project site do not operate acceptably during the AM and/or PM peak hour.

- Intersection #2 – Foothill Boulevard/Santa Rosa Street (AM and PM peak hour)
- Intersection #4 – Walnut Street/Santa Rosa Street (AM peak hour)
- Intersection #6 – Taft Street/California Boulevard (PM peak hour)
- Intersection #7 – US 101 NB Ramps/California Boulevard (AM and PM peak hour)

TABLE 6
EXISTING INTERSECTION LEVELS OF SERVICE

	Intersection	Peak Hour[1]	Intersection Control	Delay[2]	LOS[3]	Deficient?[4]			Signal Warrant Met?[5]
						TSM	SLO	CT	
1	Highland Drive/Santa Rosa Street	AM PM	Signal	24.6 30.6	C C	No No	No No	No No	N/A
2	Foothill Boulevard/Santa Rosa Street	AM PM	Signal	**37.8** **45.9**	**D** **D**	No No	No No	**Yes** **Yes**	N/A
3	Olive Street/Santa Rosa Street	AM PM	Signal	11.9 11.3	B B	No No	No No	No No	N/A
4	Walnut Street/Santa Rosa Street	AM PM	Signal	**35.8** 23.9	**D** C	No No	No No	**Yes** No	N/A
5	Foothill Boulevard/California Boulevard	AM PM	Signal	30.8 45.7	C C	No No	No No	N/A	N/A
6	Taft Street/California Boulevard	AM PM	Side Street Stop Control	32.0 **>180**	D **F**	No **Yes**	No **Yes**	N/A	Yes **Yes**
7	US 101 Northbound Ramps/California Boulevard	AM PM	Side Street Stop Control	**35.8** **66.2**	**E** **F**	**Yes** **Yes**	**Yes** **Yes**	**Yes** **Yes**	**Yes** **Yes**

Notes:
2. AM = morning peak hour, PM = afternoon peak hour.
3. Signalized intersections: whole-intersection average vehicle control delay. Unsignalized intersections: worst side street approach average control delay
4. LOS = Level of Service.
5. TSM = CSU TSM guidelines, SLO = City of San Luis Obispo guidelines, CT = Caltrans guidelines
6. California MUTCD Section 4C.04: Signal Warrant #3 – Peak Hour Warrant

Bold indicates deficient intersection operations.
Source: Fehr & Peers, November 2013.

SIGNAL WARRANT ANALYSIS

The peak-hour signal warrant (Warrant 3) from the *Manual on Uniform Traffic Control Devices* (MUTCD) was used to evaluate unsignalized intersections that operate unacceptably under Existing Conditions to determine if a traffic signal is warranted. The following unsignalized intersections operate unacceptably and meet peak hour signal warrants (see **Appendix D**):

- Intersection #6 – Taft Street/California Boulevard (AM and PM peak hours)
- Intersection #7 – US 101 Northbound Ramps/California Boulevard (AM and PM peak hours)

This analysis is intended to examine the general correlation between the current level of development in the region and the need to install new traffic signals. It estimates current traffic compared against a sub-set of the standard traffic signal warrants recommended in the Federal Highway Administration *Manual on Uniform Traffic Control Devices* and associated California MUTCD guidelines. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated by an experienced engineer based on field-measured rather than forecast traffic data and a thorough study of traffic and roadway conditions. Furthermore, the decision to install a signal should not be based solely upon the warrants, since the installation of signals can lead to certain types of collisions. The appropriate agency should undertake regular monitoring of actual traffic conditions and accident data, and timely re-evaluation of the full set of warrants to prioritize and program intersections for signalization.

EXISTING PARKING DEMAND

Parking lot occupancy data was provided by the University Police Department (UPD). UPD collected two-week empty space counts in April 2013 at the six large general parking areas and the three residential parking areas on campus for the AM and PM peak parking hours (10:00-11:00 AM and 2:00-3:00 PM). Parking lot count information is summarized in **Table 7** and shown on **Figures 7a and 7b**.

TABLE 7
EXISTING PARKING LOT COUNTS

Parking Lot	Lot Capacity (spaces)	10:00-11:00 AM Hour		2:00-3:00 PM Hour	
		Empty Spaces	% Occupied	Empty Spaces	% Occupied
General (Non-Residential) Parking					
H-1	366	345	6%	340	7%
H-12	441	12	97%	26	94%
H-14	367	282	23%	229	38%
H-16	506	148	71%	134	74%
G-1	426	62	85%	87	80%
Grand Ave Structure[1]	618	35	94%	53	91%
Resident Only Parking					
R-1	789	69	91%	89	89%
R-3	940	352	63%	361	62%
R-4[2]	971	363	63%	372	62%
Combined Residential-General Parking					
R-2/G-4[3]	898	373	58%	417	54%

Notes:
1. Structure includes staff parking in addition to general parking. Only general parking data presented.
2. Data not collected for R-4 garage, but Cal Poly Parking reports R-4 experiences similar occupancies to R-3
3. Lot allows for overflow general parking. Majority of parking is residential parking.

Source: University Police Department and Fehr & Peers, July 2013.

Based on the April 2013 parking lot counts, the University has enough parking supply to meet demand during the morning and afternoon peak hours of parking demand. However, because the parking lots are located at the north and south ends of campus, drivers may circulate within and between lots to find spots closest to their final destination on campus. In addition to the lots presented in **Table 7**, there are other smaller lots spread throughout campus.

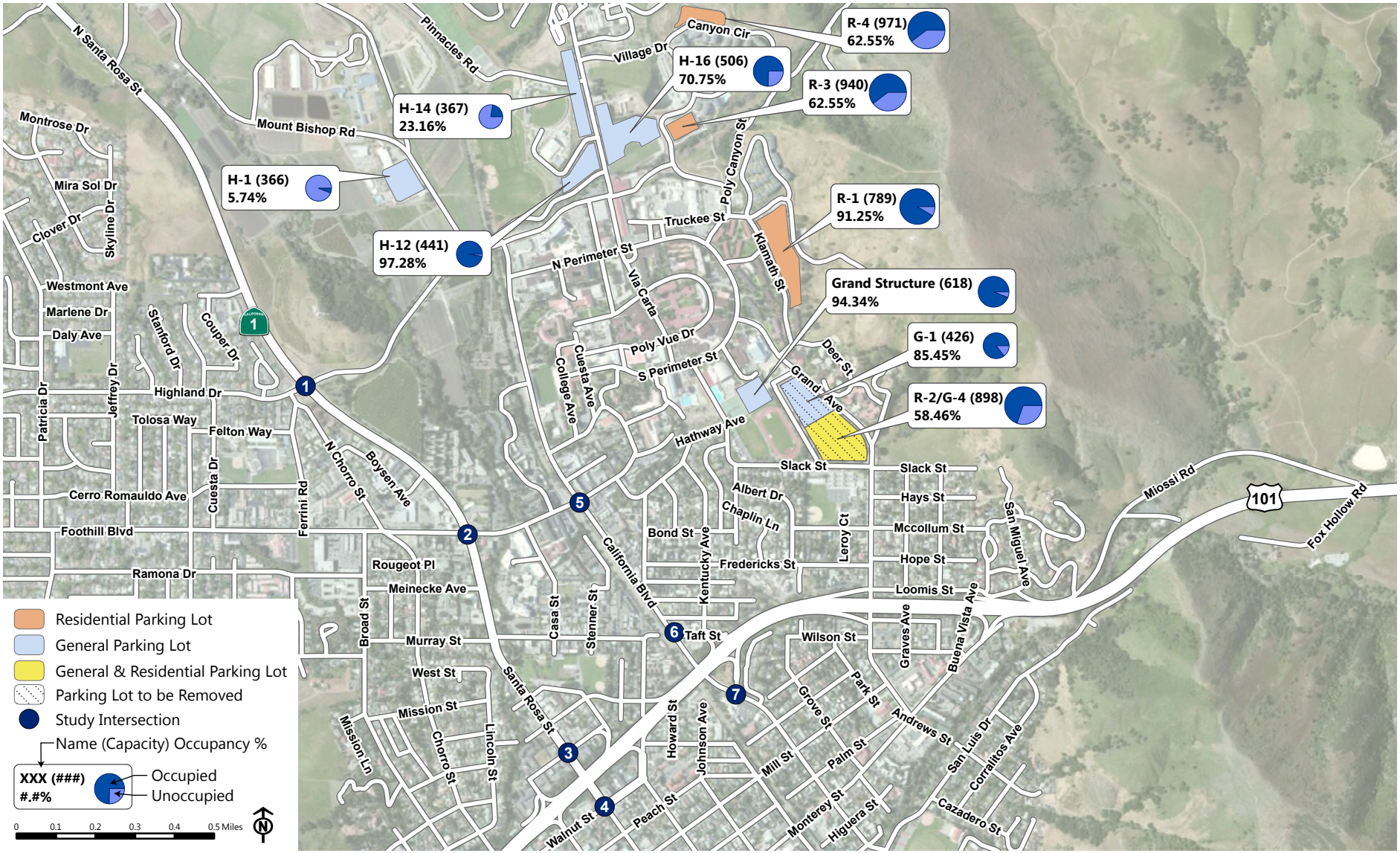


Figure 7a

Parking Lots and Lot Occupancies (10 - 11 AM Hour)

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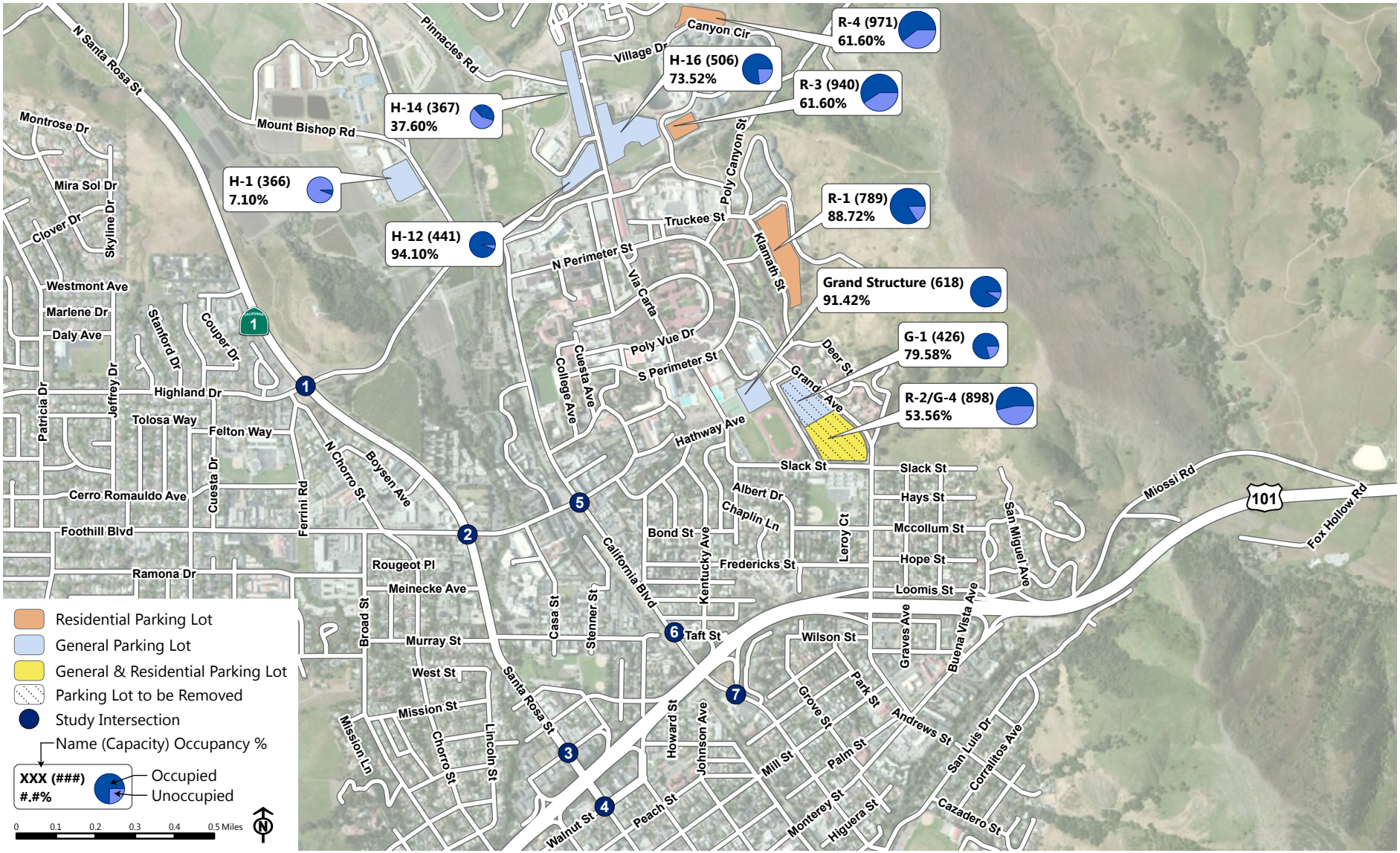


Figure 7b

Parking Lots and Lot Occupancies (2 - 3 PM Hour)

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FEHR PEERS

3. EXISTING WITH PROJECT CONDITIONS

This chapter presents the impacts of the proposed project on the surrounding roadway system under Existing with Project Conditions. Since the project is expected to be constructed within a few years of approval, the Existing with Project Conditions analysis will determine the project's impacts in the near-term. The Cumulative with Project Conditions analysis (presented in **Chapter 4**) will determine the project's impacts in the far-term.

In this chapter, the method used to estimate the amount of traffic generated by proposed development is described first. Then, the results of the level of service calculations for Existing with Project Conditions are presented. Existing with Project Conditions are defined as Existing Conditions with traffic generated by the proposed project. Impacts under this scenario are then identified by comparing the level of service results under Existing with Project Conditions to those under Existing Conditions. Pedestrian, bicycle, and transit impacts are also addressed in this chapter.

PROJECT TRAFFIC VOLUMES

The amount of traffic added to the roadway system by the proposed project is estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. The first step estimates the amount of traffic added to the roadway network. The second step estimates the directions of travel to and from the project site. The new trips are assigned to specific street segments and intersection turning movements during the third step. The results of the process are described in the following sections.

TRIP GENERATION

Trip generation is typically performed using rates from *Trip Generation, 9th Edition* from the Institute of Transportation Engineers (ITE). *Trip Generation* is a compendium of trip generation studies that allows for the estimate of trips for a given project based on collected data. However, owing to the lack of data on the proposed use (student housing), the removal of a substantial amount of parking on site, and the unique travel characteristics of Cal Poly campus travel (a higher propensity to walk, bike or take transit), site-specific trip generation methodology was used, in accordance with ITE guidance to use local data where possible. Vehicle trip generation for the Cal Poly Student Housing South project is comprised of the following components:

- Commute trip reduction for freshmen who would no longer drive to campus

- Trips generated by new freshmen who would live on campus as a result of the Project
- Commute trips redistributed from drivers that currently park in the G-1 and G-4 lots
- Trips redistributed from freshmen who park elsewhere on campus with the closure of the R-2 parking lot

Because there is no change in enrollment proposed with the project, we expect the number of vehicle commute trips taken by freshmen will decrease proportional to the increase of freshmen living on campus. However, this reduction will be tempered by trips taken by those new freshmen living on campus (trips to off-campus jobs, shopping, etc.). The Student Housing North EIR, completed under similar assumptions regarding no enrollment increase, followed a method that combined the commute reduction with trips generated by the new upper classmen on campus using rates from the Cal Poly Master Plan (2001). The Master Plan also provided rates for freshman trips in addition to the commute reduction rate. These components of the project trip generation are summarized in **Table 8**.

TABLE 8
PROJECT TRIP GENERATION RELATED TO HOUSING OF STUDENTS ON CAMPUS

Component	Size (beds)	Daily		AM Peak Hour				PM Peak Hour			
		Rate[1]	Total	Rate[1]	In[2]	Out[2]	Total	Rate[1]	In[2]	Out[2]	Total
Freshmen	1,475	1.72	2,537	0.051	57	19	76	0.132	68	127	195
Commute Reduction	1,475	-1.17	-1,725	-0.117	-129	-43	-172	-0.166	-85	-159	-244
Total Trips		**--**	***812***	**--**	***-72***	***-24***	***-96***	**--**	***-17***	***-32***	***-49***

Notes:
1. Rates from Cal Poly Master Plan (2001)
2. Based on in/out split data presented in Table 4

Source: Fehr & Peers, November 2013.

The addition of housing on campus will reduce the number of peak hour trips traveling to and from campus. However, the number of residential vehicles parked on campus will increase proportional to the number of freshmen living on campus. **Table 9** details the freshmen parking demand "swell" associated with the project.

TABLE 9
FRESHMAN PARKING DEMAND SWELL CALCULATION

A	Annual R Permits Sold by April 30[1]	877
B	Spring Quarter R Permits[1]	250
C	Average Daily & Weekly R Permits Sold in April[1]	27
D = A+B+C	*Total Permits Outstanding in April*	*1,154*
E	Number of Freshmen in R Permit-eligible Housing	4,246
F = D/E	*Permits Per Freshmen*	*0.27*
G =F x 1,475	***Expected Increase in Freshman R Permit Parking Demand***	***401***

Notes
1. R permits only valid in R-1 and R-2 parking lots

Source: Cal Poly UPD and Fehr & Peers, July 2013

The reduction of parking supply at the project site will result in drivers shifting to available parking supply in other areas of the campus. **Table 10** lists the spare capacities of other lots on campus, the number of cars that would shift due to the project, and the final destination of those rerouted cars. While a small percentage of the current general parking may be freshmen who would ultimately live on campus after completion of the project, to be conservative the analysis assumes that this change is zero. The adequacy of parking supply to meet demand is discussed in the Parking Supply and Demand Assessment section.

TABLE 10
PARKING LOT VEHICLE SHIFTS AFTER PROJECT CONSTRUCTION

Parking Lot	10:00-11:00 AM		2:00-3:00 PM		Notes
	Cars to Move	Spare Capacity	Cars to Move	Spare Capacity	
General Parking					
G-1	364	300	339	300	Vehicles move to Grand Structure and new 300 space parking structure to fill available capacity; remainder of vehicles move to Lots H-12, H-14, and H-16 based on available capacity closest to campus core
G-4[1]	100	0	36	0	
Grand Structure	0	35	0	53	Grand Structure fills to capacity
H-12	0	12	0	26	Remainder of general cars to be moved shift to these three lots
H-14	0	282	0	229	
H-16	0	148	0	134	
H-1	0	345	0	340	No general vehicles shift to this lot due to lack of proximity to campus core
Residential Parking					
R-2[1]	425	0	445	0	Vehicles move to Lots R-1 & R-3
New Residential Demand	401	0	401	0	
R-1	0	69	0	89	R-1 fills to capacity
R-3	0	352	0	361	R-3 lots handle spillover from R-1
R-4	0	363	0	372	
Total Vehicles Shifted (for Trip Generation Calculation)[2]					
General	129	--	22	--	Vehicles that shift to Lots H-12, H-14 and H-16
Residential	826	--	846	--	Vehicles that shift to Lots R-1 and R-3

Notes:
1. Based on the number of R permits sold and the number of vehicles in Lots R-1 and R-2/G-4, the number of general and resident vehicles in R-2/G-4 can be back-calculated
2. While they represent existing trips, vehicles shifted to new locations are assumed to be new trips for purposes of this analysis because they would utilize new routes to get to available parking facilities

Source: University Police Department and Fehr & Peers, November 2013.

The reduction in freshman commute trips due to the project counteracts the redistribution of general commute traffic due to the parking lot closures and the new residential parking demand generated by the

project. Only a portion of the peak period parking demand to be redistributed actually travels in the peak hour of travel; however, these trips will be diverted onto other roadways to access the other parking areas. The proportion of peak parking demand that travels in the peak hour and the directional distribution (inbound vs. outbound) is based on the Grand Avenue count data summarized in **Table 4**. Likewise, only a small proportion of redistributed residential trips occur in the peak hour of travel, but they will mostly be diverted to roadways other than Grand Avenue. However, the proportions are low as many students will still be in the residence halls during the morning peak hour of travel, and many students will be in class during the afternoon peak hour of travel. Also, many of these redistributed vehicles will belong to freshmen; freshmen housed on campus generally take advantage of amenities on campus that reduce their need for travel off-campus, such as on-campus dining, shopping and entertainment.

Table 11 presents the combined trip calculation, and summarizes trips from the project itself and the vehicle redistributions. Because they would utilize new routes to get to available parking facilities, redistributed vehicles are assumed to be "new" trips for trip generation results shown in **Table 11**.

TABLE 11
PROJECT TRIP GENERATION

Component	Peak Hour	Parking Lot Redistribution			Peak Hour Trips					
		Total Vehicles Shifted[1]	% of Shifted Vehicles Traveling in Peak Hour		AM Peak Hour			PM Peak Hour		
			Inbound	Outbound	In	Out	Total	In	Out	Total
General Parking Redistribution	AM PM	129 22	30%[2] 11%[4]	10%[4] 20%[2]	39	13	52	3	5	8
Residential Parking Redistribution	AM PM	826 846	2%[3] 10%[3]	3%[3] 12%[3]	21	28	49	87	104	191
Freshman Trip Reduction	N/A	N/A	N/A	N/A	-72	-24	-96	-17	-32	-49
				Total Combined Trips	***-12***	***17***	***5***	***73***	***77***	***150***

Notes:
1. From Table 9
2. Factors From Table 4
3. Factors From Table 5
4. Factors derived from In/Out trip splits in Table 4

Sample Calculation: General Parking PM Peak Hour, off-peak direction (inbound) = 322 * 11% ≈ 36 trips
Source: Fehr & Peers, November 2013.

TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of project trips on the roadway is primarily based on the relative distribution of existing traffic on local roadways. For Cal Poly, the three primary gateways into campus are Grand Avenue, California Boulevard and Highland Drive. A gateway also exists on Stenner Creek Road north of the project site, but given the extra distance required to travel to the campus core, this gateway serves a low number of trips. Cal Poly has a high non-automobile mode share; many students who live near campus walk, bike or take transit, which suggests that automobile trips to campus are primarily from areas outside of the northern part of the City of San Luis Obispo (areas further than 1-2 miles away from the campus core).

Two-day, 48-hour pneumatic tube counts were conducted on roadways in the study area when the intersection turning movements were performed in May 2012. AM and PM peak hour data for the three gateways was reviewed to estimate the current percentage of general parking lot trips that use each gateway. The travel patterns for each gateway is shown in **Table 12** and percent of project related traffic that was assigned to each gateway considers the count data, speed limits and travel distances from the gateways to the general parking lots on the north side of campus

TABLE 12
CAL POLY CAMPUS GATEWAY VOLUMES

Gateway	AM Peak Hour		PM Peak Hour		% Project Trips in Analysis
	Volume	% Of Total	Volume	% Of Total	
Grand Avenue	756	44%	696	32%	10%[1]
California Boulevard	525	30%	605	28%	50%
Highland Drive	456	26%	863	40%	40%
Total	*1,737*	*100%*	*2,164*	*100%*	*100%*

Notes:

1. While a large proportion of overall Cal Poly trips currently use the Grand Avenue gateway to access parking lots and structures on the south side of campus, we expect that most trips for the northern parking lots would use the California Boulevard or Highland Drive gateways to access parking lot H-1 due to slow travel along Grand Avenue and Perimeter Road to reach the parking lots.

Source: Fehr & Peers, June 2013.

While the distribution presented in **Table 12** works well for commute trips (the general parking redistribution and the reduction in trips due to the increase of freshmen living on campus), freshmen on-campus residents generally follow a different set of travel patterns. The distribution for freshman on-campus residents is based on assumptions made about the types of trips on-campus freshman make to

locations such a part time jobs, off-campus restaurants, other student housing; on-campus students would not make commute trips to campus, so the general parking trip distribution is not suitable for use for the on-campus freshman trips.

The trip distribution patterns for general parking/freshmen reduction and resident parking trips are shown on **Figure 8**. Based on the trip totals and trip distribution patterns, trips were assigned through the roadway network. The trip assignment is shown on **Figure 9**. Existing with Project scenario volumes are shown on **Figure 10**.

EXISTING WITH PROJECT INTERSECTION LEVELS OF SERVICE

Level of service calculations were conducted to evaluate intersection operations under Existing with Project Conditions. The results of the LOS analysis are summarized in **Table 13**.

The results for Existing Conditions are included for comparison purposes, along with the net trips added, the results of a signal warrant analysis (presented in the next section), and the determination of impact significance under various impact significance thresholds as outlined in Chapter 1. The corresponding LOS calculation sheets are included in **Appendix C**.

The results of the LOS calculations indicate that the majority of the study intersections will operate at acceptable levels of service according to their designed LOS standard. The following four (4) study intersections do not meet their respective LOS designation for AM and/or PM.

- Intersection #2 – Foothill Boulevard/Santa Rosa Street (AM and PM peak hours)
- Intersection #4 – Walnut Street/Santa Rosa Street (AM peak hour)
- Intersection #6 – Taft Street/California Boulevard (PM peak hour)
- Intersection #7 – US 101 Northbound Ramps/California Boulevard (AM and PM peak hour)

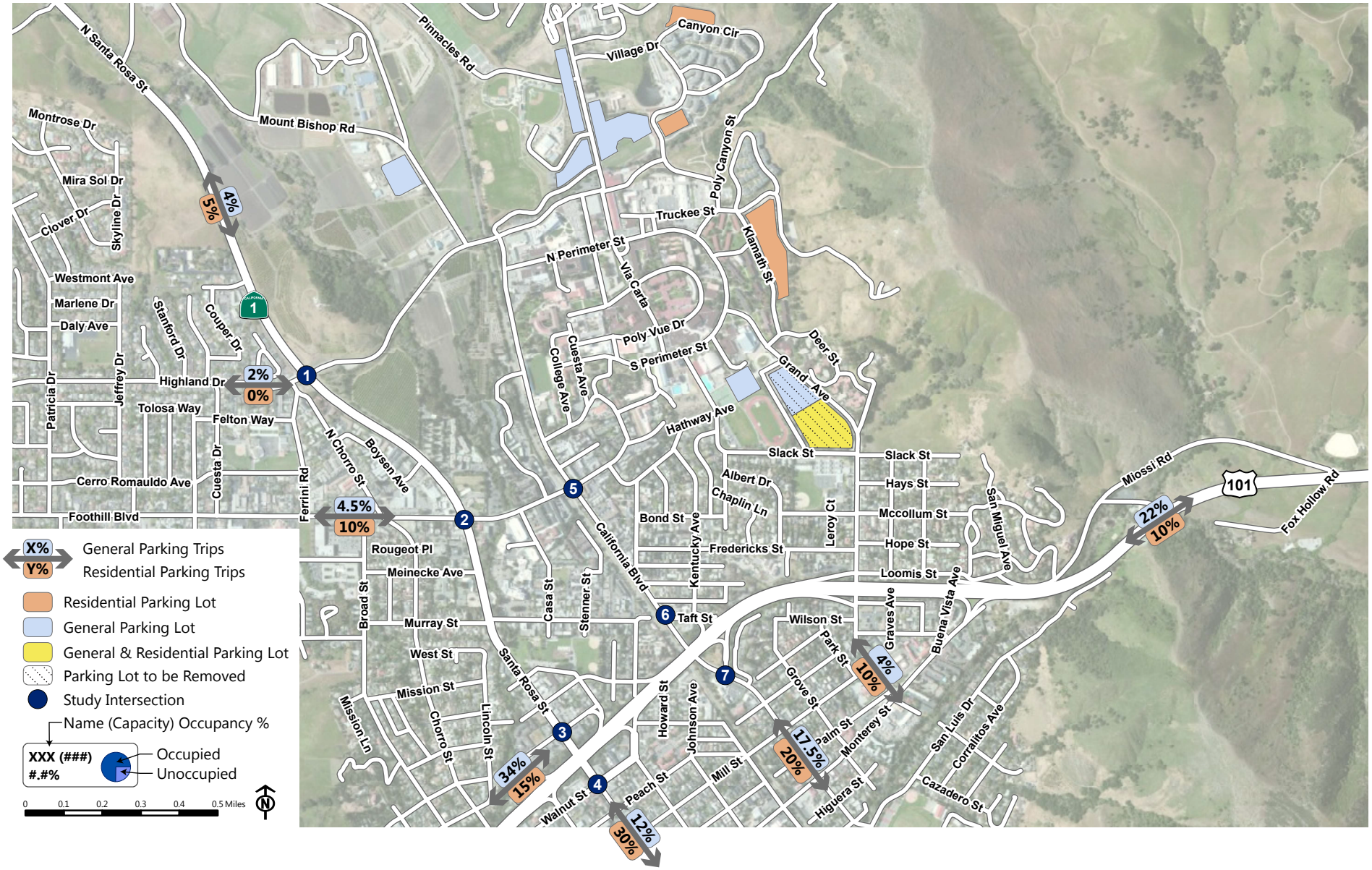
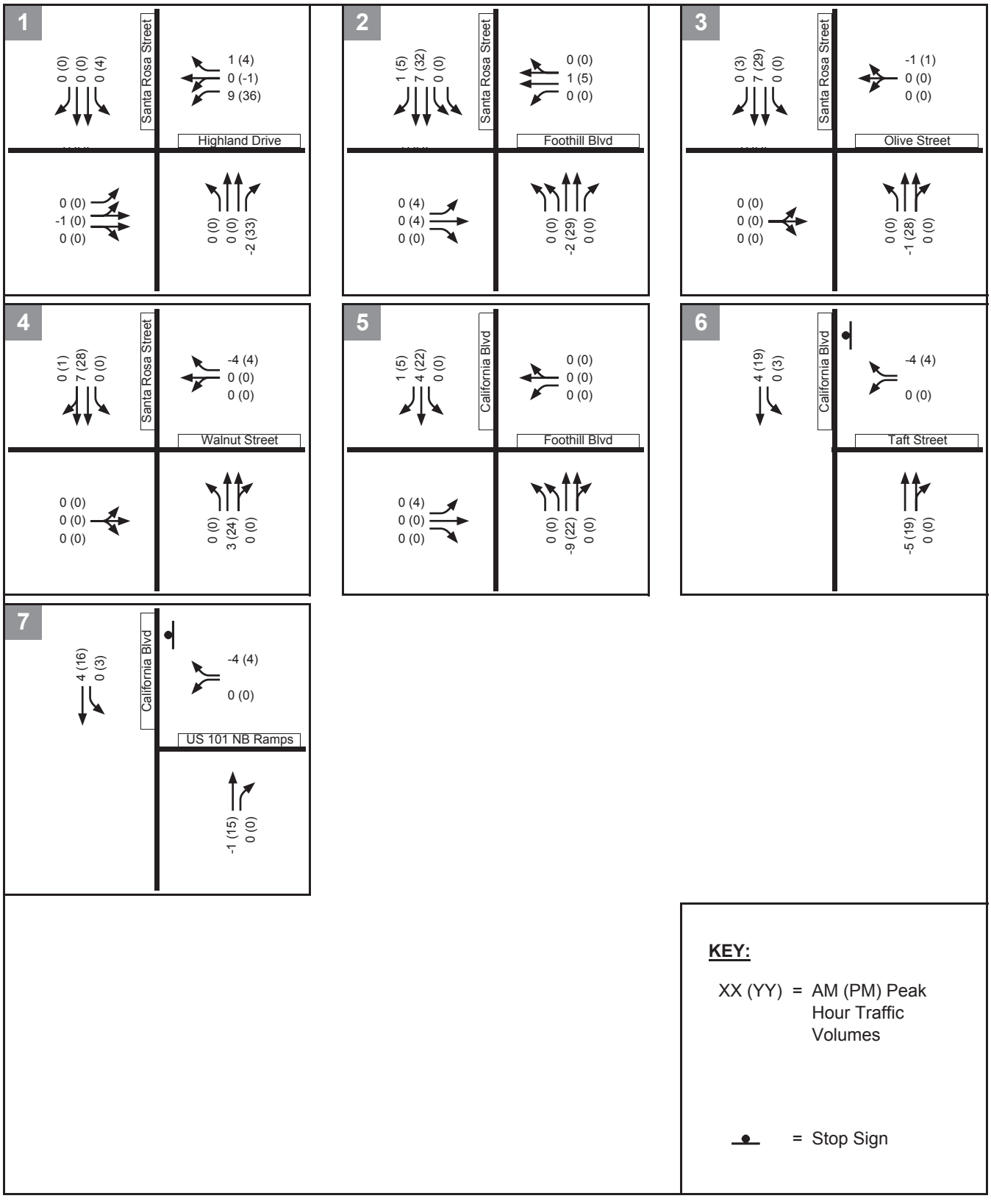


Figure 8

Project Trip Distribution

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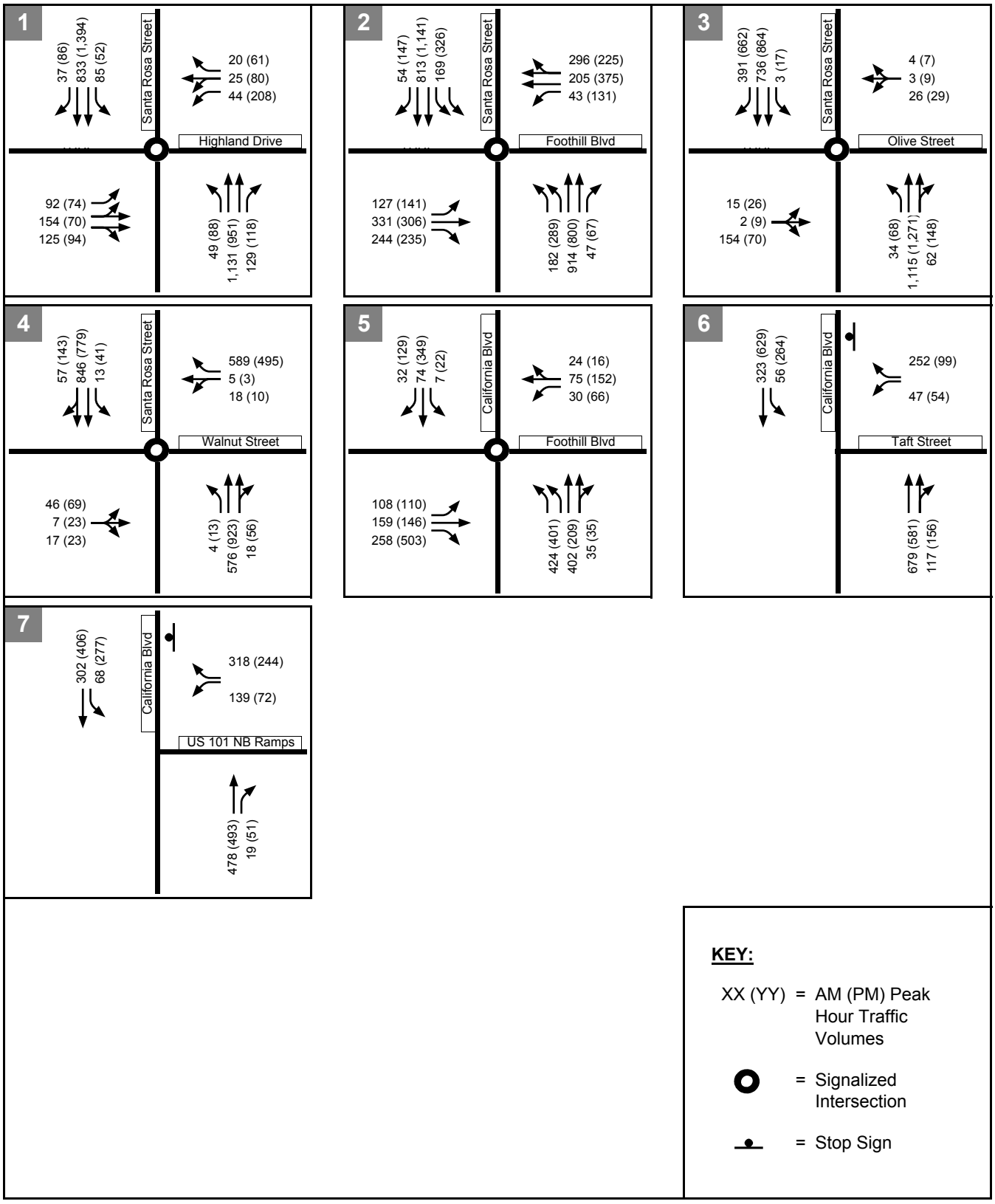


Cal Poly Student Housing South

FEHR PEERS

October 2013
SJ13-1439

PROJECT TRIP ASSIGNMENT
FIGURE 9



Cal Poly Student Housing South

EXISTING WITH PROJECT PEAK HOUR TRAFFIC VOLUMES, TRAFFIC CONTROL AND LANE CONFIGURATIONS

FIGURE 10

FEHR PEERS

October 2013
SJ13-1439

TABLE 13
EXISTING WITH PROJECT INTERSECTION LEVELS OF SERVICE

	Intersection	Peak Hour[1]	Existing Conditions		Existing with Project Conditions		Net Trips Added	Signal Warrant Met?[4]		Impact?[5]		
			Delay[2]	LOS[3]	Delay[2]	LOS[3]		Without Project	With Project	TSM	SLO	CT
1	Highland Drive/Santa Rosa Street	AM	24.6	C	24.7	C	7	N/A	N/A	No	No	No
		PM	30.6	C	32.3	C	76			No	No	No
2	Foothill Boulevard/ Santa Rosa Street	AM	**37.8**	**D**	**37.8**	**D**	7	N/A	N/A	No	No	**Yes**
		PM	**45.9**	**D**	**46.4**	**D**	79			No	No	**Yes**
3	Olive Street/Santa Rosa Street	AM	11.9	B	11.8	B	5	N/A	N/A	No	No	No
		PM	11.3	B	11.4	B	61			No	No	No
4	Walnut Street/Santa Rosa Street	AM	**35.8**	**D**	**34.8**	**C**	5	N/A	N/A	No	No	**Yes**
		PM	23.9	C	24.0	C	57			No	No	No
5	Foothill Boulevard/ California Boulevard	AM	30.8	C	30.8	C	-4	N/A	N/A	No	No	N/A
		PM	45.7	C	47.1	D	53			No	No	
6	Taft Street/California Boulevard	AM	32.0	D	31.5	D	-5	**Yes**	**Yes**	No	No	N/A
		PM	**>180**	**F**	**>180**	**F**	45	**Yes**	**Yes**	No	No	
7	US 101 Northbound Ramps/California Boulevard	AM	**35.8**	**E**	**35.6**	**E**	-2	**Yes**	**Yes**	No	No	No
		PM	**66.2**	**F**	**74.4**	**F**	38	**Yes**	**Yes**	No	No	**Yes**

Notes:
1. AM = morning peak hour, PM = afternoon peak hour.
2. Signalized intersections: whole-intersection average vehicle control delay. Unsignalized intersections: worst side street approach average control delay
3. LOS = Level of Service.
4. California MUTCD Section 4C.04: Signal Warrant #3 – Peak Hour Warrant
5. TSM = CSU TSM guidelines, SLO = City of San Luis Obispo guidelines, CT = Caltrans guidelines

Bold indicates deficient intersection operations. **Bold and highlighted** indicates a significant impact.
Source: Fehr & Peers, November 2013.

SIGNAL WARRANT ANALYSIS

The peak-hour signal warrant (Warrant 3) from the *Manual on Uniform Traffic Control Devices* (MUTCD) was evaluated for the unsignalized intersections that operate unacceptably under Existing with Project Conditions to determine if a traffic signal is warranted. The following unsignalized intersections operate unacceptably and meet peak hour signal warrants (see **Appendix D)**:

- Intersection #6 – Taft Street/California Boulevard (AM and PM peak hours)
- Intersection #7 – US 101 Northbound Ramps/California Boulevard (AM and PM peak hours)

This analysis is intended to examine the general correlation between the planned level of future development and the need to install new traffic signals. It estimates future development-generated traffic compared against a sub-set of the standard traffic signal warrants recommended in the Federal Highway Administration *Manual on Uniform Traffic Control Devices* and associated California MUTCD guidelines. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated by an experienced engineer based on field-measured rather than forecast traffic data and a thorough study of traffic and roadway conditions. Furthermore, the decision to install a signal should not be based solely upon the warrants, since the installation of signals can lead to certain types of collisions. The appropriate agency should undertake regular monitoring of actual traffic conditions and accident data, and timely re-evaluation of the full set of warrants to prioritize and program intersections for signalization.

INTERSECTION IMPACTS

Based on the impact criteria listed in **Chapter 1**, the proposed project will have a significant impact at three (3) study intersections within the City of San Luis Obispo during the following peak hours:

- Intersection #2 – Foothill Boulevard/Santa Rosa Street (AM and PM peak hours)
- Intersection #4 – Walnut Street/Santa Rosa Street (AM peak hour)
- Intersection #7 – US 101 Northbound Ramps/California Boulevard (PM peak hour)

CITY OF SAN LUIS OBISPO/CALTRANS SHARED INTERSECTIONS

Foothill Boulevard/Santa Rosa Street (Intersection #2) – The addition of project traffic under Existing with Project Conditions exacerbate unacceptable intersection operations during the AM and PM peak hour per

the Caltrans LOS criteria. Under the Caltrans impact significance criteria, the net addition of project trips results in the project causing a **potentially significant impact** at this intersection.

Walnut Street/Santa Rosa Street (Intersection #4) – The addition of project traffic under Existing with Project Conditions exacerbates unacceptable intersection operations during the AM peak hour. Under the Caltrans impact significance criteria, the net addition of project trips results in the project causing a **potentially significant impact** at this intersection.

US 101 Northbound Ramps/California Boulevard (Intersection #7) – The addition of project traffic under Existing with Project Conditions exacerbates unacceptable intersection operations during the PM peak hour. Under the City of San Luis Obispo criteria, the impact is less than significant as the intersection meets signal warrants under both the Existing and Existing with Project scenarios. Under the Caltrans impact significance criteria, the net addition of project trips results in the project causing a **potentially significant impact** at this intersection.

Measures to mitigate these impacts are discussed in **Chapter 6**.

PEDESTRIAN, BICYCLE, AND TRANSIT IMPACTS

A project is determined to cause a significant impact to pedestrian, bicycle, and transit facilities and services based on the criteria presented in **Chapter 1**.

PEDESTRIAN AND BICYCLE FACILITIES

Pedestrian connections to other areas on campus from the project site are currently provided by sidewalks along Grand Avenue and an undercrossing below the Grand Avenue Parking Structure entrance. Bicycle access would be provided by the undercrossing and bike lanes along Grand Avenue. Owing to the more direct route provided by the undercrossing, the majority of residents traveling to destinations on campus from the project site would use the undercrossing. This pathway is approximately 7-10 feet wide, and may need to be widened in order to adequately accommodate peak bicycle and pedestrian flows and should be considered as part of the site planning process. Pedestrian trips to areas other than the campus core would be handled by the sidewalk network. Sidewalks are currently not provided along the north side of Slack Street from Grand Avenue to Longview Lane. Increased pedestrian flows in this area could lead to a safety hazard by not providing a convenient pedestrian route along the perimeter of the site; this is **potentially significant impact**. Sidewalks should be provided around the frontage of the project (including providing sidewalks along Pacheco Way and along the north side of Slack Street from Slack Street to Parking Lot G-2). Marked crosswalks should be provided to transition pedestrians from the off-

site sidewalk network to the on-site pedestrian facility network. The addition of these sidewalks and crosswalks would reduce the impact to a level that is **less-than-significant with mitigation**. Bicycle trips to other off-campus areas can be accommodated by existing bicycle facilities as described in **Chapter 2,** so impacts to bicycles are **less-than-significant**.

The proposed project will replace an existing surface parking lot with new student housing buildings. The site plan shows bicycle parking spread throughout the site with a main pathway in the center of the site connecting the various buildings on the project site. While it is anticipated that many bicyclists would use the Grand Avenue Parking Structure undercrossing, safe bicycle connections to bike lanes along Grand Avenue should be established as well. Recommendations for these connections are discussed further in **Chapter 5**.

With the increase in students concentrated on the campus border, the surrounding neighborhood may see an influx of pedestrian and bicycle activity. This activity would be concentrated along Grand Avenue, but would eventually disperse into the local neighborhoods. The local streets in the neighborhoods south of the University are generally low volume roadways without bike lanes and, in many cases, sidewalks. A reduction in peak hour vehicle trips through the Grand Avenue gateway will ultimately provide a more comfortable environment for pedestrians and bicyclists in the local area as the number of conflicts during the periods of heaviest travel would be reduced. Specifically, the number of trips along Grand Avenue would be reduced as they would be diverted to California Boulevard (a facility with a separated bicycle path) and Santa Rosa Street (a facility with lower pedestrian traffic). Because the Cal Poly campus provides many of the amenities that on-campus residents need (dining halls, recreation, etc.), the majority of off-campus bicycle and pedestrian trips would take place outside of the peak hours of travel. Therefore the off-site impacts to pedestrians and bicycles on the local street network (with the exception of on the north side of Slack Street as discussed previously) are **less-than-significant**. Strategies to minimize the likelihood of on-site potential impacts are discussed in **Chapter 5**.

TRANSIT SERVICE

The project will generate new demand for the transit services and facilities that serve the area as described in **Chapter 2**. Fixed-route bus service operates near the site with stops located within walking distance of the proposed development. Overall student enrollment is not expected to increase as part of the project; therefore peak hour transit ridership is not expected to increase. As more students will live on campus, there is a high likelihood that commute transit trips will be reduced similar to the reduction in peak hour automobile commute trips. Therefore impacts to transit are **less-than-significant**.

PARKING SUPPLY AND DEMAND ASSESSMENT

Based on parking information in **Table 10**, the campus has enough available general parking supply to meet demand with the removal of G-1 and R-2/G-4 parking areas (shifting of 429 AM peak vehicles and 322 PM peak vehicles). The Grand Avenue parking structure will likely fill to capacity during the peak periods of parking demand (filling the 35 and 53 empty spaces during the AM and PM, respectively), which will result in vehicles circulating in the garage to find spaces, or circulating through campus to reach the northern parking lots (partially filling the 430 and 389 spare spaces in the AM and PM, respectively). The H-1 parking lot is located far from the campus core; drivers tend to park closest to their final destination, which suggests that the H-1 lot will continue to be underutilized even as Lots H-12, H-14 and H-16 approach capacity.

The analysis of current residential parking supply and demand to be shifted shows that there is adequate capacity to handle the shift of 425 resident parking vehicles in the AM and 445 resident parking vehicles in the PM. Residents may need to park in lots farther away from their residence halls as demand redistributes between the R-1, R-3 and R-4 parking areas (with their spare capacity of 784 spaces in the AM and 822 spaces in the PM). However, the supply of resident parking is not adequate to handle both the current demand and new demand generated by the project (401 spaces). The net deficiency in residential parking supply is 42 spaces in the morning and 24 spaces in the afternoon. This suggests that changes to residential parking supply or residential parking policies and programs may be needed to ensure that supply does not exceed demand. The parking supply shortage is considered a **potentially significant impact**.

The redistribution of parked vehicles (and the trips associated with the redistribution) could be lessened with the addition of a parking garage to the site plan. If a parking garage is planned, care should be taken to allocate spaces to the three parking types (residential, staff, and general) to reduce the redistribution of traffic along the primary corridors into campus. Increasing the staff parking on campus by providing a parking garage without a corresponding re-designation of staff spaces in the Grand Avenue parking structure to general parking spaces may not reduce the redistribution of traffic from general parking vehicles to the north side of campus.

4. CUMULATIVE CONDITIONS

This chapter presents the results of the intersection level of service calculations under Cumulative Conditions with and without the Project. Cumulative without Project Conditions are defined as existing volumes plus traffic generated by all foreseen development projects that would affect the transportation system in the study area, including "approved but not yet built," pending development projects that have not yet been approved and other land use growth envisioned to occur by 2035. Cumulative with Project Conditions are defined as Cumulative without Project Conditions plus traffic generated by the proposed project.

CUMULATIVE WITHOUT PROJECT TRAFFIC VOLUMES

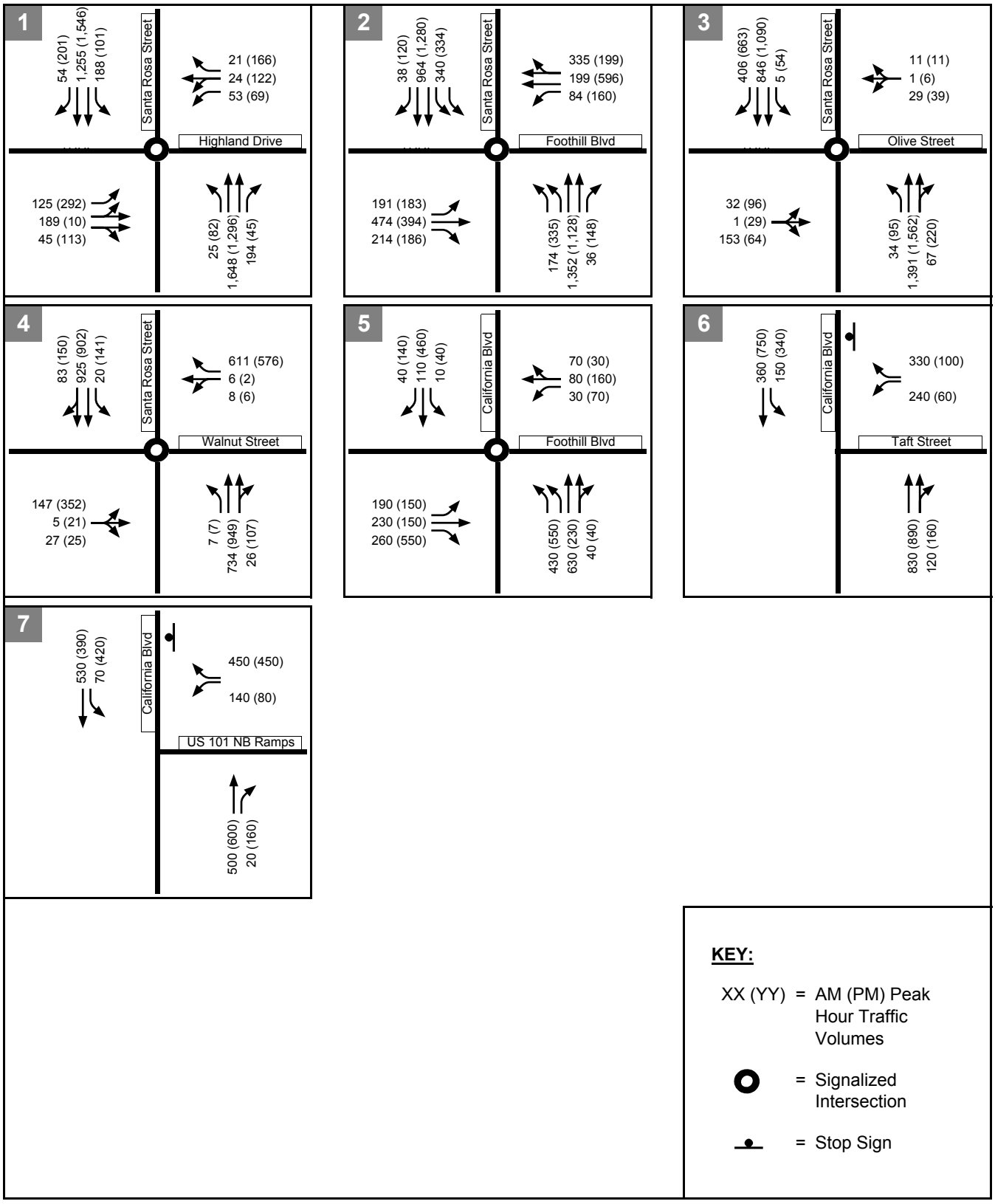
Cumulative Conditions were estimated by using volumes from two sources: the City of San Luis Obispo Citywide Travel Model and the *State Route 1 Major Investment Study (MIS)*. The City's travel model was run for the Base year (2008) and the future year (2035) conditions. The MIS forecasts volumes along the Santa Rosa Street corridor (including turning movement volumes for Intersections 1-4 in this document) were developed for Year 2035 conditions using a travel demand model developed for the study (which itself was based on the Citywide Travel Model).

Cumulative without Project volumes for Intersections 1-4 were taken directly from the MIS to be consistent with previously published information regarding this corridor. For Intersections 5-7, the existing count data for the intersections were adjusted higher using the difference method – adding the growth in traffic volumes in the Citywide Travel Model to the existing count volumes. Volumes from the MIS are presented in **Appendix B**.

Figure 11 presents the AM and PM peak-hour turning movement volumes at the study intersections under this scenario.

CUMULATIVE WITH PROJECT VOLUMES

Net new trips from the proposed project were added to the cumulative traffic projections to develop traffic volumes for Cumulative with Project Conditions. The resulting volumes are shown on **Figure 12**.



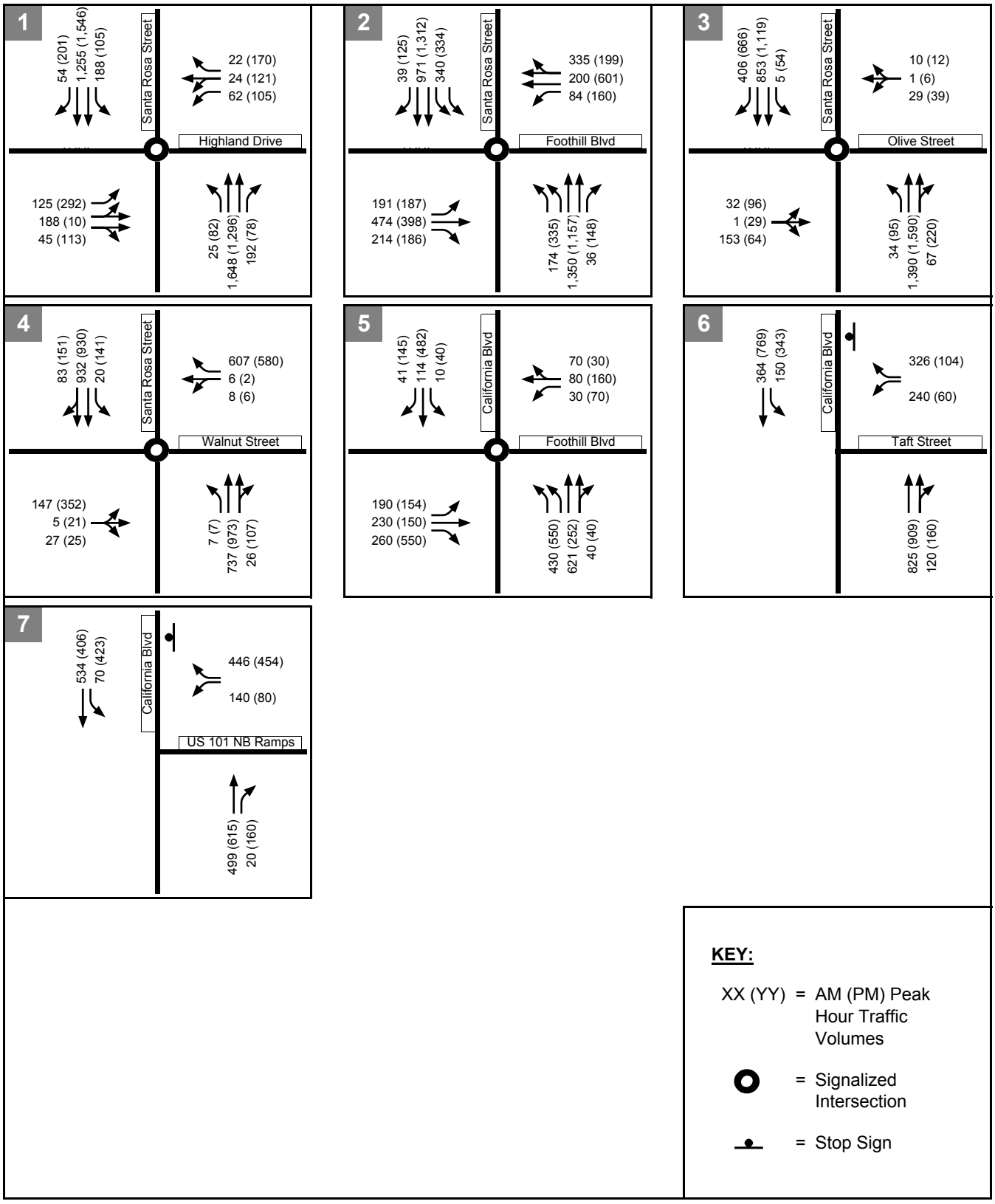
Cal Poly Student Housing South

CUMULATIVE WITHOUT PROJECT PEAK HOUR TRAFFIC VOLUMES, TRAFFIC CONTROL AND LANE CONFIGURATIONS

FIGURE 11

FEHR PEERS

October 2013
SJ13-1439



Cal Poly Student Housing South

CUMULATIVE WITH PROJECT PEAK HOUR TRAFFIC VOLUMES, TRAFFIC CONTROL AND LANE CONFIGURATIONS

FIGURE 12

FEHR PEERS

October 2013
SJ13-1439

CUMULATIVE INTERSECTION LEVELS OF SERVICE

Level of service calculations were conducted to evaluate intersection operations under Cumulative without project and Cumulative with Conditions. The results of the LOS analysis are summarized in **Table 14**.

The results for Cumulative without Project Conditions are included for comparison purposes, along with the net trips added, the results of a signal warrant analysis (presented in the next section), and the determination of impact significance under various impact significance thresholds as outlined in Chapter 1. The corresponding LOS calculation sheets are included in **Appendix C**.

The results of the LOS calculations indicate that the majority of the study intersections will operate at acceptable levels of service according to their designed LOS standard. The following five (5) intersections do not meet their respective LOS designation for AM and/or PM under Cumulative without Project Conditions.

- Intersection #1 – Highland Drive/Santa Rosa Street (AM and PM peak hours)
- Intersection #2 – Foothill Boulevard/Santa Rosa Street (AM and PM peak hours)
- Intersection #4 – Walnut Street/Santa Rosa Street (AM and PM peak hours)
- Intersection #6 – Taft Street/California Boulevard (AM and PM peak hours)
- Intersection #7 – US 101 NB Ramps/California Boulevard (AM and PM peak hours)



TABLE 14
CUMULATIVE CONDITIONS INTERSECTION LEVELS OF SERVICE

	Intersection	Peak Hour[1]	Cumulative Conditions		Cumulative with Project Conditions		Net Trips Added	Signal Warrant Met?[4]		Impact?[5]		
			Delay[2]	LOS[3]	Delay[2]	LOS[3]		Without Project	With Project	TSM	SLO	CT
1	Highland Drive/Santa Rosa Street	AM	**39.9**	**D**	**40.2**	**D**	7	N/A	N/A	No	No	**Yes**
		PM	**37.1**	**D**	**37.9**	**D**	76			No	No	**Yes**
2	Foothill Boulevard/ Santa Rosa Street	AM	**90.8**	**F**	**90.5**	**F**	7	N/A	N/A	No	**Yes**	**Yes**
		PM	**88.6**	**F**	**96.4**	**F**	79			**Yes**	**Yes**	**Yes**
3	Olive Street/Santa Rosa Street	AM	11.8	B	11.8	B	5	N/A	N/A	No	No	No
		PM	20.0	B	20.1	C	61			No	No	No
4	Walnut Street/Santa Rosa Street	AM	**56.1**	**E**	**54.8**	**D**	5	N/A	N/A	No	**Yes**	**Yes**
		PM	**35.1**	**D**	**35.4**	**D**	57			No	No	**Yes**
5	Foothill Boulevard/ California Boulevard	AM	35.4	C	35.4	D	-4	N/A	N/A	No	No	N/A
		PM	44.2	D	44.7	D	53			No	No	
6	Taft Street/California Boulevard	AM	**>180**	**F**	**>180**	**F**	-5	**Yes**	**Yes**	No	No	N/A
		PM	**>180**	**F**	**>180**	**F**	45	**Yes**	**Yes**	No	No	
7	US 101 Northbound Ramps/California Boulevard	AM	**100.3**	**F**	**98.6**	**F**	-2	**Yes**	**Yes**	No	No	No
		PM	**>180**	**F**	**>180**	**F**	38	**Yes**	**Yes**	No	No	**Yes**

Notes:
1. AM = morning peak hour, PM = afternoon peak hour.
2. Signalized intersections: whole-intersection average vehicle control delay. Unsignalized intersections: worst side street approach average control delay
3. LOS = Level of Service.
4. California MUTCD Section 4C.04: Signal Warrant #3 – Peak Hour Warrant
5. TSM = CSU TSM guidelines, SLO = City of San Luis Obispo guidelines, CT = Caltrans guidelines

Bold indicates deficient intersection operations. **Bold and highlighted** indicates a significant impact.
Source: Fehr & Peers, November 2013.

SIGNAL WARRANT ANALYSIS

The peak-hour signal warrant (Warrant 3) from the *Manual on Uniform Traffic Control Devices* (MUTCD) was evaluated for the unsignalized intersections that operate unacceptably under Cumulative without Project and Cumulative with Project Conditions to determine if a traffic signal is warranted. The following unsignalized intersections operate unacceptably and meet peak hour signal warrants under both the Cumulative without Project and Cumulative with Project scenarios (see **Appendix D)**:

- Intersection #6 – Taft Street/California Boulevard (AM and PM peak hours)
- Intersection #7 – US 101 Northbound Ramps/California Boulevard (AM and PM peak hours)

This analysis is intended to examine the general correlation between the planned level of future development and the need to install new traffic signals. It estimates future development-generated traffic compared against a sub-set of the standard traffic signal warrants recommended in the Federal Highway Administration *Manual on Uniform Traffic Control Devices* and associated California MUTCD guidelines. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated by an experienced engineer based on field-measured rather than forecast traffic data and a thorough study of traffic and roadway conditions. Furthermore, the decision to install a signal should not be based solely upon the warrants, since the installation of signals can lead to certain types of collisions. The appropriate agency should undertake regular monitoring of actual traffic conditions and accident data, and timely re-evaluation of the full set of warrants to prioritize and program intersections for signalization.

INTERSECTION IMPACTS

Based on the impact criteria listed in Chapter 1, the proposed project will have a significant impact at four (4) study intersections within the City of San Luis Obispo during the following peak hours:

- Intersection #1 – Highland Drive/Santa Rosa Street (AM and PM peak hours)
- Intersection #2 – Foothill Boulevard/Santa Rosa Street (AM and PM peak hours)
- Intersection #4 – Walnut Street/Santa Rosa Street (AM and PM peak hours)
- Intersection #7 – US 101 NB Ramps/California Boulevard (PM peak hour)



CITY OF SAN LUIS OBISPO/CALTRANS SHARED INTERSECTIONS

Highland Drive/Santa Rosa Street (Intersection #1) –The addition of project traffic under Cumulative with Project Conditions exacerbates unacceptable intersection operations during the AM and PM peak hour per the Caltrans LOS criteria. Under the Caltrans impact significance criteria, the net addition of project trips results in the project causing a **potentially significant impact** at this intersection.

Foothill Boulevard/Santa Rosa Street (Intersection #2) –The addition of project traffic under Cumulative with Project Conditions exacerbates unacceptable intersection operations during the AM and PM peak hour per the CSU TSM, City of San Luis Obispo and Caltrans LOS criteria. Under the City of San Luis Obispo and Caltrans impact significance criteria, the net addition of project trips results in the project causing a **potentially significant impact** at this intersection. Likewise, the project adds more than 10 trips through the intersection and causes an increase in delay greater than 5.0 seconds during the PM peak hour. Therefore, the project contributes a **potentially significant impact** under the CSU TSM criteria as well.

Walnut Street/Santa Rosa Street (Intersection #4) –The addition of project traffic under Cumulative with Project Conditions exacerbates unacceptable intersection operations during the AM and PM peak hour per the Caltrans LOS criteria. Under the Caltrans impact significance criteria, the net addition of project trips results in the project causing a **potentially significant impact** at this intersection. For the AM peak hour, the project also meets the significance criteria for the City of San Luis Obispo as it adds trips through an intersection at LOS E, resulting in a **potentially significant impact** under the San Luis Obispo guidelines under this scenario as well.

US 101 Northbound Ramps/California Boulevard (Intersection #7) – The addition of project traffic under Cumulative with Project Conditions exacerbates unacceptable intersection operations during the PM peak hour. Under the City of San Luis Obispo criteria, the impact is less than significant as the intersection meets signal warrants under both the Existing and Existing with Project scenarios. Under the Caltrans impact significance criteria, the net addition of project trips results in the project causing a **potentially significant impact** at this intersection.

Measures to mitigate these impacts are discussed in **Chapter 6**.

PEDESTRIAN, BICYCLE, AND TRANSIT IMPACTS

The project impact to pedestrian, bicycle, and transit facilities are discussed in the **Chapter 3** (Existing with Project conditions). Like Existing with Project conditions, the impacts to pedestrian, bicycle and transit modes are expected to be **less-than-significant** or **less-than-significant with mitigation** under Cumulative with Project conditions.

5. SITE ACCESS AND ON-SITE CIRCULATION

This chapter analyzes site access and internal circulation for vehicles, pedestrians, bicycles, and transit vehicles. Recommendations presented address on-site vehicle circulation issues to improve wayfinding and reduce driver confusion. Active and transit mode recommendations include provision of pedestrian and bicycle facilities and direct connections, and efficient linkages with existing and potential future transit stops external to the site. Ultimately, the final site plan should be reviewed to identify and mitigate potential impacts before the project is built.

VEHICLE SITE ACCESS AND CIRCULATION

The project as currently proposed will provide a 300 space parking garage on site. Access to the project site for service vehicles will be provided via driveways on Pacheco Way, Grand Avenue and the access road in front of the Performing Arts Center. For the parking to be provided on site, the recommendations below can serve as general guidelines to enhance safety, access and circulation.

- For dead-end aisles, extend the drive aisle 8 feet beyond the last parking space to allow cars to maneuver in and out of the last parking space of each aisle.
- Designate accessible parking spaces near elevators.
- Recommend drive aisle widths be consistent with typical design practice to accommodate necessary vehicle and truck maneuvers.
- Minimize the number of pedestrian-vehicle conflict points by positioning project driveways where other driveways exist (at the Performing Arts Center Loop entrance/exit, for example).
- Enhance the pedestrian crossings at the intersection of Grand Avenue/Parking Structure Access Road with high visibility crosswalks, corner bulbouts and signage to accommodate the increased pedestrian demand.

Currently, it is difficult to ascertain the ingress and egress points for the new parking garage structure on site. Access for the garage could either be taken using the driveway on the Parking Structure Access Road or along Pacheco Way. The Pacheco Way alternative would be preferable as it would minimize the number of new conflict points between vehicles, bicycles and pedestrians. Pacheco Way should be designed to accommodate two travel lanes (one in each direction, approximately 11-12 feet in width); this should be performed regardless as part of providing a service entrance along Pacheco Way.



PEDESTRIAN, BICYCLE, AND TRANSIT ACCESS AND CIRCULATION

This section of the report addresses both off-site and on-site facilities that provide pedestrian and bicycle access and circulation for the project.

ON-SITE PEDESTRIAN AND BICYCLE FACILITY EVALUATION

The project is comprised of eight buildings spread throughout the site along with various amenities. These elements are connected via a series of wide pathways on site. Main pathways along highly traveled routes may be separated into bicycle-only and pedestrian-only facilities. Examples of this on the Cal Poly campus include Via Carta near Campus Market, or the Feed Mill Road pedestrian pathway that connects Poly Canyon Village to the campus core. Bicycle storage appears to be provided at all buildings on site and should be monitored to determine if bicycle storage demand exceeds capacity at a given location.

Pedestrian access to off-site areas would primarily be handled by connections to Grand Avenue at Slack Street and at the Parking Garage Access Roadway, as well as a connection across Pacheco Way to the Parking Structure undercrossing. We recommend sidewalks be provided around the frontage of the project (including providing sidewalks along Pacheco Way and along the north side of Slack Street from Slack Street to Parking Lot G-2) to facilitate direct pedestrian access from the surrounding area to the project site.

Additional midblock crosswalks are provided along Grand Avenue – one unsignalized crosswalk approximately 160 feet south of the intersection of Grand Avenue and the Parking Garage Access roadway and one signalized crossing approximately halfway between Slack Street and the Parking Garage Access roadway. Because the primary purpose of the unsignalized crosswalk is to provide accessible pedestrian access to parking spaces in the G-1 parking lot (which will be moved to the parking structure), we recommend consolidating this crosswalk with the signalized crosswalk, or moving the unsignalized crosswalk to a point roughly halfway between the signalized crosswalk and the Parking Garage Access Roadway. Since the Pacheco Way pedestrian crossing will see high pedestrian volumes, we recommend that the crossing be enhanced with pedestrian bulbouts or a raised crossing, other other features to improve visibility of the crossing and promote comfortable walking and bicycling access to other areas of the campus.

With bicycle parking available throughout the site, bicycles exiting the site will attempt to access Pacheco Way or Grand Avenue at the first point of access. Based on the site layout, many bicyclists will likely use the service access roadways along Grand Avenue to take access to the Grand Avenue bike lanes. Bicyclists crossing Grand Avenue to access the inbound (into campus) bike lane should be directed to use marked crosswalks to cross Grand Avenue.



TRANSIT ACCESS

The project is located adjacent to existing transit lines and bus stops operating along Grand Avenue. Although any increase in passenger demand may not exceed capacity, enhancements to existing service are recommended to encourage transit use. The University can improve transit access by considering installing transit stops near the project frontage, or by upgrading existing stops to include larger bus shelters, improved lighting and improved wayfinding information.

6. INTERSECTION AND PARKING MITIGATION MEASURES

This chapter provides measures to mitigate potentially significant intersection and parking impacts as described in **Chapters 3 and 4**. Since the current projected impacts are related to addition of net new project trips through study intersections, the proposed measures focus on reducing the number of project trips through impacted study intersections.[1] An additional impact relates to a lack of residential parking supply.

The proposed mitigation measures consist of the provision of general and residential parking on site to reduce the number of trips redistributed to Santa Rosa Street and California Boulevard, and a Transportation Demand Management (TDM) program (with monitoring) to reduce the number of trips so that impacts along Santa Rosa Street and California Boulevard are less-than-significant. The feasibility of these measures is also discussed. Other mitigation measures such as reducing the project site, construction of intersection improvements and payment of traffic impact fees are discussed later in this chapter.

ON-SITE PARKING REPLACEMENT

Currently, the proposed project will replace 300 parking spaces of the parking lost in the G-1 and R-2/G-4 lots after the project is constructed. As such, trips will redistribute to parking areas with spare supply and will utilize the most direct (in terms of time and distance) routes to reach their destination. Parking facilities with available capacity are located on the north side of campus, and therefore most redistributed trips would use Santa Rosa Street or California Boulevard, and bypassing the campus core. As a mitigation measure, parking replacement on the project site would encourage trips to campus to be made using existing travel patterns, thus reducing the redistribution to California Boulevard and Santa Rosa Street.

After discussions with University staff, it was determined that a 500 space parking area may be possible. At this time, the ultimate feasibility of the 500 space parking area is to be determined. The 500 space parking area alone is not enough to mitigate project impacts to a less than significant level (as shown in the following analysis). If a 500 space parking area is not feasible, further enhancements to the TDM and monitoring program described in the next section will be required to successfully mitigate project impacts to less-than-significant levels.

[1] If significance criteria at Caltrans intersections are different and permitted higher levels of congestion (for example, LOS D is acceptable versus LOS C as assumed in this analysis), some impacts would be reduced or eliminated altogether.



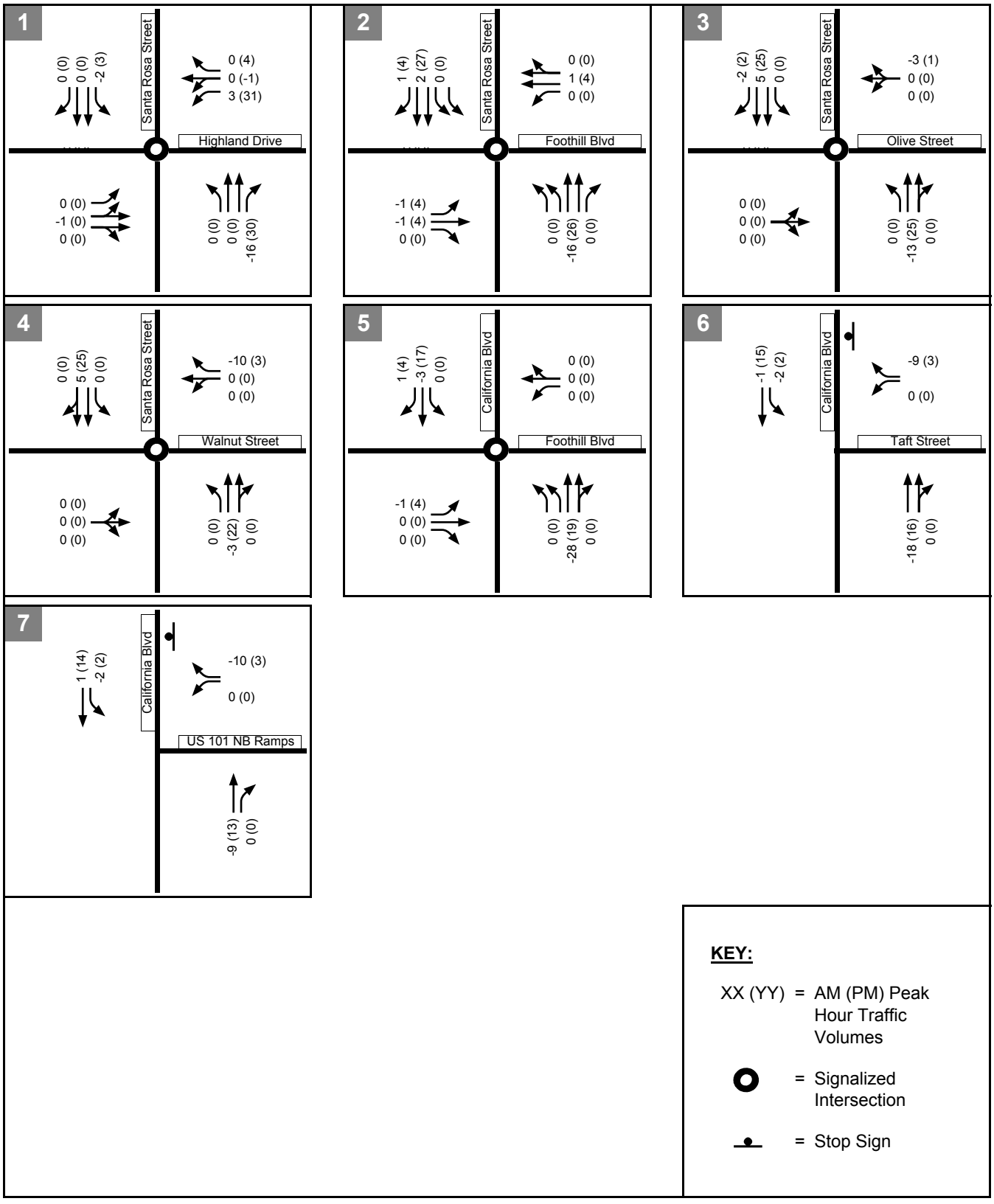
The analysis in **Table 10** (**Chapter 3**) shows that 129 morning and 22 afternoon general parking vehicles would be shifted out of the G-1 and R-2/G-4 lots. Likewise, the residential portion of the parking supply and demand analysis in **Chapter 3** shows that the current residential parking supply would be 42 spaces short in the morning and 24 spaces short in the afternoon. Therefore, of the 500 parking spaces, 440 should be apportioned to general parking, and 60 should be apportioned to residents. The provision of these spaces would reduce the net trips show in **Table 10** to the levels in **Table 15**. Accordingly, the trip assignment would be revised to the levels shown in **Figure 13.**

TABLE 15
PROJECT TRIP GENERATION AFTER ON-SITE PARKING SUPPLY REPLACEMENT

Component	Peak Hour	Parking Lot Redistribution			Peak Hour Trips					
		Total Vehicles Shifted[1]	% of Shifted Vehicles Traveling in Peak Hour		AM Peak Hour			PM Peak Hour		
			Inbound	Outbound	In	Out	Total	In	Out	Total
General Parking Redistribution	AM	0	30%[2]	10%[4]	0	0	0	0	0	0
	PM	0	11%[4]	20%[2]						
Residential Parking Redistribution	AM	766	2%[3]	3%[3]	19	26	45	81	96	177
	PM	786	10%[3]	12%[3]						
Freshman Trip Reduction	N/A	N/A	N/A	N/A	-72	-24	-96	-17	-32	-49
				Total Combined Trips	***-53***	***2***	***-51***	***64***	***64***	***128***

Notes:
1. General vehicles shifted do not become negative because the provision of excess supply does not attract more users over current use
2. Factors From Table 4
3. Factors assumed
4. Factors derived from In/Out trip splits in Table 4

Source: Fehr & Peers, November 2013.



Cal Poly Student Housing South

PROJECT TRIP ASSIGNMENT
AFTER PARKING REPLACEMENT

FIGURE 13

FEHR PEERS

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The provision of 60 residential parking spaces mitigates the parking supply impact to a less-than-significant with mitigation. However, it has not yet been determined if the 500 space parking garage would be a financially feasible element of the project. As a result, intersection impacts are still considered **significant and unavoidable**. Incorporating a 500 space garage as part of the project lessens the severity of the intersection impacts, but because the project would continue to produce a net addition of trips to impacted study intersections, it does not fully mitigate the intersection impacts to a less-than-significant levels. Therefore, an additional mitigation measure must be used in conjunction with the replacement of parking on-site to reduce the intersection impacts to a less-than-significant level.

TRANSPORTATION DEMAND MANAGEMENT AND MONITORING PROGRAM

In order to reduce the net added trips at the impacted study intersections (as shown on **Figure 12**) to zero, a Transportation Demand Management (TDM) program with monitoring would need to be implemented. The University already implements some TDM measures which should be enhanced and improved upon by expanding the current program and implementing additional TDM measures.

The TDM program must be monitored to ensure compliance with the no net trip threshold at the impacted study intersections. Since the project site plan has not been finalized and the level of parking replacement on site is still to be determined, the mitigation measure to develop a TDM and monitoring plan upon finalization of the project site plan and determination of the feasible number of parking spaces that can be provided on site cannot be undertaken at this time. As a result, the effects of the TDM measures cannot be fully quantified at this time. Therefore the intersection impacts remain **significant and unavoidable**.

Sample TDM Program with 440 Space Garage

A combination of on-site parking replacement and a monitored TDM program will produce intersection impacts that are less-than-significant with mitigation. A more aggressive TDM plan with monitoring may further reduce the number of parking spaces that need to be replaced on site. For example, the capping of freshman parking permits by 850 permits would reduce the required parking garage size to 440 spaces. Under this scenario, the trip generation calculation would include zero trips redistributed for general and residential trips while still retaining the freshman trip reduction. In this case, the trips generated by the project would be negative on Santa Rosa Street and California Boulevard, thus mitigating project impacts to those intersections. However, because this program of parking and freshman parking permit restrictions may be infeasible and a TDM plan with monitoring has not been developed, the impact to intersections is remains **significant and unavoidable**.



OTHER MITIGATION MEASURES CONSIDERED

Other mitigation measures considered included reducing the project size, physical improvements to roadways, and payment of in lieu traffic impact fees. These measures are sometimes considered as part of transportation studies for other development projects; however, these measures may not be feasible or appropriate due to the unique nature of this project (moving students on campus with no change in enrollment).

Reducing the project size by 156 beds would reduce the residential parking supply impact to less than significant levels by reducing the parking demand swell by 42 permits. This would equalize the total number of residential parking permits outstanding with the amount of residential parking provided on campus. However, the reduction in size of the project would also reduce the freshman trip credit associated with moving students onto campus. This would increase the number of vehicle trips travelling through impacted study intersection. As a result, reducing the project size would exacerbate intersection impacts rather than reduce them. Therefore, intersection impacts would remain **significant and unavoidable** with a reduced project size.

Widening of impacted intersections was also considered as part of a mitigation program. Widening of intersections would improve intersection operations and could reduce impacts to less than significant levels. However, widening of intersections, including widening Santa Rosa Street to three lanes in each direction, may have secondary impacts associated with the improvement, such as increasing pedestrian crossing distances. Widening improvements also may not be physically feasible in physically constrained areas. While the *State Route 1 Major Investment Study* discusses options related to improving operations along the Santa Rosa Street corridor, no plans or funding mechanisms (through which impact fees could be paid) have been adopted for an improvement program for the corridor. Such plans may be adopted in the near future as part of a General Plan update. Therefore this impact would remain **significant and unavoidable**.



APPENDIX A:
IN-OUT TRIP FACTOR CALCULATIONS



APPENDIX A
IN-OUT PERCENTAGES AND PEAK HOUR TRIP FACTORS FROM GRAND AVENUE COUNT

Intersection	Direction	Value
4:00AM-10:00AM Volume	Northbound/Inbound Southbound/Outbound	1,429 492
2:00PM-8:00PM Volume	Northbound/Inbound Southbound/Outbound	1,427 2,064
AM Peak Hour Volume - 7:30AM-8:30AM Volume[1]	Northbound/Inbound Southbound/Outbound	414 111
PM Peak Hour Volume - 3:30PM-4:30PM Volume[1]	Northbound/Inbound Southbound/Outbound	209 396
AM In/Out Split: Calculated (Assumed in Analysis)	Northbound/Inbound Southbound/Outbound	78.8% (75%) 21.2% (25%)
PM In/Out Split: Calculated (Assumed in Analysis)	Northbound/Inbound Southbound/Outbound	34.5% (35%) 65.5% (65%)
Percent of AM Peak Hour Parking Demand that Occurs in AM Peak Hour of Travel: Calculated (Assumed in Analysis)	N/A	29.0% (30%)
Percent of PM Peak Hour Parking Demand that Occurs in PM Peak Hour of Travel: Calculated (Assumed in Analysis)	N/A	19.2% (20%)

Notes:

1. While the peak hour along Grand Avenue may be different than these, the peak hours for roadways where impacts may be located occur during these time periods

Source: City of San Luis Obispo and Fehr & Peers, July 2013.

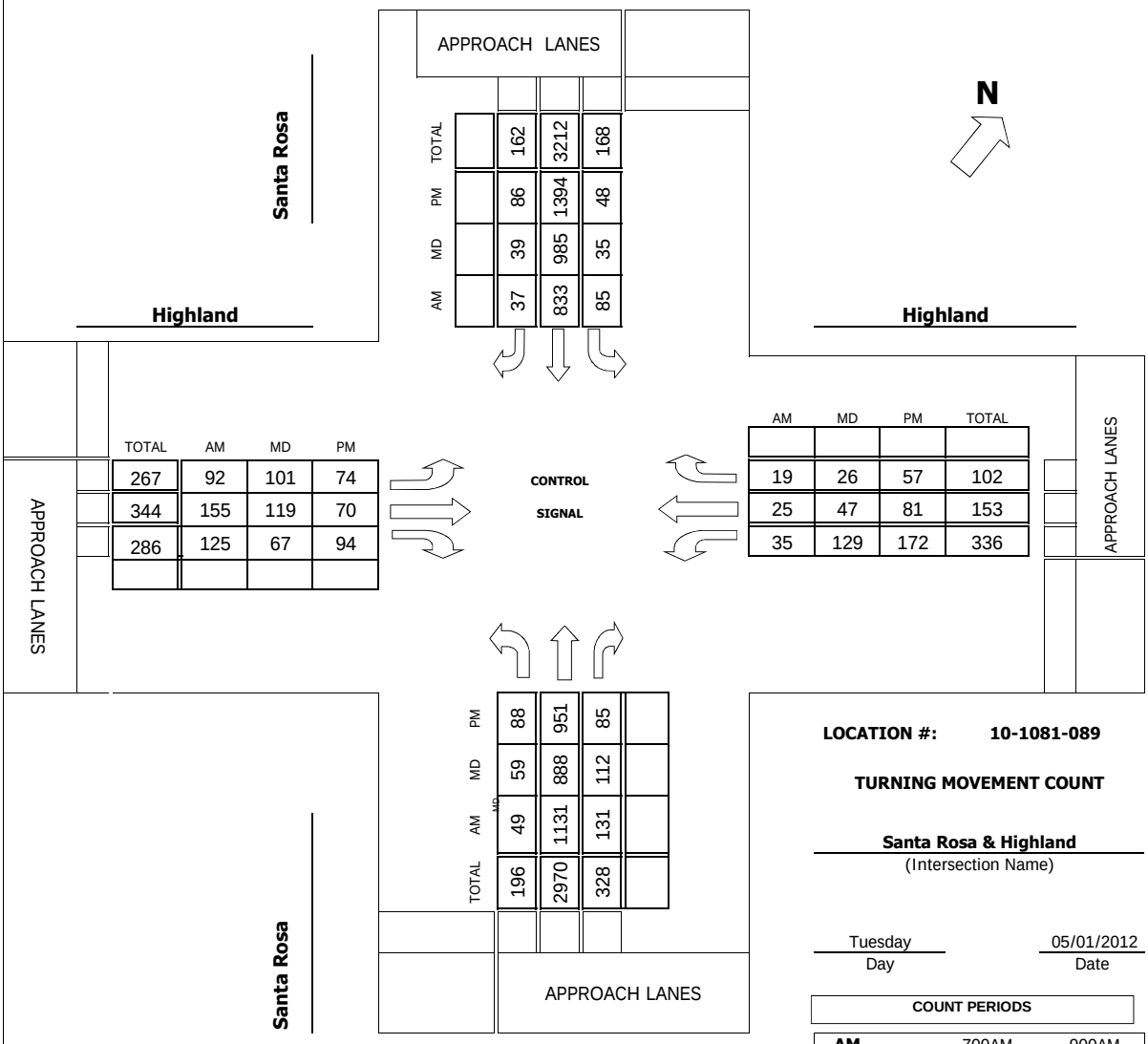
APPENDIX B:
INTERSECTION AND ROADWAY COUNTS

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 10-1081-089

TMC SUMMARY OF Santa Rosa & Highland



LOCATION #: 10-1081-089

TURNING MOVEMENT COUNT

Santa Rosa & Highland
(Intersection Name)

Tuesday (Day) 05/01/2012 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON	1100AM	-	100PM
PM	300PM	-	500PM

AM PEAK HOUR	730 AM
NOON PEAK HOUR	1115 AM
PM PEAK HOUR	330 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	Santa Rosa	DATE:	05/01/2012	LOCATION:	San Luis Obispo
E-W STREET:	Highland	DAY:	Tuesday	PROJECT#	10-1081-089

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1.5	1	0.5	1.5	0.5	1	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	20	294	28	14	188	16	22	31	24	9	9	9	664
7:15 AM	7	216	13	10	182	6	20	28	48	10	3	7	550
7:30 AM	9	354	25	24	245	9	23	32	37	10	4	2	774
7:45 AM	8	260	61	37	221	9	25	68	17	7	6	2	721
8:00 AM	20	293	26	13	181	14	22	28	24	8	10	9	648
8:15 AM	12	224	19	11	186	5	22	27	47	10	5	6	574
8:30 AM	8	291	36	17	184	3	33	37	20	7	4	6	646
8:45 AM	18	244	47	17	200	9	26	60	24	14	7	6	672
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	102	2176	255	143	1587	71	193	311	241	75	48	47	5249
Approach %	4.03	85.91	10.07	7.94	88.12	3.94	25.91	41.74	32.35	44.12	28.24	27.65	
App/Depart	2533	/	2416	1801	/	1903	745	/	709	170	/	221	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	49	1131	131	85	833	37	92	155	125	35	25	19	2717
Approach %	3.74	86.27	9.99	8.90	87.23	3.87	24.73	41.67	33.60	44.30	31.65	24.05	

PEAK HR. FACTOR:	0.845	0.859	0.845	0.731	0.878

CONTROL: Signal
COMMENT 1:
COMMENT 2:

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	Santa Rosa	DATE:	05/01/2012	LOCATION:	San Luis Obispo
E-W STREET:	Highland	DAY:	Tuesday	PROJECT#	10-1081-089

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1.5	1	0.5	1.5	0.5	1	
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	15	202	8	5	191	2	16	15	13	65	21	17	570
11:15 AM	7	207	25	7	285	7	18	12	7	30	12	8	625
11:30 AM	14	237	30	14	232	11	25	36	13	21	8	4	645
11:45 AM	21	228	38	10	251	13	31	57	25	22	11	8	715
12:00 PM	17	216	19	4	217	8	27	14	22	56	16	6	622
12:15 PM	8	187	17	2	245	6	9	9	16	26	17	8	550
12:30 PM	13	167	18	3	207	6	15	11	22	18	7	6	493
12:45 PM	16	202	17	5	220	7	14	19	13	21	5	3	542
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	111	1646	172	50	1848	60	155	173	131	259	97	60	4762
Approach %	5.75	85.33	8.92	2.55	94.38	3.06	33.77	37.69	28.54	62.26	23.32	14.42	
App/Depart	1929	/	1861	1958	/	2238	459	/	395	416	/	268	

NOON Peak Hr Begins at: 1115 AM

PEAK													
Volumes	59	888	112	35	985	39	101	119	67	129	47	26	2607
Approach %	5.57	83.85	10.58	3.31	93.01	3.68	35.19	41.46	23.34	63.86	23.27	12.87	
PEAK HR. FACTOR:		0.922			0.885			0.635			0.647		0.912

CONTROL: Signal
COMMENT 1: 0
COMMENT 2: 0

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	300	PM	500	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	Santa Rosa	DATE:	05/01/2012	LOCATION:	San Luis Obispo
E-W STREET:	Highland	DAY:	Tuesday	PROJECT#	10-1081-089

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1.5	1	0.5	1.5	0.5	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM	9	200	28	5	339	12	14	15	11	48	29	6	716
3:15 PM	29	163	10	3	306	13	14	10	14	24	11	9	606
3:30 PM	17	255	23	13	345	12	23	19	30	33	17	14	801
3:45 PM	30	230	33	9	334	18	21	27	29	35	15	10	791
4:00 PM	23	252	17	12	360	30	11	12	14	66	25	18	840
4:15 PM	18	214	12	14	355	26	19	12	21	38	24	15	768
4:30 PM	25	220	22	10	305	7	21	14	28	31	15	17	715
4:45 PM	22	201	15	3	261	7	16	9	23	41	13	12	623
5:00 PM													
5:15 PM													
5:30 PM													
5:45 PM													
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	173	1735	160	69	2605	125	139	118	170	316	149	101	5860
Approach %	8.37	83.90	7.74	2.47	93.07	4.47	32.55	27.63	39.81	55.83	26.33	17.84	
App/Depart	2068	/	1975	2799	/	3091	427	/	347	566	/	447	

PM Peak Hr Begins at: 330 PM

PEAK													
Volumes	88	951	85	48	1394	86	74	70	94	172	81	57	3200
Approach %	7.83	84.61	7.56	3.14	91.23	5.63	31.09	29.41	39.50	55.48	26.13	18.39	
PEAK HR. FACTOR:		0.953			0.950			0.773			0.711		0.952

CONTROL:	Signal
COMMENT 1:	0
COMMENT 2:	0

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Pedestrian & Bicycle Study

N-S STREET: Santa Rosa
E-W STREET: Highland

Date: 05/01/2012
Day: Tuesday

City: San Luis Obispo
Project #: 10-1081-089

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	3	0	0
7:15 AM	0	6	0	4
7:30 AM	0	11	0	2
7:45 AM	0	12	0	0
8:00 AM	0	4	0	0
8:15 AM	0	7	0	2
8:30 AM	0	13	0	1
8:45 AM	0	4	0	0
TOTAL	0	60	0	9

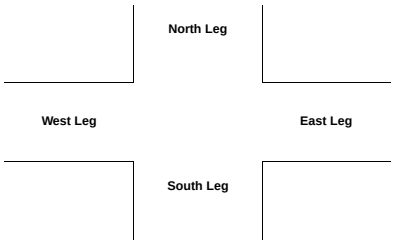
	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	0

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	0	9	0	0
11:15 AM	0	9	0	2
11:30 AM	0	5	0	0
11:45 AM	0	9	1	0
12:00 PM	0	4	0	0
12:15 PM	0	6	0	0
12:30 PM	0	4	0	2
12:45 PM	0	4	0	1
TOTAL	0	50	1	5

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	0	0	0	0
11:15 AM	0	0	0	0
11:30 AM	0	0	0	0
11:45 AM	0	0	0	0
12:00 PM	0	0	0	0
12:15 PM	0	0	0	0
12:30 PM	0	0	0	0
12:45 PM	0	0	1	0
TOTAL	0	0	1	0

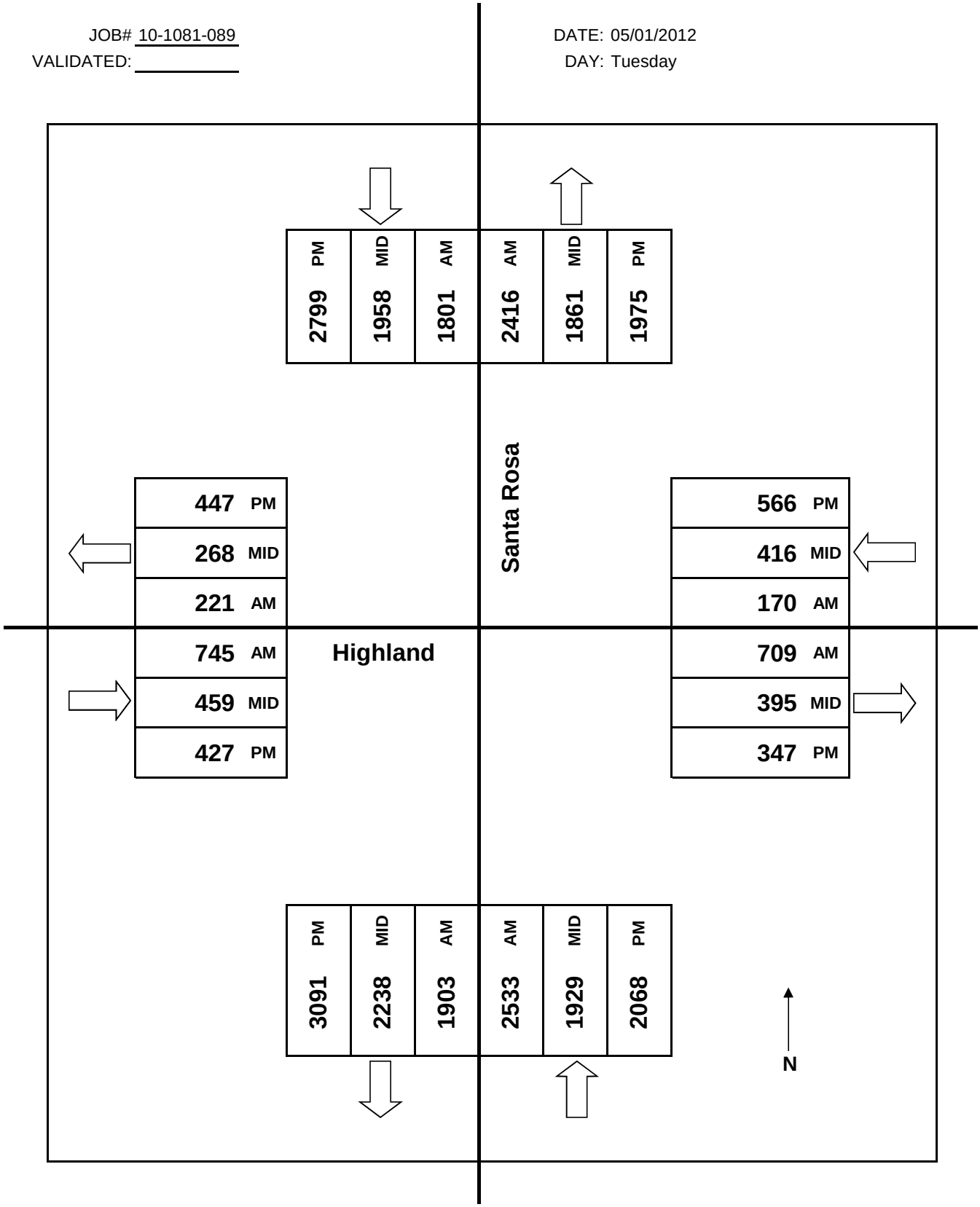
	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
3:00 PM	0	4	0	0
3:15 PM	0	4	0	2
3:30 PM	0	9	0	2
3:45 PM	0	11	0	2
4:00 PM	0	10	0	0
4:15 PM	0	8	0	0
4:30 PM	0	6	0	0
4:45 PM	0	7	0	0
TOTAL	0	59	0	6

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
3:00 PM	0	0	0	0
3:15 PM	0	1	0	1
3:30 PM	0	0	0	0
3:45 PM	0	2	0	1
4:00 PM	0	3	0	0
4:15 PM	0	1	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
TOTAL	0	7	0	2



JOB# 10-1081-089
VALIDATED: _____

DATE: 05/01/2012
DAY: Tuesday

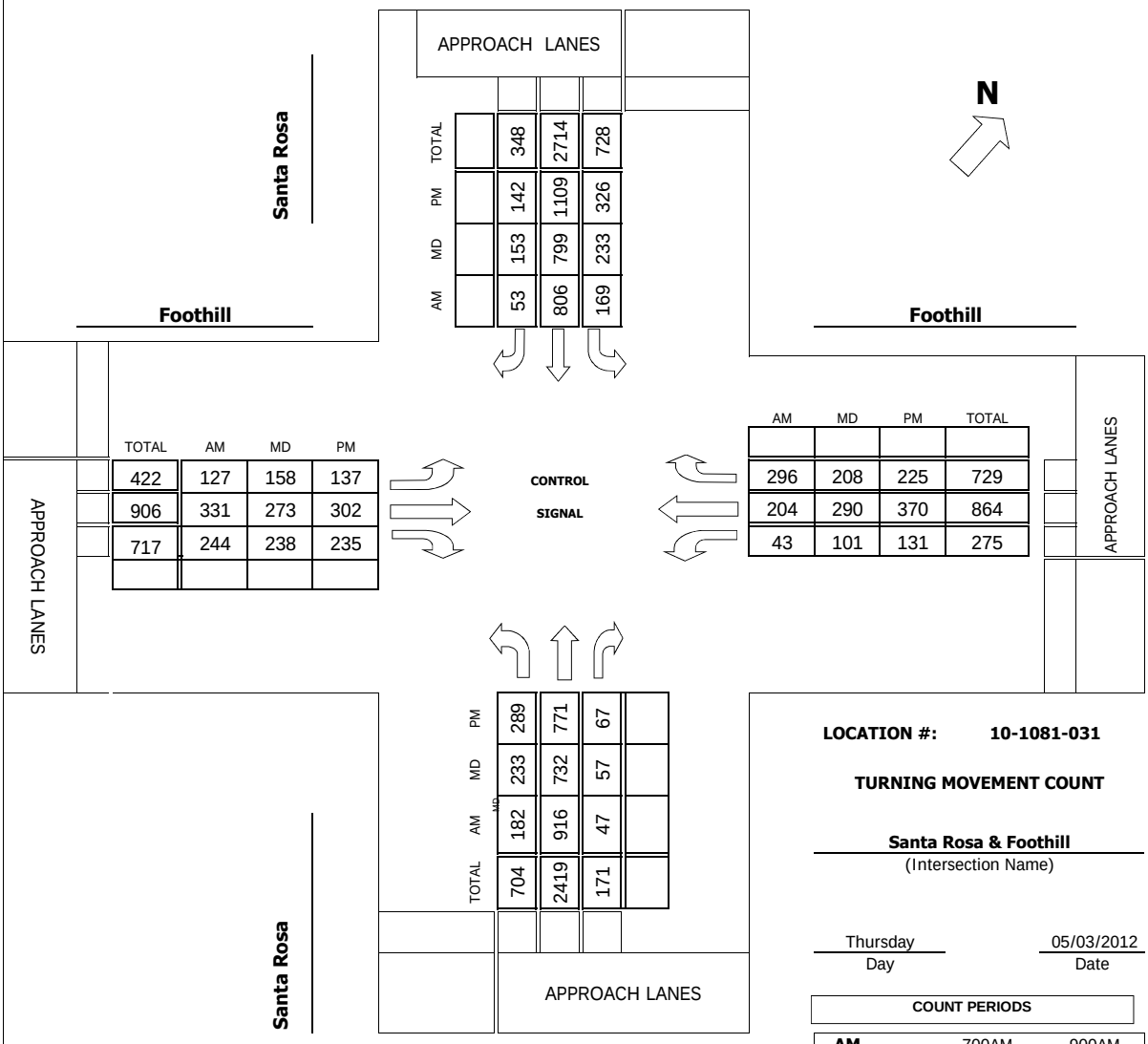


Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 10-1081-031

TMC SUMMARY OF Santa Rosa & Foothill



LOCATION #: 10-1081-031

TURNING MOVEMENT COUNT

Santa Rosa & Foothill
(Intersection Name)

Thursday (Day) 05/03/2012 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON	1100AM	-	100PM
PM	300PM	-	500PM

AM PEAK HOUR	730 AM
NOON PEAK HOUR	1115 AM
PM PEAK HOUR	345 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	Santa Rosa	DATE:	05/03/2012	LOCATION:	San Luis Obispo
E-W STREET:	Foothill	DAY:	Thursday	PROJECT#	10-1081-031

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	1	2	2	1	1	1	1	1	2	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	29	195	10	23	114	5	24	46	31	3	25	68	573
7:15 AM	16	185	13	36	134	5	23	63	41	10	31	78	635
7:30 AM	38	288	11	46	223	14	31	84	57	8	49	94	943
7:45 AM	46	248	15	42	235	15	35	93	60	12	45	64	910
8:00 AM	49	233	11	32	170	6	31	77	52	14	68	78	821
8:15 AM	49	147	10	49	178	18	30	77	75	9	42	60	744
8:30 AM	27	218	10	25	170	14	40	81	62	15	45	88	795
8:45 AM	46	188	13	47	183	10	41	88	45	13	42	71	787
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	300	1702	93	300	1407	87	255	609	423	84	347	601	6208
Approach %	14.32	81.24	4.44	16.72	78.43	4.85	19.81	47.32	32.87	8.14	33.62	58.24	
App/Depart	2095	/	2558	1794	/	1914	1287	/	1002	1032	/	734	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	182	916	47	169	806	53	127	331	244	43	204	296	3418
Approach %	15.90	80.00	4.10	16.44	78.40	5.16	18.09	47.15	34.76	7.92	37.57	54.51	
PEAK HR. FACTOR:		0.849			0.880			0.934			0.848		0.906

CONTROL:	Signal
COMMENT 1:	
COMMENT 2:	

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	Santa Rosa	DATE:	05/03/2012	LOCATION:	San Luis Obispo
E-W STREET:	Foothill	DAY:	Thursday	PROJECT#	10-1081-031

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	1	2	2	1	1	1	1	1	2	0	
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	44	158	18	50	201	43	33	53	36	37	67	46	786
11:15 AM	47	161	12	48	178	54	33	62	70	24	72	44	805
11:30 AM	64	210	18	53	216	35	42	68	51	29	53	63	902
11:45 AM	70	194	11	67	214	34	54	89	52	22	83	58	948
12:00 PM	52	167	16	65	191	30	29	54	65	26	82	43	820
12:15 PM	66	146	18	54	179	39	28	70	66	20	71	45	802
12:30 PM	42	169	19	52	198	39	29	70	64	23	54	44	803
12:45 PM	44	152	10	43	207	23	24	72	49	16	60	52	752
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	429	1357	122	432	1584	297	272	538	453	197	542	395	6618
Approach %	22.48	71.12	6.39	18.68	68.48	12.84	21.54	42.60	35.87	17.37	47.80	34.83	
App/Depart	1908	/	2024	2313	/	2234	1263	/	1092	1134	/	1268	

NOON Peak Hr Begins at: 1115 AM

PEAK													
Volumes	233	732	57	233	799	153	158	273	238	101	290	208	3475
Approach %	22.80	71.62	5.58	19.66	67.43	12.91	23.62	40.81	35.58	16.86	48.41	34.72	
PEAK HR. FACTOR:		0.875			0.940			0.858			0.919		0.916

CONTROL: Signal
COMMENT 1: 0
COMMENT 2: 0

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	300	PM	500	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	Santa Rosa	DATE:	05/03/2012	LOCATION:	San Luis Obispo
E-W STREET:	Foothill	DAY:	Thursday	PROJECT#	10-1081-031

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	1	2	2	1	1	1	1	1	2	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM	56	183	17	64	292	36	34	69	53	34	77	45	960
3:15 PM	73	141	12	73	229	33	21	79	68	21	98	54	902
3:30 PM	64	210	14	77	291	36	43	81	65	27	80	64	1052
3:45 PM	76	187	14	77	242	35	42	70	63	27	96	59	988
4:00 PM	62	220	23	81	298	36	31	73	66	40	86	67	1083
4:15 PM	81	168	14	76	261	31	27	80	57	25	86	45	951
4:30 PM	70	196	16	92	308	40	37	79	49	39	102	54	1082
4:45 PM	68	169	26	80	245	37	28	66	59	37	111	48	974
5:00 PM													
5:15 PM													
5:30 PM													
5:45 PM													
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	550	1474	136	620	2166	284	263	597	480	250	736	436	7992
Approach %	25.46	68.24	6.30	20.20	70.55	9.25	19.63	44.55	35.82	17.58	51.76	30.66	
App/Depart	2160	/	2173	3070	/	2896	1340	/	1353	1422	/	1570	

PM Peak Hr Begins at: 345 PM

PEAK													
Volumes	289	771	67	326	1109	142	137	302	235	131	370	225	4104
Approach %	25.64	68.41	5.94	20.67	70.32	9.00	20.33	44.81	34.87	18.04	50.96	30.99	

PEAK HR. FACTOR:	0.924	0.896	0.963	0.931	0.947

CONTROL:	Signal
COMMENT 1:	0
COMMENT 2:	0

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Pedestrian & Bicycle Study

N-S STREET: Santa Rosa
E-W STREET: Foothill

Date: 05/03/2012
Day: Thursday

City: San Luis Obispo
Project #: 10-1081-031

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	3	1	4	0
7:15 AM	6	1	5	2
7:30 AM	9	2	6	2
7:45 AM	5	0	7	1
8:00 AM	4	0	6	0
8:15 AM	11	0	3	11
8:30 AM	3	0	3	4
8:45 AM	5	1	1	4
TOTAL	**46**	**5**	**35**	**24**

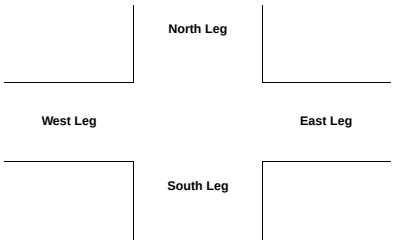
	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	1	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	**0**	**0**	**1**	**0**

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	9	0	1	2
11:15 AM	6	13	7	4
11:30 AM	7	10	2	3
11:45 AM	5	3	5	0
12:00 PM	4	8	2	8
12:15 PM	6	8	4	10
12:30 PM	2	6	3	4
12:45 PM	2	0	3	4
TOTAL	**41**	**48**	**27**	**35**

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	1	0	0	0
11:15 AM	0	0	0	0
11:30 AM	0	2	0	0
11:45 AM	0	1	0	0
12:00 PM	0	0	0	0
12:15 PM	1	1	0	0
12:30 PM	1	0	0	0
12:45 PM	1	1	0	0
TOTAL	**4**	**5**	**0**	**0**

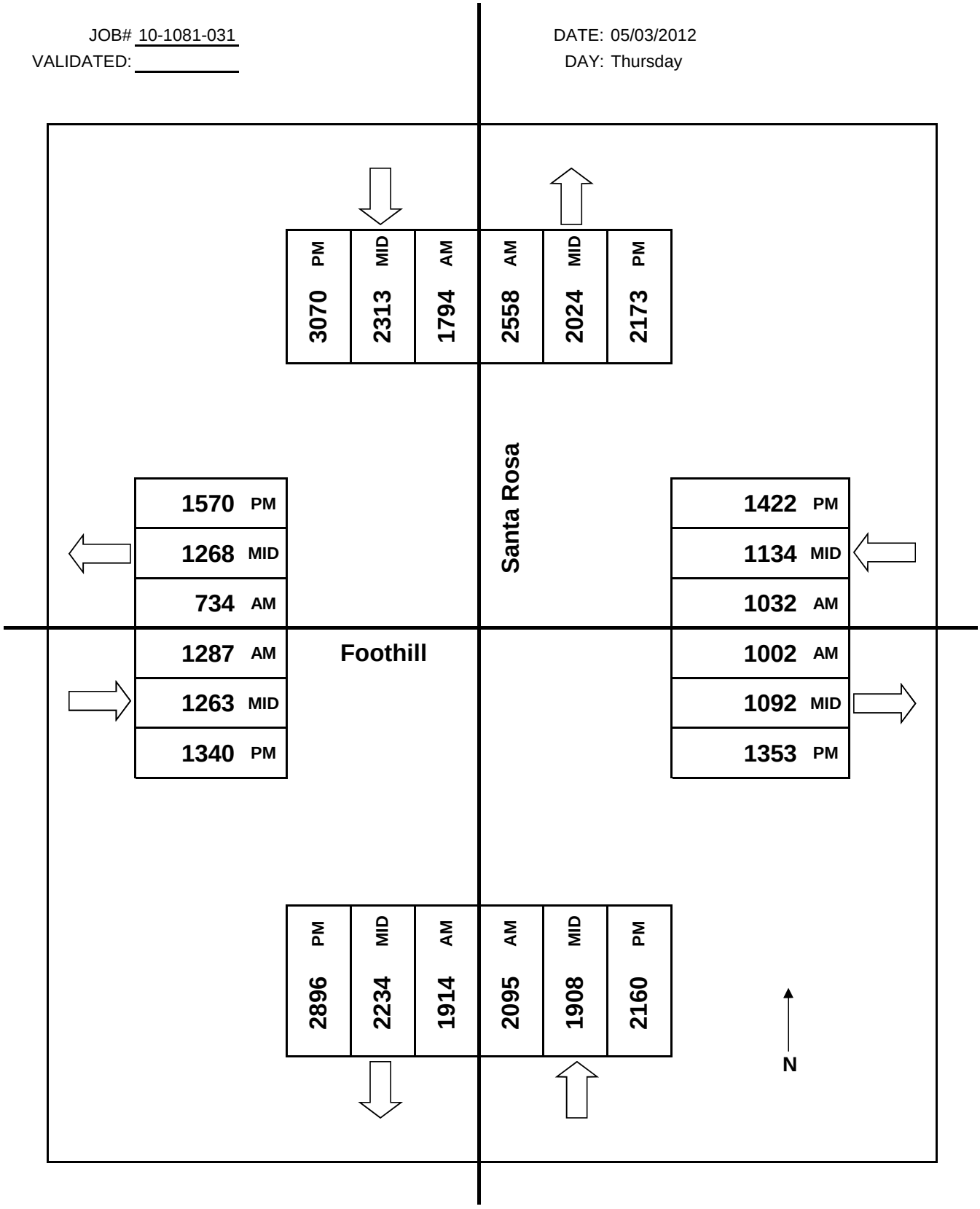
	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
3:00 PM	11	4	1	2
3:15 PM	8	1	1	3
3:30 PM	5	4	1	3
3:45 PM	4	7	1	2
4:00 PM	9	1	9	1
4:15 PM	11	0	4	16
4:30 PM	6	0	1	1
4:45 PM	12	2	15	2
TOTAL	**66**	**19**	**33**	**30**

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
3:00 PM	2	0	0	0
3:15 PM	0	0	0	1
3:30 PM	0	0	0	0
3:45 PM	1	0	0	0
4:00 PM	1	0	0	0
4:15 PM	2	1	0	0
4:30 PM	0	0	0	0
4:45 PM	0	1	0	0
TOTAL	**6**	**2**	**0**	**1**



JOB# 10-1081-031
VALIDATED: _____

DATE: 05/03/2012
DAY: Thursday

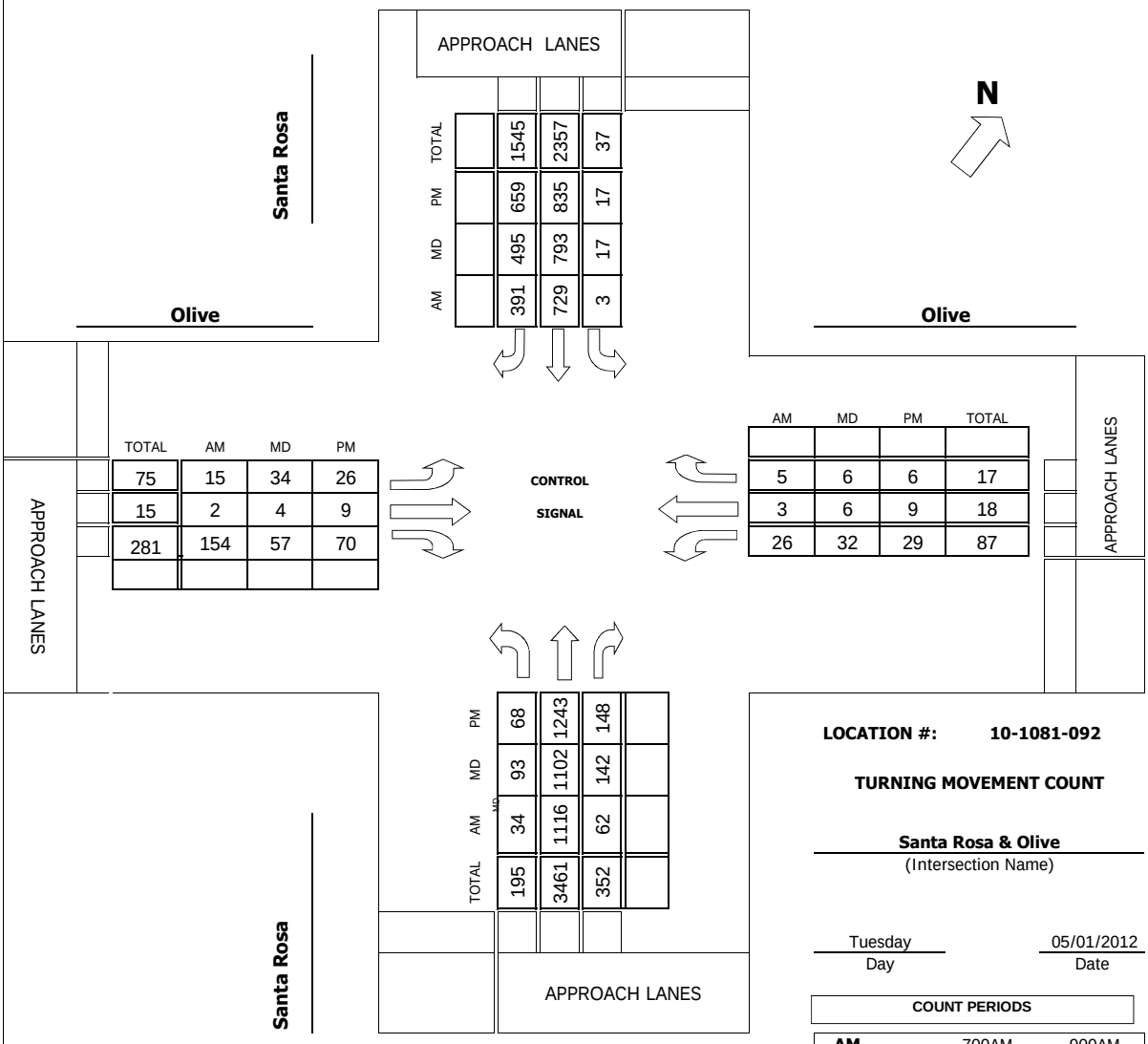


Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 10-1081-092

TMC SUMMARY OF Santa Rosa & Olive



LOCATION #: 10-1081-092

TURNING MOVEMENT COUNT

Santa Rosa & Olive
(Intersection Name)

Tuesday
Day

05/01/2012
Date

COUNT PERIODS			
AM	700AM	-	900AM
NOON	1100AM	-	100PM
PM	300PM	-	500PM

AM PEAK HOUR	730 AM
NOON PEAK HOUR	1130 AM
PM PEAK HOUR	330 PM

Intersection Turning Movement
Prepared by:



N-S STREET:	Santa Rosa	DATE:	05/01/2012	LOCATION:	San Luis Obispo
E-W STREET:	Olive	DAY:	Tuesday	PROJECT#	10-1081-092

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	0	1	0	0	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	9	210	10	0	69	67	4	1	16	2	0	1	389
7:15 AM	5	226	17	0	132	81	2	0	27	3	1	0	494
7:30 AM	10	311	14	1	187	92	4	1	35	6	1	0	662
7:45 AM	10	345	22	1	212	132	1	0	49	12	1	2	787
8:00 AM	8	250	12	1	138	77	5	1	27	5	1	3	528
8:15 AM	6	210	14	0	192	90	5	0	43	3	0	0	563
8:30 AM	7	251	16	1	156	91	5	1	34	6	0	4	572
8:45 AM	8	282	19	1	156	104	2	0	29	1	0	0	602
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	63	2085	124	5	1242	734	28	4	260	38	4	10	4597
Approach %	2.77	91.77	5.46	0.25	62.70	37.05	9.59	1.37	89.04	73.08	7.69	19.23	
App/Depart	2272	/	2123	1981	/	1540	292	/	133	52	/	801	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	34	1116	62	3	729	391	15	2	154	26	3	5	2540
Approach %	2.81	92.08	5.12	0.27	64.92	34.82	8.77	1.17	90.06	76.47	8.82	14.71	

PEAK HR. FACTOR:	0.804	0.814	0.855	0.567	0.807

CONTROL:	Signal
COMMENT 1:	
COMMENT 2:	

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	Santa Rosa	DATE:	05/01/2012	LOCATION:	San Luis Obispo
E-W STREET:	Olive	DAY:	Tuesday	PROJECT#	10-1081-092

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	0	1	0	0	1	0	
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	21	238	22	3	160	127	1	1	11	4	2	5	595
11:15 AM	12	236	26	2	187	104	10	0	12	7	4	0	600
11:30 AM	18	277	29	6	187	131	8	2	10	3	3	0	674
11:45 AM	24	308	34	5	189	117	8	0	16	8	1	3	713
12:00 PM	32	264	42	4	205	119	7	2	14	7	1	3	700
12:15 PM	19	253	37	2	212	128	11	0	17	14	1	0	694
12:30 PM	16	244	41	3	178	125	4	1	22	6	3	4	647
12:45 PM	21	264	27	2	201	107	14	0	22	14	0	2	674
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	163	2084	258	27	1519	958	63	6	124	63	15	17	5297
Approach %	6.51	83.19	10.30	1.08	60.66	38.26	32.64	3.11	64.25	66.32	15.79	17.89	
App/Depart	2505	/	2164	2504	/	1706	193	/	291	95	/	1136	

NOON Peak Hr Begins at: 1130 AM

PEAK													
Volumes	93	1102	142	17	793	495	34	4	57	32	6	6	2781
Approach %	6.96	82.42	10.62	1.30	60.77	37.93	35.79	4.21	60.00	72.73	13.64	13.64	
PEAK HR. FACTOR:		0.913			0.954			0.848			0.733		0.975

CONTROL: Signal
COMMENT 1: 0
COMMENT 2: 0

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	300	PM	500	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	Santa Rosa	DATE:	05/01/2012	LOCATION:	San Luis Obispo
E-W STREET:	Olive	DAY:	Tuesday	PROJECT#	10-1081-092

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	0	1	0	0	1	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM	19	284	34	8	222	149	6	2	15	9	1	1	750
3:15 PM	21	270	33	5	208	172	3	4	21	11	1	1	750
3:30 PM	15	329	40	3	209	168	6	3	17	7	3	0	800
3:45 PM	14	313	39	7	203	168	7	3	19	8	4	2	787
4:00 PM	25	302	37	3	197	167	5	1	15	8	1	4	765
4:15 PM	14	299	32	4	226	156	8	2	19	6	1	0	767
4:30 PM	12	283	38	5	209	166	9	2	10	10	1	2	747
4:45 PM	18	313	50	4	242	161	5	2	14	4	1	2	816
5:00 PM													
5:15 PM													
5:30 PM													
5:45 PM													
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	138	2393	303	39	1716	1307	49	19	130	63	13	12	6182
Approach %	4.87	84.44	10.69	1.27	56.04	42.68	24.75	9.60	65.66	71.59	14.77	13.64	
App/Depart	2834	/	2454	3062	/	1909	198	/	361	88	/	1458	

PM Peak Hr Begins at: 330 PM

PEAK													
Volumes	68	1243	148	17	835	659	26	9	70	29	9	6	3119
Approach %	4.66	85.20	10.14	1.13	55.26	43.61	24.76	8.57	66.67	65.91	20.45	13.64	
PEAK HR. FACTOR:		0.950			0.979			0.905			0.786		0.975

CONTROL:	Signal
COMMENT 1:	0
COMMENT 2:	0

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Pedestrian & Bicycle Study

N-S STREET: Santa Rosa
E-W STREET: Olive

Date: 05/01/2012
Day: Tuesday

City: San Luis Obispo
Project #: 10-1081-092

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	1	1	3	1
7:15 AM	3	0	3	5
7:30 AM	0	0	4	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	3	1
8:30 AM	1	0	0	3
8:45 AM	2	1	0	2
TOTAL	7	2	13	12

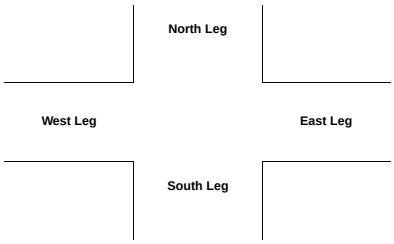
	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	1
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	0	0	0	1

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	1	0	2	2
11:15 AM	0	2	1	3
11:30 AM	0	0	1	2
11:45 AM	0	0	1	1
12:00 PM	3	0	3	0
12:15 PM	0	0	4	2
12:30 PM	3	0	2	1
12:45 PM	1	0	1	4
TOTAL	8	2	15	15

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	0	0	1	0
11:15 AM	0	0	1	0
11:30 AM	0	0	0	0
11:45 AM	0	0	0	0
12:00 PM	0	0	0	0
12:15 PM	0	0	0	0
12:30 PM	0	0	0	0
12:45 PM	0	0	0	0
TOTAL	0	0	2	0

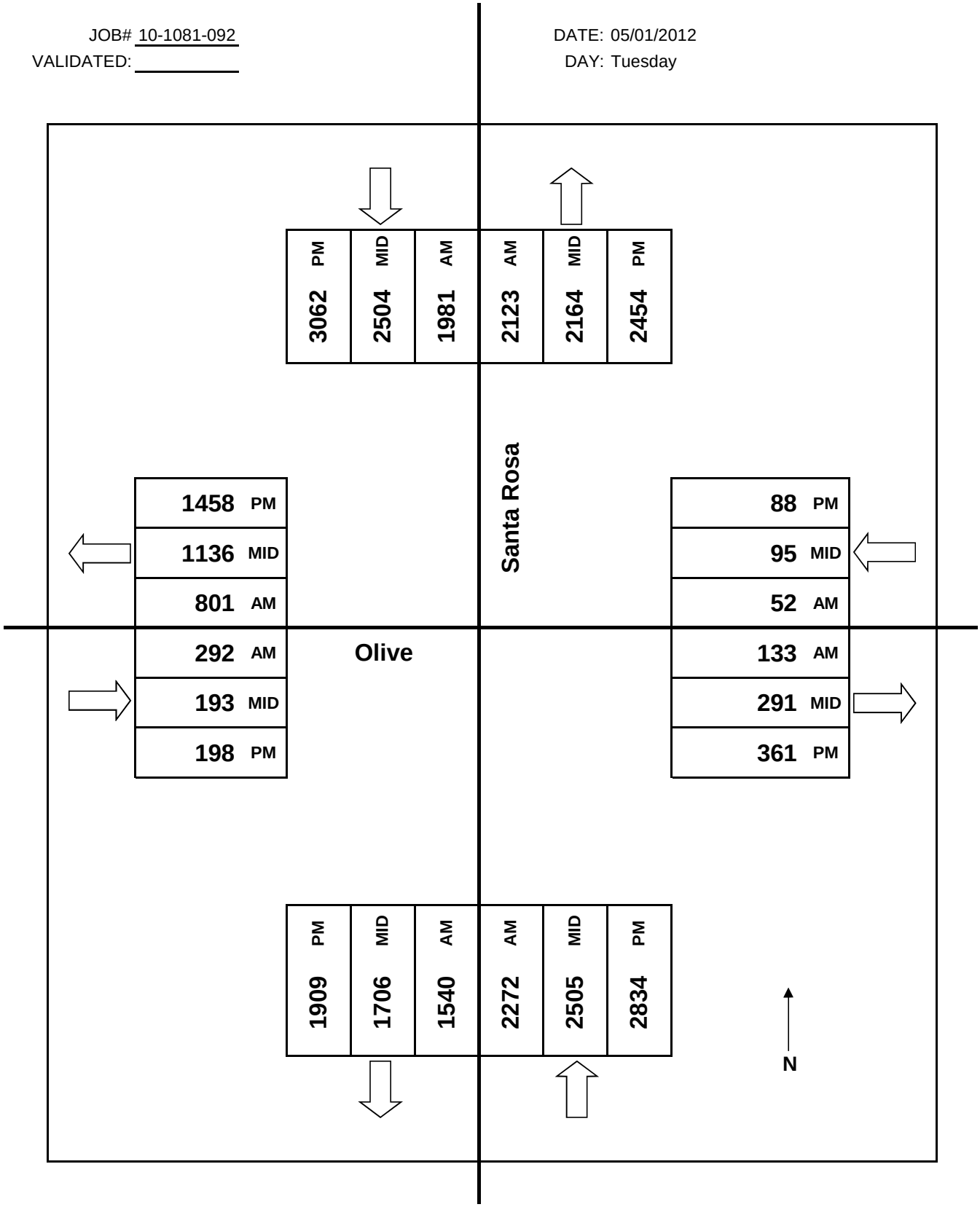
	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
3:00 PM	0	0	3	5
3:15 PM	0	0	8	3
3:30 PM	0	0	3	0
3:45 PM	2	0	2	1
4:00 PM	3	1	4	2
4:15 PM	3	0	5	0
4:30 PM	4	1	2	1
4:45 PM	1	1	4	1
TOTAL	13	3	31	13

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
3:00 PM	0	0	2	0
3:15 PM	0	0	0	0
3:30 PM	0	0	1	0
3:45 PM	0	0	1	0
4:00 PM	0	0	0	0
4:15 PM	0	1	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
TOTAL	0	1	4	0



JOB# 10-1081-092
VALIDATED: _____

DATE: 05/01/2012
DAY: Tuesday

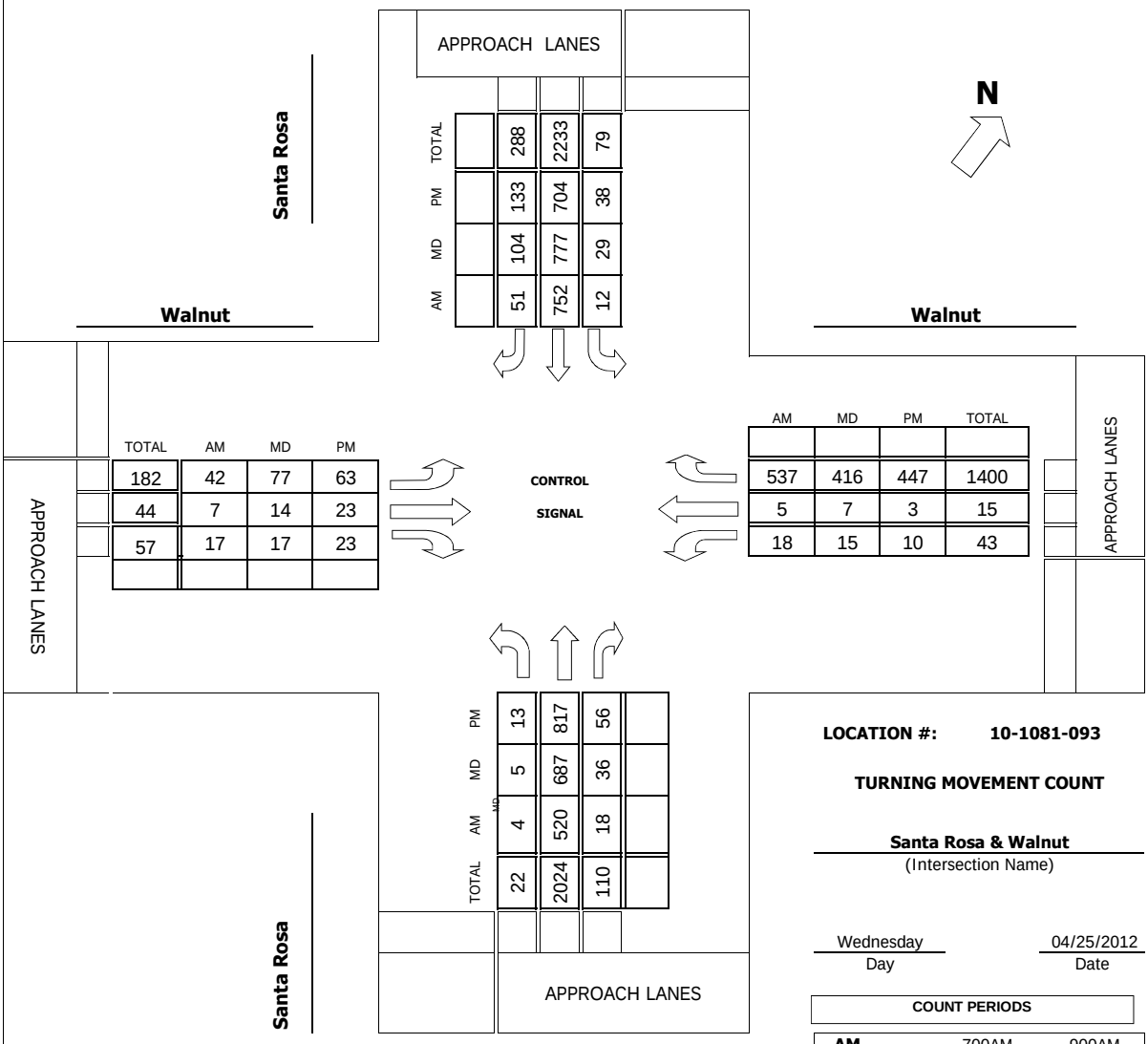


Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 10-1081-093

TMC SUMMARY OF Santa Rosa & Walnut



LOCATION #: 10-1081-093

TURNING MOVEMENT COUNT

Santa Rosa & Walnut
(Intersection Name)

Wednesday (Day) 04/25/2012 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON	1100AM	-	100PM
PM	330PM	-	530PM

AM PEAK HOUR	730 AM
NOON PEAK HOUR	1130 AM
PM PEAK HOUR	415 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	Santa Rosa	DATE:	04/25/2012	LOCATION:	San Luis Obispo
E-W STREET:	Walnut	DAY:	Wednesday	PROJECT#	10-1081-093

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	0	1	0	0.5	0.5	1	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	51	1	1	90	14	14	2	2	1	0	99	275
7:15 AM	1	75	3	4	146	12	9	0	5	0	0	117	372
7:30 AM	0	136	4	4	202	12	10	2	3	5	1	155	534
7:45 AM	1	174	3	5	206	8	14	3	7	1	0	144	566
8:00 AM	1	109	5	1	166	12	9	1	1	7	3	127	442
8:15 AM	2	101	6	2	178	19	9	1	6	5	1	111	441
8:30 AM	1	99	4	6	180	10	14	4	4	3	1	110	436
8:45 AM	1	127	3	7	158	19	13	2	6	6	2	111	455
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	7	872	29	30	1326	106	92	15	34	28	8	974	3521
Approach %	0.77	96.04	3.19	2.05	90.70	7.25	65.25	10.64	24.11	2.77	0.79	96.44	
App/Depart	908	/	1938	1462	/	1388	141	/	74	1010	/	121	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	4	520	18	12	752	51	42	7	17	18	5	537	1983
Approach %	0.74	95.94	3.32	1.47	92.27	6.26	63.64	10.61	25.76	3.21	0.89	95.89	
PEAK HR. FACTOR:		0.761			0.930			0.688			0.870		0.876

CONTROL:	Signal
COMMENT 1:	
COMMENT 2:	

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	Santa Rosa	DATE:	04/25/2012	LOCATION:	San Luis Obispo
E-W STREET:	Walnut	DAY:	Wednesday	PROJECT#	10-1081-093

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	0	1	0	0.5	0.5	1	
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	3	127	12	3	163	22	13	1	5	2	1	97	449
11:15 AM	3	147	7	9	176	24	14	3	11	5	3	95	497
11:30 AM	2	169	5	7	175	25	23	6	6	5	3	108	534
11:45 AM	0	203	13	6	214	17	19	2	2	4	1	117	598
12:00 PM	1	144	8	9	168	29	19	1	6	1	2	101	489
12:15 PM	2	171	10	7	220	33	16	5	3	5	1	90	563
12:30 PM	2	143	6	6	158	19	15	1	2	6	0	114	472
12:45 PM	0	167	6	10	176	20	17	2	5	6	1	93	503
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	13	1271	67	57	1450	189	136	21	40	34	12	815	4105
Approach %	0.96	94.08	4.96	3.36	85.50	11.14	69.04	10.66	20.30	3.95	1.39	94.66	
App/Depart	1351	/	2222	1696	/	1524	197	/	145	861	/	214	

NOON Peak Hr Begins at: 1130 AM

PEAK													
Volumes	5	687	36	29	777	104	77	14	17	15	7	416	2184
Approach %	0.69	94.37	4.95	3.19	85.38	11.43	71.30	12.96	15.74	3.42	1.60	94.98	
PEAK HR. FACTOR:		0.843			0.875			0.771			0.898		0.913

CONTROL: Signal
COMMENT 1: 0
COMMENT 2: 0

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	330	PM	530	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	Santa Rosa	DATE:	04/25/2012	LOCATION:	San Luis Obispo
E-W STREET:	Walnut	DAY:	Wednesday	PROJECT#	10-1081-093

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	0	1	0	0.5	0.5	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM	3	188	15	5	179	32	15	0	6	6	1	104	554
3:45 PM	2	191	14	7	165	32	14	2	5	1	0	73	506
4:00 PM	1	199	13	7	181	38	13	0	3	7	2	102	566
4:15 PM	3	210	12	11	158	33	7	2	3	1	0	110	550
4:30 PM	3	199	14	5	176	34	16	6	8	6	0	97	564
4:45 PM	6	188	13	13	194	32	14	6	5	1	0	99	571
5:00 PM	1	220	17	9	176	34	26	9	7	2	3	141	645
5:15 PM	2	200	7	5	156	27	15	4	5	7	1	95	524
5:30 PM													
5:45 PM													
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	21	1595	105	62	1385	262	120	29	42	31	7	821	4480
Approach %	1.22	92.68	6.10	3.63	81.04	15.33	62.83	15.18	21.99	3.61	0.81	95.58	
App/Depart	1721	/	2536	1709	/	1458	191	/	196	859	/	290	

PM Peak Hr Begins at: 415 PM

PEAK													
Volumes	13	817	56	38	704	133	63	23	23	10	3	447	2330
Approach %	1.47	92.21	6.32	4.34	80.46	15.20	57.80	21.10	21.10	2.17	0.65	97.17	
PEAK HR. FACTOR:		0.931			0.915			0.649			0.788		0.903

CONTROL:	Signal
COMMENT 1:	0
COMMENT 2:	0

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Pedestrian & Bicycle Study

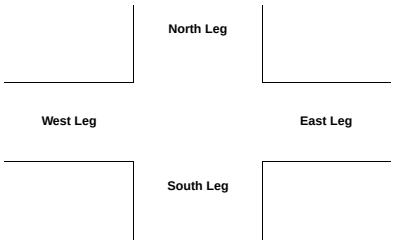
N-S STREET: Santa Rosa
E-W STREET: Walnut

Date: 04/25/2012
Day: Wednesday

City: San Luis Obispo
Project #: 10-1081-093

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	1	0
7:15 AM	0	0	3	3
7:30 AM	0	1	3	2
7:45 AM	0	0	0	0
8:00 AM	1	1	0	2
8:15 AM	1	1	4	2
8:30 AM	0	0	1	1
8:45 AM	0	1	3	1
TOTAL	**2**	**4**	**15**	**11**

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	1	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	0
7:45 AM	0	0	0	0
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	0
TOTAL	**0**	**0**	**1**	**0**



	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	0	0	1	4
11:15 AM	0	0	0	1
11:30 AM	2	1	1	1
11:45 AM	2	0	2	1
12:00 PM	1	4	2	2
12:15 PM	3	1	1	1
12:30 PM	1	0	1	2
12:45 PM	0	0	0	3
TOTAL	**9**	**6**	**8**	**15**

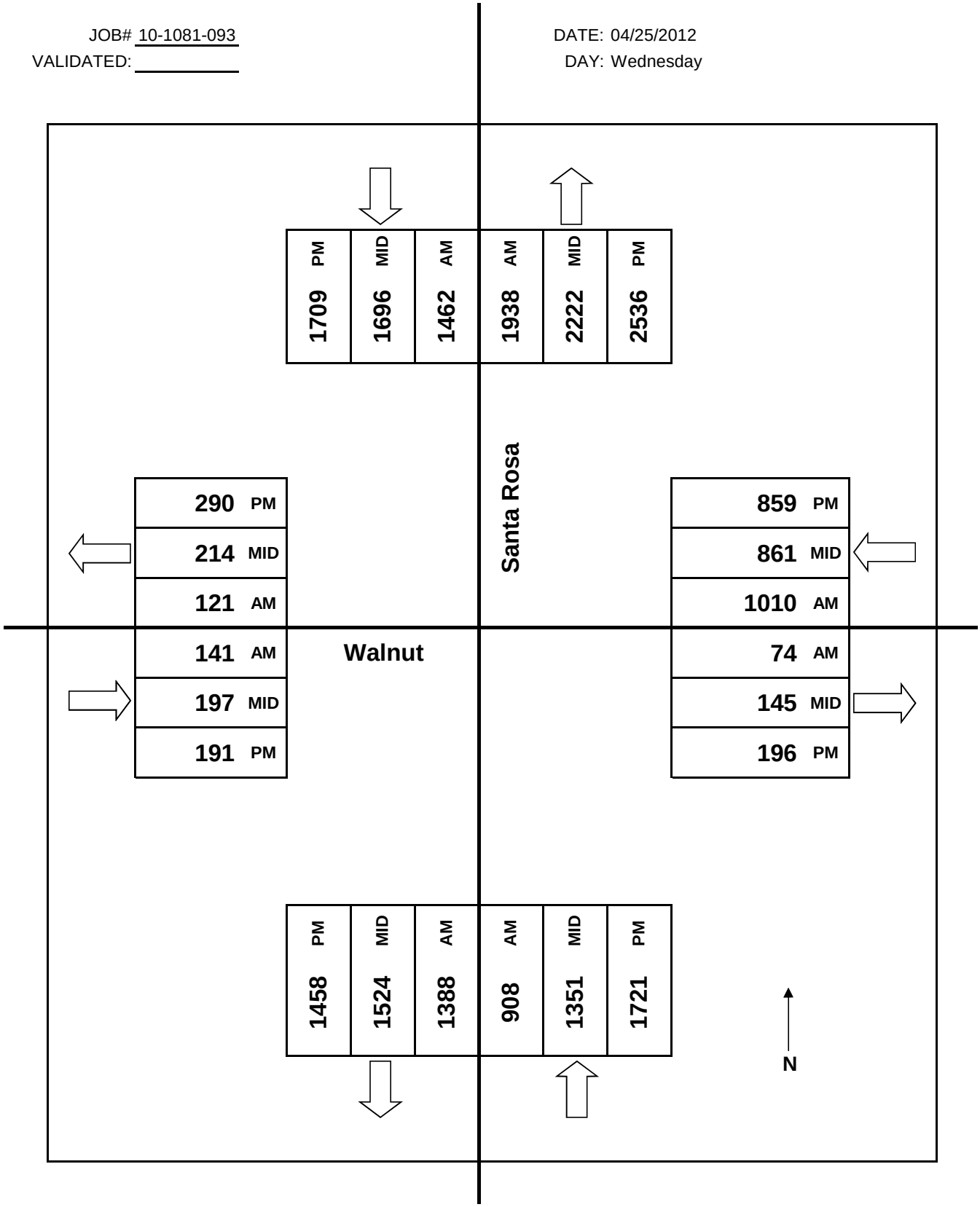
	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	0	0	0	0
11:15 AM	0	0	0	0
11:30 AM	0	0	0	0
11:45 AM	0	0	0	0
12:00 PM	0	0	0	0
12:15 PM	0	0	0	0
12:30 PM	0	0	0	0
12:45 PM	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
3:30 PM	0	0	2	2
3:45 PM	0	0	21	0
4:00 PM	0	0	0	3
4:15 PM	0	1	5	2
4:30 PM	1	0	1	1
4:45 PM	0	0	20	2
5:00 PM	0	0	4	5
5:15 PM	0	0	1	0
TOTAL	**1**	**1**	**54**	**15**

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
3:30 PM	0	0	0	0
3:45 PM	0	0	0	0
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**

JOB# 10-1081-093
VALIDATED: _____

DATE: 04/25/2012
DAY: Wednesday

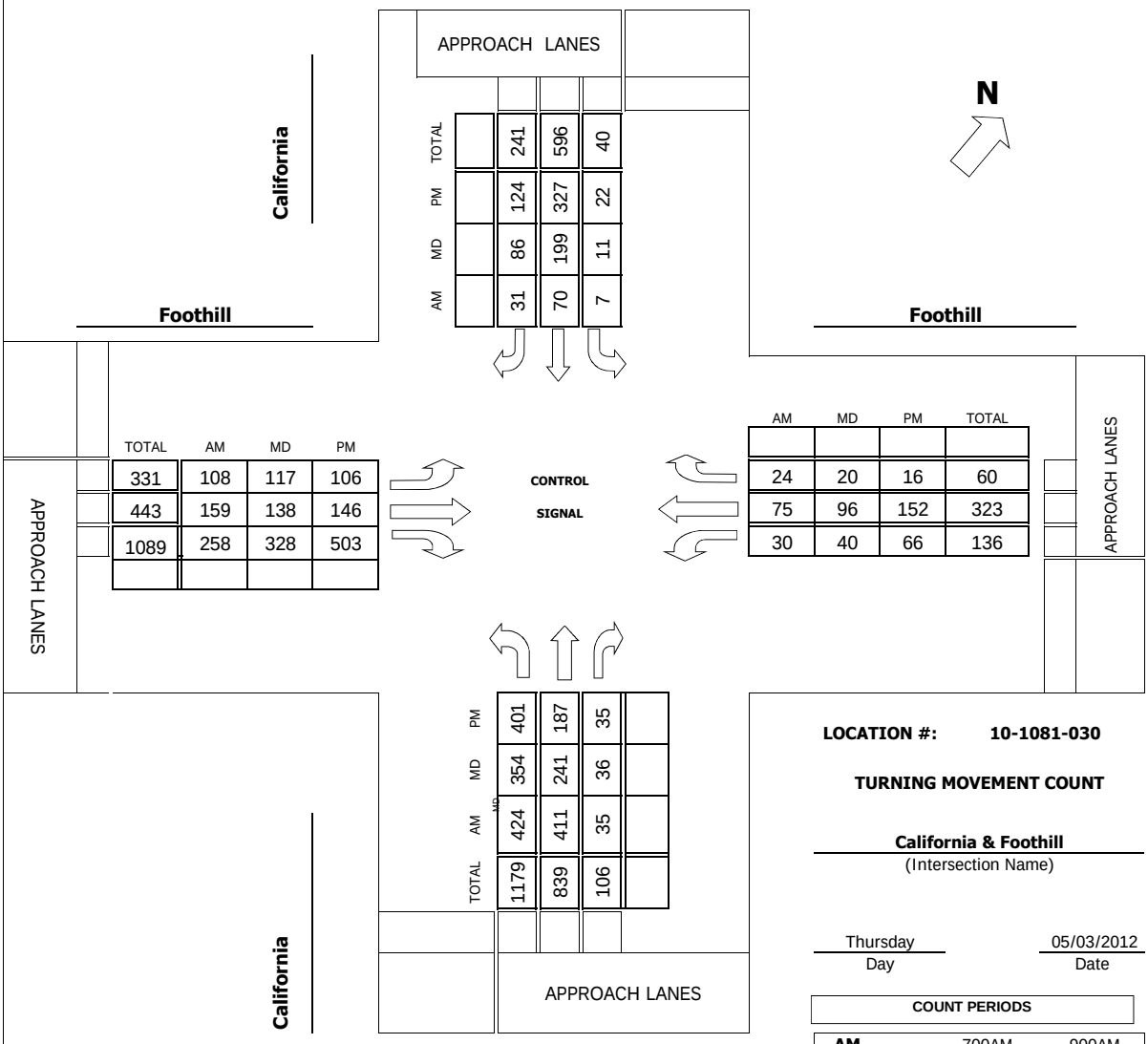


Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 10-1081-030

TMC SUMMARY OF California & Foothill



	TOTAL	AM	MD	PM
TOTAL	1089	258	328	503
	443	159	138	146
	331	108	117	106

	AM	MD	PM	TOTAL
	30	40	66	136
	75	96	152	323
	24	20	16	60

	TOTAL	AM	MD	PM
	40	7	11	22
	596	70	199	327
	241	31	86	124

	TOTAL	AM	MD	PM
	106	35	35	187
	839	411	241	241
	1179	424	354	401

LOCATION #: 10-1081-030

TURNING MOVEMENT COUNT

California & Foothill
(Intersection Name)

Thursday (Day) 05/03/2012 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON	1100AM	-	100PM
PM	300PM	-	500PM

AM PEAK HOUR	745 AM
NOON PEAK HOUR	1130 AM
PM PEAK HOUR	345 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	California	DATE:	05/03/2012	LOCATION:	San Luis Obispo
E-W STREET:	Foothill	DAY:	Thursday	PROJECT#	10-1081-030

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1.5	0.5	0.5	1.5	1	1.5	0.5	1	1	0.5	0.5	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	90	50	5	0	7	3	13	18	46	1	4	1	238
7:15 AM	92	80	6	0	5	4	19	23	61	6	6	2	304
7:30 AM	131	68	10	1	11	8	13	15	84	9	7	4	361
7:45 AM	89	142	11	3	18	4	39	64	62	4	14	10	460
8:00 AM	130	90	2	2	22	11	28	25	59	3	19	9	400
8:15 AM	87	70	10	0	18	5	21	33	81	12	25	1	363
8:30 AM	118	109	12	2	12	11	20	37	56	11	17	4	409
8:45 AM	88	110	6	4	25	7	26	53	75	10	21	6	431
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	825	719	62	12	118	53	179	268	524	56	113	37	2966
Approach %	51.37	44.77	3.86	6.56	64.48	28.96	18.43	27.60	53.96	27.18	54.85	17.96	
App/Depart	1606	/	935	183	/	698	971	/	342	206	/	991	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	424	411	35	7	70	31	108	159	258	30	75	24	1632
Approach %	48.74	47.24	4.02	6.48	64.81	28.70	20.57	30.29	49.14	23.26	58.14	18.60	
PEAK HR. FACTOR:		0.899			0.771			0.795			0.849		0.887

CONTROL: Signal
COMMENT 1:
COMMENT 2:

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	California	DATE:	05/03/2012	LOCATION:	San Luis Obispo
E-W STREET:	Foothill	DAY:	Thursday	PROJECT#	10-1081-030

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1.5	0.5	0.5	1.5	1	1.5	0.5	1	1	0.5	0.5	
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	78	37	5	7	62	31	19	31	65	6	36	3	380
11:15 AM	90	32	7	2	42	12	20	29	66	8	34	4	346
11:30 AM	74	64	15	2	35	21	22	32	61	10	28	4	368
11:45 AM	111	94	7	2	34	20	46	60	71	10	12	10	477
12:00 PM	100	49	7	4	79	30	30	25	100	12	32	5	473
12:15 PM	69	34	7	3	51	15	19	21	96	8	24	1	348
12:30 PM	88	36	8	0	33	16	28	29	74	10	20	4	346
12:45 PM	61	43	4	1	29	13	24	39	77	8	23	2	324
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	671	389	60	21	365	158	208	266	610	72	209	33	3062
Approach %	59.91	34.73	5.36	3.86	67.10	29.04	19.19	24.54	56.27	22.93	66.56	10.51	
App/Depart	1120	/	630	544	/	1047	1084	/	347	314	/	1038	

NOON Peak Hr Begins at: 1130 AM

PEAK													
Volumes	354	241	36	11	199	86	117	138	328	40	96	20	1666
Approach %	56.10	38.19	5.71	3.72	67.23	29.05	20.07	23.67	56.26	25.64	61.54	12.82	
PEAK HR. FACTOR:	0.744			0.655			0.823			0.796			0.873

CONTROL: Signal
COMMENT 1: 0
COMMENT 2: 0

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	300	PM	500	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	California	DATE:	05/03/2012	LOCATION:	San Luis Obispo
E-W STREET:	Foothill	DAY:	Thursday	PROJECT#	10-1081-030

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1.5	0.5	0.5	1.5	1	1.5	0.5	1	1	0.5	0.5	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM	90	29	10	7	82	30	17	25	116	13	32	3	454
3:15 PM	105	41	6	2	52	18	13	27	114	17	27	4	426
3:30 PM	111	56	7	5	46	17	24	26	117	9	29	6	453
3:45 PM	96	77	7	4	70	26	47	41	118	11	35	6	538
4:00 PM	107	36	7	7	88	37	13	41	134	21	44	2	537
4:15 PM	83	32	11	5	82	26	26	34	134	23	41	6	503
4:30 PM	115	42	10	6	87	35	20	30	117	11	32	2	507
4:45 PM	98	38	9	3	72	28	26	33	102	16	36	2	463
5:00 PM													
5:15 PM													
5:30 PM													
5:45 PM													
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	805	351	67	39	579	217	186	257	952	121	276	31	3881
Approach %	65.82	28.70	5.48	4.67	69.34	25.99	13.33	18.42	68.24	28.27	64.49	7.24	
App/Depart	1223	/	568	835	/	1652	1395	/	363	428	/	1298	

PM Peak Hr Begins at: 345 PM

PEAK													
Volumes	401	187	35	22	327	124	106	146	503	66	152	16	2085
Approach %	64.37	30.02	5.62	4.65	69.13	26.22	14.04	19.34	66.62	28.21	64.96	6.84	
PEAK HR. FACTOR:		0.865			0.896			0.916			0.836		0.969

CONTROL:	Signal
COMMENT 1:	0
COMMENT 2:	0

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Pedestrian & Bicycle Study

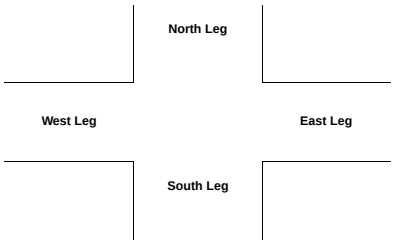
N-S STREET: California
E-W STREET: Foothill

Date: 05/03/2012
Day: Thursday

City: San Luis Obispo
Project #: 10-1081-030

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	3	5
7:15 AM	0	0	8	10
7:30 AM	0	1	3	5
7:45 AM	0	8	28	20
8:00 AM	0	0	6	11
8:15 AM	0	2	3	0
8:30 AM	1	0	9	10
8:45 AM	0	5	34	39
TOTAL	**1**	**16**	**94**	**100**

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	1
7:15 AM	0	0	3	2
7:30 AM	0	1	0	1
7:45 AM	0	8	7	5
8:00 AM	0	0	1	6
8:15 AM	0	2	0	2
8:30 AM	1	0	0	7
8:45 AM	0	5	0	9
TOTAL	**1**	**16**	**11**	**33**



	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	0	13	14	15
11:15 AM	0	14	3	8
11:30 AM	0	15	10	17
11:45 AM	0	31	35	52
12:00 PM	0	23	20	22
12:15 PM	0	14	11	7
12:30 PM	0	19	8	9
12:45 PM	0	10	4	10
TOTAL	**0**	**139**	**105**	**140**

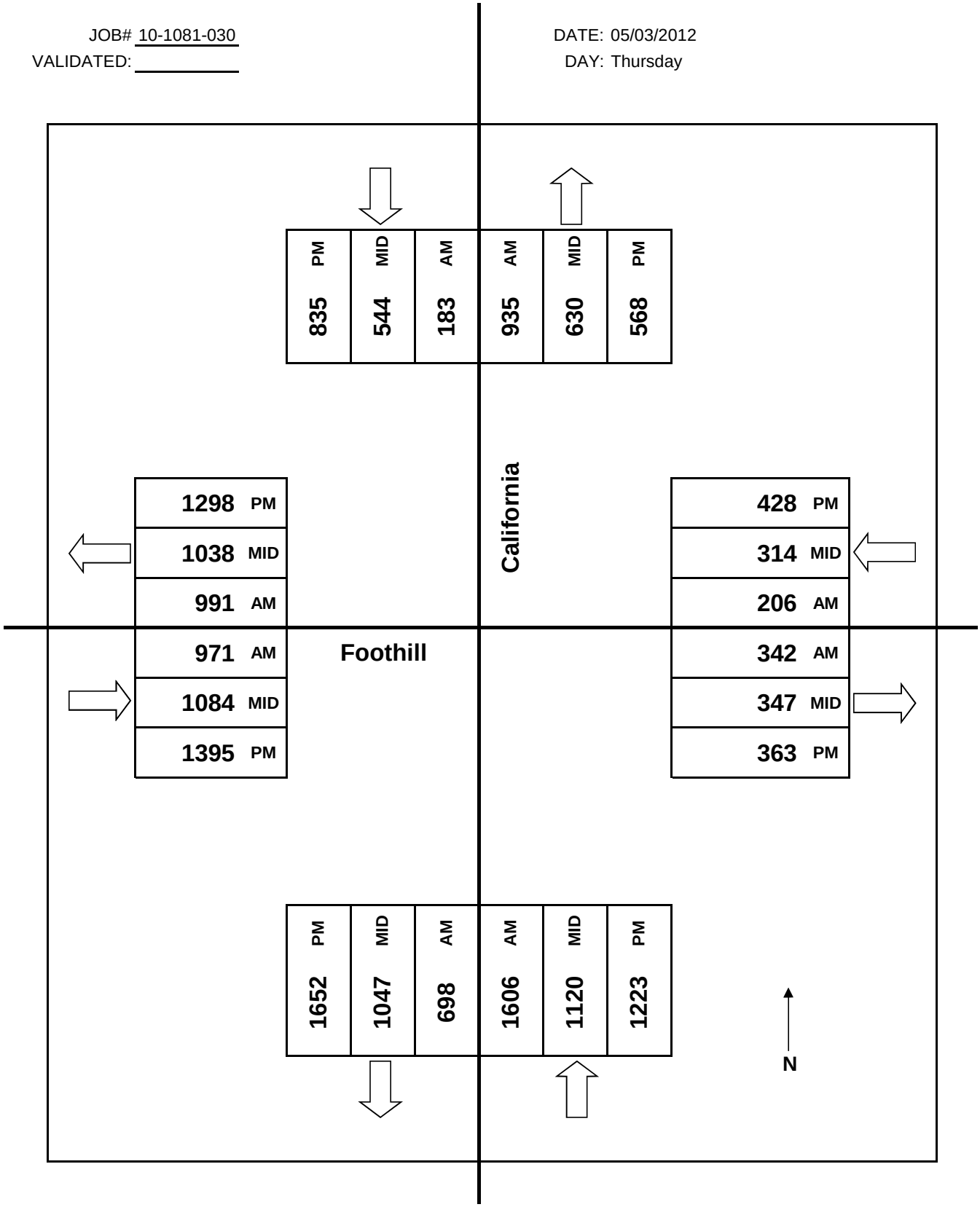
	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	0	0	2	9
11:15 AM	0	0	1	2
11:30 AM	0	1	0	3
11:45 AM	0	4	2	7
12:00 PM	0	2	3	15
12:15 PM	0	0	1	6
12:30 PM	0	2	1	0
12:45 PM	0	0	0	5
TOTAL	**0**	**9**	**10**	**47**

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
3:00 PM	1	19	6	22
3:15 PM	0	11	3	9
3:30 PM	0	23	17	14
3:45 PM	0	29	28	31
4:00 PM	0	24	19	34
4:15 PM	0	17	5	7
4:30 PM	0	23	6	20
4:45 PM	0	17	5	16
TOTAL	**1**	**163**	**89**	**153**

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
3:00 PM	0	3	1	3
3:15 PM	0	1	1	1
3:30 PM	0	0	2	2
3:45 PM	1	1	1	9
4:00 PM	0	1	0	8
4:15 PM	0	1	1	4
4:30 PM	0	0	0	1
4:45 PM	0	1	0	4
TOTAL	**1**	**8**	**6**	**32**

JOB# 10-1081-030
VALIDATED: _____

DATE: 05/03/2012
DAY: Thursday

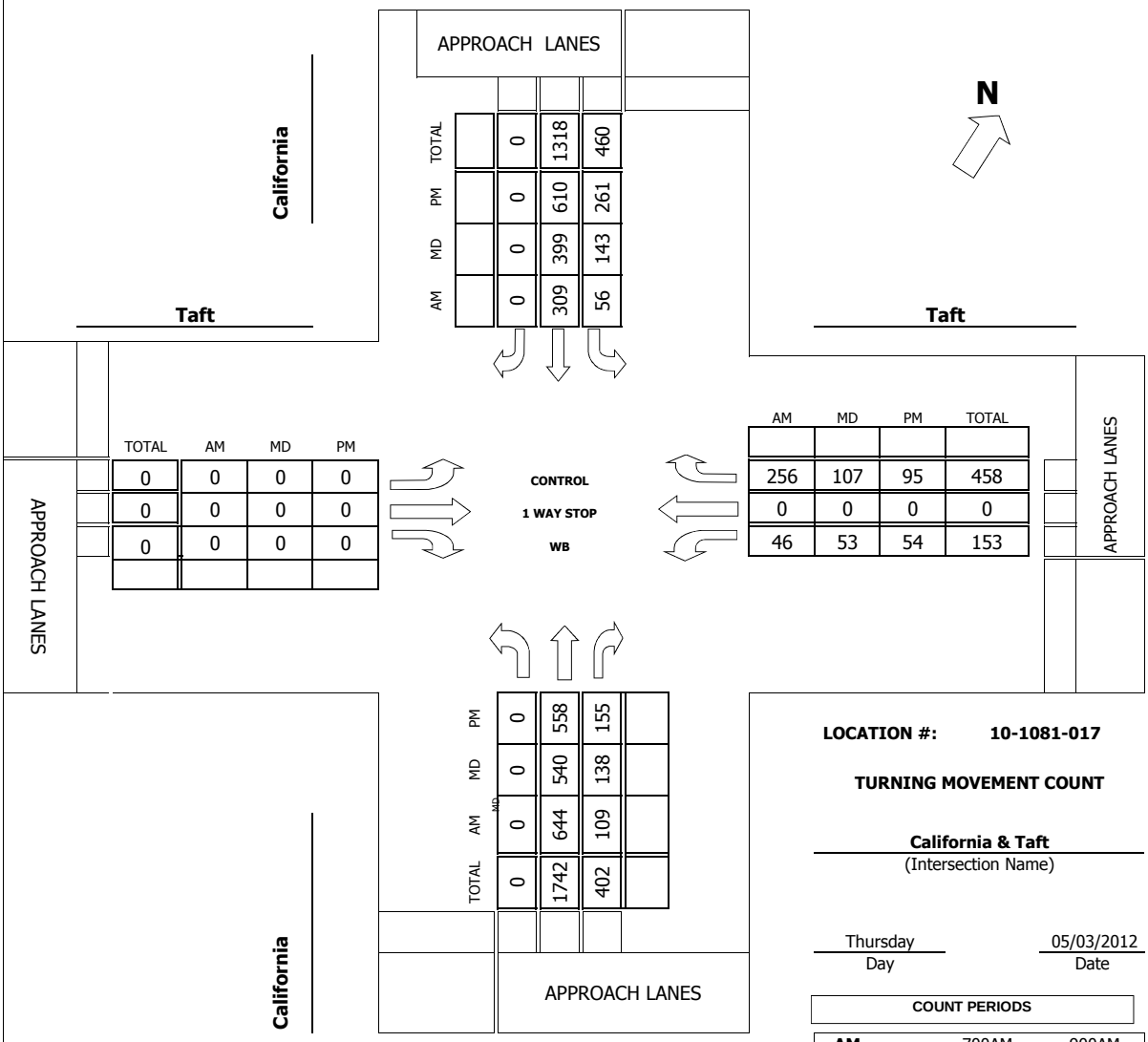


Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 10-1081-017

TMC SUMMARY OF California & Taft



LOCATION #: 10-1081-017

TURNING MOVEMENT COUNT

California & Taft
(Intersection Name)

Thursday (Day) 05/03/2012 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON	1100AM	-	100PM
PM	330PM	-	530PM

AM PEAK HOUR	730 AM
NOON PEAK HOUR	1130 AM
PM PEAK HOUR	415 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	California	DATE:	05/03/2012	LOCATION:	San Luis Obispo
E-W STREET:	Taft	DAY:	Thursday	PROJECT#	10-1081-017

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	0	1	1	0	0	0	0	1	0	1	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	84	13	5	46	0	0	0	0	3	0	66	217
7:15 AM	0	126	17	11	64	0	0	0	0	8	0	71	297
7:30 AM	0	138	34	20	89	0	0	0	0	6	0	75	362
7:45 AM	0	241	48	10	69	0	0	0	0	11	0	65	444
8:00 AM	0	139	15	13	65	0	0	0	0	7	0	59	298
8:15 AM	0	126	12	13	86	0	0	0	0	22	0	57	316
8:30 AM	0	185	21	13	67	0	0	0	0	13	0	57	356
8:45 AM	0	169	26	20	84	0	0	0	0	16	0	44	359
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	1208	186	105	570	0	0	0	0	86	0	494	2649
Approach %	0.00	86.66	13.34	15.56	84.44	0.00	####	####	####	14.83	0.00	85.17	
App/Depart	1394	/	1702	675	/	656	0	/	291	580	/	0	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	0	644	109	56	309	0	0	0	0	46	0	256	1420
Approach %	0.00	85.52	14.48	15.34	84.66	0.00	####	####	####	15.23	0.00	84.77	

PEAK HR. FACTOR:	0.651	0.837	0.000	0.932	0.800

CONTROL: 1 WAY STOP (WB)
COMMENT 1:
COMMENT 2:

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	California	DATE:	05/03/2012	LOCATION:	San Luis Obispo
E-W STREET:	Taft	DAY:	Thursday	PROJECT#	10-1081-017

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	0	1	1	0	0	0	0	1	0	1	
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	0	101	27	41	81	0	0	0	0	12	0	28	290
11:15 AM	0	90	31	31	71	0	0	0	0	20	0	32	275
11:30 AM	0	155	37	30	86	0	0	0	0	13	0	30	351
11:45 AM	0	165	33	29	68	0	0	0	0	13	0	34	342
12:00 PM	0	114	45	57	128	0	0	0	0	17	0	24	385
12:15 PM	0	106	23	27	117	0	0	0	0	10	0	19	302
12:30 PM	0	107	24	34	89	0	0	0	0	19	0	29	302
12:45 PM	0	94	37	24	74	0	0	0	0	7	0	30	266
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	932	257	273	714	0	0	0	0	111	0	226	2513
Approach %	0.00	78.39	21.61	27.66	72.34	0.00	####	####	####	32.94	0.00	67.06	
App/Depart	1189	/	1158	987	/	825	0	/	530	337	/	0	

NOON Peak Hr Begins at: 1130 AM

PEAK													
Volumes	0	540	138	143	399	0	0	0	0	53	0	107	1380
Approach %	0.00	79.65	20.35	26.38	73.62	0.00	####	####	####	33.13	0.00	66.88	
PEAK HR. FACTOR:		0.856			0.732			0.000			0.851		0.896

CONTROL: 1 WAY STOP (WB)
COMMENT 1: 0
COMMENT 2: 0

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	330	PM	530	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	California	DATE:	05/03/2012	LOCATION:	San Luis Obispo
E-W STREET:	Taft	DAY:	Thursday	PROJECT#	10-1081-017

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	2	0	1	1	0	0	0	0	1	0	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM	0	164	38	34	129	0	0	0	0	13	0	24	402
3:45 PM	0	149	37	52	150	0	0	0	0	14	0	32	434
4:00 PM	0	119	42	63	162	0	0	0	0	12	0	22	420
4:15 PM	0	125	30	75	160	0	0	0	0	18	0	19	427
4:30 PM	0	123	50	57	161	0	0	0	0	16	0	26	433
4:45 PM	0	140	37	64	127	0	0	0	0	9	0	22	399
5:00 PM	0	170	38	65	162	0	0	0	0	11	0	28	474
5:15 PM	0	114	40	61	146	0	0	0	0	13	0	26	400
5:30 PM													
5:45 PM													
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	1104	312	471	1197	0	0	0	0	106	0	199	3389
Approach %	0.00	77.97	22.03	28.24	71.76	0.00	####	####	####	34.75	0.00	65.25	
App/Depart	1416	/	1303	1668	/	1303	0	/	783	305	/	0	

PM Peak Hr Begins at: 415 PM

PEAK													
Volumes	0	558	155	261	610	0	0	0	0	54	0	95	1733
Approach %	0.00	78.26	21.74	29.97	70.03	0.00	####	####	####	36.24	0.00	63.76	
PEAK HR. FACTOR:		0.857			0.927			0.000			0.887		0.914

CONTROL:	1 WAY STOP (WB)
COMMENT 1:	0
COMMENT 2:	0

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Pedestrian & Bicycle Study

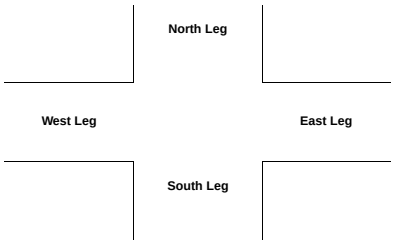
N-S STREET: California
E-W STREET: Taft

Date: 05/03/2012
Day: Thursday

City: San Luis Obispo
Project #: 10-1081-017

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	1	1
7:15 AM	0	0	0	0
7:30 AM	0	0	0	4
7:45 AM	0	0	2	0
8:00 AM	0	0	1	0
8:15 AM	0	0	0	2
8:30 AM	0	0	4	2
8:45 AM	0	0	1	0
TOTAL	0	0	9	9

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	0	0	1
7:45 AM	0	0	0	2
8:00 AM	0	0	0	0
8:15 AM	0	0	0	0
8:30 AM	0	0	0	0
8:45 AM	0	0	0	2
TOTAL	0	0	0	5



	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	0	2	0	4
11:15 AM	0	0	3	1
11:30 AM	0	0	0	1
11:45 AM	1	0	0	1
12:00 PM	0	0	3	1
12:15 PM	0	0	2	3
12:30 PM	0	0	4	3
12:45 PM	0	0	0	3
TOTAL	1	2	12	17

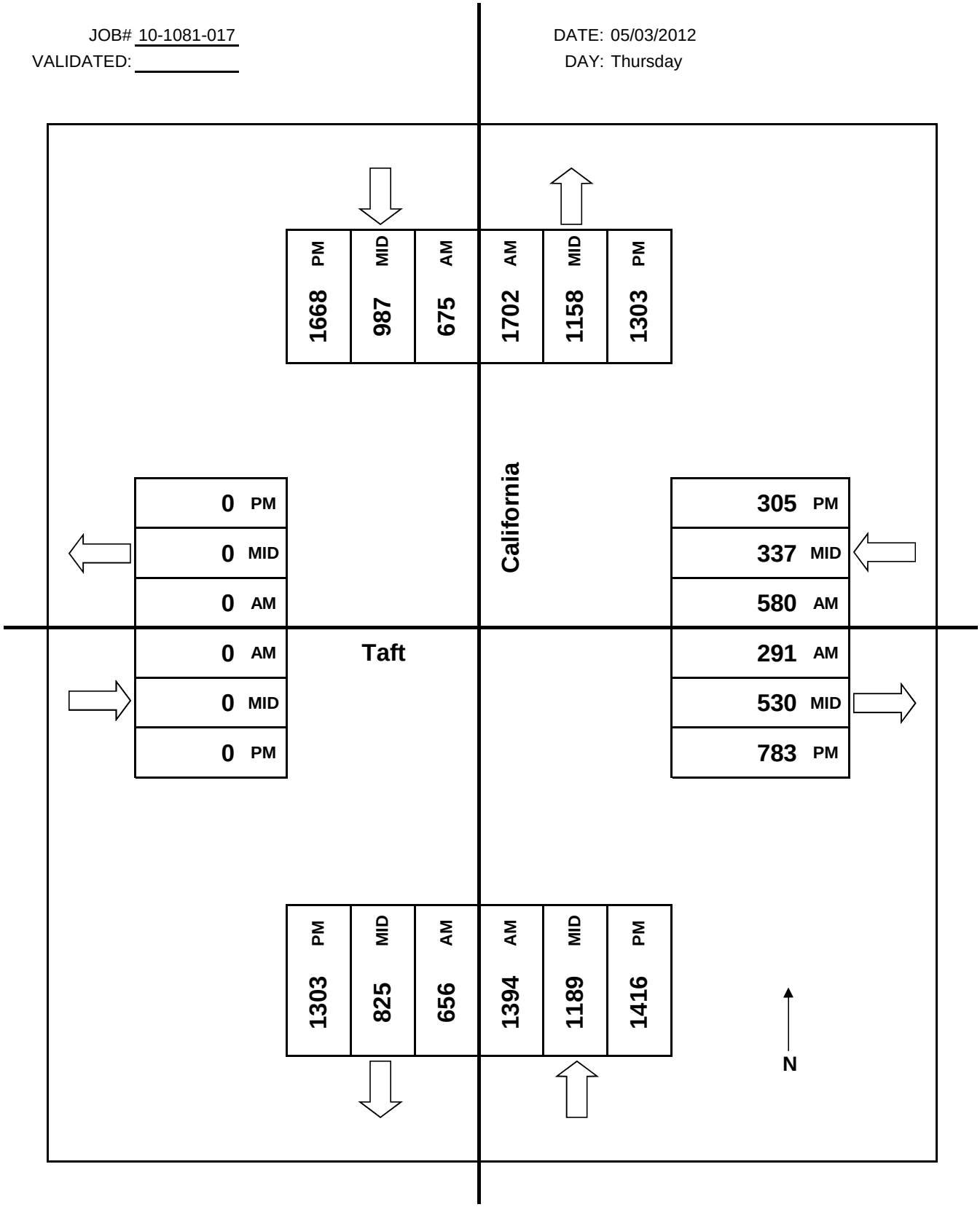
	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	0	0	0	1
11:15 AM	0	0	0	0
11:30 AM	0	0	0	0
11:45 AM	0	0	0	0
12:00 PM	0	0	0	0
12:15 PM	0	0	0	0
12:30 PM	0	0	0	0
12:45 PM	0	0	0	0
TOTAL	0	0	0	1

	PEDESTRIANS			
	N-LEG	S-LEG	E-LEG	W-LEG
3:30 PM	0	0	1	3
3:45 PM	0	0	0	1
4:00 PM	0	0	1	1
4:15 PM	0	0	2	1
4:30 PM	0	0	0	1
4:45 PM	0	0	0	3
5:00 PM	0	0	1	1
5:15 PM	0	0	0	4
TOTAL	0	0	5	15

	BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG
3:30 PM	0	0	0	0
3:45 PM	0	0	0	0
4:00 PM	0	0	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	1	0
TOTAL	0	0	1	0

JOB# 10-1081-017
VALIDATED: _____

DATE: 05/03/2012
DAY: Thursday

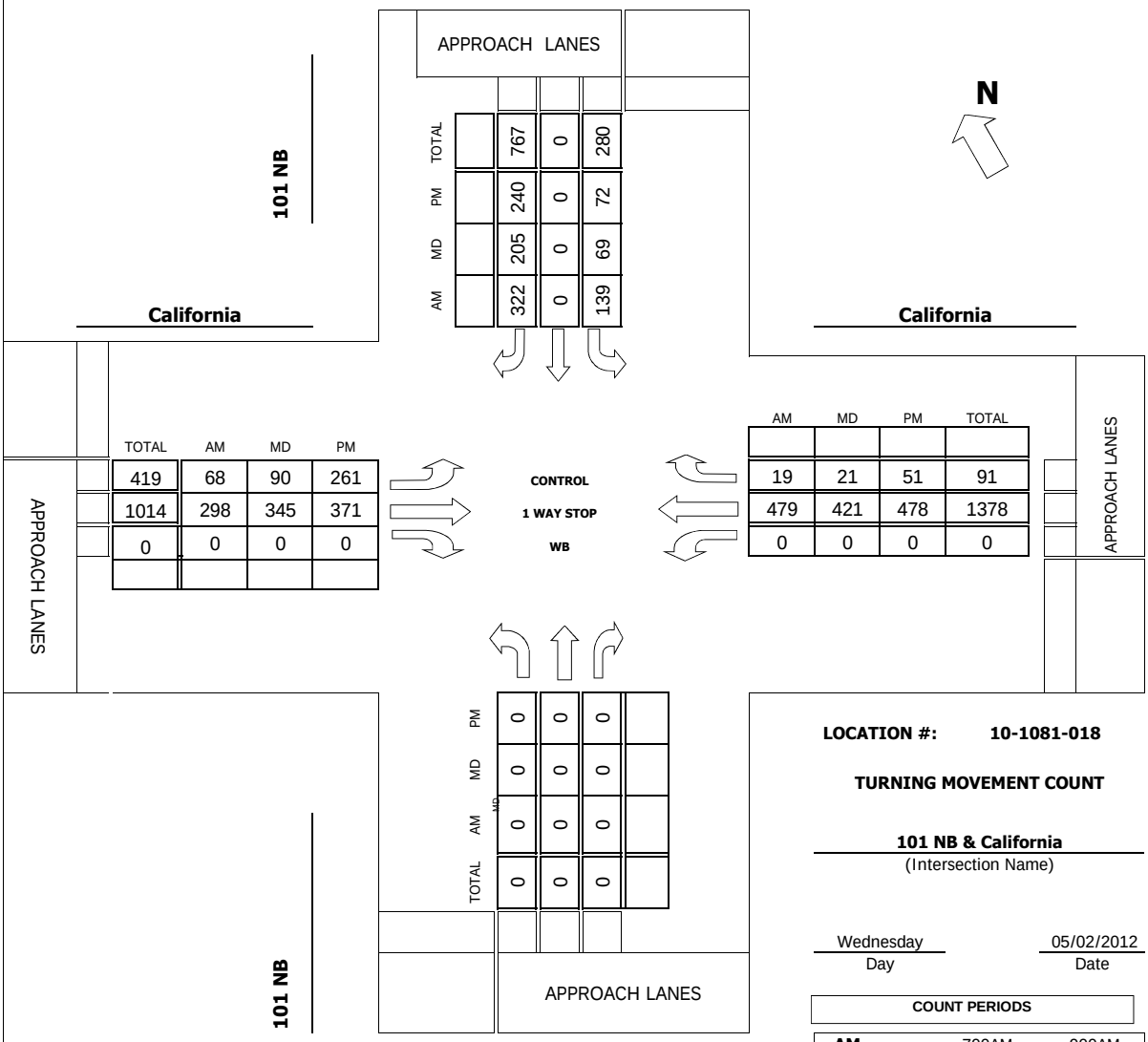


Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 10-1081-018

TMC SUMMARY OF 101 NB & California



LOCATION #: 10-1081-018

TURNING MOVEMENT COUNT

101 NB & California
(Intersection Name)

Wednesday (Day) 05/02/2012 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON	1100AM	-	100PM
PM	330PM	-	530PM

AM PEAK HOUR	715 AM
NOON PEAK HOUR	1145 AM
PM PEAK HOUR	430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	101 NB	DATE:	05/02/2012	LOCATION:	San Luis Obispo
E-W STREET:	California	DAY:	Wednesday	PROJECT#	10-1081-018

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	0	1	1	1	0	0	1	1	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	9	0	40	15	30	0	0	60	4	158
7:15 AM	0	0	0	39	0	69	21	72	0	0	91	5	297
7:30 AM	0	0	0	46	0	98	17	97	0	0	125	4	387
7:45 AM	0	0	0	25	0	98	19	68	0	0	148	3	361
8:00 AM	0	0	0	29	0	57	11	61	0	0	115	7	280
8:15 AM	0	0	0	29	0	56	30	80	0	0	67	6	268
8:30 AM	0	0	0	28	0	66	17	71	0	0	105	6	293
8:45 AM	0	0	0	25	0	100	17	66	0	0	96	5	309
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	230	0	584	147	545	0	0	807	40	2353
Approach %	####	####	####	28.26	0.00	71.74	21.24	78.76	0.00	0.00	95.28	4.72	
App/Depart	0	/	187	814	/	0	692	/	775	847	/	1391	

AM Peak Hr Begins at: 715 AM

PEAK													
Volumes	0	0	0	139	0	322	68	298	0	0	479	19	1325
Approach %	####	####	####	30.15	0.00	69.85	18.58	81.42	0.00	0.00	96.18	3.82	

PEAK HR. FACTOR:	0.000	0.800	0.803	0.825	0.856

CONTROL: 1 WAY STOP (WB)
COMMENT 1:
COMMENT 2:

Intersection Turning Movement

Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	101 NB	DATE:	05/02/2012	LOCATION:	San Luis Obispo
E-W STREET:	California	DAY:	Wednesday	PROJECT#	10-1081-018

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	0	1	1	1	0	0	1	1	
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM	0	0	0	18	0	51	19	78	0	0	86	5	257
11:15 AM	0	0	0	16	0	40	17	43	0	0	89	6	211
11:30 AM	0	0	0	13	0	55	14	74	0	0	112	3	271
11:45 AM	0	0	0	23	0	66	21	82	0	0	149	3	344
12:00 PM	0	0	0	12	0	46	24	94	0	0	107	4	287
12:15 PM	0	0	0	17	0	38	24	88	0	0	69	10	246
12:30 PM	0	0	0	17	0	55	21	81	0	0	96	4	274
12:45 PM	0	0	0	32	0	57	21	76	0	0	92	4	282
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	148	0	408	161	616	0	0	800	39	2172
Approach %	####	####	####	26.62	0.00	73.38	20.72	79.28	0.00	0.00	95.35	4.65	
App/Depart	0	/	200	556	/	0	777	/	764	839	/	1208	

NOON Peak Hr Begins at: 1145 AM

PEAK													
Volumes	0	0	0	69	0	205	90	345	0	0	421	21	1151
Approach %	####	####	####	25.18	0.00	74.82	20.69	79.31	0.00	0.00	95.25	4.75	
PEAK HR. FACTOR:		0.000			0.770			0.000			0.727		0.836

CONTROL: 1 WAY STOP (WB)
COMMENT 1:
COMMENT 2: 0

HOURS:

	FROM:		TO:	
AM	700	AM	900	AM
NOON	1100	AM	100	PM
PM	330	PM	530	PM

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

N-S STREET:	101 NB	DATE:	05/02/2012	LOCATION:	San Luis Obispo
E-W STREET:	California	DAY:	Wednesday	PROJECT#	10-1081-018

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	0	1	1	1	0	0	1	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM	0	0	0	17	0	78	51	83	0	0	137	8	374
3:45 PM	0	0	0	21	0	70	57	88	0	0	136	12	384
4:00 PM	0	0	0	18	0	56	64	86	0	0	111	12	347
4:15 PM	0	0	0	14	0	53	65	103	0	0	94	5	334
4:30 PM	0	0	0	15	0	55	68	93	0	0	111	12	354
4:45 PM	0	0	0	20	0	56	55	85	0	0	128	12	356
5:00 PM	0	0	0	21	0	70	74	108	0	0	129	17	419
5:15 PM	0	0	0	16	0	59	64	85	0	0	110	10	344
5:30 PM													
5:45 PM													
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	142	0	497	498	731	0	0	956	88	2912
Approach %	####	####	####	22.22	0.00	77.78	40.52	59.48	0.00	0.00	91.57	8.43	
App/Depart	0	/	586	639	/	0	1229	/	873	1044	/	1453	

PM Peak Hr Begins at: 430 PM

PEAK													
Volumes	0	0	0	72	0	240	261	371	0	0	478	51	1473
Approach %	####	####	####	23.08	0.00	76.92	41.30	58.70	0.00	0.00	90.36	9.64	

PEAK HR. FACTOR:	0.000	0.857	0.868	0.906	0.879

CONTROL:	1 WAY STOP (WB)
COMMENT 1:	0
COMMENT 2:	0

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Pedestrian & Bicycle Study

N-S STREET: 101 NB
E-W STREET: California

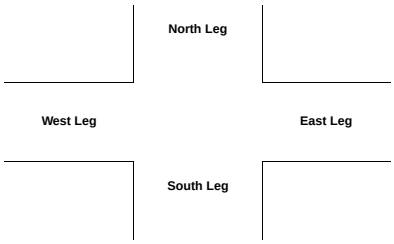
Date: 05/02/2012
Day: Wednesday

City: San Luis Obispo
Project #: 10-1081-018

	PEDESTRIANS				BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
7:00 AM	2	1	0	0	0	0	0	0
7:15 AM	1	0	0	0	0	0	0	0
7:30 AM	1	3	0	0	0	1	0	0
7:45 AM	2	1	0	0	0	0	0	0
8:00 AM	0	1	0	0	0	0	0	0
8:15 AM	2	2	0	0	0	0	0	0
8:30 AM	1	2	0	0	0	0	0	0
8:45 AM	0	1	0	0	0	0	0	0
TOTAL	**9**	**11**	**0**	**0**	**0**	**1**	**0**	**0**

	PEDESTRIANS				BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
11:00 AM	3	1	0	0	0	0	0	0
11:15 AM	3	4	0	0	0	0	0	0
11:30 AM	2	1	0	0	0	0	0	0
11:45 AM	0	4	0	0	0	0	0	0
12:00 PM	2	2	1	0	0	0	0	0
12:15 PM	2	3	0	0	0	0	0	0
12:30 PM	2	1	0	0	0	0	0	0
12:45 PM	2	6	0	0	0	0	0	0
TOTAL	**16**	**22**	**1**	**0**	**0**	**0**	**0**	**0**

	PEDESTRIANS				BICYCLES			
	N-LEG	S-LEG	E-LEG	W-LEG	N-LEG	S-LEG	E-LEG	W-LEG
3:30 PM	1	4	0	0	0	0	0	0
3:45 PM	3	0	0	0	0	0	0	0
4:00 PM	5	7	0	0	0	0	0	0
4:15 PM	3	0	0	0	0	0	0	0
4:30 PM	3	2	0	0	1	0	0	0
4:45 PM	1	2	0	0	0	0	0	0
5:00 PM	1	2	0	0	0	0	0	0
5:15 PM	1	2	0	0	0	0	0	0
TOTAL	**18**	**19**	**0**	**0**	**1**	**0**	**0**	**0**



JOB# 10-1081-018
VALIDATED: _____

DATE: 05/02/2012
DAY: Wednesday

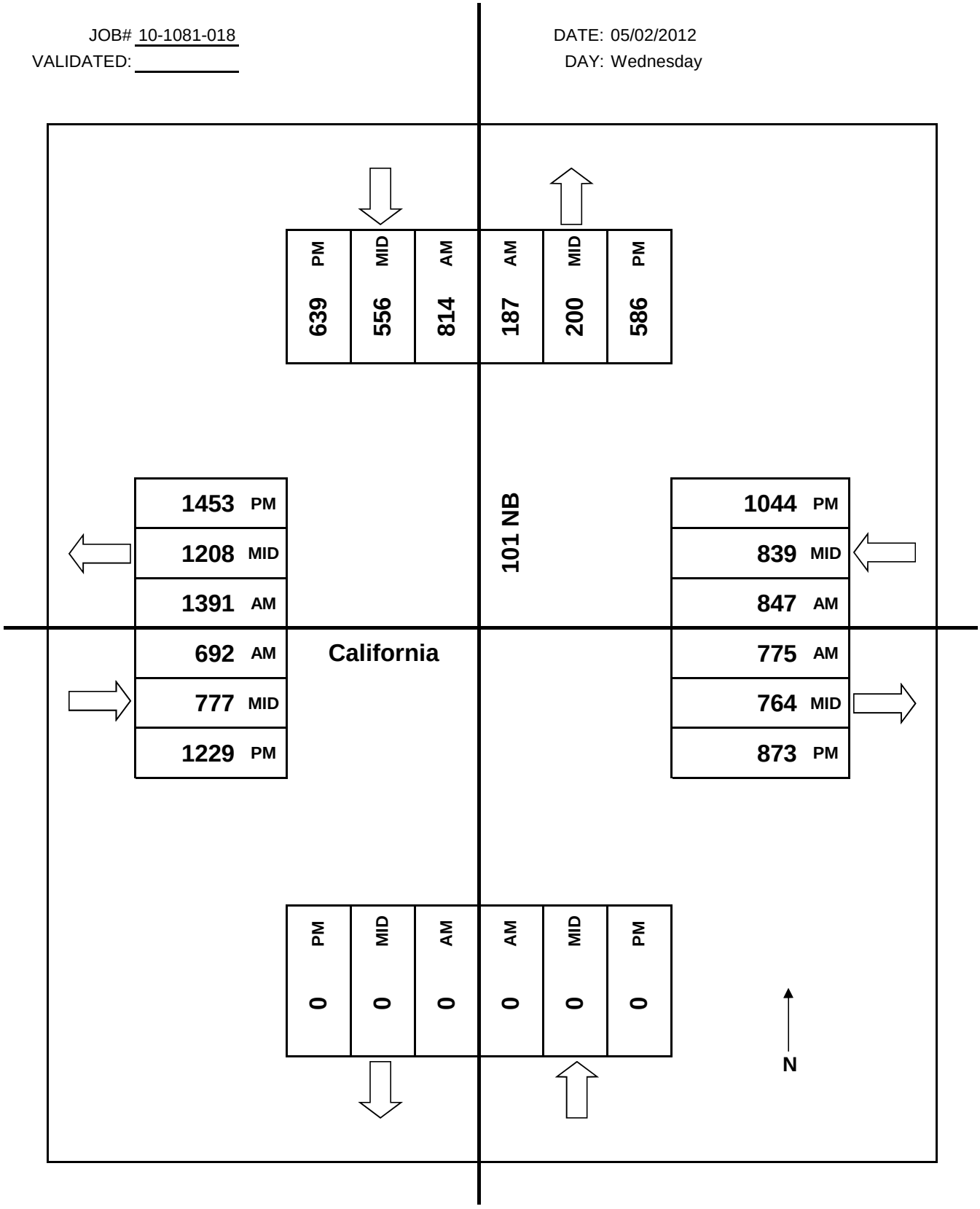
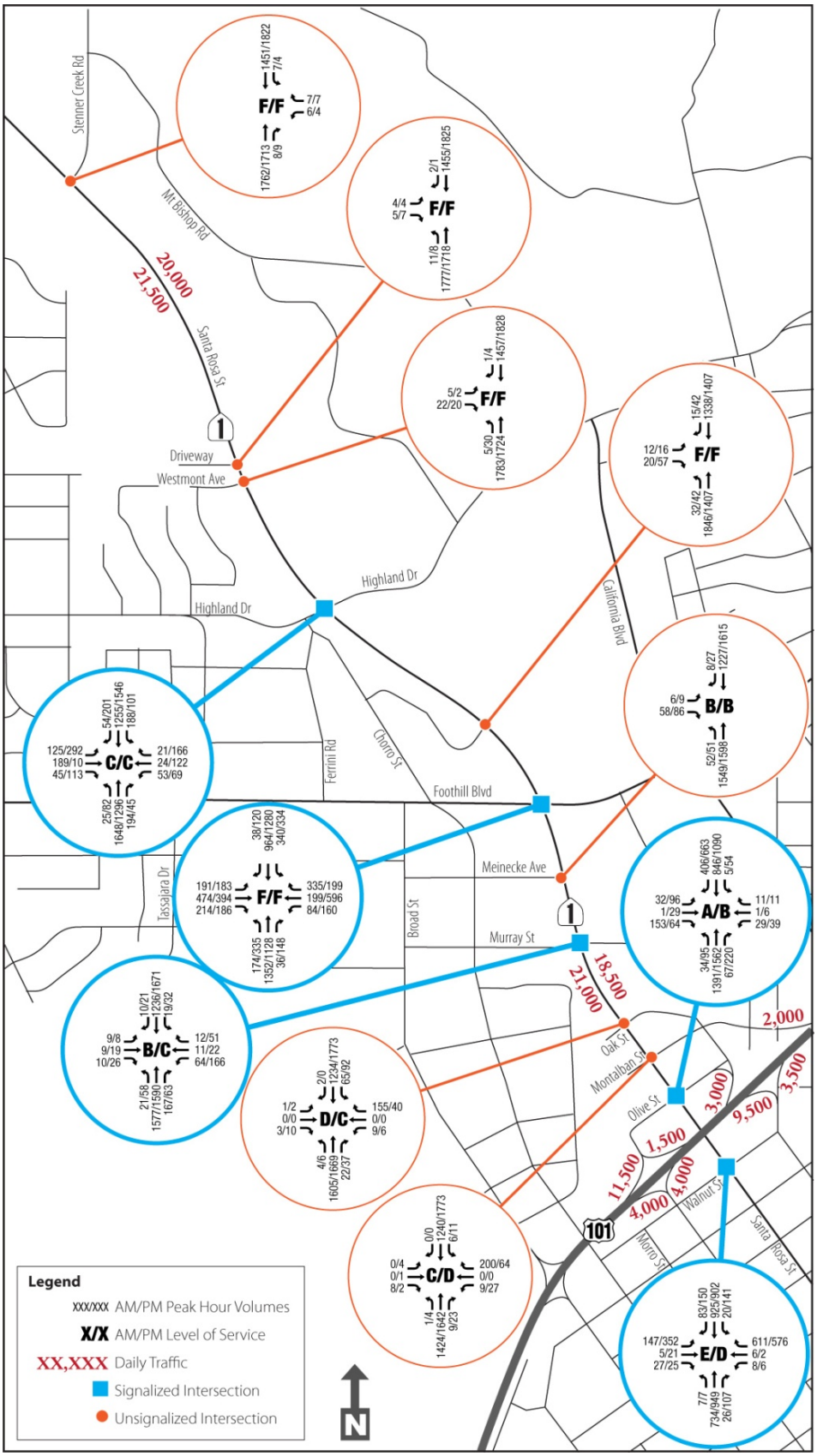


Figure 6-1
Future Traffic Volumes and Intersection Operations



Prepared by: Field Data Services of Arizona (520) 316-6745

Volumes for: Tuesday, April 24, 2012 **City:** San Luis Obispo **Project#** 12-1081-055

Location : Grand south of McCollum

DAY 1

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	19		19					12:00	87		106				
00:15	20		20					12:15	51		98				
00:30	21		14					12:30	67		86				
00:45	14	74	19	72			146	12:45	89	294	53	343			637
01:00	16		13					13:00	64		73				
01:15	13		8					13:15	88		68				
01:30	11		5					13:30	86		98				
01:45	10	50	7	33			83	13:45	100	338	93	332			670
02:00	14		11					14:00	78		127				
02:15	8		10					14:15	69		117				
02:30	5		14					14:30	70		112				
02:45	9	36	8	43			79	14:45	89	306	114	470			776
03:00	10		7					15:00	86		127				
03:15	14		5					15:15	55		117				
03:30	8		6					15:30	75		129				
03:45	7	39	3	21			60	15:45	103	319	98	471			790
04:00	5		2					16:00	67		172				
04:15	9		5					16:15	59		142				
04:30	6		2					16:30	64		144				
04:45	3	23	1	10			33	16:45	73	263	128	586			849
05:00	2		4					17:00	65		172				
05:15	5		1					17:15	68		155				
05:30	19		5					17:30	75		107				
05:45	20	46	9	19			65	17:45	110	318	138	572			890
06:00	32		6					18:00	79		208				
06:15	54		16					18:15	79		192				
06:30	41		18					18:30	54		128				
06:45	45	172	17	57			229	18:45	98	310	95	623			933
07:00	88		20					19:00	100		117				
07:15	133		24					19:15	65		88				
07:30	128		26					19:30	74		94				
07:45	210	559	41	111			670	19:45	68	307	83	382			689
08:00	154		43					20:00	64		99				
08:15	111		66					20:15	63		117				
08:30	104		60					20:30	72		106				
08:45	122	491	65	234			725	20:45	78	277	88	410			687
09:00	108		58					21:00	81		83				
09:15	87		54					21:15	74		63				
09:30	85		74					21:30	50		59				
09:45	96	376	85	271			647	21:45	53	258	73	278			536
10:00	106		76					22:00	50		82				
10:15	103		60					22:15	45		60				
10:30	122		65					22:30	36		47				
10:45	115	446	62	263			709	22:45	32	163	27	216			379
11:00	82		123					23:00	36		25				
11:15	73		99					23:15	21		24				
11:30	101		76					23:30	20		25				
11:45	154	410	75	373			783	23:45	25	102	31	105			207
Total Vol.		2722		1507			**4229**			3255		4788			**8043**

Daily Totals

NB	SB	EB	WB	**Combined**
5977	6295			**12272**

	AM			**PM**		
Split %	64.4%	35.6%	**34.5%**	40.5%	59.5%	**65.5%**
Peak Hour	07:15	11:00	**07:45**	13:15	17:45	**17:30**
Volume	625	373	**789**	352	666	**988**
P.H.F.	0.74	0.76	**0.79**	0.88	0.80	**0.86**

Prepared by: Field Data Services of Arizona (520) 316-6745

Volumes for: Wednesday, April 25, 2012 **City:** San Luis Obispo **Project#** 12-1081-055

Location : Grand south of McCollum

DAY 2

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	23		21					12:00	89		103				
00:15	21		21					12:15	60		100				
00:30	18		12					12:30	65		87				
00:45	16	78	14	68			146	12:45	87	301	85	375			676
01:00	13		9					13:00	74		96				
01:15	12		12					13:15	78		99				
01:30	24		17					13:30	80		90				
01:45	11	60	12	50			110	13:45	96	328	87	372			700
02:00	13		8					14:00	103		122				
02:15	9		8					14:15	87		114				
02:30	12		9					14:30	85		112				
02:45	11	45	6	31			76	14:45	88	363	136	484			847
03:00	7		5					15:00	80		122				
03:15	4		2					15:15	87		117				
03:30	8		2					15:30	74		122				
03:45	17	36	9	18			54	15:45	100	341	120	481			822
04:00	4		2					16:00	59		185				
04:15	2		1					16:15	60		155				
04:30	8		2					16:30	65		154				
04:45	5	19	4	9			28	16:45	58	242	147	641			883
05:00	3		3					17:00	57		174				
05:15	7		6					17:15	74		152				
05:30	14		6					17:30	78		139				
05:45	23	47	6	21			68	17:45	106	315	154	619			934
06:00	32		3					18:00	85		210				
06:15	35		11					18:15	89		188				
06:30	32		12					18:30	90		128				
06:45	53	152	12	38			190	18:45	98	362	111	637			999
07:00	69		23					19:00	99		104				
07:15	123		16					19:15	90		87				
07:30	116		26					19:30	87		85				
07:45	203	511	43	108			619	19:45	74	350	89	365			715
08:00	134		35					20:00	50		90				
08:15	116		58					20:15	54		110				
08:30	111		54					20:30	41		103				
08:45	128	489	74	221			710	20:45	85	230	85	388			618
09:00	104		50					21:00	82		66				
09:15	86		59					21:15	77		60				
09:30	96		63					21:30	75		65				
09:45	99	385	66	238			623	21:45	60	294	58	249			543
10:00	106		87					22:00	54		54				
10:15	122		85					22:15	58		74				
10:30	128		89					22:30	54		50				
10:45	111	467	90	351			818	22:45	41	207	54	232			439
11:00	114		103					23:00	21		42				
11:15	106		87					23:15	28		29				
11:30	87		85					23:30	24		30				
11:45	139	446	77	352			798	23:45	21	94	25	126			220
Total Vol.		2735		1505			**4240**			3427		4969			**8396**

Daily Totals

NB	SB	EB	WB	**Combined**
6162	6474			**12636**

	AM			PM		
Split %	64.5%	35.5%	**33.6%**	40.8%	59.2%	**66.4%**
Peak Hour	07:15	10:30	**10:15**	18:30	17:30	**17:45**
Volume	576	369	**842**	377	691	**1050**
P.H.F.	0.71	0.90	**0.97**	0.95	0.82	**0.89**

Prepared by: Field Data Services of Arizona (520) 316-6745

Volumes for: Tuesday, April 24, 2012 & Wednesday, April 25, 2012 **City:** San Luis Obispo **Project#** 12-1081-055

Location : Grand south of McCollum

2-DAY AVERAGE

AM Period	NB		SB		EB		WB			PM Period	NB		SB		EB		WB		
00:00	21		20		0		0			12:00	88		105		0		0		
00:15	21		21		0		0			12:15	56		99		0		0		
00:30	20		13		0		0			12:30	66		87		0		0		
00:45	15	76	17	70	0	0	0	0	146	12:45	88	298	69	359	0	0	0	0	657
01:00	15		11		0		0			13:00	69		85		0		0		
01:15	13		10		0		0			13:15	83		84		0		0		
01:30	18		11		0		0			13:30	83		94		0		0		
01:45	11	55	10	42	0	0	0	0	97	13:45	98	333	90	352	0	0	0	0	685
02:00	14		10		0		0			14:00	91		125		0		0		
02:15	9		9		0		0			14:15	78		116		0		0		
02:30	9		12		0		0			14:30	78		112		0		0		
02:45	10	41	7	37	0	0	0	0	78	14:45	89	335	125	477	0	0	0	0	812
03:00	9		6		0		0			15:00	83		125		0		0		
03:15	9		4		0		0			15:15	71		117		0		0		
03:30	8		4		0		0			15:30	75		126		0		0		
03:45	12	38	6	20	0	0	0	0	57	15:45	102	330	109	476	0	0	0	0	806
04:00	5		2		0		0			16:00	63		179		0		0		
04:15	6		3		0		0			16:15	60		149		0		0		
04:30	7		2		0		0			16:30	65		149		0		0		
04:45	4	21	3	10	0	0	0	0	31	16:45	66	253	138	614	0	0	0	0	866
05:00	3		4		0		0			17:00	61		173		0		0		
05:15	6		4		0		0			17:15	71		154		0		0		
05:30	17		6		0		0			17:30	77		123		0		0		
05:45	22	47	8	20	0	0	0	0	67	17:45	108	317	146	596	0	0	0	0	912
06:00	32		5		0		0			18:00	82		209		0		0		
06:15	45		14		0		0			18:15	84		190		0		0		
06:30	37		15		0		0			18:30	72		128		0		0		
06:45	49	162	15	48	0	0	0	0	210	18:45	98	336	103	630	0	0	0	0	966
07:00	79		22		0		0			19:00	100		111		0		0		
07:15	128		20		0		0			19:15	78		88		0		0		
07:30	122		26		0		0			19:30	81		90		0		0		
07:45	207	535	42	110	0	0	0	0	645	19:45	71	329	86	374	0	0	0	0	702
08:00	144		39		0		0			20:00	57		95		0		0		
08:15	114		62		0		0			20:15	59		114		0		0		
08:30	108		57		0		0			20:30	57		105		0		0		
08:45	125	490	70	228	0	0	0	0	718	20:45	82	254	87	399	0	0	0	0	653
09:00	106		54		0		0			21:00	82		75		0		0		
09:15	87		57		0		0			21:15	76		62		0		0		
09:30	91		69		0		0			21:30	63		62		0		0		
09:45	98	381	76	255	0	0	0	0	635	21:45	57	276	66	264	0	0	0	0	540
10:00	106		82		0		0			22:00	52		68		0		0		
10:15	113		73		0		0			22:15	52		67		0		0		
10:30	125		77		0		0			22:30	45		49		0		0		
10:45	113	457	76	307	0	0	0	0	764	22:45	37	185	41	224	0	0	0	0	409
11:00	98		113		0		0			23:00	29		34		0		0		
11:15	90		93		0		0			23:15	25		27		0		0		
11:30	94		81		0		0			23:30	22		28		0		0		
11:45	147	428	76	363	0	0	0	0	791	23:45	23	98	28	116	0	0	0	0	214

Total Vol.	2729		1506						**4235**		3341		4879						**8220**

																		Daily Totals	
																		NB	SB
																		6070	6385

			AM										**PM**						
Split %	64.4%		35.6%						**34.0%**		40.6%		59.4%						**66.0%**
Peak Hour	07:15		11:45						**11:00**		18:45		17:45						**17:45**
Volume	601		366						**791**		356		673						**1019**
P.H.F.	0.73		0.88						**0.89**		0.89		0.81						**0.88**

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[9] 9**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: West (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 10 / 139 (7.19%)

* Monday, October 14, 2013 - Total=2 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	0	0	0	0

* Tuesday, October 15, 2013 - Total=0, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	
0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1200 - 1300 (0), PM PHF=1.00

* Wednesday, October 16, 2013 - Total=2, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**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	**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	**1**	0	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0930 - 1030 (1), AM PHF=0.25 PM Peak 1200 - 1300 (1), PM PHF=0.25

* Thursday, October 17, 2013 - Total=3, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	**1**	0	0	0	0	0	0	0	0	1	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 1415 - 1515 (2), PM PHF=0.50

* Friday, October 18, 2013 - Total=3 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0	0	0	0	0	0	0	0	0	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	1	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	1	0	-	-	-	-	-	-	-	-	-

AM Peak 0915 - 1015 (1), AM PHF=0.25

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[9] 9**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: East (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 122 / 139 (87.77%)

* Monday, October 14, 2013 - Total=12 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**5**	**2**	**1**	**1**	**2**	**0**	**1**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	0	0	0	0	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	1	1	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	0	1	0	0	0

* Tuesday, October 15, 2013 - Total=27, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**2**	**1**	**0**	**1**	**0**	**2**	**2**	**3**	**1**	**3**	**5**	**2**	**2**	**0**	
0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	0	3	0	0	**3**	0	1	0	0
1	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	1	0	0	1	**1**	1	0	1	0	0
0	0	0	0	0	0	0	0	0	**0**	0	1	0	1	0	0	0	0	0	**2**	0	2	0	0	1
0	0	0	0	0	0	1	0	0	**1**	1	0	0	0	0	1	2	0	0	**0**	1	0	0	0	0

AM Peak 0915 - 1015 (2), AM PHF=0.50 PM Peak 1915 - 2015 (6), PM PHF=0.50

* Wednesday, October 16, 2013 - Total=26, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**1**	**0**	**6**	**1**	**3**	**0**	**2**	**2**	**3**	**3**	**1**	**0**	**0**	
0	0	0	0	0	0	0	0	0	0	**1**	0	0	**2**	1	1	0	0	0	0	1	1	0	0	0
0	0	0	0	0	0	0	0	0	**0**	0	0	0	**1**	0	1	0	1	0	1	0	0	0	0	0
1	0	0	0	0	0	0	0	0	**2**	0	0	0	**2**	0	0	0	0	1	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0	**0**	0	1	0	**1**	0	1	0	1	1	2	1	0	0	0	0

AM Peak 0915 - 1015 (3), AM PHF=0.38 PM Peak 1300 - 1400 (6), PM PHF=0.75

* Thursday, October 17, 2013 - Total=37, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**3**	**0**	**0**	**2**	**1**	**4**	**0**	**2**	**3**	**1**	**8**	**4**	**3**	**2**	
0	0	0	0	0	0	0	0	0	**3**	1	0	0	0	0	2	0	1	0	0	**2**	1	0	0	0
0	0	0	0	0	0	0	0	**0**	0	1	0	0	1	0	0	0	0	2	0	**1**	2	0	1	0
0	0	0	0	0	0	0	0	**0**	0	1	0	0	0	0	1	0	0	1	0	**2**	1	0	1	0
0	0	0	0	0	0	1	0	**0**	0	0	0	0	1	1	1	0	1	0	1	**3**	0	3	0	0

AM Peak 0815 - 0915 (3), AM PHF=0.25 PM Peak 2000 - 2100 (8), PM PHF=0.67

* Friday, October 18, 2013 - Total=20 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**2**	**5**	**0**	**3**	**5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0	1	1	0	0	0	0	0	0	0	0	0	**0**	0	1	2	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	1	0	0	1	1	**0**	0	1	0	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	0	**2**	0	0	0	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	1	**1**	3	0	1	3	-	-	-	-	-	-	-	-	-

AM Peak 1145 - 1245 (3), AM PHF=0.38

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[8] 8**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: West (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 529 / 1011 (52.32%)

* Monday, October 14, 2013 - Total=34 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6**	**11**	**10**	**2**	**2**	**2**	**1**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	2	0	1	0	1	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	0	0	1	1	0	2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	4	3	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	5	2	0	1	0	0

* Tuesday, October 15, 2013 - Total=137, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	**0**	**0**	**0**	**0**	**2**	**1**	**6**	**6**	**4**	**6**	**11**	**8**	**6**	**7**	**13**	**9**	**6**	**10**	**15**	**12**	**9**	**2**	**2**	
0	0	0	0	0	0	0	0	1	1	1	3	**2**	1	4	3	3	1	5	**4**	3	2	0	0	1
2	0	0	0	0	1	1	4	3	0	2	0	**2**	0	1	2	3	1	2	**6**	4	3	2	0	0
0	0	0	0	0	1	0	2	2	1	3	**3**	2	3	0	2	2	1	1	**2**	4	2	0	2	0
0	0	0	0	0	0	0	0	0	2	0	**5**	2	2	2	6	1	3	2	**3**	1	2	0	0	0

AM Peak 1130 - 1230 (12), AM PHF=0.60 PM Peak 1900 - 2000 (15), PM PHF=0.63

* Wednesday, October 16, 2013 - Total=101, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**1**	**0**	**0**	**1**	**1**	**2**	**3**	**0**	**4**	**6**	**7**	**9**	**10**	**5**	**9**	**4**	**8**	**7**	**6**	**11**	**4**	**2**	
1	0	1	0	0	0	0	0	1	0	1	**2**	1	**3**	4	1	3	1	2	0	2	4	0	0	3
0	0	0	0	0	0	0	0	1	0	1	**1**	1	**4**	2	2	3	2	1	4	2	5	1	1	1
0	0	0	0	0	1	1	1	1	0	1	**2**	1	**2**	2	1	2	1	3	0	0	1	2	1	1
0	0	0	0	0	0	0	1	0	0	**1**	1	**4**	0	2	1	1	0	2	3	2	1	1	0	0

AM Peak 1045 - 1145 (6), AM PHF=0.75 PM Peak 1245 - 1345 (13), PM PHF=0.81

* Thursday, October 17, 2013 - Total=155, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
5	**1**	**0**	**0**	**1**	**1**	**2**	**2**	**2**	**4**	**4**	**14**	**4**	**6**	**7**	**9**	**15**	**14**	**17**	**14**	**13**	**8**	**4**	**8**	
3	1	0	0	1	0	0	2	0	1	1	**3**	1	1	0	1	3	4	**3**	7	7	2	0	1	0
1	0	0	0	0	0	1	0	1	0	2	**5**	1	1	3	3	6	1	**6**	3	4	1	1	1	0
1	0	0	0	0	0	1	0	0	2	0	**3**	1	0	1	2	3	2	**5**	3	1	3	1	4	2
0	0	0	0	0	1	0	0	1	1	1	**3**	1	4	3	3	3	**7**	3	1	1	2	2	2	0

AM Peak 1100 - 1200 (14), AM PHF=0.70 PM Peak 1745 - 1845 (21), PM PHF=0.75

* Friday, October 18, 2013 - Total=102 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	**0**	**0**	**0**	**0**	**0**	**3**	**5**	**3**	**7**	**5**	**15**	**14**	**14**	**17**	**17**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0	0	0	0	0	0	0	2	0	3	0	3	**6**	5	1	7	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	2	0	3	**5**	2	6	2	5	-	-	-	-	-	-	-	-	-
2	0	0	0	0	0	3	1	0	2	2	**2**	4	1	5	2	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	2	1	2	0	**5**	2	2	9	3	-	-	-	-	-	-	-	-	-

AM Peak 1115 - 1215 (18), AM PHF=0.75

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[8] 8**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: East (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 459 / 1011 (45.40%)

* Monday, October 14, 2013 - Total=36 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**6**	**10**	**5**	**5**	**5**	**4**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	3	1	0	2	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	4	0	2	1	1	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3	1	1	1	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	3	1	1	3	1	0

* Tuesday, October 15, 2013 - Total=108, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**1**	**0**	**4**	**1**	**1**	**5**	**10**	**4**	**4**	**8**	**13**	**7**	**3**	**8**	**15**	**10**	**7**	**4**	**3**	
0	0	0	0	0	0	0	0	0	0	1	**4**	2	2	5	4	2	1	3	**5**	0	2	2	0	1
0	0	0	0	0	1	0	1	1	0	0	**0**	0	1	1	2	3	0	2	**5**	4	2	2	1	0
0	0	0	0	0	0	0	3	0	0	3	**4**	1	1	0	2	1	1	2	**0**	2	1	0	2	0
0	0	0	0	0	0	0	0	0	1	1	**2**	1	0	2	5	1	1	1	**5**	4	2	0	0	0

AM Peak 1100 - 1200 (10), AM PHF=0.63 PM Peak 1900 - 2000 (15), PM PHF=0.75

* Wednesday, October 16, 2013 - Total=96, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**3**	**1**	**2**	**4**	**9**	**9**	**7**	**7**	**7**	**6**	**4**	**3**	**6**	**15**	**6**	**4**	
1	0	0	0	0	0	0	0	0	0	0	0	**2**	2	2	2	1	0	1	0	4	**5**	3	0	1
0	0	0	0	0	0	0	0	1	0	1	1	**4**	3	2	2	3	1	0	1	1	**5**	1	2	0
0	0	0	0	0	0	0	1	2	0	1	**1**	0	4	1	1	0	4	2	0	0	**2**	1	1	1
0	0	0	0	0	0	0	1	0	1	0	**2**	3	0	2	2	3	1	1	2	1	**3**	1	1	1

AM Peak 1130 - 1230 (9), AM PHF=0.56 PM Peak 2100 - 2200 (15), PM PHF=0.75

* Thursday, October 17, 2013 - Total=121, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**2**	**13**	**6**	**8**	**8**	**6**	**8**	**7**	**9**	**8**	**19**	**10**	**3**	**6**	
1	0	0	0	0	0	0	1	0	1	0	**3**	2	2	1	1	3	1	2	3	**9**	2	1	2	4
0	0	0	0	0	0	0	0	0	0	1	**4**	1	2	3	2	4	2	4	0	**7**	3	1	0	2
1	0	0	0	0	0	0	0	0	0	0	**3**	1	2	2	0	0	1	3	**3**	0	2	0	3	0
1	1	0	0	0	0	0	0	1	1	1	**3**	2	2	2	3	1	3	0	**2**	3	3	1	1	0

AM Peak 1100 - 1200 (13), AM PHF=0.81 PM Peak 1930 - 2030 (21), PM PHF=0.58

* Friday, October 18, 2013 - Total=98 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
6	**0**	**0**	**0**	**0**	**0**	**2**	**4**	**3**	**7**	**8**	**16**	**17**	**9**	**14**	**12**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
4	0	0	0	0	0	0	3	0	3	1	5	**6**	5	4	8	-	-	-	-	-	-	-	-	-
2	0	0	0	0	0	0	0	1	0	3	**4**	3	2	0	3	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	2	0	1	3	2	**4**	5	1	5	0	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	1	1	1	2	**3**	3	1	5	1	-	-	-	-	-	-	-	-	-

AM Peak 1115 - 1215 (17), AM PHF=0.71

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[7] 7**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: West (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 211 / 509 (41.45%)

* Monday, October 14, 2013 - Total=25 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**6**	**4**	**6**	**4**	**1**	**1**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	2	2	1	1	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	0	1	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	3	2	1	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	1	2	2	0	0	0

* Tuesday, October 15, 2013 - Total=46, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**1**	**0**	**2**	**0**	**2**	**2**	**1**	**3**	**7**	**5**	**8**	**5**	**4**	**2**	**2**	**0**	
0	0	0	0	0	0	0	0	0	0	**0**	0	1	1	0	0	3	1	**3**	0	3	0	0	0	0
0	0	0	0	0	1	0	0	0	0	**0**	0	1	1	0	2	1	0	**4**	0	1	1	2	0	0
0	0	0	0	0	0	1	0	1	0	**0**	0	0	0	1	1	0	**2**	1	0	0	1	0	0	0
0	0	0	0	0	0	0	0	0	0	**2**	0	0	0	0	0	3	**2**	0	5	0	0	0	0	0

AM Peak 1000 - 1100 (2), AM PHF=0.25 PM Peak 1730 - 1830 (11), PM PHF=0.69

* Wednesday, October 16, 2013 - Total=36, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**0**	**3**	**2**	**1**	**5**	**1**	**3**	**9**	**1**	**1**	**1**	**1**	**3**	**1**	
0	0	0	0	0	0	0	0	1	0	0	**0**	0	0	3	0	0	**3**	0	0	1	0	2	0	0
0	0	0	0	0	0	0	0	0	0	0	**1**	1	1	0	1	1	**3**	0	0	0	0	0	1	0
0	0	0	0	0	0	0	0	1	0	0	**1**	0	0	1	0	2	**2**	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	2	0	**1**	1	0	1	0	0	**1**	0	1	0	1	1	0	0

AM Peak 1100 - 1200 (3), AM PHF=0.75 PM Peak 1700 - 1800 (9), PM PHF=0.75

* Thursday, October 17, 2013 - Total=62, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**6**	**4**	**2**	**3**	**1**	**7**	**5**	**9**	**8**	**4**	**6**	**3**	**0**	
0	0	0	0	0	0	0	0	0	0	0	**4**	0	1	0	0	1	0	2	**1**	2	1	1	0	0
0	0	0	0	0	0	0	0	0	0	0	**1**	0	1	3	0	3	2	2	**2**	0	3	0	0	0
0	0	0	0	0	0	0	0	0	1	**2**	1	3	0	0	1	1	1	3	**5**	1	1	1	0	0
0	0	0	0	0	0	0	0	1	0	**0**	0	1	0	0	0	2	2	**2**	0	1	1	1	0	0

AM Peak 1030 - 1130 (7), AM PHF=0.44 PM Peak 1845 - 1945 (10), PM PHF=0.50

* Friday, October 18, 2013 - Total=42 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**2**	**7**	**12**	**5**	**7**	**6**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0	0	0	0	0	0	0	0	2	0	0	2	**6**	1	2	3	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	1	1	**2**	2	2	0	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	1	0	1	**4**	3	2	3	2	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	0	**0**	1	0	0	1	-	-	-	-	-	-	-	-	-

AM Peak 1130 - 1230 (12), AM PHF=0.50

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[7] 7**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: East (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 283 / 509 (55.60%)

* Monday, October 14, 2013 - Total=24 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**4**	**3**	**6**	**6**	**0**	**2**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	0	1	3	0	2	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	0	2	1	0	0	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	1	1	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	2	2	2	0	0	0

* Tuesday, October 15, 2013 - Total=71, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**1**	**1**	**2**	**2**	**2**	**2**	**1**	**7**	**7**	**7**	**8**	**8**	**7**	**8**	**2**	**1**	
0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	1	3	2	1	1	**2**	1	0	0	1
1	0	0	0	0	1	0	**2**	1	1	1	0	1	2	0	3	0	3	6	2	**3**	0	1	0	0
0	0	0	0	0	0	**1**	0	0	0	1	1	1	0	0	1	3	1	0	**0**	0	3	0	0	0
0	0	0	0	0	0	**0**	0	0	0	0	1	0	0	1	2	1	1	1	**5**	2	4	1	1	0

AM Peak 0630 - 0730 (3), AM PHF=0.38 PM Peak 1930 - 2030 (10), PM PHF=0.50

* Wednesday, October 16, 2013 - Total=51, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**4**	**1**	**4**	**5**	**2**	**3**	**8**	**3**	**4**	**5**	**3**	**3**	**2**	
1	0	0	0	0	0	0	0	0	0	0	**0**	0	0	1	1	0	**1**	1	0	3	0	1	1	0
0	0	0	0	0	0	0	1	0	0	0	**2**	0	0	0	1	2	**5**	0	2	0	1	0	1	0
0	0	0	0	0	0	1	0	0	0	1	**1**	0	3	2	0	0	**0**	1	0	2	0	1	0	0
0	0	0	0	0	0	0	0	0	0	0	**1**	1	1	2	0	1	**2**	1	2	0	2	1	0	0

AM Peak 1100 - 1200 (4), AM PHF=0.50 PM Peak 1700 - 1800 (8), PM PHF=0.40

* Thursday, October 17, 2013 - Total=91, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**2**	**1**	**6**	**5**	**3**	**2**	**5**	**8**	**10**	**8**	**14**	**4**	**12**	**6**	**2**	
0	0	0	0	0	0	0	0	0	0	1	**2**	1	0	0	2	3	3	3	**1**	0	4	3	1	0
0	0	0	0	0	0	0	1	1	1	0	**2**	0	0	2	1	2	2	2	**3**	2	6	2	1	0
0	0	0	0	0	0	1	0	0	1	0	**2**	3	2	0	2	1	1	1	**7**	1	1	0	0	0
0	0	0	0	0	0	0	0	0	0	**0**	0	1	1	0	0	2	4	2	**3**	1	1	1	0	0

AM Peak 1045 - 1145 (6), AM PHF=0.75 PM Peak 1900 - 2000 (14), PM PHF=0.50

* Friday, October 18, 2013 - Total=46 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**5**	**3**	**9**	**6**	**10**	**9**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0	0	0	0	0	0	0	0	0	0	0	1	**4**	0	4	2	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	1	0	0	1	0	**2**	5	2	2	-	-	-	-	-	-	-	-	-
0	0	1	0	0	0	0	0	0	1	3	2	**3**	1	4	4	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	1	0	0	1	**0**	0	0	0	1	-	-	-	-	-	-	-	-	-

AM Peak 1145 - 1245 (9), AM PHF=0.56

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[6] 6**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: West (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 887 / 1802 (49.22%)

* Monday, October 14, 2013 - Total=57 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**7**	**19**	**10**	**11**	**3**	**5**	**2**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	4	4	3	1	3	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	4	1	2	2	0	0	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	8	4	4	0	1	1	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	1	2	0	1	1	0

* Tuesday, October 15, 2013 - Total=199, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**2**	**2**	**0**	**1**	**1**	**3**	**6**	**6**	**5**	**6**	**18**	**11**	**9**	**12**	**23**	**11**	**14**	**13**	**19**	**7**	**12**	**14**	**3**	
0	2	0	0	0	0	1	2	2	1	4	**7**	3	1	3	**7**	0	5	5	6	1	1	8	0	0
1	0	0	0	0	0	1	0	1	1	0	**3**	3	4	3	**2**	5	2	3	1	3	5	2	2	0
0	0	2	0	0	0	0	2	3	1	1	**2**	2	1	2	**7**	2	2	2	5	1	1	3	0	0
0	0	0	0	1	1	1	2	0	2	1	**6**	3	3	4	**7**	4	5	3	7	2	5	1	1	0

AM Peak 1100 - 1200 (18), AM PHF=0.64 PM Peak 1500 - 1600 (23), PM PHF=0.82

* Wednesday, October 16, 2013 - Total=169, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**1**	**0**	**0**	**1**	**0**	**6**	**1**	**2**	**3**	**7**	**13**	**10**	**11**	**12**	**13**	**13**	**13**	**17**	**16**	**9**	**5**	**7**	**9**	
0	1	0	0	1	0	1	0	0	0	1	**3**	1	1	2	3	3	4	3	**5**	4	1	3	3	1
0	0	0	0	0	0	1	1	1	0	2	**3**	1	3	6	1	6	4	3	**6**	2	1	1	2	0
0	0	0	0	0	0	0	0	1	1	2	**3**	6	5	4	1	3	2	**10**	1	1	0	1	2	1
0	0	0	0	0	0	4	0	0	2	2	**4**	2	2	0	8	1	3	**1**	4	2	3	2	2	1

AM Peak 1100 - 1200 (13), AM PHF=0.81 PM Peak 1830 - 1930 (22), PM PHF=0.55

* Thursday, October 17, 2013 - Total=273, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	**0**	**0**	**0**	**0**	**3**	**3**	**5**	**3**	**14**	**9**	**24**	**10**	**14**	**12**	**20**	**17**	**16**	**36**	**26**	**27**	**17**	**7**	**7**	
1	0	0	0	0	1	2	1	2	4	2	**5**	2	3	4	8	6	4	**12**	3	4	7	0	2	1
0	0	0	0	0	1	0	0	0	1	1	**4**	2	1	3	3	4	3	**3**	4	5	3	4	3	4
1	0	0	0	0	1	0	2	1	3	4	**8**	2	2	4	3	6	2	**12**	11	12	4	1	1	0
1	0	0	0	0	0	1	2	0	6	2	**7**	4	8	1	6	1	7	**9**	8	6	3	2	1	1

AM Peak 1100 - 1200 (24), AM PHF=0.75 PM Peak 1800 - 1900 (36), PM PHF=0.75

* Friday, October 18, 2013 - Total=189 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
6	**6**	**1**	**0**	**0**	**1**	**3**	**6**	**9**	**14**	**18**	**16**	**26**	**30**	**27**	**26**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
1	2	0	0	0	0	1	1	4	2	5	4	**6**	9	6	4	-	-	-	-	-	-	-	-	-
4	2	0	0	0	0	0	2	1	4	3	5	**7**	9	7	8	-	-	-	-	-	-	-	-	-
0	1	0	0	0	1	0	1	2	2	4	4	**7**	6	7	10	-	-	-	-	-	-	-	-	-
1	1	1	0	0	0	2	2	2	6	6	**3**	6	6	7	4	-	-	-	-	-	-	-	-	-

AM Peak 1145 - 1245 (23), AM PHF=0.82

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[6] 6**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: East (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 886 / 1802 (49.17%)

* Monday, October 14, 2013 - Total=59 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8**	**18**	**14**	**10**	**4**	**4**	**1**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	5	2	5	1	1	0	2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	4	2	1	2	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	5	0	1	2	0	0	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6	8	2	0	1	0	0

* Tuesday, October 15, 2013 - Total=218, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
4	**4**	**1**	**0**	**1**	**0**	**0**	**7**	**6**	**6**	**6**	**15**	**7**	**9**	**13**	**22**	**17**	**10**	**29**	**8**	**12**	**21**	**19**	**1**	
2	2	0	0	0	0	0	2	2	4	0	**3**	3	3	4	8	3	3	**4**	1	3	4	7	0	0
1	1	0	0	0	0	0	2	0	1	0	**5**	1	1	4	4	9	2	**7**	1	2	9	5	1	0
1	0	1	0	0	0	0	3	3	1	2	**3**	3	2	1	3	2	1	**7**	5	4	3	3	0	0
0	1	0	0	1	0	0	0	1	0	**4**	4	0	3	4	7	3	4	**11**	1	3	5	4	0	2

AM Peak 1045 - 1145 (15), AM PHF=0.75 PM Peak 1800 - 1900 (29), PM PHF=0.66

* Wednesday, October 16, 2013 - Total=180, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**3**	**4**	**10**	**5**	**8**	**11**	**10**	**14**	**16**	**17**	**12**	**25**	**16**	**11**	**6**	**5**	
0	0	0	0	0	0	0	2	0	2	1	**2**	1	0	4	7	4	4	2	**5**	4	2	3	1	0
0	0	0	0	0	0	0	1	0	0	**5**	0	1	7	2	2	4	7	3	**4**	2	3	3	2	0
0	0	0	0	0	0	0	2	2	1	**2**	1	4	2	3	4	2	3	5	**7**	3	5	0	0	0
2	0	0	0	0	0	0	0	1	1	**2**	2	2	2	1	1	6	3	2	**9**	7	1	0	2	2

AM Peak 1015 - 1115 (11), AM PHF=0.55 PM Peak 1900 - 2000 (25), PM PHF=0.69

* Thursday, October 17, 2013 - Total=258, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	**1**	**0**	**0**	**0**	**1**	**0**	**4**	**7**	**9**	**14**	**12**	**11**	**18**	**20**	**13**	**18**	**14**	**21**	**20**	**27**	**21**	**13**	**12**	
0	1	0	0	0	1	0	0	3	1	1	**4**	3	3	3	6	5	1	5	3	4	**11**	3	3	5
0	0	0	0	0	0	0	0	0	1	2	**5**	2	3	6	3	5	3	1	4	**9**	3	4	3	3
0	0	0	0	0	0	0	3	4	5	**8**	1	3	2	4	1	7	4	8	10	**11**	4	4	3	4
2	0	0	0	0	0	0	1	0	2	**3**	2	3	10	7	3	1	6	7	3	**3**	3	2	3	0

AM Peak 1030 - 1130 (20), AM PHF=0.63 PM Peak 2015 - 2115 (34), PM PHF=0.77

* Friday, October 18, 2013 - Total=171 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
12	**2**	**1**	**0**	**0**	**0**	**0**	**5**	**5**	**12**	**17**	**16**	**23**	**27**	**21**	**30**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
5	1	0	0	0	0	0	3	0	4	5	4	**5**	12	2	8	-	-	-	-	-	-	-	-	-
3	1	1	0	0	0	0	1	2	3	3	2	**1**	6	9	8	-	-	-	-	-	-	-	-	-
4	0	0	0	0	0	0	0	1	1	5	3	**9**	4	3	6	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	1	2	4	4	**7**	8	5	7	8	-	-	-	-	-	-	-	-	-

AM Peak 1145 - 1245 (22), AM PHF=0.61

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[5] 5**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: South (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 449 / 945 (47.51%)

* Monday, October 14, 2013 - Total=35 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6**	**7**	**4**	**5**	**6**	**4**	**3**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	1	1	3	2	2	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	2	1	1	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	2	1	0	1	0	1	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	1	0	2	1	1	1

* Tuesday, October 15, 2013 - Total=110, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	**3**	**2**	**1**	**0**	**1**	**0**	**0**	**5**	**6**	**6**	**6**	**7**	**1**	**5**	**10**	**6**	**6**	**5**	**13**	**9**	**6**	**6**	**4**	
0	2	0	0	0	1	0	0	2	2	0	1	**2**	1	3	2	0	2	2	**4**	4	1	0	2	1
1	0	0	0	0	0	0	0	0	0	3	1	**2**	0	1	1	1	1	0	**3**	1	3	1	0	0
0	0	2	1	0	0	0	0	2	3	2	**3**	1	0	1	4	2	3	2	**3**	2	0	3	1	1
1	1	0	0	0	0	0	0	1	1	1	**1**	2	0	0	3	3	0	1	**3**	2	2	2	1	0

AM Peak 1130 - 1230 (8), AM PHF=0.67 PM Peak 1900 - 2000 (13), PM PHF=0.81

* Wednesday, October 16, 2013 - Total=99, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	**0**	**1**	**0**	**0**	**0**	**1**	**2**	**3**	**6**	**2**	**9**	**2**	**6**	**4**	**8**	**8**	**11**	**2**	**8**	**6**	**7**	**8**	**3**	
1	0	0	0	0	0	0	0	0	1	2	**1**	0	0	0	2	4	**2**	1	1	2	2	2	1	1
0	0	0	0	0	0	0	0	0	2	0	**1**	0	1	2	2	2	**1**	0	2	2	4	1	1	1
1	0	1	0	0	0	0	1	0	1	0	**2**	1	2	1	1	1	**3**	1	3	2	1	1	0	2
0	0	0	0	0	0	1	1	3	2	0	**5**	1	3	1	3	1	**5**	0	2	0	0	4	1	0

AM Peak 1100 - 1200 (9), AM PHF=0.45 PM Peak 1700 - 1800 (11), PM PHF=0.55

* Thursday, October 17, 2013 - Total=138, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
4	**1**	**0**	**0**	**0**	**1**	**1**	**2**	**4**	**3**	**4**	**8**	**1**	**5**	**9**	**2**	**7**	**15**	**15**	**14**	**12**	**14**	**9**	**7**	
1	1	0	0	0	0	1	1	1	1	2	**3**	0	0	2	1	1	5	2	**4**	5	5	2	1	0
1	0	0	0	0	1	0	0	1	0	0	**3**	1	0	2	0	2	2	3	**4**	2	1	2	2	2
2	0	0	0	0	0	0	0	1	0	**2**	0	0	3	4	0	2	3	**6**	4	3	5	3	2	2
0	0	0	0	0	0	0	1	1	2	**0**	2	0	2	1	1	2	5	**4**	2	2	3	2	2	0

AM Peak 1030 - 1130 (8), AM PHF=0.67 PM Peak 1830 - 1930 (18), PM PHF=0.75

* Friday, October 18, 2013 - Total=67 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
4	**5**	**2**	**2**	**0**	**0**	**1**	**1**	**1**	**6**	**5**	**6**	**7**	**10**	**11**	**6**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0	2	1	0	0	0	0	0	0	0	**2**	2	1	2	2	0	-	-	-	-	-	-	-	-	-
2	1	0	2	0	0	0	1	0	1	**2**	1	1	1	3	1	-	-	-	-	-	-	-	-	-
2	1	0	0	0	0	0	0	1	**3**	0	1	1	3	3	2	-	-	-	-	-	-	-	-	-
0	1	1	0	0	0	1	0	0	**2**	1	2	4	4	3	3	-	-	-	-	-	-	-	-	-

AM Peak 0930 - 1030 (9), AM PHF=0.75

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[5] 5**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: North (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 460 / 945 (48.68%)

* Monday, October 14, 2013 - Total=33 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**6**	**9**	**4**	**5**	**3**	**3**	**3**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3	1	1	1	1	2	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2	1	2	0	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	0	1	0	2	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	4	1	2	0	0	0	0

* Tuesday, October 15, 2013 - Total=108, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**3**	**2**	**0**	**1**	**0**	**1**	**4**	**5**	**5**	**2**	**7**	**6**	**4**	**5**	**11**	**5**	**7**	**11**	**7**	**7**	**8**	**5**	**1**	
0	2	0	0	0	0	0	1	1	1	0	1	**3**	1	0	3	1	1	**1**	1	1	2	2	1	0
1	1	1	0	0	0	0	1	1	0	1	0	**1**	2	3	0	3	0	**6**	2	3	4	0	0	0
0	0	1	0	1	0	0	0	3	1	0	**2**	0	0	1	4	1	**2**	1	4	3	0	1	0	0
0	0	0	0	0	0	1	2	0	3	1	**4**	2	1	1	4	0	**4**	3	0	0	2	2	0	1

AM Peak 1130 - 1230 (10), AM PHF=0.63 PM Peak 1730 - 1830 (13), PM PHF=0.54

* Wednesday, October 16, 2013 - Total=106, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**1**	**0**	**0**	**0**	**0**	**0**	**3**	**5**	**5**	**5**	**6**	**9**	**3**	**6**	**9**	**11**	**7**	**11**	**3**	**9**	**5**	**3**	**4**	
0	1	0	0	0	0	0	0	2	4	1	2	**3**	0	1	**2**	4	3	1	1	3	3	1	1	1
0	0	0	0	0	0	0	2	1	0	3	0	**1**	1	0	**3**	3	0	4	0	1	1	2	1	0
0	0	0	0	0	0	0	0	2	0	0	0	**2**	0	2	**3**	1	1	3	1	1	1	0	1	0
1	0	0	0	0	0	0	1	0	1	1	**4**	3	2	**3**	1	3	3	3	1	4	0	0	1	0

AM Peak 1145 - 1245 (10), AM PHF=0.63 PM Peak 1445 - 1545 (11), PM PHF=0.92

* Thursday, October 17, 2013 - Total=123, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**1**	**0**	**1**	**0**	**0**	**0**	**2**	**5**	**4**	**7**	**4**	**10**	**5**	**8**	**10**	**9**	**8**	**14**	**15**	**5**	**7**	**3**	**4**	
1	0	0	0	0	0	0	2	2	0	2	1	**5**	0	3	3	3	1	**3**	4	0	2	1	0	0
0	1	0	1	0	0	0	0	1	2	3	**2**	1	2	1	2	3	2	**4**	3	4	0	0	3	2
0	0	0	0	0	0	0	0	2	1	0	**1**	2	1	2	3	3	3	**7**	4	1	4	0	0	1
0	0	0	0	0	0	0	0	0	0	1	2	**0**	2	2	2	2	0	**2**	0	4	0	1	2	1	0

AM Peak 1115 - 1215 (8), AM PHF=0.40 PM Peak 1745 - 1845 (16), PM PHF=0.57

* Friday, October 18, 2013 - Total=90 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	**2**	**1**	**2**	**0**	**0**	**3**	**3**	**4**	**6**	**7**	**9**	**16**	**9**	**12**	**13**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0	0	0	2	0	0	1	0	1	4	1	4	**6**	0	4	6	-	-	-	-	-	-	-	-	-
2	0	0	0	0	0	0	1	2	0	4	0	**5**	2	4	4	-	-	-	-	-	-	-	-	-
1	2	1	0	0	0	1	0	0	1	1	**2**	1	5	3	2	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	1	2	1	1	1	**3**	4	2	1	1	-	-	-	-	-	-	-	-	-

AM Peak 1130 - 1230 (16), AM PHF=0.67

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[4] 4**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: South (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 247 / 560 (44.11%)

* Monday, October 14, 2013 - Total=27 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**5**	**3**	**8**	**4**	**2**	**2**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	1	3	2	1	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	0	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	1	0	1	1	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	0	4	0	0	0	1

* Tuesday, October 15, 2013 - Total=68, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**2**	**2**	**3**	**2**	**2**	**4**	**3**	**8**	**5**	**9**	**6**	**5**	**7**	**1**	
1	**2**	0	0	0	0	0	0	0	0	1	2	2	1	0	2	0	2	**3**	2	1	3	3	0	1
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**2**	1	2	1	2	1	1	1
0	0	1	0	0	0	0	0	1	1	1	0	0	0	1	1	0	**0**	1	2	2	0	2	0	1
1	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	2	**4**	0	3	2	0	1	0	0

AM Peak 0015 - 0115 (4), AM PHF=0.50 PM Peak 1715 - 1815 (9), PM PHF=0.56

* Wednesday, October 16, 2013 - Total=50, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**2**	**3**	**1**	**2**	**1**	**1**	**2**	**3**	**8**	**3**	**3**	**1**	**5**	**5**	**2**	**3**	
1	0	0	0	1	0	0	0	0	**1**	1	0	1	0	1	0	**2**	1	3	0	0	2	1	1	0
1	0	0	0	0	0	0	1	0	**0**	0	0	0	0	1	1	**2**	0	0	0	2	3	0	0	2
1	0	0	0	0	0	0	0	1	**2**	0	2	0	0	0	2	**4**	1	0	0	1	0	1	0	0
0	0	0	0	0	0	0	0	**1**	0	0	0	0	1	0	**0**	0	1	0	1	2	0	0	2	0

AM Peak 0845 - 0945 (4), AM PHF=0.50 PM Peak 1545 - 1645 (8), PM PHF=0.50

* Thursday, October 17, 2013 - Total=65, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**2**	**4**	**2**	**3**	**6**	**5**	**5**	**6**	**8**	**7**	**3**	**5**	**2**	**1**	
0	0	0	0	0	0	0	0	0	0	0	**4**	0	1	2	0	**2**	1	2	1	2	1	1	0	2
2	0	0	0	0	0	0	0	2	2	**0**	0	0	0	1	2	**3**	3	1	1	1	1	1	0	0
0	0	0	0	0	0	0	0	0	0	**0**	0	2	2	2	**2**	0	2	3	3	0	2	0	1	2
0	0	0	0	0	0	0	0	0	0	**2**	0	0	0	1	**1**	0	0	2	2	0	1	0	0	1

AM Peak 1015 - 1115 (6), AM PHF=0.38 PM Peak 1530 - 1630 (8), PM PHF=0.67

* Friday, October 18, 2013 - Total=37 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
5	**2**	**1**	**0**	**0**	**0**	**1**	**3**	**3**	**2**	**3**	**1**	**2**	**2**	**5**	**7**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
2	0	0	0	0	0	0	0	2	0	0	1	1	0	1	2	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	1	0	0	1	0	1	1	1	1	-	-	-	-	-	-	-	-	-
2	2	1	0	0	0	1	2	0	0	2	0	0	0	2	2	-	-	-	-	-	-	-	-	-
1	0	0	0	0	0	0	0	1	2	0	0	0	1	1	2	-	-	-	-	-	-	-	-	-

AM Peak 0000 - 0100 (5), AM PHF=0.63

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[4] 4**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: North (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 290 / 560 (51.79%)

* Monday, October 14, 2013 - Total=19 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4**	**5**	**2**	**4**	**0**	**3**	**1**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2	0	1	0	2	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0	1	0	0	0	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	1	0	0	1	0	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	3	0	0	0	0

* Tuesday, October 15, 2013 - Total=79, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	**1**	**1**	**0**	**0**	**0**	**3**	**2**	**2**	**3**	**3**	**5**	**3**	**4**	**7**	**1**	**5**	**5**	**11**	**7**	**5**	**3**	**6**	**0**	
0	0	1	0	0	0	0	0	1	0	1	**1**	0	0	3	1	0	1	0	**2**	0	0	3	0	1
1	0	0	0	0	0	1	0	1	2	1	**1**	2	3	0	0	0	1	**3**	2	2	1	2	0	0
1	0	0	0	0	0	1	1	0	0	0	**0**	0	0	1	0	4	2	**5**	0	2	1	1	0	0
0	1	0	0	0	0	1	1	0	1	1	**3**	1	1	3	0	1	1	**3**	3	1	1	0	0	0

AM Peak 1100 - 1200 (5), AM PHF=0.42 PM Peak 1815 - 1915 (13), PM PHF=0.65

* Wednesday, October 16, 2013 - Total=64, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**0**	**2**	**3**	**3**	**4**	**4**	**1**	**4**	**2**	**7**	**7**	**3**	**2**	**8**	**5**	**3**	**2**	**1**	**2**	
1	0	0	0	0	0	1	0	**2**	1	1	0	1	0	0	1	**1**	0	0	0	1	0	0	1	0
0	0	0	0	0	0	0	**1**	1	2	1	0	1	1	0	0	**2**	0	1	1	0	0	1	0	0
0	0	0	0	0	0	1	**2**	0	1	0	1	1	0	5	**4**	0	0	5	2	0	1	0	0	0
0	0	0	0	0	0	0	**0**	0	0	2	0	1	1	2	**2**	0	2	2	2	2	1	0	1	0

AM Peak 0715 - 0815 (5), AM PHF=0.63 PM Peak 1530 - 1630 (9), PM PHF=0.56

* Thursday, October 17, 2013 - Total=76, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**6**	**4**	**3**	**6**	**5**	**3**	**7**	**4**	**3**	**7**	**9**	**7**	**4**	**0**	**2**	**3**	
0	0	0	0	0	0	1	0	**3**	2	0	2	1	1	1	2	0	1	**4**	3	3	0	1	1	1
0	0	0	0	0	0	0	1	**1**	1	0	0	0	2	1	1	1	**2**	1	2	0	0	1	2	0
0	0	0	0	0	0	0	0	**1**	1	2	1	0	0	2	0	1	**3**	3	0	1	0	0	0	0
0	0	0	0	0	0	0	**1**	1	0	1	3	4	0	3	1	1	**1**	1	2	0	0	0	0	0

AM Peak 0745 - 0845 (6), AM PHF=0.50 PM Peak 1715 - 1815 (10), PM PHF=0.63

* Friday, October 18, 2013 - Total=52 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**0**	**4**	**5**	**3**	**2**	**6**	**3**	**6**	**6**	**11**	**5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
1	0	0	0	0	0	1	1	0	1	**3**	2	2	1	4	1	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	1	1	1	1	**2**	0	1	3	2	0	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	2	2	1	0	**1**	0	2	1	2	2	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	1	1	**0**	0	1	1	1	3	2	-	-	-	-	-	-	-	-	-

AM Peak 0945 - 1045 (6), AM PHF=0.50

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[3] 3**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: South (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 157 / 439 (35.76%)

* Monday, October 14, 2013 - Total=13 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4**	**2**	**3**	**0**	**2**	**1**	**1**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	0	0	1	1	1	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	2	0	1	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	1	0	0	0	0	0

* Tuesday, October 15, 2013 - Total=35, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**3**	**3**	**0**	**1**	**5**	**2**	**2**	**1**	**4**	**2**	**1**	**3**	**2**	**1**	**1**	**2**	
0	0	0	0	0	0	0	0	1	**2**	0	0	**2**	0	1	0	2	1	0	0	1	1	0	0	0
0	0	0	0	0	1	0	0	**1**	0	0	0	**0**	2	1	0	1	0	1	0	0	0	1	1	0
0	0	0	0	0	0	0	1	**1**	1	0	0	**1**	0	0	1	0	1	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	**0**	0	0	1	**2**	0	0	0	1	0	0	3	1	0	0	1	1

AM Peak 0815 - 0915 (4), AM PHF=0.50 PM Peak 1200 - 1300 (5), PM PHF=0.63

* Wednesday, October 16, 2013 - Total=41, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**5**	**4**	**1**	**6**	**0**	**3**	**4**	**3**	**1**	**2**	**2**	**1**	**3**	**1**	**2**	**0**	
0	0	1	0	0	0	0	0	1	1	1	**1**	0	0	0	**0**	1	0	0	0	1	0	1	0	0
0	0	0	0	0	1	0	0	0	0	0	**1**	0	1	0	**1**	0	0	1	0	1	0	1	0	0
0	0	0	0	0	0	0	0	3	2	0	**3**	0	2	**2**	1	0	1	1	1	1	0	0	0	1
1	0	0	0	0	0	0	0	1	1	0	**1**	0	0	**2**	1	0	1	0	0	0	1	0	0	0

AM Peak 1100 - 1200 (6), AM PHF=0.50 PM Peak 1430 - 1530 (5), PM PHF=0.63

* Thursday, October 17, 2013 - Total=38, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**3**	**1**	**0**	**3**	**0**	**3**	**4**	**2**	**4**	**1**	**6**	**4**	**1**	**3**	
0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	1	**1**	0	2	0	2	1	0	0	0
0	0	0	0	0	1	0	0	0	0	**0**	0	0	0	0	0	**2**	0	0	0	2	1	0	1	0
1	0	0	0	0	0	0	0	1	0	**2**	0	0	1	0	0	**1**	1	1	1	1	1	0	1	0
0	0	0	0	0	0	0	0	0	**0**	0	1	0	2	0	**2**	0	1	1	0	1	1	1	1	0

AM Peak 0945 - 1045 (3), AM PHF=0.38 PM Peak 1545 - 1645 (6), PM PHF=0.75

* Friday, October 18, 2013 - Total=30 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**2**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**2**	**3**	**5**	**4**	**4**	**3**	**5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0	1	0	0	0	0	0	0	0	1	1	**1**	1	1	0	1	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	1	0	**2**	1	1	0	0	-	-	-	-	-	-	-	-	-
0	0	1	0	0	0	0	1	0	0	0	**1**	0	0	0	3	-	-	-	-	-	-	-	-	-
0	1	0	0	0	0	0	0	0	0	**2**	1	2	2	3	1	-	-	-	-	-	-	-	-	-

AM Peak 1045 - 1145 (6), AM PHF=0.75

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[3] 3**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: North (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 242 / 439 (55.13%)

* Monday, October 14, 2013 - Total=16 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**4**	**1**	**2**	**2**	**2**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	1	0	0	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	2	0	2	1	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	2	0	0	1	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	0	0	0	0	0	0

* Tuesday, October 15, 2013 - Total=46, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**5**	**2**	**4**	**7**	**1**	**2**	**1**	**2**	**2**	**2**	**4**	**3**	**2**	**5**	**0**	
1	0	0	0	0	0	0	0	1	0	0	0	**3**	0	1	0	0	0	0	1	0	2	0	0	0
1	0	0	0	0	0	0	0	0	3	0	0	**1**	1	0	0	2	0	1	0	0	0	3	0	0
0	0	0	0	0	0	1	0	0	1	1	**4**	**1**	0	1	0	0	2	1	1	2	0	1	0	0
0	0	0	0	0	0	0	0	0	1	1	**0**	**2**	0	0	1	0	0	0	2	1	0	1	0	0

AM Peak 1130 - 1230 (8), AM PHF=0.50 PM Peak 1200 - 1300 (7), PM PHF=0.58

* Wednesday, October 16, 2013 - Total=58, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**4**	**2**	**2**	**6**	**5**	**4**	**5**	**5**	**1**	**2**	**3**	**3**	**3**	**7**	**4**	**1**	
0	0	0	0	0	0	0	0	1	2	0	1	**1**	0	1	1	0	0	0	1	1	**2**	1	0	0
0	0	0	0	0	0	0	0	0	0	1	2	**3**	1	0	0	0	0	1	1	0	**3**	1	0	0
0	0	0	0	0	0	0	0	2	0	1	**2**	0	2	3	0	0	2	1	0	**1**	0	1	0	1
0	0	0	0	0	0	1	0	1	0	0	**1**	1	1	1	4	1	0	1	1	**1**	2	1	1	0

AM Peak 1130 - 1230 (7), AM PHF=0.58 PM Peak 2030 - 2130 (7), PM PHF=0.58

* Thursday, October 17, 2013 - Total=56, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**2**	**2**	**0**	**4**	**4**	**0**	**10**	**6**	**12**	**3**	**3**	**3**	**1**	**3**	
0	0	0	0	0	0	0	0	0	1	**1**	0	0	1	2	0	2	1	**4**	0	1	1	0	1	2
0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	1	0	7	2	**3**	0	1	1	0	0	0
1	0	0	0	0	1	0	0	0	**0**	0	2	0	1	0	0	0	1	**4**	2	0	1	1	1	1
0	0	0	0	0	0	0	0	0	**0**	0	0	0	2	1	0	1	**2**	1	1	1	0	0	1	0

AM Peak 0930 - 1030 (2), AM PHF=0.50 PM Peak 1745 - 1845 (13), PM PHF=0.81

* Friday, October 18, 2013 - Total=66 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**2**	**4**	**7**	**13**	**8**	**9**	**9**	**9**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
2	0	0	0	0	0	0	0	1	0	3	**5**	3	1	2	3	-	-	-	-	-	-	-	-	-
0	0	0	0	0	1	0	0	0	2	0	**4**	2	4	2	1	-	-	-	-	-	-	-	-	-
1	0	1	0	0	0	0	0	1	1	1	**2**	1	0	2	3	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	1	**3**	2	2	4	3	2	-	-	-	-	-	-	-	-	-

AM Peak 1045 - 1145 (14), AM PHF=0.70

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[2] 2**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: South (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 214 / 256 (83.59%)

* Monday, October 14, 2013 - Total=17 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**5**	**4**	**4**	**1**	**0**	**2**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	2	0	0	1	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1	0	0	0	0	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3	0	2	1	0	1	2
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	2	0	0	0	0	0

* Tuesday, October 15, 2013 - Total=54, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	**1**	**0**	**0**	**0**	**0**	**1**	**2**	**1**	**1**	**2**	**5**	**1**	**3**	**0**	**3**	**2**	**5**	**3**	**3**	**6**	**7**	**4**	**1**	
0	0	0	0	0	0	0	2	1	0	1	**1**	1	0	0	0	0	2	2	1	**4**	1	1	1	1
1	0	0	0	0	0	0	0	0	0	1	**1**	0	0	0	3	1	0	1	0	**1**	2	1	0	0
2	0	0	0	0	0	1	0	0	0	0	**2**	0	2	0	0	0	3	0	**1**	0	3	1	0	0
0	1	0	0	0	0	0	0	0	1	0	**1**	0	1	0	0	1	0	0	**1**	1	1	1	0	0

AM Peak 1100 - 1200 (5), AM PHF=0.63 PM Peak 1930 - 2030 (7), PM PHF=0.44

* Wednesday, October 16, 2013 - Total=37, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**2**	**1**	**1**	**1**	**2**	**3**	**3**	**0**	**4**	**2**	**4**	**4**	**3**	**2**	**1**	
1	0	0	0	0	0	0	0	**1**	0	1	0	0	0	**2**	1	0	0	0	1	2	3	0	0	1
0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	**0**	0	0	1	0	2	0	0	2	1	1
0	0	0	0	0	0	0	0	**0**	1	0	1	0	0	**1**	1	0	2	1	1	1	0	0	0	1
0	0	0	0	0	0	0	0	**2**	1	0	0	1	**2**	0	1	0	1	1	0	1	0	0	0	1

AM Peak 0800 - 0900 (3), AM PHF=0.38 PM Peak 1345 - 1445 (5), PM PHF=0.63

* Thursday, October 17, 2013 - Total=67, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
4	**1**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**2**	**1**	**4**	**4**	**2**	**3**	**6**	**4**	**1**	**4**	**5**	**7**	**6**	**3**	**7**	
1	1	0	0	0	0	0	0	0	1	0	2	1	0	1	3	1	1	1	0	**3**	1	0	2	3
1	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	2	0	0	**4**	1	3	1	2	0
1	0	0	0	0	0	0	0	0	1	0	1	1	1	1	2	1	0	0	**0**	1	1	0	2	0
1	0	0	0	0	0	1	1	1	0	0	1	1	1	1	1	0	0	3	**1**	2	1	2	1	0

AM Peak 0000 - 0100 (4), AM PHF=1.00 PM Peak 1915 - 2015 (8), PM PHF=0.50

* Friday, October 18, 2013 - Total=39 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
3	**0**	**1**	**0**	**0**	**0**	**1**	**3**	**2**	**1**	**1**	**7**	**4**	**3**	**8**	**5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
3	0	0	0	0	0	0	1	1	1	0	**1**	1	1	1	1	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	1	0	0	0	**5**	0	0	1	3	-	-	-	-	-	-	-	-	-
0	0	1	0	0	0	1	0	1	0	**0**	0	2	1	4	0	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	1	0	0	**1**	1	1	1	2	1	-	-	-	-	-	-	-	-	-

AM Peak 1030 - 1130 (7), AM PHF=0.35

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[2] 2**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: North (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 29 / 256 (11.33%)

* Monday, October 14, 2013 - Total=1 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	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

* Tuesday, October 15, 2013 - Total=5, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**0**	
0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	1	**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	1	0	0	0	0	0	0	0	0	0	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

AM Peak 0815 - 0915 (1), AM PHF=0.25 PM Peak 2045 - 2145 (2), PM PHF=0.50

* Wednesday, October 16, 2013 - Total=4, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	
0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	**1**	0	0	0	0	0	0	0	0	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	1	1	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	**1**	0	**0**	0	0	0	0	0	0	0	0	0	0	0

AM Peak 1100 - 1200 (1), AM PHF=0.25 PM Peak 1315 - 1415 (1), PM PHF=0.25

* Thursday, October 17, 2013 - Total=15, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**	**2**	**1**	**0**	**1**	**1**	**4**	**2**	**0**	**0**	
1	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	1	1	0	0	0	**1**	0	0	0	0
0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	0	0	0	1	**1**	2	0	0	0
0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	1	0	0	1	0	**1**	0	0	0	0
0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	1	0	0	0	0	**1**	0	0	0	0

AM Peak 0930 - 1030 (2), AM PHF=0.50 PM Peak 2000 - 2100 (4), PM PHF=1.00

* Friday, October 18, 2013 - Total=4 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0	0	0	0	0	0	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	**1**	0	0	0	0	0	0	0	1	0	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	1	0	-	-	-	-	-	-	-	-	-

AM Peak 0615 - 0715 (2), AM PHF=0.50

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[1] 1**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: South (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 16 / 161 (9.94%)

* Monday, October 14, 2013 - Total=2 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	0	0	0	0	0	0

* Tuesday, October 15, 2013 - Total=1, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**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	0	**0**	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**	0	0	0	0

AM Peak 0000 - 0100 (0), AM PHF=1.00 PM Peak 2000 - 2100 (1), PM PHF=0.25

* Wednesday, October 16, 2013 - Total=2, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**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	**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	**1**	0	0	0	0	0	0	0	0	0	0	0

AM Peak 0930 - 1030 (1), AM PHF=0.25 PM Peak 1200 - 1300 (1), PM PHF=0.25

* Thursday, October 17, 2013 - Total=6, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**2**	**0**	
0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	0	0	1	0	0	0	**0**	0	0
0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	0	0	0	0	1	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	1	0	0	0	0	0	0	**1**	0	0

AM Peak 0930 - 1030 (1), AM PHF=0.25 PM Peak 2200 - 2300 (2), PM PHF=0.50

* Friday, October 18, 2013 - Total=5 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**1**	**0**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0	0	0	0	0	0	0	0	0	**1**	0	0	0	1	0	0	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	**0**	0	0	1	0	0	0	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0	1	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-

AM Peak 0900 - 1000 (2), AM PHF=0.50

Traffic Data Service
Vehicle Counts

Datasets:

Site: **[1] 1**
Data type: Axle sensors - Paired (Class/Speed/Count)

Profile:

Included classes: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
Speed range: 0 - 100 mph.
Direction: North (bound)
Separation: All - (Headway)
Name: Default Profile
Scheme: Vehicle classification (Scheme F)
Units: Non metric (ft, mi, ft/s, mph, lb, ton)
In profile: Vehicles = 131 / 161 (81.37%)

* Monday, October 14, 2013 - Total=11 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
-	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4**	**2**	**1**	**1**	**2**	**0**	**1**	
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	0	0	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	0	0	0	0	1	1
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	0	1	1	0	0	0
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1	0	1	0	0	0

* Tuesday, October 15, 2013 - Total=26, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**1**	**0**	**2**	**2**	**3**	**2**	**2**	**5**	**2**	**2**	**0**	
0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	0	3	0	0	**3**	0	1	0	0
1	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	1	0	0	1	0	**1**	0	1	0	0
0	0	0	0	0	0	0	0	0	**0**	0	1	0	1	0	0	0	0	0	**2**	0	2	0	0	1
0	0	0	0	0	0	1	0	0	**0**	0	0	0	0	0	1	2	0	1	**0**	1	0	0	0	0

AM Peak 0915 - 1015 (2), AM PHF=0.50 PM Peak 1930 - 2030 (6), PM PHF=0.50

* Wednesday, October 16, 2013 - Total=29, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**3**	**0**	**4**	**2**	**2**	**2**	**2**	**3**	**2**	**3**	**2**	**0**	**0**	
0	0	0	0	0	0	0	0	0	0	**1**	0	0	1	**2**	1	1	0	1	0	1	1	0	0	0
0	0	0	0	0	0	0	0	0	**0**	0	1	0	**1**	0	0	1	1	0	2	0	1	0	0	0
1	0	0	0	0	0	0	0	0	**2**	0	0	0	**1**	0	0	0	0	2	0	1	0	0	0	0
0	0	0	0	0	0	0	0	0	**0**	0	2	0	**1**	0	1	0	1	0	0	1	0	0	0	0

AM Peak 0915 - 1015 (3), AM PHF=0.38 PM Peak 1315 - 1415 (5), PM PHF=0.63

* Thursday, October 17, 2013 - Total=41, 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
0	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**3**	**1**	**1**	**1**	**2**	**3**	**1**	**2**	**7**	**1**	**7**	**4**	**3**	**2**	
0	0	0	0	0	0	0	0	0	2	**1**	0	1	0	1	2	0	0	**0**	0	3	0	0	0	1
0	0	0	0	0	0	0	0	0	0	**1**	0	0	1	0	0	0	1	**2**	0	1	1	0	1	0
0	0	0	0	0	0	0	0	0	0	**1**	1	0	0	0	1	1	1	**3**	1	1	3	0	1	1
0	0	0	0	0	0	1	0	0	**0**	0	0	0	0	1	0	0	0	**2**	0	2	0	3	0	0

AM Peak 0945 - 1045 (3), AM PHF=0.75 PM Peak 1800 - 1900 (7), PM PHF=0.58

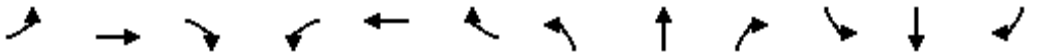
* Friday, October 18, 2013 - Total=24 (Incomplete) , 15 minute drops

0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	
2	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**3**	**1**	**7**	**3**	**0**	**6**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
1	0	1	0	0	0	0	0	0	0	0	0	**1**	2	0	2	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	1	0	0	1	0	**1**	0	0	1	-	-	-	-	-	-	-	-	-
1	0	0	0	0	0	0	0	0	0	1	0	**3**	1	0	2	-	-	-	-	-	-	-	-	-
0	0	0	0	0	0	0	0	0	0	1	**1**	2	0	0	1	-	-	-	-	-	-	-	-	-

AM Peak 1145 - 1245 (6), AM PHF=0.50

APPENDIX C:
INTERSECTION LEVEL OF SERVICE CALCULATIONS

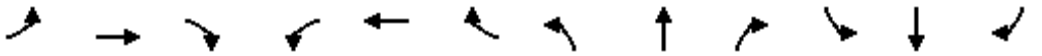




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	155	125	35	25	19	49	1131	131	85	833	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.91	0.91		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3085		1681	1752	1583	1770	3539	1519	1770	3539	1538
Flt Permitted	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3085		1681	1752	1583	1770	3539	1519	1770	3539	1538
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	105	176	142	40	28	22	56	1285	149	97	947	42
RTOR Reduction (vph)	0	90	0	0	0	20	0	0	77	0	0	21
Lane Group Flow (vph)	94	239	0	33	35	2	56	1285	72	97	947	21
Confl. Peds. (#/hr)			52						47			5
Turn Type	Split			Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)	18.4	18.4		7.4	7.4	7.4	7.0	47.5	47.5	7.8	48.3	48.3
Effective Green, g (s)	18.4	18.4		7.4	7.4	7.4	7.0	47.5	47.5	7.8	48.3	48.3
Actuated g/C Ratio	0.19	0.19		0.08	0.08	0.08	0.07	0.48	0.48	0.08	0.49	0.49
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	300	576		126	131	119	126	1705	732	140	1734	753
v/s Ratio Prot	0.06	c0.08		0.02	c0.02		0.03	c0.36		c0.05	0.27	
v/s Ratio Perm						0.00			0.05			0.01
v/c Ratio	0.31	0.41		0.26	0.27	0.01	0.44	0.75	0.10	0.69	0.55	0.03
Uniform Delay, d1	34.6	35.4		43.0	43.0	42.2	43.9	20.8	13.9	44.2	17.5	13.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5		1.1	1.1	0.0	2.5	1.9	0.1	13.8	0.4	0.0
Delay (s)	35.2	35.8		44.1	44.1	42.3	46.4	22.7	14.0	58.0	17.9	13.0
Level of Service	D	D		D	D	D	D	C	B	E	B	B
Approach Delay (s)		35.7			43.7			22.7			21.3	
Approach LOS		D			D			C			C	

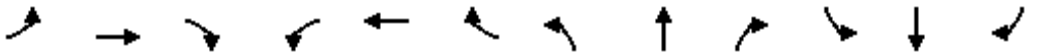
Intersection Summary			
HCM Average Control Delay	24.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	98.6	Sum of lost time (s)	17.5
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	127	331	244	43	204	296	182	916	47	169	806	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.96		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1528	1770	3104		3433	3539	1498	3433	3539	1448
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1528	1770	3104		3433	3539	1498	3433	3539	1448
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	140	364	268	47	224	325	200	1007	52	186	886	58
RTOR Reduction (vph)	0	0	205	0	192	0	0	0	25	0	0	32
Lane Group Flow (vph)	140	364	63	47	357	0	200	1007	27	186	886	26
Confl. Peds. (#/hr)			20			57			27			50
Confl. Bikes (#/hr)									1			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	11.0	28.1	28.1	7.3	24.4		11.7	54.9	54.9	11.4	54.6	54.6
Effective Green, g (s)	11.0	28.1	28.1	7.3	24.4		11.7	54.9	54.9	11.4	54.6	54.6
Actuated g/C Ratio	0.09	0.23	0.23	0.06	0.20		0.10	0.46	0.46	0.10	0.46	0.46
Clearance Time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	436	358	108	631		335	1619	685	326	1610	659
v/s Ratio Prot	c0.08	c0.20		0.03	0.12		c0.06	c0.28		0.05	0.25	
v/s Ratio Perm			0.04						0.02			0.02
v/c Ratio	0.86	0.83	0.18	0.44	0.57		0.60	0.62	0.04	0.57	0.55	0.04
Uniform Delay, d1	53.8	43.7	36.7	54.4	43.0		51.9	24.7	18.0	52.0	23.8	18.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.9	12.9	0.2	2.8	1.2		2.9	1.8	0.1	2.4	1.4	0.1
Delay (s)	88.7	56.7	36.9	57.2	44.2		54.7	26.5	18.1	54.4	25.1	18.3
Level of Service	F	E	D	E	D		D	C	B	D	C	B
Approach Delay (s)		55.6			45.2			30.6			29.6	
Approach LOS		E			D			C			C	

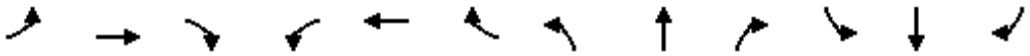
Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	2	154	26	3	5	34	1116	62	3	729	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.88			0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00			0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1606			1752		1770	3500		1770	3539	1541
Flt Permitted		0.97			0.32		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1563			578		1770	3500		1770	3539	1541
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	19	2	190	32	4	6	42	1378	77	4	900	483
RTOR Reduction (vph)	0	172	0	0	5	0	0	3	0	0	0	120
Lane Group Flow (vph)	0	39	0	0	37	0	42	1452	0	4	900	363
Confl. Peds. (#/hr)	7		2	2		7			13			2
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)		11.3			11.3		6.8	82.1		14.2	89.5	89.5
Effective Green, g (s)		11.3			11.3		6.8	82.1		14.2	89.5	89.5
Actuated g/C Ratio		0.09			0.09		0.06	0.68		0.12	0.75	0.75
Clearance Time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Vehicle Extension (s)		3.5			3.5		2.5	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		147			54		100	2395		209	2640	1149
v/s Ratio Prot							0.02	c0.41		0.00	c0.25	
v/s Ratio Perm		0.02			c0.06							0.24
v/c Ratio		0.26			0.68		0.42	0.61		0.02	0.34	0.32
Uniform Delay, d1		50.5			52.6		54.7	10.2		46.7	5.2	5.1
Progression Factor		1.00			1.00		1.07	0.74		1.00	1.00	1.00
Incremental Delay, d2		1.1			29.7		1.7	0.9		0.2	0.4	0.7
Delay (s)		51.6			82.3		60.1	8.5		46.9	5.5	5.8
Level of Service		D			F		E	A		D	A	A
Approach Delay (s)		51.6			82.3			9.9			5.8	
Approach LOS		D			F			A			A	

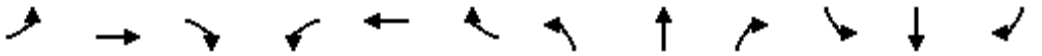
Intersection Summary			
HCM Average Control Delay	11.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.9
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	7	17	18	5	593	4	573	18	13	839	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1733			1786	1559	1770	3516		1770	3491	
Flt Permitted		0.82			0.83	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1471			1539	1559	1770	3516		1770	3491	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	52	8	19	20	6	674	5	651	20	15	953	65
RTOR Reduction (vph)	0	10	0	0	0	254	0	2	0	0	3	0
Lane Group Flow (vph)	0	69	0	0	26	420	5	669	0	15	1015	0
Confl. Peds. (#/hr)	2		4	4		2			15			11
Confl. Bikes (#/hr)									1			
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		31.0			31.0	31.0	1.5	73.9		2.7	75.1	
Effective Green, g (s)		31.0			31.0	31.0	1.5	73.9		2.7	75.1	
Actuated g/C Ratio		0.26			0.26	0.26	0.01	0.62		0.02	0.63	
Clearance Time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Vehicle Extension (s)		3.0			3.0	3.0	3.7	3.0		2.0	3.0	
Lane Grp Cap (vph)		380			398	403	22	2165		40	2185	
v/s Ratio Prot							0.00	0.19		c0.01	c0.29	
v/s Ratio Perm		0.05			0.02	c0.27						
v/c Ratio		0.18			0.07	1.04	0.23	0.31		0.38	0.46	
Uniform Delay, d1		34.6			33.6	44.5	58.7	10.9		57.8	11.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.26	0.67	
Incremental Delay, d2		0.2			0.1	55.9	6.5	0.4		2.0	0.7	
Delay (s)		34.9			33.6	100.4	65.2	11.3		74.9	8.6	
Level of Service		C			C	F	E	B		E	A	
Approach Delay (s)		34.9			98.0			11.7			9.6	
Approach LOS		C			F			B			A	

Intersection Summary			
HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	159	258	30	75	24	424	411	35	7	70	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	14.0		5.0	14.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1533	1770	1787		3433	3469		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1533	1770	1787		3433	3469		1770	1863	1583
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	121	179	290	34	84	27	476	462	39	8	79	35
RTOR Reduction (vph)	0	0	182	0	9	0	0	4	0	0	0	24
Lane Group Flow (vph)	121	179	108	34	102	0	476	497	0	8	79	11
Confl. Peds. (#/hr)			16			1			47			50
Confl. Bikes (#/hr)			16			1			11			33
Turn Type	Split		pm+ov	Split			Prot			Prot		custom
Protected Phases	8	8	1	4	4		1	7 6		5	7 2	2 8
Permitted Phases			8									
Actuated Green, G (s)	16.6	16.6	32.3	7.6	7.6		15.7	27.9		0.7	12.9	26.5
Effective Green, g (s)	16.6	16.6	32.3	7.6	7.6		15.7	27.9		0.7	12.9	26.5
Actuated g/C Ratio	0.19	0.19	0.37	0.09	0.09		0.18	0.32		0.01	0.15	0.31
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0			5.0		
Vehicle Extension (s)	5.5	5.5	4.0	2.5	2.5		4.0			2.0		
Lane Grp Cap (vph)	339	356	570	155	156		621	1115		14	277	483
v/s Ratio Prot	0.07	c0.10	0.03	0.02	c0.06		c0.14	c0.14		0.00	0.04	0.01
v/s Ratio Perm			0.04									
v/c Ratio	0.36	0.50	0.19	0.22	0.65		0.77	0.45		0.57	0.29	0.02
Uniform Delay, d1	30.5	31.4	18.4	36.8	38.3		33.8	23.3		42.9	32.9	21.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	2.7	0.2	0.5	8.4		6.0	0.1		30.5	0.2	0.0
Delay (s)	32.0	34.1	18.6	37.4	46.8		39.8	23.4		73.4	33.1	21.1
Level of Service	C	C	B	D	D		D	C		E	C	C
Approach Delay (s)		26.1			44.6			31.4			32.3	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM Average Control Delay	30.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	86.8	Sum of lost time (s)	29.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	47	256	684	117	56	319
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	59	320	855	146	70	399
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1476	510			1010	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1476	510			1010	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	44	37			90	
cM capacity (veh/h)	104	505			677	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	59	320	570	431	70	399
Volume Left	59	0	0	0	70	0
Volume Right	0	320	0	146	0	0
cSH	104	505	1700	1700	677	1700
Volume to Capacity	0.56	0.63	0.34	0.25	0.10	0.23
Queue Length 95th (ft)	66	109	0	0	9	0
Control Delay (s)	77.1	23.7	0.0	0.0	10.9	0.0
Lane LOS	F	C			B	
Approach Delay (s)	32.0		0.0		1.6	
Approach LOS	D					

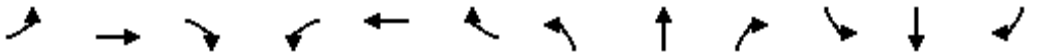
Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	139	322	479	19	68	298
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	162	374	557	22	79	347
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1071	566			566	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1071	566			566	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	28	28			92	
cM capacity (veh/h)	223	520			998	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	162	374	557	22	79	347
Volume Left	162	0	0	0	79	0
Volume Right	0	374	0	22	0	0
cSH	223	520	1700	1700	998	1700
Volume to Capacity	0.72	0.72	0.33	0.01	0.08	0.20
Queue Length 95th (ft)	121	146	0	0	6	0
Control Delay (s)	54.3	27.8	0.0	0.0	8.9	0.0
Lane LOS	F	D			A	
Approach Delay (s)	35.8		0.0		1.7	
Approach LOS	E					

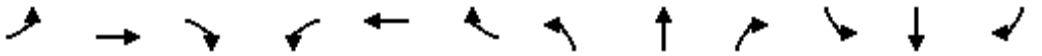
Intersection Summary			
Average Delay	12.9		
Intersection Capacity Utilization	51.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	70	94	172	81	57	88	951	85	48	1394	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.91	0.91		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.96		1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	2987		1681	1737	1583	1770	3539	1522	1770	3539	1535
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	2987		1681	1737	1583	1770	3539	1522	1770	3539	1535
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	84	80	107	195	92	65	100	1081	97	55	1584	98
RTOR Reduction (vph)	0	95	0	0	0	58	0	0	47	0	0	45
Lane Group Flow (vph)	76	100	0	140	147	7	100	1081	50	55	1584	53
Confl. Peds. (#/hr)			52						47			5
Turn Type	Split			Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)	13.6	13.6		12.5	12.5	12.5	12.1	61.6	61.6	14.8	64.3	64.3
Effective Green, g (s)	13.6	13.6		12.5	12.5	12.5	12.1	61.6	61.6	14.8	64.3	64.3
Actuated g/C Ratio	0.11	0.11		0.10	0.10	0.10	0.10	0.51	0.51	0.12	0.54	0.54
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	182	339		175	181	165	178	1817	781	218	1896	823
v/s Ratio Prot	c0.05	0.03		0.08	c0.08		0.06	c0.31		0.03	c0.45	
v/s Ratio Perm						0.00			0.03			0.03
v/c Ratio	0.42	0.30		0.80	0.81	0.04	0.56	0.59	0.06	0.25	0.84	0.06
Uniform Delay, d1	49.5	48.8		52.5	52.6	48.4	51.4	20.5	14.7	47.6	23.4	13.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.72	0.84	0.54	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.5		22.4	23.4	0.1	3.1	1.1	0.1	0.6	4.5	0.2
Delay (s)	51.1	49.3		74.9	76.0	48.5	40.1	18.4	8.1	48.2	27.9	13.5
Level of Service	D	D		E	E	D	D	B	A	D	C	B
Approach Delay (s)		49.8			70.5			19.3			27.8	
Approach LOS		D			E			B			C	

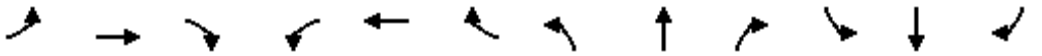
Intersection Summary			
HCM Average Control Delay	30.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



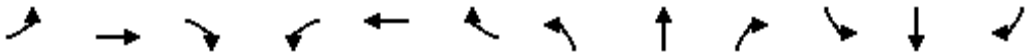
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	137	302	235	131	370	225	289	771	67	326	1109	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.98		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1528	1770	3259		3433	3539	1498	3433	3539	1448
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1528	1770	3259		3433	3539	1498	3433	3539	1448
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	151	332	258	144	407	247	318	847	74	358	1219	156
RTOR Reduction (vph)	0	0	189	0	78	0	0	0	43	0	0	88
Lane Group Flow (vph)	151	332	69	144	576	0	318	847	31	358	1219	68
Confl. Peds. (#/hr)			20			57			27			50
Confl. Bikes (#/hr)									1			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	11.0	25.7	25.7	10.0	24.7		14.0	50.3	50.3	15.7	52.0	52.0
Effective Green, g (s)	11.0	25.7	25.7	10.0	24.7		14.0	50.3	50.3	15.7	52.0	52.0
Actuated g/C Ratio	0.09	0.21	0.21	0.08	0.21		0.12	0.42	0.42	0.13	0.43	0.43
Clearance Time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	399	327	148	671		401	1483	628	449	1534	627
v/s Ratio Prot	c0.09	c0.18		0.08	0.18		0.09	0.24		c0.10	c0.34	
v/s Ratio Perm			0.04						0.02			0.05
v/c Ratio	0.93	0.83	0.21	0.97	0.86		0.79	0.57	0.05	0.80	0.79	0.11
Uniform Delay, d1	54.1	45.1	38.8	54.9	46.0		51.6	26.6	20.7	50.6	29.4	20.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.19	0.82	1.83
Incremental Delay, d2	50.8	13.8	0.3	65.4	10.6		10.3	1.6	0.1	5.6	2.5	0.2
Delay (s)	105.0	58.9	39.1	120.2	56.6		61.9	28.2	20.8	65.7	26.7	37.2
Level of Service	F	E	D	F	E		E	C	C	E	C	D
Approach Delay (s)		61.4			68.1			36.4			35.7	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM Average Control Delay	45.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.7
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	9	70	29	9	6	68	1243	148	17	835	659
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00		1.00	0.99		1.00	1.00	0.94
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.91			0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1647			1759		1770	3437		1770	3539	1484
Flt Permitted		0.93			0.56		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1545			1025		1770	3437		1770	3539	1484
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	27	9	71	30	9	6	69	1268	151	17	852	672
RTOR Reduction (vph)	0	64	0	0	5	0	0	6	0	0	0	175
Lane Group Flow (vph)	0	43	0	0	40	0	69	1413	0	17	852	497
Confl. Peds. (#/hr)	13		3	3		13			31			13
Confl. Bikes (#/hr)			1						4			
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)		10.4			10.4		8.4	82.0		15.2	88.8	88.8
Effective Green, g (s)		10.4			10.4		8.4	82.0		15.2	88.8	88.8
Actuated g/C Ratio		0.09			0.09		0.07	0.68		0.13	0.74	0.74
Clearance Time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Vehicle Extension (s)		3.5			3.5		2.5	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		134			89		124	2349		224	2619	1098
v/s Ratio Prot							0.04	c0.41		0.01	0.24	
v/s Ratio Perm		0.03			c0.04							c0.33
v/c Ratio		0.32			0.45		0.56	0.60		0.08	0.33	0.45
Uniform Delay, d1		51.5			52.1		54.0	10.2		46.2	5.3	6.1
Progression Factor		1.00			1.00		1.01	0.81		1.00	1.00	1.00
Incremental Delay, d2		1.6			4.3		3.6	1.0		0.7	0.3	1.3
Delay (s)		53.1			56.4		58.1	9.2		46.9	5.7	7.5
Level of Service		D			E		E	A		D	A	A
Approach Delay (s)		53.1			56.4			11.5			6.9	
Approach LOS		D			E			B			A	

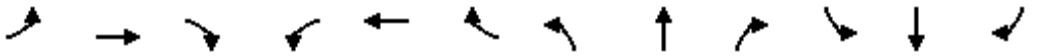
Intersection Summary			
HCM Average Control Delay	11.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.9
Intersection Capacity Utilization	65.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	23	23	10	3	491	13	899	56	41	751	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.99	1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1791	1562	1770	3485		1770	3411	
Flt Permitted		0.83			0.85	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1490			1575	1562	1770	3485		1770	3411	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	77	26	26	11	3	546	14	999	62	46	834	158
RTOR Reduction (vph)	0	10	0	0	0	202	0	3	0	0	8	0
Lane Group Flow (vph)	0	119	0	0	14	344	14	1058	0	46	984	0
Confl. Peds. (#/hr)	1		1	1		1			27			15
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		32.0			32.0	32.0	3.3	68.9		6.7	72.3	
Effective Green, g (s)		32.0			32.0	32.0	3.3	68.9		6.7	72.3	
Actuated g/C Ratio		0.27			0.27	0.27	0.03	0.57		0.06	0.60	
Clearance Time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Vehicle Extension (s)		3.0			3.0	3.0	3.7	3.0		2.0	3.0	
Lane Grp Cap (vph)		397			420	417	49	2001		99	2055	
v/s Ratio Prot							0.01	c0.30		c0.03	c0.29	
v/s Ratio Perm		0.08			0.01	c0.22						
v/c Ratio		0.30			0.03	0.82	0.29	0.53		0.46	0.48	
Uniform Delay, d1		35.1			32.6	41.4	57.2	15.6		54.9	13.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.14	0.78	
Incremental Delay, d2		0.4			0.0	12.4	4.0	1.0		1.2	0.8	
Delay (s)		35.5			32.6	53.8	61.2	16.6		63.9	11.1	
Level of Service		D			C	D	E	B		E	B	
Approach Delay (s)		35.5			53.3			17.2			13.5	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	23.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	74.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	146	503	66	152	16	401	187	35	22	327	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	14.0		5.0	14.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.90	1.00	1.00		1.00	0.98		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1425	1770	1834		3433	3396		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1425	1770	1834		3433	3396		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	109	151	519	68	157	16	413	193	36	23	337	128
RTOR Reduction (vph)	0	0	171	0	3	0	0	10	0	0	0	45
Lane Group Flow (vph)	109	151	348	68	170	0	413	219	0	23	337	83
Confl. Peds. (#/hr)			82			1			45			77
Confl. Bikes (#/hr)			8			1			6			32
Turn Type	Split		pm+ov	Split			Prot			Prot		custom
Protected Phases	8	8	1	4	4		1	7 6		5	7 2	2 8
Permitted Phases			8									
Actuated Green, G (s)	15.8	15.8	29.6	12.6	12.6		13.8	38.1		2.4	26.7	38.9
Effective Green, g (s)	15.8	15.8	29.6	12.6	12.6		13.8	38.1		2.4	26.7	38.9
Actuated g/C Ratio	0.15	0.15	0.29	0.12	0.12		0.13	0.37		0.02	0.26	0.38
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0			5.0		
Vehicle Extension (s)	5.5	5.5	4.0	2.5	2.5		4.0			2.0		
Lane Grp Cap (vph)	272	286	410	217	225		460	1257		41	483	598
v/s Ratio Prot	0.06	0.08	c0.11	0.04	c0.09		c0.12	0.06		0.01	c0.18	0.05
v/s Ratio Perm			0.13									
v/c Ratio	0.40	0.53	0.85	0.31	0.76		0.90	0.17		0.56	0.70	0.14
Uniform Delay, d1	39.3	40.1	34.5	41.2	43.7		43.9	21.8		49.7	34.5	21.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.4	3.8	15.6	0.6	12.9		20.2	0.0		10.0	3.5	0.1
Delay (s)	41.6	44.0	50.1	41.8	56.6		64.1	21.8		59.8	38.0	21.1
Level of Service	D	D	D	D	E		E	C		E	D	C
Approach Delay (s)		47.7			52.4			49.0			34.6	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	45.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	102.9	Sum of lost time (s)	43.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	54	95	562	156	261	610
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	59	104	618	171	287	670
Pedestrians	5					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1952	400			794	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1952	400			794	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	83			65	
cM capacity (veh/h)	36	598			820	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	59	104	412	377	287	670
Volume Left	59	0	0	0	287	0
Volume Right	0	104	0	171	0	0
cSH	36	598	1700	1700	820	1700
Volume to Capacity	1.63	0.17	0.24	0.22	0.35	0.39
Queue Length 95th (ft)	159	16	0	0	39	0
Control Delay (s)	551.5	12.3	0.0	0.0	11.7	0.0
Lane LOS	F	B			B	
Approach Delay (s)	207.7		0.0		3.5	
Approach LOS	F					

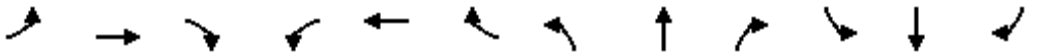
Intersection Summary			
Average Delay	19.6		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	72	240	478	51	274	390
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	82	273	543	58	311	443
Pedestrians	18					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1627	561			561	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1627	561			561	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	47			69	
cM capacity (veh/h)	76	519			995	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	82	273	543	58	311	443
Volume Left	82	0	0	0	311	0
Volume Right	0	273	0	58	0	0
cSH	76	519	1700	1700	995	1700
Volume to Capacity	1.08	0.53	0.32	0.03	0.31	0.26
Queue Length 95th (ft)	148	76	0	0	34	0
Control Delay (s)	222.2	19.4	0.0	0.0	10.3	0.0
Lane LOS	F	C			B	
Approach Delay (s)	66.2		0.0		4.2	
Approach LOS	F					

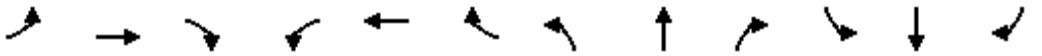
Intersection Summary			
Average Delay	15.6		
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	92	154	125	44	25	20	49	1131	129	85	833	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.91	0.91		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3084		1681	1743	1583	1770	3539	1519	1770	3539	1538
Flt Permitted	0.95	1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3084		1681	1743	1583	1770	3539	1519	1770	3539	1538
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	105	175	142	50	28	23	56	1285	147	97	947	42
RTOR Reduction (vph)	0	93	0	0	0	21	0	0	76	0	0	21
Lane Group Flow (vph)	94	235	0	38	40	2	56	1285	71	97	947	21
Confl. Peds. (#/hr)			52						47			5
Turn Type	Split			Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)	18.3	18.3		7.5	7.5	7.5	7.1	47.6	47.6	7.8	48.3	48.3
Effective Green, g (s)	18.3	18.3		7.5	7.5	7.5	7.1	47.6	47.6	7.8	48.3	48.3
Actuated g/C Ratio	0.19	0.19		0.08	0.08	0.08	0.07	0.48	0.48	0.08	0.49	0.49
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	299	572		128	132	120	127	1707	733	140	1732	753
v/s Ratio Prot	0.06	c0.08		0.02	c0.02		0.03	c0.36		c0.05	0.27	
v/s Ratio Perm						0.00			0.05			0.01
v/c Ratio	0.31	0.41		0.30	0.30	0.01	0.44	0.75	0.10	0.69	0.55	0.03
Uniform Delay, d1	34.8	35.4		43.1	43.1	42.2	43.9	20.8	13.9	44.3	17.6	13.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5		1.3	1.3	0.0	2.4	1.9	0.1	13.8	0.4	0.0
Delay (s)	35.4	35.9		44.4	44.4	42.2	46.3	22.7	13.9	58.1	17.9	13.1
Level of Service	D	D		D	D	D	D	C	B	E	B	B
Approach Delay (s)		35.8			43.9			22.7			21.3	
Approach LOS		D			D			C			C	

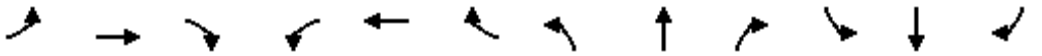
Intersection Summary			
HCM Average Control Delay	24.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	17.5
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	127	331	244	43	205	296	182	914	47	169	813	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.96		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1528	1770	3104		3433	3539	1498	3433	3539	1448
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1528	1770	3104		3433	3539	1498	3433	3539	1448
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	140	364	268	47	225	325	200	1004	52	186	893	59
RTOR Reduction (vph)	0	0	205	0	193	0	0	0	25	0	0	32
Lane Group Flow (vph)	140	364	63	47	357	0	200	1004	27	186	893	27
Confl. Peds. (#/hr)			20			57			27			50
Confl. Bikes (#/hr)									1			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	11.0	28.1	28.1	7.3	24.4		11.7	54.9	54.9	11.4	54.6	54.6
Effective Green, g (s)	11.0	28.1	28.1	7.3	24.4		11.7	54.9	54.9	11.4	54.6	54.6
Actuated g/C Ratio	0.09	0.23	0.23	0.06	0.20		0.10	0.46	0.46	0.10	0.46	0.46
Clearance Time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	436	358	108	631		335	1619	685	326	1610	659
v/s Ratio Prot	c0.08	c0.20		0.03	0.12		c0.06	c0.28		0.05	0.25	
v/s Ratio Perm			0.04						0.02			0.02
v/c Ratio	0.86	0.83	0.18	0.44	0.57		0.60	0.62	0.04	0.57	0.55	0.04
Uniform Delay, d1	53.8	43.7	36.7	54.4	43.0		51.9	24.7	18.0	52.0	23.8	18.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.9	12.9	0.2	2.8	1.2		2.9	1.8	0.1	2.4	1.4	0.1
Delay (s)	88.7	56.7	36.9	57.2	44.2		54.7	26.4	18.1	54.4	25.2	18.3
Level of Service	F	E	D	E	D		D	C	B	D	C	B
Approach Delay (s)		55.6			45.2			30.6			29.6	
Approach LOS		E			D			C			C	

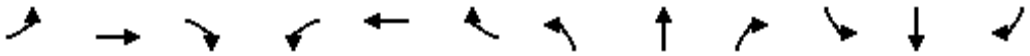
Intersection Summary			
HCM Average Control Delay	37.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	2	154	26	3	4	34	1115	62	3	736	391
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.88			0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected		1.00			0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1606			1756		1770	3499		1770	3539	1541
Flt Permitted		0.97			0.32		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1563			575		1770	3499		1770	3539	1541
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	19	2	190	32	4	5	42	1377	77	4	909	483
RTOR Reduction (vph)	0	172	0	0	5	0	0	3	0	0	0	119
Lane Group Flow (vph)	0	39	0	0	36	0	42	1451	0	4	909	364
Confl. Peds. (#/hr)	7		2	2		7			13			2
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)		11.3			11.3		6.8	82.1		14.2	89.5	89.5
Effective Green, g (s)		11.3			11.3		6.8	82.1		14.2	89.5	89.5
Actuated g/C Ratio		0.09			0.09		0.06	0.68		0.12	0.75	0.75
Clearance Time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Vehicle Extension (s)		3.5			3.5		2.5	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		147			54		100	2394		209	2640	1149
v/s Ratio Prot							0.02	c0.41		0.00	c0.26	
v/s Ratio Perm		0.02			c0.06							0.24
v/c Ratio		0.26			0.68		0.42	0.61		0.02	0.34	0.32
Uniform Delay, d1		50.5			52.6		54.7	10.2		46.7	5.2	5.1
Progression Factor		1.00			1.00		1.07	0.74		1.00	1.00	1.00
Incremental Delay, d2		1.1			29.5		1.7	0.9		0.2	0.4	0.7
Delay (s)		51.6			82.1		60.1	8.5		46.9	5.6	5.8
Level of Service		D			F		E	A		D	A	A
Approach Delay (s)		51.6			82.1			9.9			5.8	
Approach LOS		D			F			A			A	

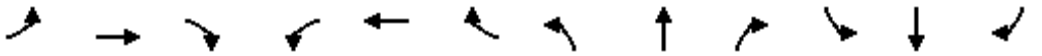
Intersection Summary			
HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.9
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	46	7	17	18	5	589	4	575	18	13	846	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1733			1786	1559	1770	3516		1770	3492	
Flt Permitted		0.82			0.83	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1471			1539	1559	1770	3516		1770	3492	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	52	8	19	20	6	669	5	653	20	15	961	65
RTOR Reduction (vph)	0	10	0	0	0	254	0	2	0	0	3	0
Lane Group Flow (vph)	0	69	0	0	26	415	5	671	0	15	1023	0
Confl. Peds. (#/hr)	2		4	4		2			15			11
Confl. Bikes (#/hr)									1			
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		31.0			31.0	31.0	1.5	73.9		2.7	75.1	
Effective Green, g (s)		31.0			31.0	31.0	1.5	73.9		2.7	75.1	
Actuated g/C Ratio		0.26			0.26	0.26	0.01	0.62		0.02	0.63	
Clearance Time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Vehicle Extension (s)		3.0			3.0	3.0	3.7	3.0		2.0	3.0	
Lane Grp Cap (vph)		380			398	403	22	2165		40	2185	
v/s Ratio Prot							0.00	0.19		c0.01	c0.29	
v/s Ratio Perm		0.05			0.02	c0.27						
v/c Ratio		0.18			0.07	1.03	0.23	0.31		0.38	0.47	
Uniform Delay, d1		34.6			33.6	44.5	58.7	10.9		57.8	11.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.26	0.67	
Incremental Delay, d2		0.2			0.1	52.9	6.5	0.4		2.0	0.7	
Delay (s)		34.9			33.6	97.4	65.2	11.3		75.0	8.6	
Level of Service		C			C	F	E	B		E	A	
Approach Delay (s)		34.9			95.0			11.7			9.6	
Approach LOS		C			F			B			A	

Intersection Summary			
HCM Average Control Delay	34.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	108	159	258	30	75	24	424	402	35	7	74	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	14.0		5.0	14.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1533	1770	1787		3433	3468		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1533	1770	1787		3433	3468		1770	1863	1583
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	121	179	290	34	84	27	476	452	39	8	83	36
RTOR Reduction (vph)	0	0	182	0	9	0	0	5	0	0	0	25
Lane Group Flow (vph)	121	179	108	34	102	0	476	486	0	8	83	11
Confl. Peds. (#/hr)			16			1			47			50
Confl. Bikes (#/hr)			16			1			11			33
Turn Type	Split		pm+ov	Split			Prot			Prot		custom
Protected Phases	8	8	1	4	4		1	7 6		5	7 2	2 8
Permitted Phases			8									
Actuated Green, G (s)	16.6	16.6	32.3	7.6	7.6		15.7	28.0		0.7	13.0	26.6
Effective Green, g (s)	16.6	16.6	32.3	7.6	7.6		15.7	28.0		0.7	13.0	26.6
Actuated g/C Ratio	0.19	0.19	0.37	0.09	0.09		0.18	0.32		0.01	0.15	0.31
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0			5.0		
Vehicle Extension (s)	5.5	5.5	4.0	2.5	2.5		4.0			2.0		
Lane Grp Cap (vph)	338	356	570	155	156		620	1117		14	279	485
v/s Ratio Prot	0.07	c0.10	0.03	0.02	c0.06		c0.14	c0.14		0.00	0.04	0.01
v/s Ratio Perm			0.04									
v/c Ratio	0.36	0.50	0.19	0.22	0.65		0.77	0.44		0.57	0.30	0.02
Uniform Delay, d1	30.5	31.5	18.4	36.9	38.4		33.9	23.2		43.0	32.9	21.1
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.6	2.7	0.2	0.5	8.4		6.0	0.1		30.5	0.2	0.0
Delay (s)	32.1	34.2	18.7	37.4	46.8		39.9	23.3		73.4	33.1	21.1
Level of Service	C	C	B	D	D		D	C		E	C	C
Approach Delay (s)		26.1			44.6			31.5			32.2	
Approach LOS		C			D			C			C	

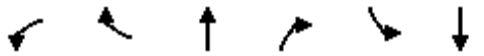
Intersection Summary			
HCM Average Control Delay	30.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	86.9	Sum of lost time (s)	29.0
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	47	252	679	117	56	323
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	59	315	849	146	70	404
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1475	506			1004	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1475	506			1004	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	44	38			90	
cM capacity (veh/h)	104	507			680	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	59	315	566	429	70	404
Volume Left	59	0	0	0	70	0
Volume Right	0	315	0	146	0	0
cSH	104	507	1700	1700	680	1700
Volume to Capacity	0.56	0.62	0.33	0.25	0.10	0.24
Queue Length 95th (ft)	66	105	0	0	9	0
Control Delay (s)	76.8	23.0	0.0	0.0	10.9	0.0
Lane LOS	F	C			B	
Approach Delay (s)	31.5		0.0		1.6	
Approach LOS	D					

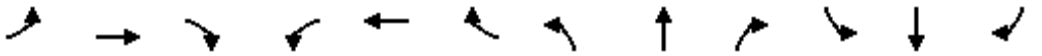
Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	139	318	478	19	68	302
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	162	370	556	22	79	351
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1074	565			565	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1074	565			565	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	27	29			92	
cM capacity (veh/h)	222	521			999	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	162	370	556	22	79	351
Volume Left	162	0	0	0	79	0
Volume Right	0	370	0	22	0	0
cSH	222	521	1700	1700	999	1700
Volume to Capacity	0.73	0.71	0.33	0.01	0.08	0.21
Queue Length 95th (ft)	122	141	0	0	6	0
Control Delay (s)	54.9	27.1	0.0	0.0	8.9	0.0
Lane LOS	F	D			A	
Approach Delay (s)	35.6		0.0		1.6	
Approach LOS	E					

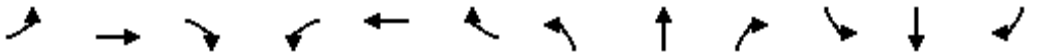
Intersection Summary			
Average Delay	12.7		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	74	70	94	208	80	61	88	951	118	52	1394	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.91	0.91		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.96		1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	2987		1681	1730	1583	1770	3539	1521	1770	3539	1535
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	2987		1681	1730	1583	1770	3539	1521	1770	3539	1535
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	84	80	107	236	91	69	100	1081	134	59	1584	98
RTOR Reduction (vph)	0	95	0	0	0	62	0	0	66	0	0	45
Lane Group Flow (vph)	76	100	0	160	167	7	100	1081	68	59	1584	53
Confl. Peds. (#/hr)			52						47			5
Turn Type	Split			Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)	13.6	13.6		13.0	13.0	13.0	12.1	61.1	61.1	14.8	63.8	63.8
Effective Green, g (s)	13.6	13.6		13.0	13.0	13.0	12.1	61.1	61.1	14.8	63.8	63.8
Actuated g/C Ratio	0.11	0.11		0.11	0.11	0.11	0.10	0.51	0.51	0.12	0.53	0.53
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	182	339		182	187	171	178	1802	774	218	1882	816
v/s Ratio Prot	c0.05	0.03		0.10	c0.10		0.06	c0.31		0.03	c0.45	
v/s Ratio Perm						0.00			0.04			0.03
v/c Ratio	0.42	0.30		0.88	0.89	0.04	0.56	0.60	0.09	0.27	0.84	0.07
Uniform Delay, d1	49.5	48.8		52.7	52.8	47.9	51.4	20.8	15.1	47.7	23.8	13.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.72	0.83	0.59	1.00	1.00	1.00
Incremental Delay, d2	1.6	0.5		34.8	37.3	0.1	3.0	1.1	0.2	0.7	4.8	0.2
Delay (s)	51.1	49.3		87.5	90.1	48.0	40.1	18.3	9.1	48.4	28.6	13.8
Level of Service	D	D		F	F	D	D	B	A	D	C	B
Approach Delay (s)		49.8			81.7			19.0			28.4	
Approach LOS		D			F			B			C	

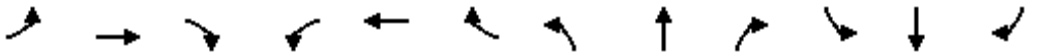
Intersection Summary			
HCM Average Control Delay	32.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



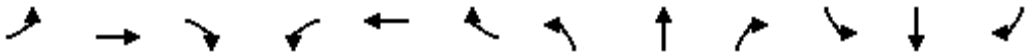
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	306	235	131	375	225	289	800	67	326	1141	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.98		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1528	1770	3261		3433	3539	1498	3433	3539	1448
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1528	1770	3261		3433	3539	1498	3433	3539	1448
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	155	336	258	144	412	247	318	879	74	358	1254	162
RTOR Reduction (vph)	0	0	188	0	75	0	0	0	43	0	0	92
Lane Group Flow (vph)	155	336	70	144	584	0	318	879	31	358	1254	70
Confl. Peds. (#/hr)			20			57			27			50
Confl. Bikes (#/hr)									1			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	11.0	25.8	25.8	10.0	24.8		14.0	50.2	50.2	15.7	51.9	51.9
Effective Green, g (s)	11.0	25.8	25.8	10.0	24.8		14.0	50.2	50.2	15.7	51.9	51.9
Actuated g/C Ratio	0.09	0.22	0.22	0.08	0.21		0.12	0.42	0.42	0.13	0.43	0.43
Clearance Time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	162	401	329	148	674		401	1480	627	449	1531	626
v/s Ratio Prot	c0.09	c0.18		0.08	0.18		0.09	0.25		c0.10	c0.35	
v/s Ratio Perm			0.05						0.02			0.05
v/c Ratio	0.96	0.84	0.21	0.97	0.87		0.79	0.59	0.05	0.80	0.82	0.11
Uniform Delay, d1	54.3	45.1	38.8	54.9	46.0		51.6	27.0	20.7	50.6	29.9	20.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.17	0.84	1.88
Incremental Delay, d2	57.3	14.1	0.3	65.4	11.3		10.3	1.8	0.1	5.4	2.8	0.2
Delay (s)	111.6	59.2	39.1	120.2	57.3		61.9	28.8	20.9	64.6	27.8	38.3
Level of Service	F	E	D	F	E		E	C	C	E	C	D
Approach Delay (s)		63.1			68.6			36.6			36.2	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM Average Control Delay	46.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.7
Intersection Capacity Utilization	93.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	9	70	29	9	7	68	1271	148	17	864	662
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		0.99			1.00		1.00	0.99		1.00	1.00	0.94
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.91			0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1647			1755		1770	3439		1770	3539	1484
Flt Permitted		0.93			0.57		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1544			1031		1770	3439		1770	3539	1484
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	27	9	71	30	9	7	69	1297	151	17	882	676
RTOR Reduction (vph)	0	64	0	0	5	0	0	6	0	0	0	176
Lane Group Flow (vph)	0	43	0	0	41	0	69	1442	0	17	882	500
Confl. Peds. (#/hr)	13		3	3		13			31			13
Confl. Bikes (#/hr)			1						4			
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)		10.4			10.4		8.4	82.0		15.2	88.8	88.8
Effective Green, g (s)		10.4			10.4		8.4	82.0		15.2	88.8	88.8
Actuated g/C Ratio		0.09			0.09		0.07	0.68		0.13	0.74	0.74
Clearance Time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Vehicle Extension (s)		3.5			3.5		2.5	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		134			89		124	2350		224	2619	1098
v/s Ratio Prot							0.04	c0.42		0.01	0.25	
v/s Ratio Perm		0.03			c0.04							c0.34
v/c Ratio		0.32			0.46		0.56	0.61		0.08	0.34	0.46
Uniform Delay, d1		51.5			52.1		54.0	10.4		46.2	5.4	6.1
Progression Factor		1.00			1.00		1.00	0.82		1.00	1.00	1.00
Incremental Delay, d2		1.6			4.3		3.6	1.0		0.7	0.3	1.4
Delay (s)		53.1			56.4		57.8	9.5		46.9	5.8	7.5
Level of Service		D			E		E	A		D	A	A
Approach Delay (s)		53.1			56.4			11.7			6.9	
Approach LOS		D			E			B			A	

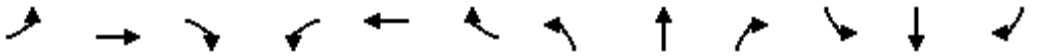
Intersection Summary			
HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.9
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	23	23	10	3	495	13	923	56	41	779	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.99	1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1791	1562	1770	3486		1770	3415	
Flt Permitted		0.83			0.85	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1491			1576	1562	1770	3486		1770	3415	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	77	26	26	11	3	550	14	1026	62	46	866	159
RTOR Reduction (vph)	0	9	0	0	0	200	0	3	0	0	8	0
Lane Group Flow (vph)	0	120	0	0	14	350	14	1085	0	46	1017	0
Confl. Peds. (#/hr)	1		1	1		1			27			15
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		32.5			32.5	32.5	3.3	68.4		6.7	71.8	
Effective Green, g (s)		32.5			32.5	32.5	3.3	68.4		6.7	71.8	
Actuated g/C Ratio		0.27			0.27	0.27	0.03	0.57		0.06	0.60	
Clearance Time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Vehicle Extension (s)		3.0			3.0	3.0	3.7	3.0		2.0	3.0	
Lane Grp Cap (vph)		404			427	423	49	1987		99	2043	
v/s Ratio Prot							0.01	c0.31		c0.03	c0.30	
v/s Ratio Perm		0.08			0.01	c0.22						
v/c Ratio		0.30			0.03	0.83	0.29	0.55		0.46	0.50	
Uniform Delay, d1		34.7			32.2	41.1	57.2	16.1		54.9	13.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.15	0.78	
Incremental Delay, d2		0.4			0.0	12.5	4.0	1.1		1.2	0.8	
Delay (s)		35.1			32.2	53.7	61.2	17.2		64.3	11.6	
Level of Service		D			C	D	E	B		E	B	
Approach Delay (s)		35.1			53.1			17.8			13.8	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	17.3
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	110	146	503	66	152	16	401	209	35	22	349	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	14.0		5.0	14.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.90	1.00	1.00		1.00	0.98		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1423	1770	1834		3433	3408		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1423	1770	1834		3433	3408		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	113	151	519	68	157	16	413	215	36	23	360	133
RTOR Reduction (vph)	0	0	165	0	3	0	0	9	0	0	0	43
Lane Group Flow (vph)	113	151	354	68	170	0	413	242	0	23	360	90
Confl. Peds. (#/hr)			82			1			45			77
Confl. Bikes (#/hr)			8			1			6			32
Turn Type	Split		pm+ov	Split			Prot			Prot		custom
Protected Phases	8	8	1	4	4		1	7 6		5	7 2	2 8
Permitted Phases			8									
Actuated Green, G (s)	15.8	15.8	29.6	12.7	12.7		13.8	39.2		2.4	27.8	40.0
Effective Green, g (s)	15.8	15.8	29.6	12.7	12.7		13.8	39.2		2.4	27.8	40.0
Actuated g/C Ratio	0.15	0.15	0.28	0.12	0.12		0.13	0.38		0.02	0.27	0.38
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0			5.0		
Vehicle Extension (s)	5.5	5.5	4.0	2.5	2.5		4.0			2.0		
Lane Grp Cap (vph)	269	283	405	216	224		455	1283		41	498	608
v/s Ratio Prot	0.06	0.08	c0.12	0.04	c0.09		c0.12	0.07		0.01	c0.19	0.06
v/s Ratio Perm			0.13									
v/c Ratio	0.42	0.53	0.88	0.31	0.76		0.91	0.19		0.56	0.72	0.15
Uniform Delay, d1	40.0	40.7	35.5	41.7	44.2		44.5	21.8		50.3	34.7	20.9
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.6	4.0	19.0	0.6	13.5		21.9	0.0		10.0	4.4	0.1
Delay (s)	42.6	44.8	54.5	42.3	57.7		66.4	21.8		60.4	39.0	21.0
Level of Service	D	D	D	D	E		E	C		E	D	C
Approach Delay (s)		50.9			53.4			49.6			35.3	
Approach LOS		D			D			D			D	

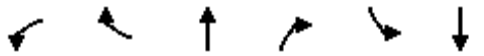
Intersection Summary			
HCM Average Control Delay	47.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	104.1	Sum of lost time (s)	43.0
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	54	99	581	156	264	629
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	59	109	638	171	290	691
Pedestrians	5					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2001	410			815	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2001	410			815	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	82			64	
cM capacity (veh/h)	33	588			805	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	59	109	426	384	290	691
Volume Left	59	0	0	0	290	0
Volume Right	0	109	0	171	0	0
cSH	33	588	1700	1700	805	1700
Volume to Capacity	1.79	0.18	0.25	0.23	0.36	0.41
Queue Length 95th (ft)	166	17	0	0	41	0
Control Delay (s)	636.2	12.5	0.0	0.0	12.0	0.0
Lane LOS	F	B			B	
Approach Delay (s)	232.6		0.0		3.5	
Approach LOS	F					

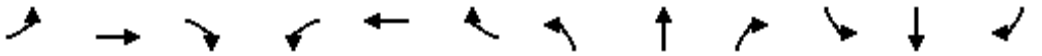
Intersection Summary			
Average Delay	21.7		
Intersection Capacity Utilization	49.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	72	244	493	51	277	406
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	82	277	560	58	315	461
Pedestrians	18					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1669	578			578	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1669	578			578	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	45			68	
cM capacity (veh/h)	71	508			981	

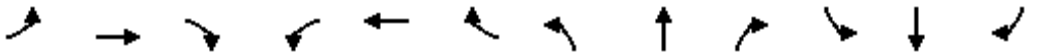
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	82	277	560	58	315	461
Volume Left	82	0	0	0	315	0
Volume Right	0	277	0	58	0	0
cSH	71	508	1700	1700	981	1700
Volume to Capacity	1.16	0.55	0.33	0.03	0.32	0.27
Queue Length 95th (ft)	157	81	0	0	35	0
Control Delay (s)	257.7	20.3	0.0	0.0	10.4	0.0
Lane LOS	F	C			B	
Approach Delay (s)	74.4		0.0		4.2	
Approach LOS	F					

Intersection Summary			
Average Delay	17.1		
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		



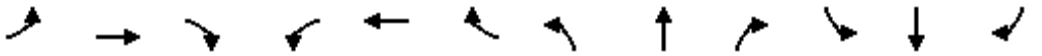
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	189	45	53	24	21	25	1648	194	188	1255	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.91	0.91		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3244		1681	1736	1583	1770	3539	1524	1770	3539	1533
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3244		1681	1736	1583	1770	3539	1524	1770	3539	1533
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor (vph)	104%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	148	215	51	60	27	24	28	1873	220	214	1426	61
RTOR Reduction (vph)	0	13	0	0	0	23	0	0	65	0	0	23
Lane Group Flow (vph)	133	268	0	43	44	1	28	1873	155	214	1426	38
Confl. Peds. (#/hr)			52						47			5
Turn Type	Split			Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)	20.2	20.2		8.3	8.3	8.3	3.7	72.4	72.4	14.7	83.4	83.4
Effective Green, g (s)	20.2	20.2		8.3	8.3	8.3	3.7	72.4	72.4	14.7	83.4	83.4
Actuated g/C Ratio	0.15	0.15		0.06	0.06	0.06	0.03	0.54	0.54	0.11	0.63	0.63
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	244	492		105	108	99	49	1925	829	195	2218	961
v/s Ratio Prot	0.08	c0.08		c0.03	0.03		0.02	c0.53		c0.12	0.40	
v/s Ratio Perm						0.00			0.10			0.02
v/c Ratio	0.55	0.55		0.41	0.41	0.02	0.57	0.97	0.19	1.10	0.64	0.04
Uniform Delay, d1	52.2	52.2		60.0	60.0	58.6	63.9	29.4	15.4	59.2	15.5	9.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	1.2		2.6	2.5	0.1	15.1	14.6	0.1	92.9	0.6	0.0
Delay (s)	54.7	53.4		62.6	62.5	58.6	79.0	44.0	15.5	152.1	16.2	9.5
Level of Service	D	D		E	E	E	E	D	B	F	B	A
Approach Delay (s)		53.8			61.7			41.5			33.0	
Approach LOS		D			E			D			C	

Intersection Summary			
HCM Average Control Delay	39.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	133.1	Sum of lost time (s)	17.5
Intersection Capacity Utilization	91.7%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	474	214	84	199	335	174	1352	36	340	964	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.96		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1528	1770	3079		3433	3539	1498	3433	3539	1448
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1528	1770	3079		3433	3539	1498	3433	3539	1448
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	210	521	235	92	219	368	191	1486	40	374	1059	42
RTOR Reduction (vph)	0	0	155	0	133	0	0	0	14	0	0	26
Lane Group Flow (vph)	210	521	80	92	454	0	191	1486	26	374	1059	16
Confl. Peds. (#/hr)			20			57			27			50
Confl. Bikes (#/hr)									1			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	13.5	36.8	36.8	10.1	33.4		9.5	38.8	38.8	16.0	45.3	45.3
Effective Green, g (s)	13.5	36.8	36.8	10.1	33.4		9.5	38.8	38.8	16.0	45.3	45.3
Actuated g/C Ratio	0.11	0.31	0.31	0.08	0.28		0.08	0.32	0.32	0.13	0.38	0.38
Clearance Time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	199	571	469	149	857		272	1144	484	458	1336	547
v/s Ratio Prot	c0.12	c0.28		0.05	0.15		0.06	c0.42		c0.11	0.30	
v/s Ratio Perm			0.05						0.02			0.01
v/c Ratio	1.06	0.91	0.17	0.62	0.53		0.70	1.30	0.05	0.82	0.79	0.03
Uniform Delay, d1	53.2	40.0	30.4	53.1	36.7		53.9	40.6	28.0	50.6	33.2	23.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	79.1	18.7	0.1	5.3	0.3		6.5	141.0	0.2	10.2	4.9	0.1
Delay (s)	132.4	58.7	30.5	58.3	37.0		60.4	181.6	28.2	60.8	38.1	23.6
Level of Service	F	E	C	E	D		E	F	C	E	D	C
Approach Delay (s)		67.9			39.9			164.6			43.4	
Approach LOS		E			D			F			D	

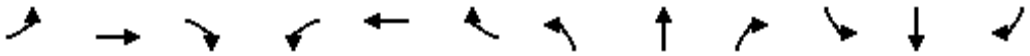
Intersection Summary			
HCM Average Control Delay	90.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	1	153	29	1	11	34	1391	67	5	846	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.89			0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.99			0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1620			1720		1770	3505		1770	3539	1541
Flt Permitted		0.94			0.37		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1537			654		1770	3505		1770	3539	1541
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	40	1	189	36	1	14	42	1717	83	6	1044	501
RTOR Reduction (vph)	0	159	0	0	13	0	0	2	0	0	0	98
Lane Group Flow (vph)	0	71	0	0	38	0	42	1798	0	6	1044	403
Confl. Peds. (#/hr)	7		2	2		7			13			2
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)		12.1			12.1		6.4	83.3		12.2	89.1	89.1
Effective Green, g (s)		12.1			12.1		6.4	83.3		12.2	89.1	89.1
Actuated g/C Ratio		0.10			0.10		0.05	0.69		0.10	0.74	0.74
Clearance Time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Vehicle Extension (s)		2.5			2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		155			66		94	2433		180	2628	1144
v/s Ratio Prot							0.02	c0.51		0.00	c0.29	
v/s Ratio Perm		0.05			c0.06							0.26
v/c Ratio		0.46			0.58		0.45	0.74		0.03	0.40	0.35
Uniform Delay, d1		50.9			51.5		55.1	11.5		48.6	5.6	5.4
Progression Factor		1.00			1.00		1.11	0.63		1.00	1.00	1.00
Incremental Delay, d2		1.6			10.4		0.9	1.5		0.3	0.5	0.9
Delay (s)		52.4			61.9		62.0	8.8		48.9	6.1	6.2
Level of Service		D			E		E	A		D	A	A
Approach Delay (s)		52.4			61.9			10.0			6.3	
Approach LOS		D			E			A			A	

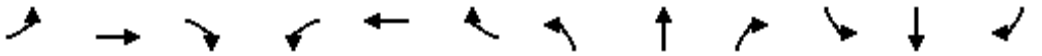
Intersection Summary			
HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.9
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	5	27	8	6	611	7	734	26	20	925	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.96			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1743			1808	1559	1770	3512		1770	3478	
Flt Permitted		0.75			0.87	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1368			1615	1559	1770	3512		1770	3478	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	167	6	31	9	7	694	8	834	30	23	1051	94
RTOR Reduction (vph)	0	5	0	0	0	174	0	2	0	0	5	0
Lane Group Flow (vph)	0	199	0	0	16	520	8	862	0	23	1140	0
Confl. Peds. (#/hr)	2		4	4		2			15			11
Confl. Bikes (#/hr)									1			
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		31.0			31.0	31.0	1.3	72.8		3.8	75.3	
Effective Green, g (s)		31.0			31.0	31.0	1.3	72.8		3.8	75.3	
Actuated g/C Ratio		0.26			0.26	0.26	0.01	0.61		0.03	0.63	
Clearance Time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Vehicle Extension (s)		3.0			3.0	3.0	3.7	3.0		2.0	3.0	
Lane Grp Cap (vph)		353			417	403	19	2131		56	2182	
v/s Ratio Prot							0.00	0.25		c0.01	c0.33	
v/s Ratio Perm		0.15			0.01	c0.33						
v/c Ratio		0.56			0.04	1.29	0.42	0.40		0.41	0.52	
Uniform Delay, d1		38.6			33.3	44.5	59.0	12.3		57.0	12.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.19	0.64	
Incremental Delay, d2		2.1			0.0	147.9	17.8	0.6		1.7	0.8	
Delay (s)		40.7			33.4	192.4	76.8	12.9		69.4	8.8	
Level of Service		D			C	F	E	B		E	A	
Approach Delay (s)		40.7			188.8			13.5			10.0	
Approach LOS		D			F			B			A	

Intersection Summary			
HCM Average Control Delay	56.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	230	260	30	80	70	430	630	40	10	110	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	14.0		5.0	14.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1536	1770	1719		3433	3482		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1536	1770	1719		3433	3482		1770	1863	1583
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	213	258	292	34	90	79	483	708	45	11	124	45
RTOR Reduction (vph)	0	0	164	0	24	0	0	3	0	0	0	32
Lane Group Flow (vph)	213	258	128	34	145	0	483	750	0	11	124	13
Confl. Peds. (#/hr)			16			1			47			50
Confl. Bikes (#/hr)			16			1			11			33
Turn Type	Split		pm+ov	Split			Prot			Prot		custom
Protected Phases	8	8	1	4	4		1	7 6		5	7 2	2 8
Permitted Phases			8									
Actuated Green, G (s)	21.4	21.4	46.6	12.4	12.4		25.2	37.9		0.9	27.6	31.6
Effective Green, g (s)	21.4	21.4	46.6	12.4	12.4		25.2	37.9		0.9	27.6	31.6
Actuated g/C Ratio	0.20	0.20	0.44	0.12	0.12		0.24	0.36		0.01	0.26	0.30
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0			5.0		
Vehicle Extension (s)	5.5	5.5	4.0	2.5	2.5		4.0			2.0		
Lane Grp Cap (vph)	355	374	671	206	200		812	1238		15	482	469
v/s Ratio Prot	0.12	c0.14	0.04	0.02	c0.08		0.14	c0.22		0.01	c0.07	0.01
v/s Ratio Perm			0.04									
v/c Ratio	0.60	0.69	0.19	0.17	0.73		0.59	0.61		0.73	0.26	0.03
Uniform Delay, d1	38.7	39.5	18.4	42.4	45.5		36.2	28.2		52.7	31.4	26.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.5	7.3	0.2	0.3	11.6		1.4	0.6		93.0	0.1	0.0
Delay (s)	43.3	46.8	18.6	42.7	57.0		37.5	28.8		145.7	31.5	26.6
Level of Service	D	D	B	D	E		D	C		F	C	C
Approach Delay (s)		35.0			54.6			32.2			37.2	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM Average Control Delay	35.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	106.6	Sum of lost time (s)	38.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	240	330	830	120	150	360
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	300	412	1038	150	188	450
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1946	603			1196	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1946	603			1196	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	6			67	
cM capacity (veh/h)	38	439			575	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	300	412	692	496	188	450
Volume Left	300	0	0	0	188	0
Volume Right	0	412	0	150	0	0
cSH	38	439	1700	1700	575	1700
Volume to Capacity	7.92	0.94	0.41	0.29	0.33	0.26
Queue Length 95th (ft)	Err	272	0	0	35	0
Control Delay (s)	Err	60.1	0.0	0.0	14.3	0.0
Lane LOS	F	F			B	
Approach Delay (s)	4244.9		0.0		4.2	
Approach LOS	F					

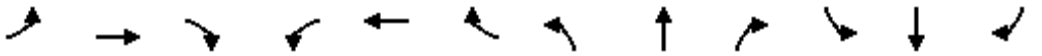
Intersection Summary			
Average Delay	1193.0		
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	140	450	500	20	70	530
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	163	523	581	23	81	616
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1369	590			590	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1369	590			590	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	0			92	
cM capacity (veh/h)	147	503			978	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	163	523	581	23	81	616
Volume Left	163	0	0	0	81	0
Volume Right	0	523	0	23	0	0
cSH	147	503	1700	1700	978	1700
Volume to Capacity	1.11	1.04	0.34	0.01	0.08	0.36
Queue Length 95th (ft)	222	383	0	0	7	0
Control Delay (s)	167.0	79.5	0.0	0.0	9.0	0.0
Lane LOS	F	F			A	
Approach Delay (s)	100.3		0.0		1.1	
Approach LOS	F					

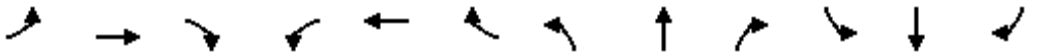
Intersection Summary			
Average Delay	35.0		
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	292	10	113	69	122	166	82	1296	45	101	1546	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.91	0.91		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3003		1681	1765	1583	1770	3539	1523	1770	3539	1535
Flt Permitted	0.95	0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3003		1681	1765	1583	1770	3539	1523	1770	3539	1535
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	332	11	128	78	139	189	93	1473	51	115	1757	228
RTOR Reduction (vph)	0	100	0	0	0	81	0	0	24	0	0	105
Lane Group Flow (vph)	166	205	0	70	147	108	93	1473	27	115	1757	124
Confl. Peds. (#/hr)			52						47			5
Turn Type	Split			Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)	16.5	16.5		12.6	12.6	12.6	8.4	63.5	63.5	9.9	65.0	65.0
Effective Green, g (s)	16.5	16.5		12.6	12.6	12.6	8.4	63.5	63.5	9.9	65.0	65.0
Actuated g/C Ratio	0.14	0.14		0.10	0.10	0.10	0.07	0.53	0.53	0.08	0.54	0.54
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	221	413		177	185	166	124	1873	806	146	1917	831
v/s Ratio Prot	c0.10	0.07		0.04	c0.08		0.05	0.42		c0.06	c0.50	
v/s Ratio Perm						0.07			0.02			0.08
v/c Ratio	0.75	0.50		0.40	0.79	0.65	0.75	0.79	0.03	0.79	0.92	0.15
Uniform Delay, d1	49.8	47.9		50.1	52.4	51.6	54.8	22.8	13.5	54.0	25.0	13.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.86	1.26	2.69	1.00	1.00	1.00
Incremental Delay, d2	12.0	0.3		0.5	19.3	6.9	2.1	0.3	0.0	22.3	8.4	0.4
Delay (s)	61.8	48.2		50.7	71.7	58.5	49.4	29.1	36.5	76.3	33.5	14.1
Level of Service	E	D		D	E	E	D	C	D	E	C	B
Approach Delay (s)		53.0			61.9			30.5			33.7	
Approach LOS		D			E			C			C	

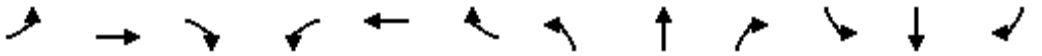
Intersection Summary			
HCM Average Control Delay	37.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



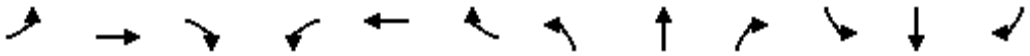
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	183	394	186	160	596	199	335	1128	148	334	1280	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.98		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1528	1770	3352		3433	3539	1498	3433	3539	1448
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1528	1770	3352		3433	3539	1498	3433	3539	1448
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	201	433	204	176	655	219	368	1240	163	367	1407	132
RTOR Reduction (vph)	0	0	147	0	27	0	0	0	67	0	0	89
Lane Group Flow (vph)	201	433	57	176	847	0	368	1240	96	367	1407	43
Confl. Peds. (#/hr)			20			57			27			50
Confl. Bikes (#/hr)									1			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	15.4	33.7	33.7	13.0	31.3		15.8	39.2	39.2	15.8	39.2	39.2
Effective Green, g (s)	15.4	33.7	33.7	13.0	31.3		15.8	39.2	39.2	15.8	39.2	39.2
Actuated g/C Ratio	0.13	0.28	0.28	0.11	0.26		0.13	0.33	0.33	0.13	0.33	0.33
Clearance Time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	227	523	429	192	874		452	1156	489	452	1156	473
v/s Ratio Prot	c0.11	0.23		0.10	c0.25		c0.11	0.35		0.11	c0.40	
v/s Ratio Perm			0.04						0.06			0.03
v/c Ratio	0.89	0.83	0.13	0.92	0.97		0.81	1.07	0.20	0.81	1.22	0.09
Uniform Delay, d1	51.4	40.4	32.2	53.0	43.9		50.7	40.4	29.1	50.7	40.4	28.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.63	1.21	3.04
Incremental Delay, d2	30.3	9.9	0.1	41.2	22.7		10.2	48.3	0.9	5.0	101.7	0.2
Delay (s)	81.7	50.4	32.3	94.1	66.5		60.9	88.7	30.0	37.0	150.5	85.3
Level of Service	F	D	C	F	E		E	F	C	D	F	F
Approach Delay (s)		53.5			71.2			77.5			124.1	
Approach LOS		D			E			E			F	

Intersection Summary			
HCM Average Control Delay	88.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	101.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	29	64	39	6	11	95	1562	220	54	1090	663
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99		1.00	0.98		1.00	1.00	0.94
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.95			0.97		1.00	0.98		1.00	1.00	0.85
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1708			1739		1770	3421		1770	3539	1484
Flt Permitted		0.83			0.67		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1451			1205		1770	3421		1770	3539	1484
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	98	30	65	40	6	11	97	1594	224	55	1112	677
RTOR Reduction (vph)	0	15	0	0	7	0	0	9	0	0	0	182
Lane Group Flow (vph)	0	178	0	0	50	0	97	1809	0	55	1112	495
Confl. Peds. (#/hr)	13		3	3		13			31			13
Confl. Bikes (#/hr)			1						4			
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)		17.2			17.2		11.1	75.9		14.5	79.3	79.3
Effective Green, g (s)		17.2			17.2		11.1	75.9		14.5	79.3	79.3
Actuated g/C Ratio		0.14			0.14		0.09	0.63		0.12	0.66	0.66
Clearance Time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Vehicle Extension (s)		3.5			3.5		2.5	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		208			173		164	2164		214	2339	981
v/s Ratio Prot							0.05	c0.53		0.03	0.31	
v/s Ratio Perm		c0.12			0.04							c0.33
v/c Ratio		0.85			0.29		0.59	0.84		0.26	0.48	0.50
Uniform Delay, d1		50.2			45.9		52.3	17.2		47.9	10.1	10.3
Progression Factor		1.00			1.00		0.88	0.96		1.00	1.00	1.00
Incremental Delay, d2		27.7			1.1		2.8	2.4		2.9	0.7	1.8
Delay (s)		77.9			47.0		48.6	19.0		50.7	10.8	12.2
Level of Service		E			D		D	B		D	B	B
Approach Delay (s)		77.9			47.0			20.5			12.5	
Approach LOS		E			D			C			B	

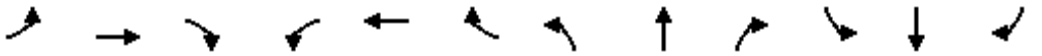
Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.9
Intersection Capacity Utilization	77.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	352	21	25	6	2	576	7	949	107	141	902	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.99	1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected		0.96			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1765			1792	1562	1770	3445		1770	3424	
Flt Permitted		0.74			0.82	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1371			1522	1562	1770	3445		1770	3424	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	391	23	28	7	2	640	8	1054	119	157	1002	167
RTOR Reduction (vph)	0	3	0	0	0	174	0	6	0	0	8	0
Lane Group Flow (vph)	0	439	0	0	9	466	8	1167	0	157	1161	0
Confl. Peds. (#/hr)	1		1	1		1			27			15
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		43.4			43.4	43.4	1.6	50.7		13.5	62.6	
Effective Green, g (s)		43.4			43.4	43.4	1.6	50.7		13.5	62.6	
Actuated g/C Ratio		0.36			0.36	0.36	0.01	0.42		0.11	0.52	
Clearance Time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Vehicle Extension (s)		3.0			3.0	3.0	3.7	3.0		2.0	3.0	
Lane Grp Cap (vph)		496			550	565	24	1456		199	1786	
v/s Ratio Prot							0.00	c0.34		c0.09	0.34	
v/s Ratio Perm		c0.32			0.01	0.30						
v/c Ratio		0.89			0.02	0.82	0.33	0.80		0.79	0.65	
Uniform Delay, d1		36.0			24.6	34.8	58.7	30.3		51.9	20.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.26	0.73	
Incremental Delay, d2		17.1			0.0	9.5	10.0	4.7		15.8	1.7	
Delay (s)		53.1			24.6	44.3	68.7	35.0		81.4	16.9	
Level of Service		D			C	D	E	C		F	B	
Approach Delay (s)		53.1			44.1			35.2			24.5	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	35.1	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	98.6%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	150	550	70	160	30	550	230	40	40	460	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	14.0		5.0	14.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.91	1.00	1.00		1.00	0.98		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1441	1770	1814		3433	3396		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1441	1770	1814		3433	3396		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	155	155	567	72	165	31	567	237	41	41	474	144
RTOR Reduction (vph)	0	0	215	0	4	0	0	8	0	0	0	30
Lane Group Flow (vph)	155	155	352	72	192	0	567	270	0	41	474	114
Confl. Peds. (#/hr)			82			1			45			77
Confl. Bikes (#/hr)			8			1			6			32
Turn Type	Split		pm+ov	Split			Prot			Prot		custom
Protected Phases	8	8	1	4	4		1	7 6		5	7 2	2 8
Permitted Phases			8									
Actuated Green, G (s)	18.9	18.9	46.5	16.4	16.4		27.6	50.9		6.1	43.4	44.5
Effective Green, g (s)	18.9	18.9	46.5	16.4	16.4		27.6	50.9		6.1	43.4	44.5
Actuated g/C Ratio	0.15	0.15	0.37	0.13	0.13		0.22	0.40		0.05	0.34	0.35
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0			5.0		
Vehicle Extension (s)	5.5	5.5	4.0	2.5	2.5		4.0			2.0		
Lane Grp Cap (vph)	265	279	531	230	236		750	1369		85	640	558
v/s Ratio Prot	0.09	0.08	c0.14	0.04	c0.11		c0.17	0.08		0.02	c0.25	0.07
v/s Ratio Perm			0.10									
v/c Ratio	0.58	0.56	0.66	0.31	0.81		0.76	0.20		0.48	0.74	0.20
Uniform Delay, d1	50.0	49.8	33.3	49.8	53.5		46.2	24.4		58.6	36.5	28.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.6	4.6	3.4	0.6	18.4		4.6	0.0		1.6	4.0	0.1
Delay (s)	55.7	54.4	36.7	50.4	71.8		50.8	24.5		60.1	40.5	28.7
Level of Service	E	D	D	D	E		D	C		E	D	C
Approach Delay (s)		43.2			66.1			42.2			39.2	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	44.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	126.3	Sum of lost time (s)	29.0
Intersection Capacity Utilization	88.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	60	100	890	160	340	750
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	66	110	978	176	374	824
Pedestrians	5					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2642	582			1159	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2642	582			1159	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	76			37	
cM capacity (veh/h)	7	454			596	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	66	110	652	502	374	824
Volume Left	66	0	0	0	374	0
Volume Right	0	110	0	176	0	0
cSH	7	454	1700	1700	596	1700
Volume to Capacity	9.40	0.24	0.38	0.30	0.63	0.48
Queue Length 95th (ft)	Err	23	0	0	109	0
Control Delay (s)	Err	15.4	0.0	0.0	20.6	0.0
Lane LOS	F	C			C	
Approach Delay (s)	3759.3		0.0		6.4	
Approach LOS	F					

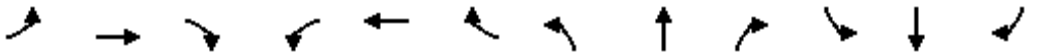
Intersection Summary			
Average Delay	264.6		
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	80	450	600	160	420	390
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	91	511	682	182	477	443
Pedestrians	18					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2098	700			700	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2098	700			700	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	0			46	
cM capacity (veh/h)	26	433			884	

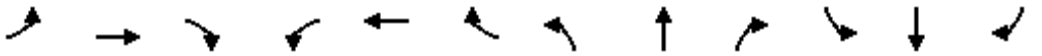
Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	91	511	682	182	477	443
Volume Left	91	0	0	0	477	0
Volume Right	0	511	0	182	0	0
cSH	26	433	1700	1700	884	1700
Volume to Capacity	3.51	1.18	0.40	0.11	0.54	0.26
Queue Length 95th (ft)	Err	490	0	0	83	0
Control Delay (s)	Err	132.2	0.0	0.0	13.8	0.0
Lane LOS	F	F			B	
Approach Delay (s)	1621.5		0.0		7.1	
Approach LOS	F					

Intersection Summary			
Average Delay	412.0		
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		



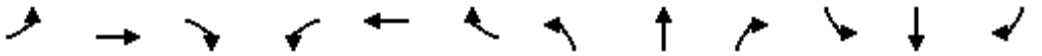
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	188	45	62	24	22	25	1648	192	188	1255	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.91	0.91		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3243		1681	1731	1583	1770	3539	1524	1770	3539	1533
Flt Permitted	0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3243		1681	1731	1583	1770	3539	1524	1770	3539	1533
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor (vph)	104%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Adj. Flow (vph)	148	214	51	70	27	25	28	1873	218	214	1426	61
RTOR Reduction (vph)	0	13	0	0	0	23	0	0	64	0	0	23
Lane Group Flow (vph)	133	267	0	48	49	2	28	1873	154	214	1426	38
Confl. Peds. (#/hr)			52						47			5
Turn Type	Split			Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)	20.2	20.2		8.5	8.5	8.5	3.7	72.4	72.4	14.7	83.4	83.4
Effective Green, g (s)	20.2	20.2		8.5	8.5	8.5	3.7	72.4	72.4	14.7	83.4	83.4
Actuated g/C Ratio	0.15	0.15		0.06	0.06	0.06	0.03	0.54	0.54	0.11	0.63	0.63
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	244	491		107	110	101	49	1922	828	195	2214	959
v/s Ratio Prot	c0.08	0.08		c0.03	0.03		0.02	c0.53		c0.12	0.40	
v/s Ratio Perm						0.00			0.10			0.02
v/c Ratio	0.55	0.54		0.45	0.45	0.02	0.57	0.97	0.19	1.10	0.64	0.04
Uniform Delay, d1	52.3	52.3		60.1	60.1	58.5	64.0	29.6	15.5	59.3	15.6	9.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	1.2		3.0	2.9	0.1	15.1	14.9	0.1	92.9	0.7	0.0
Delay (s)	54.8	53.5		63.1	63.0	58.5	79.1	44.4	15.6	152.2	16.3	9.6
Level of Service	D	D		E	E	E	E	D	B	F	B	A
Approach Delay (s)		53.9			62.1			41.9			33.2	
Approach LOS		D			E			D			C	

Intersection Summary			
HCM Average Control Delay	40.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	133.3	Sum of lost time (s)	17.5
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	191	474	214	84	200	335	174	1350	36	340	971	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.96		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1528	1770	3079		3433	3539	1498	3433	3539	1448
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1528	1770	3079		3433	3539	1498	3433	3539	1448
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	210	521	235	92	220	368	191	1484	40	374	1067	43
RTOR Reduction (vph)	0	0	155	0	133	0	0	0	14	0	0	27
Lane Group Flow (vph)	210	521	80	92	455	0	191	1484	26	374	1067	16
Confl. Peds. (#/hr)			20			57			27			50
Confl. Bikes (#/hr)									1			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	13.5	36.8	36.8	10.1	33.4		9.5	38.8	38.8	16.0	45.3	45.3
Effective Green, g (s)	13.5	36.8	36.8	10.1	33.4		9.5	38.8	38.8	16.0	45.3	45.3
Actuated g/C Ratio	0.11	0.31	0.31	0.08	0.28		0.08	0.32	0.32	0.13	0.38	0.38
Clearance Time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	199	571	469	149	857		272	1144	484	458	1336	547
v/s Ratio Prot	c0.12	c0.28		0.05	0.15		0.06	c0.42		c0.11	0.30	
v/s Ratio Perm			0.05						0.02			0.01
v/c Ratio	1.06	0.91	0.17	0.62	0.53		0.70	1.30	0.05	0.82	0.80	0.03
Uniform Delay, d1	53.2	40.0	30.4	53.1	36.7		53.9	40.6	28.0	50.6	33.3	23.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	79.1	18.7	0.1	5.3	0.3		6.5	140.3	0.2	10.2	5.1	0.1
Delay (s)	132.4	58.7	30.5	58.3	37.0		60.4	180.9	28.2	60.8	38.3	23.6
Level of Service	F	E	C	E	D		E	F	C	E	D	C
Approach Delay (s)		67.9			39.9			163.9			43.6	
Approach LOS		E			D			F			D	

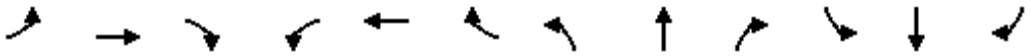
Intersection Summary			
HCM Average Control Delay	90.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	103.3%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	32	1	153	29	1	10	34	1390	67	5	853	406
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.89			0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.99			0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1619			1726		1770	3505		1770	3539	1541
Flt Permitted		0.94			0.36		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1538			642		1770	3505		1770	3539	1541
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	40	1	189	36	1	12	42	1716	83	6	1053	501
RTOR Reduction (vph)	0	159	0	0	11	0	0	2	0	0	0	97
Lane Group Flow (vph)	0	71	0	0	38	0	42	1797	0	6	1053	404
Confl. Peds. (#/hr)	7		2	2		7			13			2
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)		12.1			12.1		6.4	83.3		12.2	89.1	89.1
Effective Green, g (s)		12.1			12.1		6.4	83.3		12.2	89.1	89.1
Actuated g/C Ratio		0.10			0.10		0.05	0.69		0.10	0.74	0.74
Clearance Time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Vehicle Extension (s)		2.5			2.5		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)		155			65		94	2433		180	2628	1144
v/s Ratio Prot							0.02	c0.51		0.00	c0.30	
v/s Ratio Perm		0.05			c0.06							0.26
v/c Ratio		0.46			0.59		0.45	0.74		0.03	0.40	0.35
Uniform Delay, d1		50.9			51.6		55.1	11.5		48.6	5.7	5.4
Progression Factor		1.00			1.00		1.11	0.63		1.00	1.00	1.00
Incremental Delay, d2		1.6			10.8		0.9	1.5		0.3	0.5	0.9
Delay (s)		52.4			62.3		62.1	8.8		48.9	6.1	6.2
Level of Service		D			E		E	A		D	A	A
Approach Delay (s)		52.4			62.3			10.0			6.3	
Approach LOS		D			E			A			A	

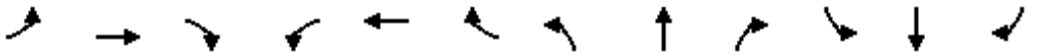
Intersection Summary			
HCM Average Control Delay	11.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.9
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	147	5	27	8	6	607	7	736	26	20	932	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.98			1.00	0.85	1.00	0.99		1.00	0.99	
Flt Protected		0.96			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1743			1808	1559	1770	3512		1770	3478	
Flt Permitted		0.75			0.87	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1368			1615	1559	1770	3512		1770	3478	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	167	6	31	9	7	690	8	836	30	23	1059	94
RTOR Reduction (vph)	0	5	0	0	0	174	0	2	0	0	5	0
Lane Group Flow (vph)	0	199	0	0	16	516	8	864	0	23	1148	0
Confl. Peds. (#/hr)	2		4	4		2			15			11
Confl. Bikes (#/hr)									1			
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		31.0			31.0	31.0	1.3	72.8		3.8	75.3	
Effective Green, g (s)		31.0			31.0	31.0	1.3	72.8		3.8	75.3	
Actuated g/C Ratio		0.26			0.26	0.26	0.01	0.61		0.03	0.63	
Clearance Time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Vehicle Extension (s)		3.0			3.0	3.0	3.7	3.0		2.0	3.0	
Lane Grp Cap (vph)		353			417	403	19	2131		56	2182	
v/s Ratio Prot							0.00	0.25		c0.01	c0.33	
v/s Ratio Perm		0.15			0.01	c0.33						
v/c Ratio		0.56			0.04	1.28	0.42	0.41		0.41	0.53	
Uniform Delay, d1		38.6			33.3	44.5	59.0	12.3		57.0	12.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.18	0.64	
Incremental Delay, d2		2.1			0.0	143.7	17.8	0.6		1.7	0.8	
Delay (s)		40.7			33.4	188.2	76.8	12.9		68.7	8.8	
Level of Service		D			C	F	E	B		E	A	
Approach Delay (s)		40.7			184.7			13.5			10.0	
Approach LOS		D			F			B			B	

Intersection Summary			
HCM Average Control Delay	54.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	230	260	30	80	70	430	621	40	10	114	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	14.0		5.0	14.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.99		1.00	0.99		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1536	1770	1719		3433	3481		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1536	1770	1719		3433	3481		1770	1863	1583
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	213	258	292	34	90	79	483	698	45	11	128	46
RTOR Reduction (vph)	0	0	164	0	24	0	0	3	0	0	0	32
Lane Group Flow (vph)	213	258	128	34	145	0	483	740	0	11	128	14
Confl. Peds. (#/hr)			16			1			47			50
Confl. Bikes (#/hr)			16			1			11			33
Turn Type	Split		pm+ov	Split			Prot			Prot		custom
Protected Phases	8	8	1	4	4		1	7 6		5	7 2	2 8
Permitted Phases			8									
Actuated Green, G (s)	21.4	21.4	46.7	12.4	12.4		25.3	38.1		0.9	27.7	31.7
Effective Green, g (s)	21.4	21.4	46.7	12.4	12.4		25.3	38.1		0.9	27.7	31.7
Actuated g/C Ratio	0.20	0.20	0.44	0.12	0.12		0.24	0.36		0.01	0.26	0.30
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0			5.0		
Vehicle Extension (s)	5.5	5.5	4.0	2.5	2.5		4.0			2.0		
Lane Grp Cap (vph)	355	373	672	206	200		813	1242		15	483	470
v/s Ratio Prot	0.12	c0.14	0.05	0.02	c0.08		0.14	c0.21		0.01	c0.07	0.01
v/s Ratio Perm			0.04									
v/c Ratio	0.60	0.69	0.19	0.17	0.73		0.59	0.60		0.73	0.27	0.03
Uniform Delay, d1	38.8	39.6	18.4	42.5	45.6		36.2	28.1		52.8	31.5	26.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.5	7.5	0.2	0.3	11.6		1.4	0.5		93.0	0.1	0.0
Delay (s)	43.4	47.1	18.6	42.8	57.1		37.6	28.6		145.8	31.6	26.7
Level of Service	D	D	B	D	E		D	C		F	C	C
Approach Delay (s)		35.2			54.7			32.1			37.1	
Approach LOS		D			D			C			D	

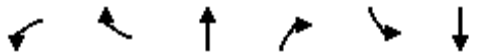
Intersection Summary			
HCM Average Control Delay	35.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	106.8	Sum of lost time (s)	38.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	240	326	825	120	150	364
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	300	408	1031	150	188	455
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1945	600			1190	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1945	600			1190	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	8			68	
cM capacity (veh/h)	38	441			578	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	300	408	688	494	188	455
Volume Left	300	0	0	0	188	0
Volume Right	0	408	0	150	0	0
cSH	38	441	1700	1700	578	1700
Volume to Capacity	7.88	0.92	0.40	0.29	0.32	0.27
Queue Length 95th (ft)	Err	261	0	0	35	0
Control Delay (s)	Err	56.8	0.0	0.0	14.2	0.0
Lane LOS	F	F			B	
Approach Delay (s)	4272.6		0.0		4.1	
Approach LOS	F					

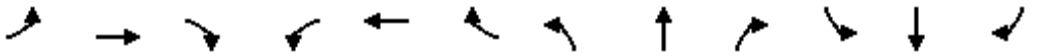
Intersection Summary			
Average Delay	1195.3		
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	140	446	499	20	70	534
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	163	519	580	23	81	621
Pedestrians	9					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1373	589			589	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1373	589			589	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	0			92	
cM capacity (veh/h)	146	504			979	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	163	519	580	23	81	621
Volume Left	163	0	0	0	81	0
Volume Right	0	519	0	23	0	0
cSH	146	504	1700	1700	979	1700
Volume to Capacity	1.11	1.03	0.34	0.01	0.08	0.37
Queue Length 95th (ft)	223	372	0	0	7	0
Control Delay (s)	169.1	76.4	0.0	0.0	9.0	0.0
Lane LOS	F	F			A	
Approach Delay (s)	98.6		0.0		1.0	
Approach LOS	F					

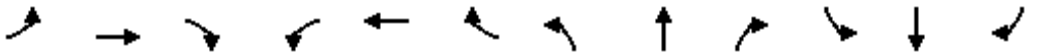
Intersection Summary			
Average Delay	34.2		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	292	10	113	105	121	170	82	1296	78	105	1546	201
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Lane Util. Factor	0.91	0.91		0.95	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.97		1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1610	3003		1681	1763	1583	1770	3539	1523	1770	3539	1535
Flt Permitted	0.95	0.97		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1610	3003		1681	1763	1583	1770	3539	1523	1770	3539	1535
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	332	11	128	119	138	193	93	1473	89	119	1757	228
RTOR Reduction (vph)	0	93	0	0	0	80	0	0	42	0	0	105
Lane Group Flow (vph)	166	212	0	107	150	113	93	1473	47	119	1757	124
Confl. Peds. (#/hr)			52						47			5
Turn Type	Split			Split		Perm	Prot		Perm	Prot		Perm
Protected Phases	4	4		3	3		5	2		1	6	
Permitted Phases						3			2			6
Actuated Green, G (s)	16.5	16.5		12.8	12.8	12.8	8.2	63.2	63.2	10.0	65.0	65.0
Effective Green, g (s)	16.5	16.5		12.8	12.8	12.8	8.2	63.2	63.2	10.0	65.0	65.0
Actuated g/C Ratio	0.14	0.14		0.11	0.11	0.11	0.07	0.53	0.53	0.08	0.54	0.54
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	3.5	6.0	6.0	3.5	6.0	6.0
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	221	413		179	188	169	121	1864	802	148	1917	831
v/s Ratio Prot	c0.10	0.07		0.06	c0.09		0.05	0.42		c0.07	c0.50	
v/s Ratio Perm						0.07			0.03			0.08
v/c Ratio	0.75	0.51		0.60	0.80	0.67	0.77	0.79	0.06	0.80	0.92	0.15
Uniform Delay, d1	49.8	48.0		51.1	52.3	51.5	55.0	23.0	13.9	54.0	25.0	13.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.86	1.29	3.16	1.00	1.00	1.00
Incremental Delay, d2	12.0	0.4		3.5	19.3	7.5	2.4	0.3	0.0	24.9	8.4	0.4
Delay (s)	61.8	48.5		54.7	71.7	59.0	49.5	30.0	43.9	78.9	33.5	14.1
Level of Service	E	D		D	E	E	D	C	D	E	C	B
Approach Delay (s)		53.2			62.2			31.9			33.9	
Approach LOS		D			E			C			C	

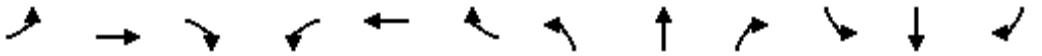
Intersection Summary			
HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.5
Intersection Capacity Utilization	94.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



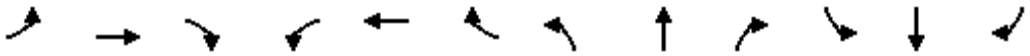
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	187	398	186	160	601	199	335	1157	148	334	1312	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95		0.97	0.95	1.00	0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	0.98		1.00	1.00	0.95	1.00	1.00	0.91
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1528	1770	3353		3433	3539	1498	3433	3539	1448
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1528	1770	3353		3433	3539	1498	3433	3539	1448
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	205	437	204	176	660	219	368	1271	163	367	1442	137
RTOR Reduction (vph)	0	0	146	0	27	0	0	0	66	0	0	93
Lane Group Flow (vph)	205	437	58	176	852	0	368	1271	97	367	1442	44
Confl. Peds. (#/hr)			20			57			27			50
Confl. Bikes (#/hr)									1			
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	15.4	33.9	33.9	13.0	31.5		15.9	38.9	38.9	15.9	38.9	38.9
Effective Green, g (s)	15.4	33.9	33.9	13.0	31.5		15.9	38.9	38.9	15.9	38.9	38.9
Actuated g/C Ratio	0.13	0.28	0.28	0.11	0.26		0.13	0.32	0.32	0.13	0.32	0.32
Clearance Time (s)	4.0	4.7	4.7	4.0	4.7		4.7	4.9	4.9	4.7	4.9	4.9
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	227	526	432	192	880		455	1147	486	455	1147	469
v/s Ratio Prot	c0.12	0.23		0.10	c0.25		c0.11	0.36		0.11	c0.41	
v/s Ratio Perm			0.04						0.06			0.03
v/c Ratio	0.90	0.83	0.13	0.92	0.97		0.81	1.11	0.20	0.81	1.26	0.09
Uniform Delay, d1	51.6	40.4	32.1	53.0	43.8		50.6	40.5	29.3	50.6	40.5	28.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	0.64	1.19	2.94
Incremental Delay, d2	34.0	10.3	0.1	41.2	22.6		9.6	61.4	0.9	4.7	119.2	0.2
Delay (s)	85.6	50.6	32.1	94.1	66.3		60.2	101.9	30.2	37.3	167.7	83.4
Level of Service	F	D	C	F	E		E	F	C	D	F	F
Approach Delay (s)		54.6			71.0			86.9			137.2	
Approach LOS		D			E			F			F	

Intersection Summary			
HCM Average Control Delay	96.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	102.7%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	96	29	64	39	6	12	95	1590	220	54	1119	666
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		0.99			0.99		1.00	0.99		1.00	1.00	0.94
Flpb, ped/bikes		0.99			1.00		1.00	1.00		1.00	1.00	1.00
Frt		0.95			0.97		1.00	0.98		1.00	1.00	0.85
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1709			1736		1770	3423		1770	3539	1484
Flt Permitted		0.83			0.67		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1449			1209		1770	3423		1770	3539	1484
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	98	30	65	40	6	12	97	1622	224	55	1142	680
RTOR Reduction (vph)	0	15	0	0	8	0	0	9	0	0	0	178
Lane Group Flow (vph)	0	178	0	0	50	0	97	1837	0	55	1142	502
Confl. Peds. (#/hr)	13		3	3		13			31			13
Confl. Bikes (#/hr)			1						4			
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								2
Actuated Green, G (s)		17.2			17.2		11.1	75.9		14.5	79.3	79.3
Effective Green, g (s)		17.2			17.2		11.1	75.9		14.5	79.3	79.3
Actuated g/C Ratio		0.14			0.14		0.09	0.63		0.12	0.66	0.66
Clearance Time (s)		4.0			4.0		3.5	4.9		3.5	4.9	4.9
Vehicle Extension (s)		3.5			3.5		2.5	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		208			173		164	2165		214	2339	981
v/s Ratio Prot							0.05	c0.54		0.03	0.32	
v/s Ratio Perm		c0.12			0.04							c0.34
v/c Ratio		0.85			0.29		0.59	0.85		0.26	0.49	0.51
Uniform Delay, d1		50.2			45.9		52.3	17.5		47.9	10.2	10.4
Progression Factor		1.00			1.00		0.88	0.96		1.00	1.00	1.00
Incremental Delay, d2		27.7			1.1		2.7	2.6		2.9	0.7	1.9
Delay (s)		77.9			47.1		48.6	19.3		50.7	10.9	12.3
Level of Service		E			D		D	B		D	B	B
Approach Delay (s)		77.9			47.1			20.8			12.6	
Approach LOS		E			D			C			B	

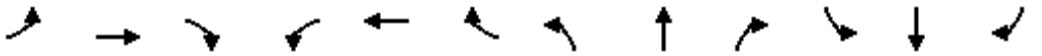
Intersection Summary			
HCM Average Control Delay	20.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.9
Intersection Capacity Utilization	78.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	352	21	25	6	2	580	7	973	107	141	930	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.99	1.00	0.99		1.00	0.99	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected		0.96			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1765			1792	1562	1770	3447		1770	3427	
Flt Permitted		0.74			0.82	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1371			1522	1562	1770	3447		1770	3427	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	391	23	28	7	2	644	8	1081	119	157	1033	168
RTOR Reduction (vph)	0	3	0	0	0	173	0	6	0	0	8	0
Lane Group Flow (vph)	0	439	0	0	9	471	8	1194	0	157	1193	0
Confl. Peds. (#/hr)	1		1	1		1			27			15
Turn Type	Perm			Perm		Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		43.4			43.4	43.4	1.6	50.7		13.5	62.6	
Effective Green, g (s)		43.4			43.4	43.4	1.6	50.7		13.5	62.6	
Actuated g/C Ratio		0.36			0.36	0.36	0.01	0.42		0.11	0.52	
Clearance Time (s)		4.0			4.0	4.0	3.5	4.9		3.5	4.9	
Vehicle Extension (s)		3.0			3.0	3.0	3.7	3.0		2.0	3.0	
Lane Grp Cap (vph)		496			550	565	24	1456		199	1788	
v/s Ratio Prot							0.00	c0.35		c0.09	0.35	
v/s Ratio Perm		c0.32			0.01	0.30						
v/c Ratio		0.89			0.02	0.83	0.33	0.82		0.79	0.67	
Uniform Delay, d1		36.0			24.6	35.0	58.7	30.6		51.9	21.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.27	0.73	
Incremental Delay, d2		17.1			0.0	10.2	10.0	5.3		15.7	1.8	
Delay (s)		53.1			24.6	45.2	68.7	35.9		81.5	17.1	
Level of Service		D			C	D	E	D		F	B	
Approach Delay (s)		53.1			44.9			36.1			24.5	
Approach LOS		D			D			D			C	

Intersection Summary			
HCM Average Control Delay	35.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.4
Intersection Capacity Utilization	99.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	154	150	550	70	160	30	550	252	40	40	482	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0		5.0	14.0		5.0	14.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		0.97	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.91	1.00	1.00		1.00	0.98		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1439	1770	1814		3433	3406		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1439	1770	1814		3433	3406		1770	1863	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	159	155	567	72	165	31	567	260	41	41	497	149
RTOR Reduction (vph)	0	0	213	0	4	0	0	8	0	0	0	29
Lane Group Flow (vph)	159	155	354	72	192	0	567	293	0	41	497	120
Confl. Peds. (#/hr)			82			1			45			77
Confl. Bikes (#/hr)			8			1			6			32
Turn Type	Split		pm+ov	Split			Prot			Prot		custom
Protected Phases	8	8	1	4	4		1	7 6		5	7 2	2 8
Permitted Phases			8									
Actuated Green, G (s)	19.1	19.1	46.8	16.6	16.6		27.7	51.4		6.2	43.9	45.2
Effective Green, g (s)	19.1	19.1	46.8	16.6	16.6		27.7	51.4		6.2	43.9	45.2
Actuated g/C Ratio	0.15	0.15	0.37	0.13	0.13		0.22	0.40		0.05	0.34	0.36
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0		5.0			5.0		
Vehicle Extension (s)	5.5	5.5	4.0	2.5	2.5		4.0			2.0		
Lane Grp Cap (vph)	266	280	529	231	237		747	1375		86	642	562
v/s Ratio Prot	0.09	0.08	c0.15	0.04	c0.11		c0.17	0.09		0.02	c0.27	0.08
v/s Ratio Perm			0.10									
v/c Ratio	0.60	0.55	0.67	0.31	0.81		0.76	0.21		0.48	0.77	0.21
Uniform Delay, d1	50.5	50.1	33.8	50.2	53.8		46.7	24.8		59.0	37.3	28.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.0	4.5	3.5	0.6	17.6		4.7	0.0		1.5	5.3	0.1
Delay (s)	56.5	54.7	37.3	50.7	71.4		51.4	24.8		60.5	42.6	28.8
Level of Service	E	D	D	D	E		D	C		E	D	C
Approach Delay (s)		43.8			65.8			42.2			40.6	
Approach LOS		D			E			D			D	

Intersection Summary			
HCM Average Control Delay	44.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	127.3	Sum of lost time (s)	29.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	60	104	909	160	343	769
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	66	114	999	176	377	845
Pedestrians	5					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2691	592			1180	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2691	592			1180	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	74			36	
cM capacity (veh/h)	6	447			585	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	66	114	666	509	377	845
Volume Left	66	0	0	0	377	0
Volume Right	0	114	0	176	0	0
cSH	6	447	1700	1700	585	1700
Volume to Capacity	10.65	0.26	0.39	0.30	0.64	0.50
Queue Length 95th (ft)	Err	25	0	0	115	0
Control Delay (s)	Err	15.8	0.0	0.0	21.6	0.0
Lane LOS	F	C			C	
Approach Delay (s)	3668.2		0.0		6.7	
Approach LOS	F					

Intersection Summary			
Average Delay	259.7		
Intersection Capacity Utilization	62.6%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	80	454	615	160	423	406
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	91	516	699	182	481	461
Pedestrians	18					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2140	717			717	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2140	717			717	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	0			45	
cM capacity (veh/h)	24	423			871	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	91	516	699	182	481	461
Volume Left	91	0	0	0	481	0
Volume Right	0	516	0	182	0	0
cSH	24	423	1700	1700	871	1700
Volume to Capacity	3.83	1.22	0.41	0.11	0.55	0.27
Queue Length 95th (ft)	Err	522	0	0	86	0
Control Delay (s)	Err	147.0	0.0	0.0	14.1	0.0
Lane LOS	F	F			B	
Approach Delay (s)	1623.0		0.0		7.2	
Approach LOS	F					

Intersection Summary			
Average Delay	408.2		
Intersection Capacity Utilization	70.2%	ICU Level of Service	C
Analysis Period (min)	15		

APPENDIX D:
PEAK HOUR SIGNAL WARRANT CALCULATIONS



Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

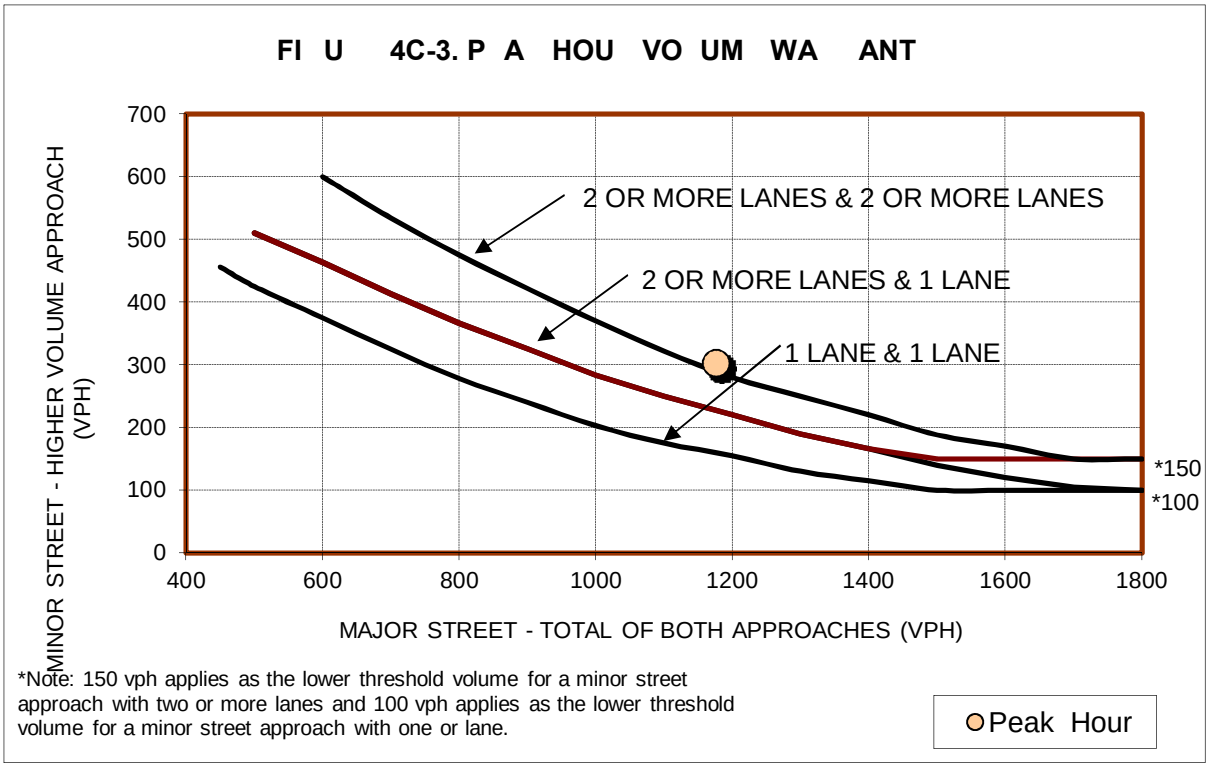
Intersection: California Blvd/Taft Street

Scenario: Existing AM

	No of lanes
Major Street	2
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
7:30 AM	1,176	303



*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one or lane.

Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

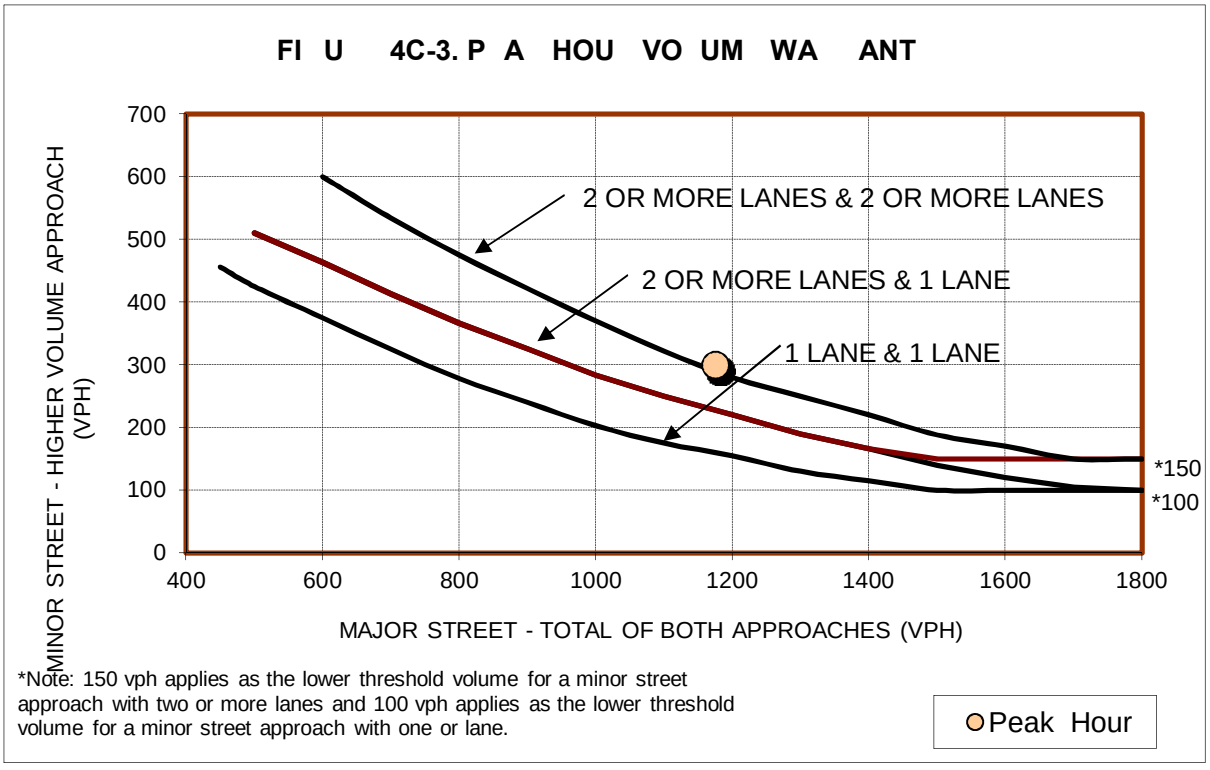
Intersection: California Blvd/Taft Street

Scenario: Existing with Project AM

	No of lanes
Major Street	2
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
7:30 AM	1,175	299



Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

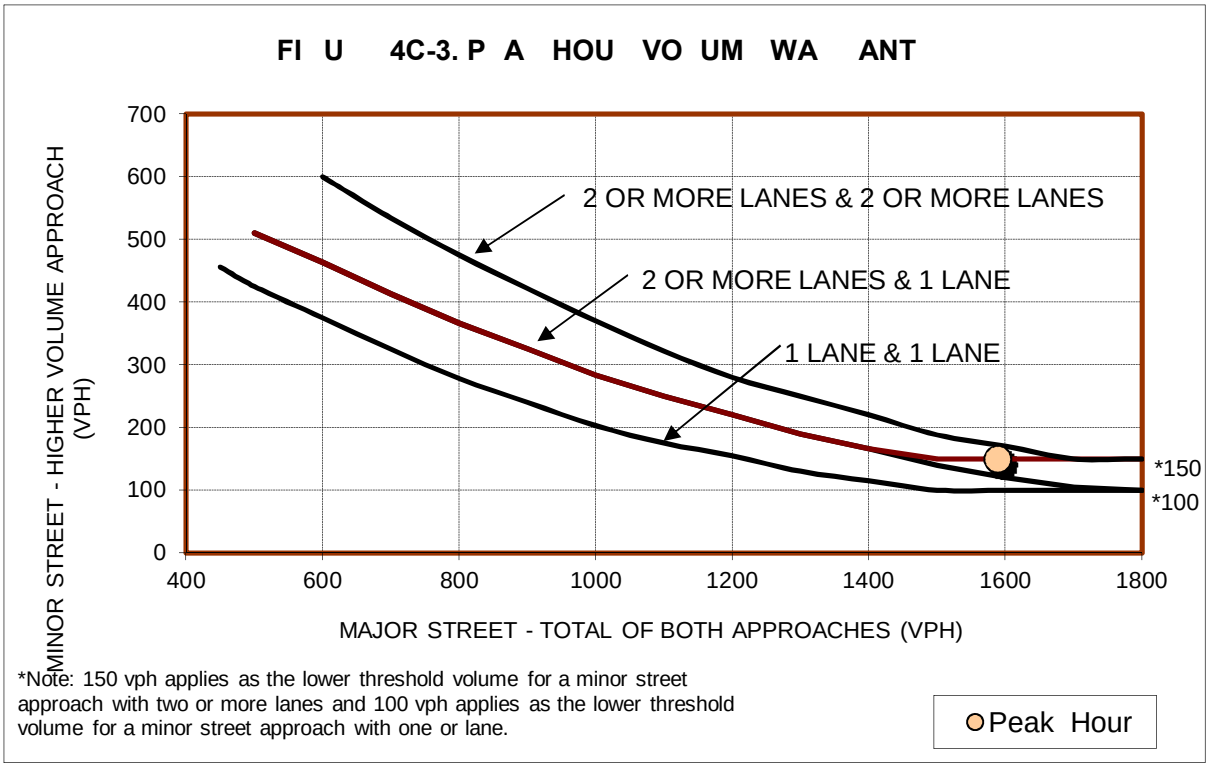
Intersection: California Blvd/Taft Street

Scenario: Existing PM

	No of lanes
Major Street	2
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
4:15 PM	1,589	149



*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one or lane.

Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

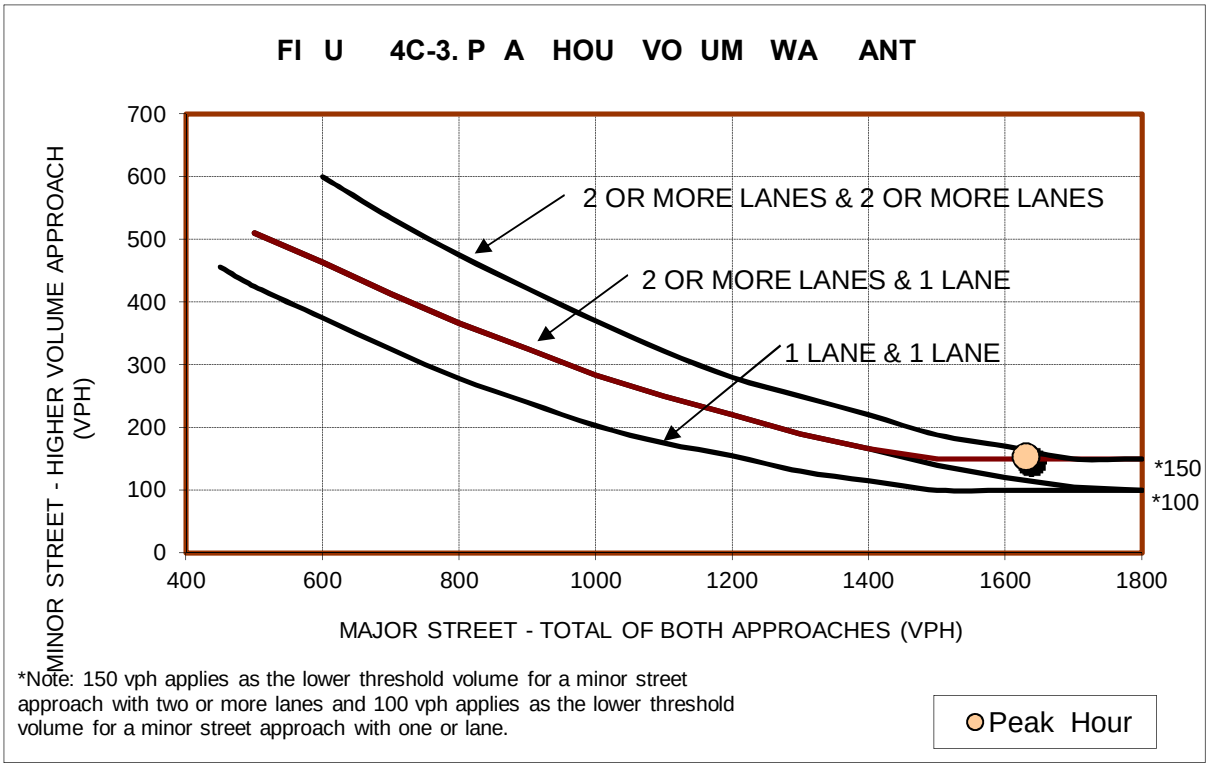
Intersection: California Blvd/Taft Street

Scenario: Existing with Project PM

	No of lanes
Major Street	2
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
4:15 PM	1,630	153



*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one or lane.

Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

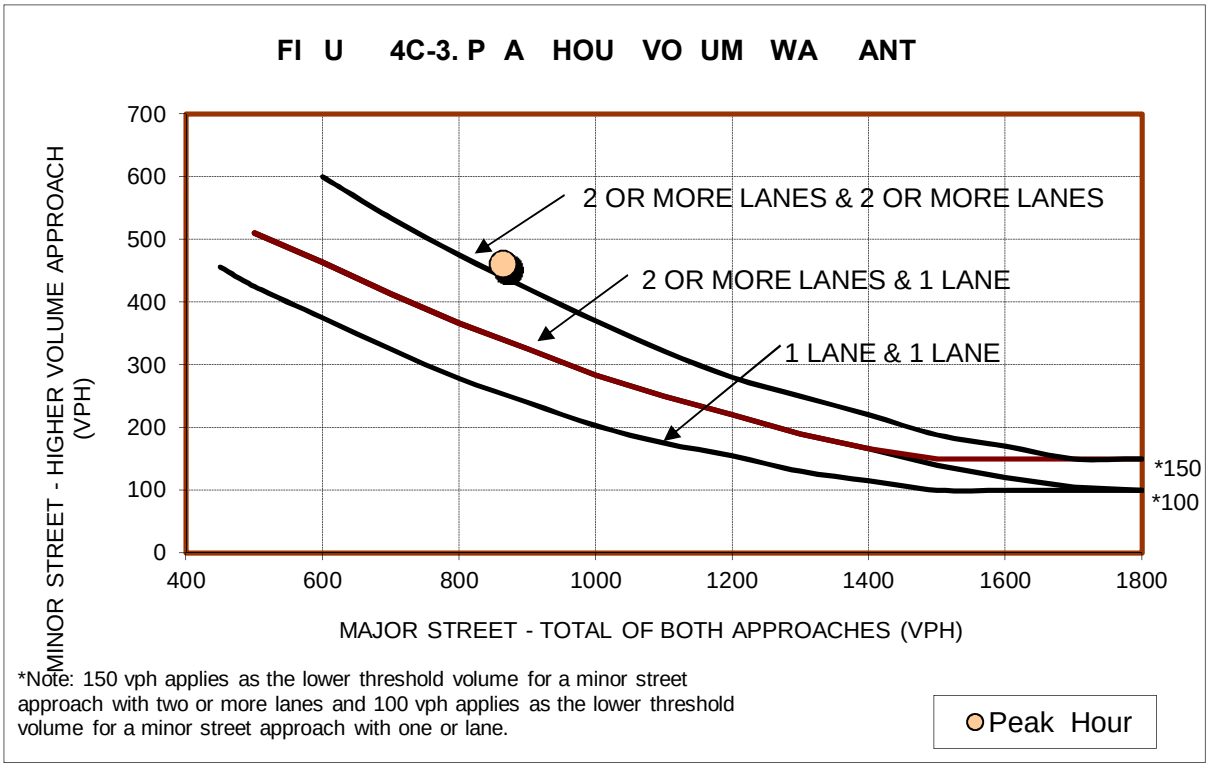
Intersection: California Blvd/US 101 NB Ramps

Scenario: Existing AM

	No of lanes
Major Street	1
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
7:15 AM	864	461



Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

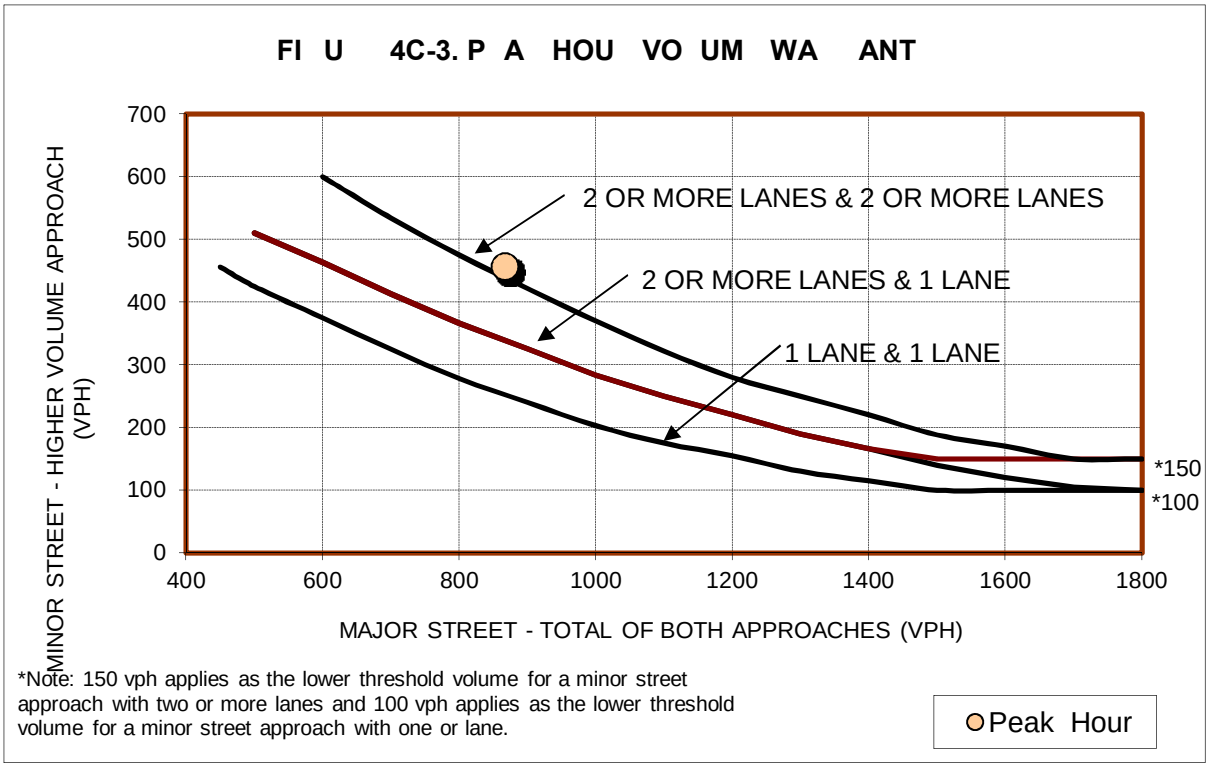
Intersection: California Blvd/US 101 NB Ramps

Scenario: Existing with Project AM

	No of lanes
Major Street	1
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
7:15 AM	867	457



Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

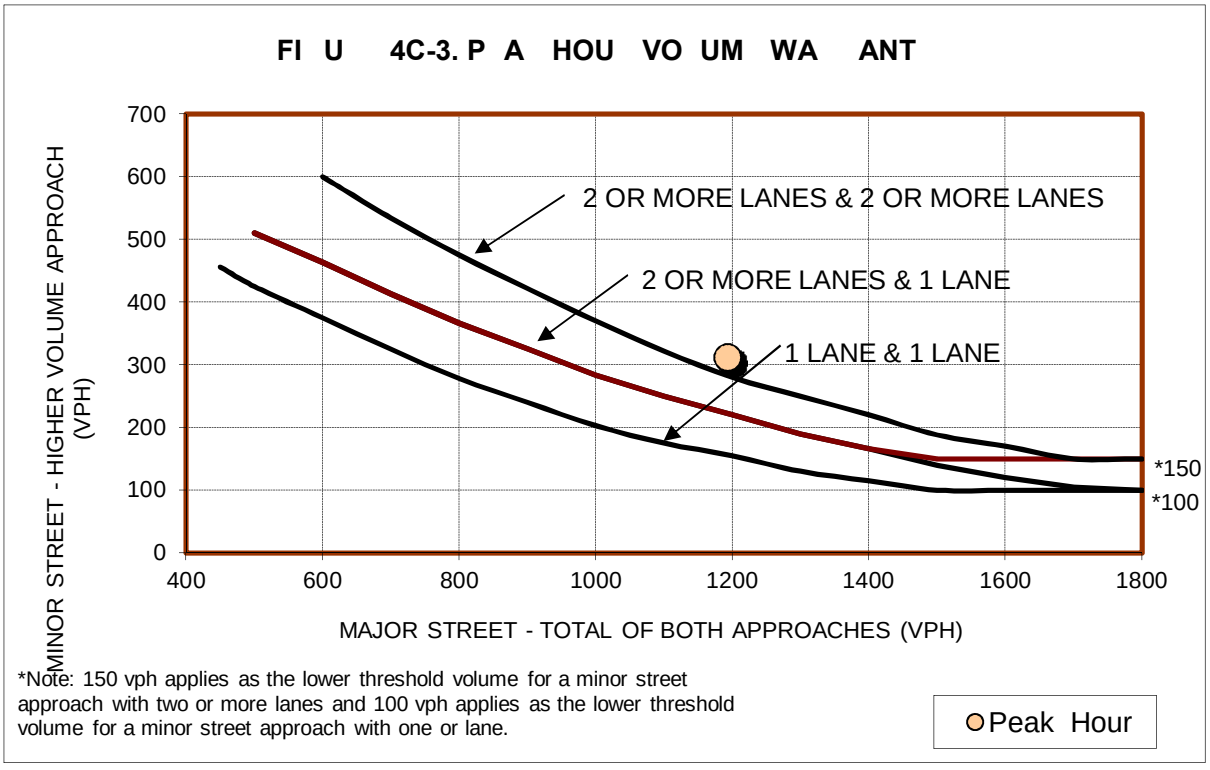
Intersection: California Blvd/US 101 NB Ramps

Scenario: Existing PM

	No of lanes
Major Street	1
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
4:30 PM	1,193	312



Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

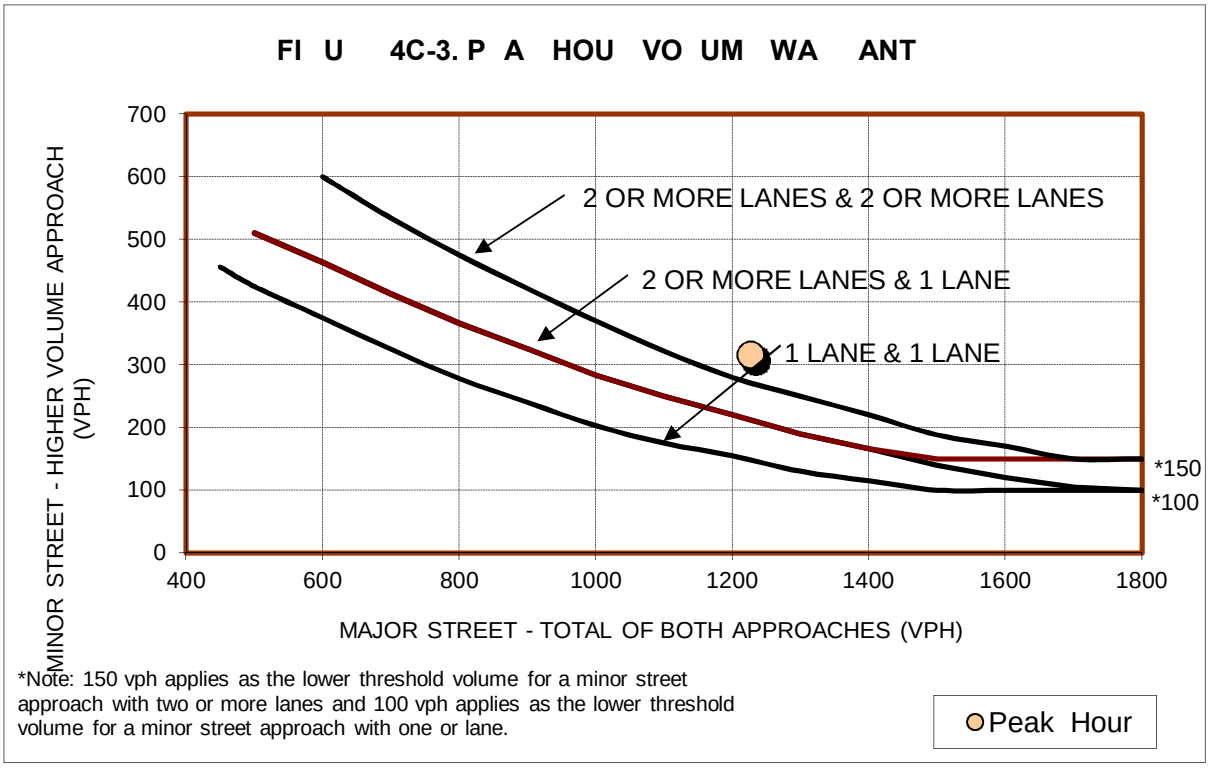
Intersection: California Blvd/US 101 NB Ramps

Scenario: Existing with Project PM

	No of lanes
Major Street	1
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
4:30 PM	1,227	316



Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

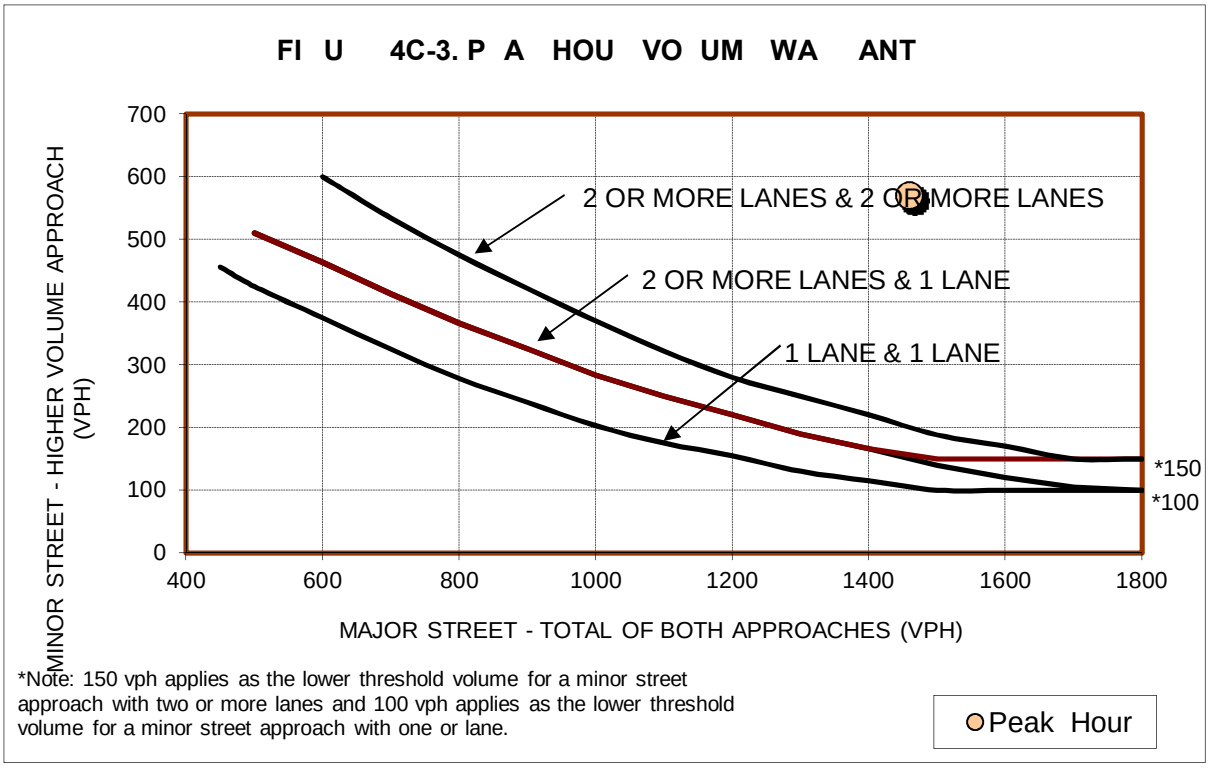
Intersection: California Blvd/Taft Street

Scenario: Cumulative W/O Project AM

	No of lanes
Major Street	2
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
7:30 AM	1,460	570



Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

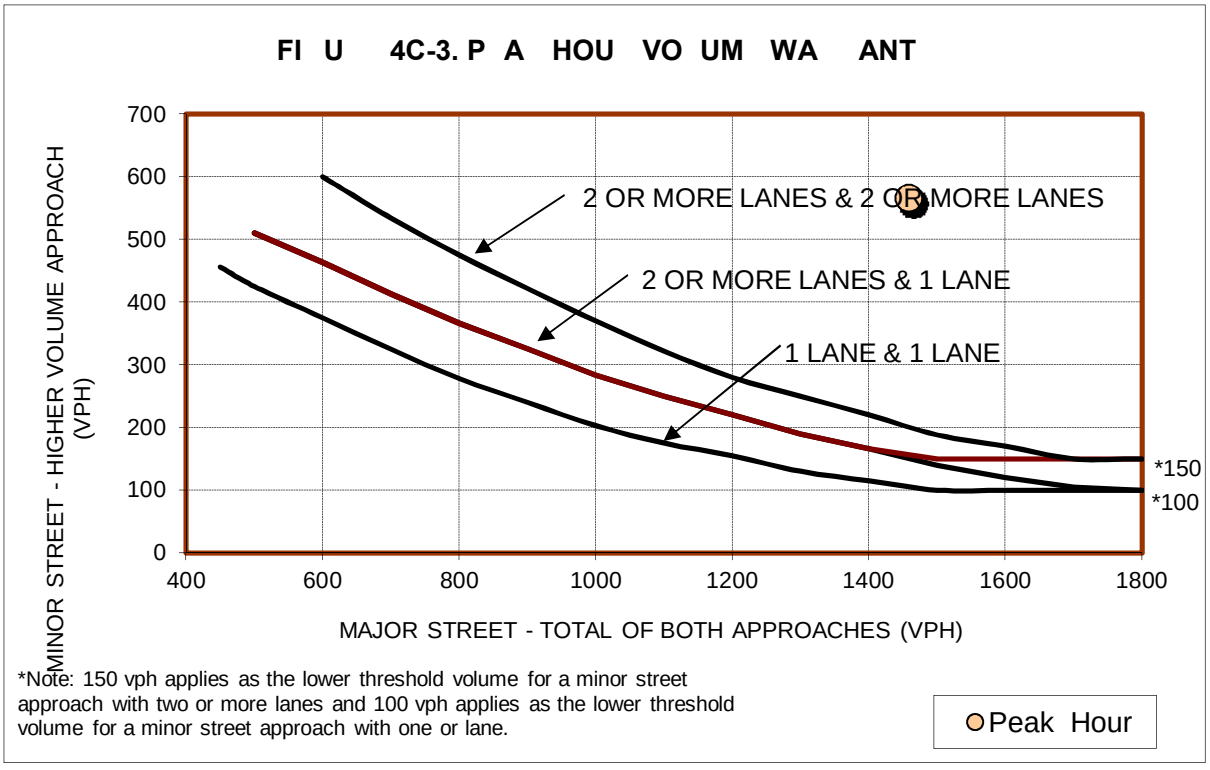
Intersection: California Blvd/Taft Street

Scenario: Cumulative W/ Project AM

	No of lanes
Major Street	2
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
7:30 AM	1,459	566



Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

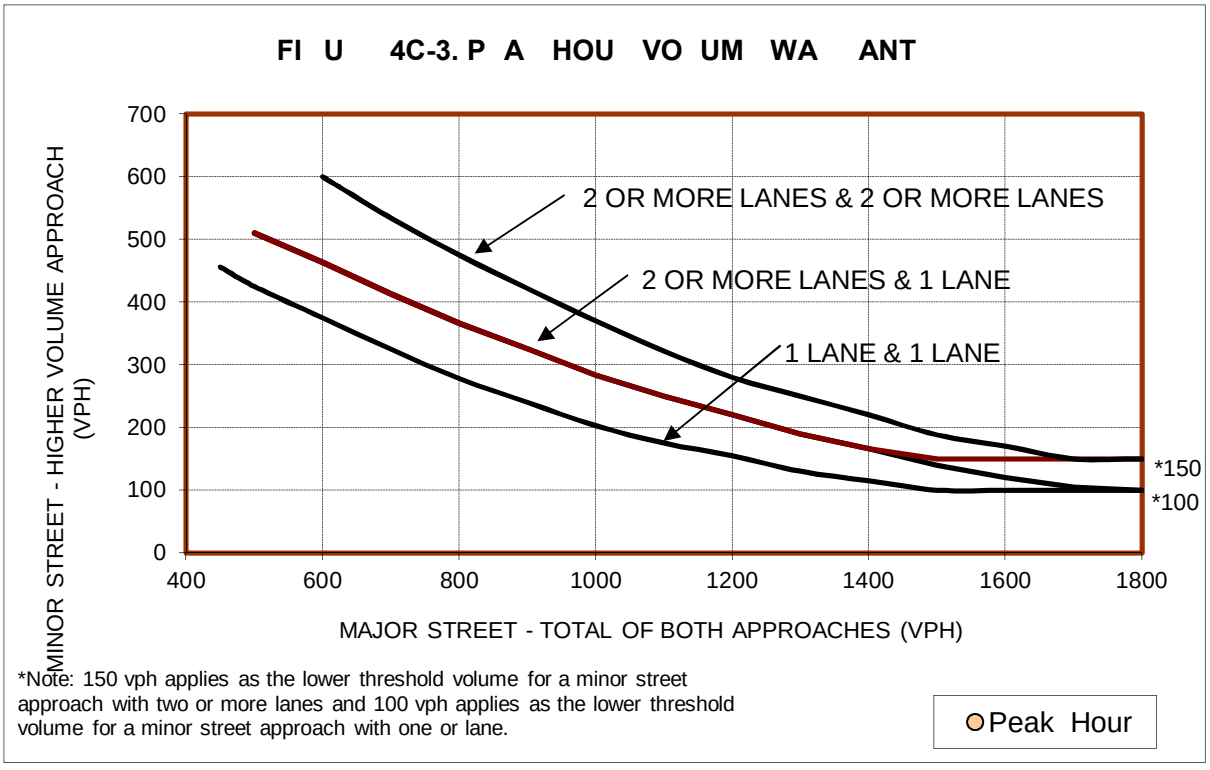
Intersection: California Blvd/Taft Street

Scenario: Cumulative W/O Project PM

	No of lanes
Major Street	2
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
4:15 PM	2,140	160



Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

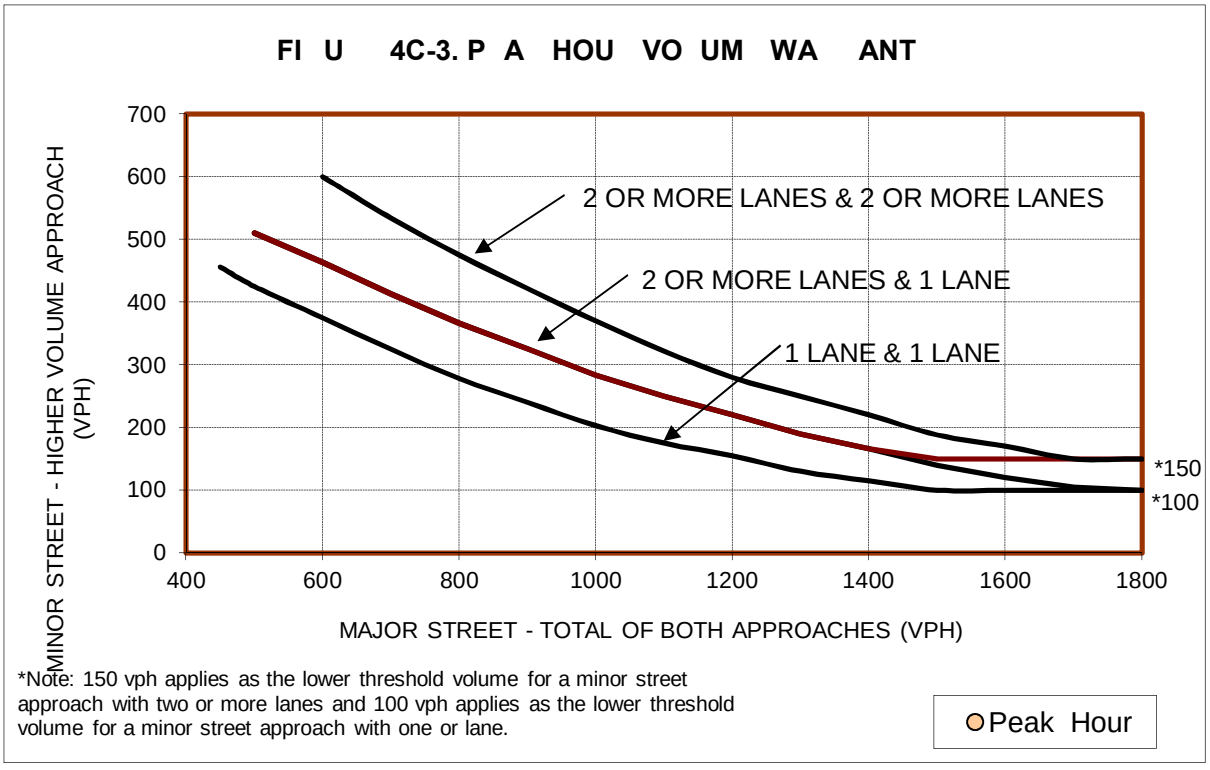
Intersection: California Blvd/Taft Street

Scenario: Cumulative W/ Project PM

	No of lanes
Major Street	2
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
4:15 PM	2,201	164



Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

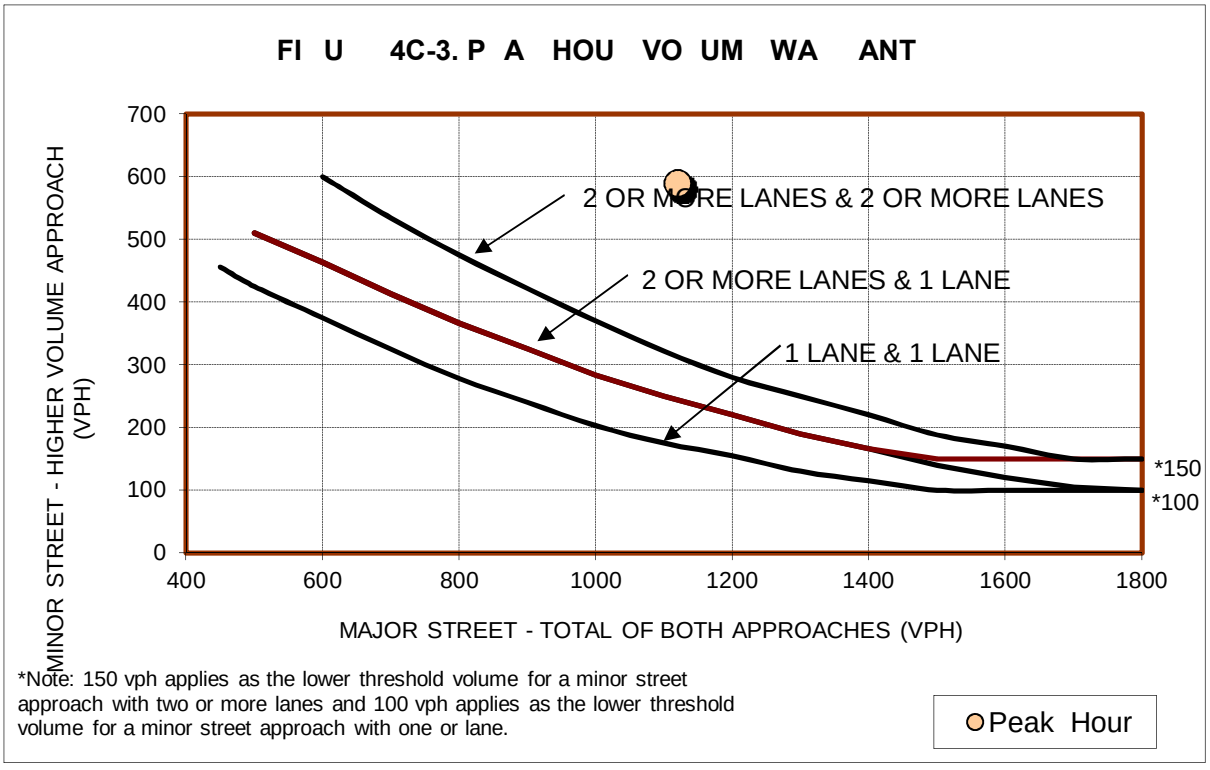
Intersection: California Blvd/US 101 NB Ramps

Scenario: Cumulative W/O Project AM

	No of lanes
Major Street	1
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
7:15 AM	1,120	590



Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

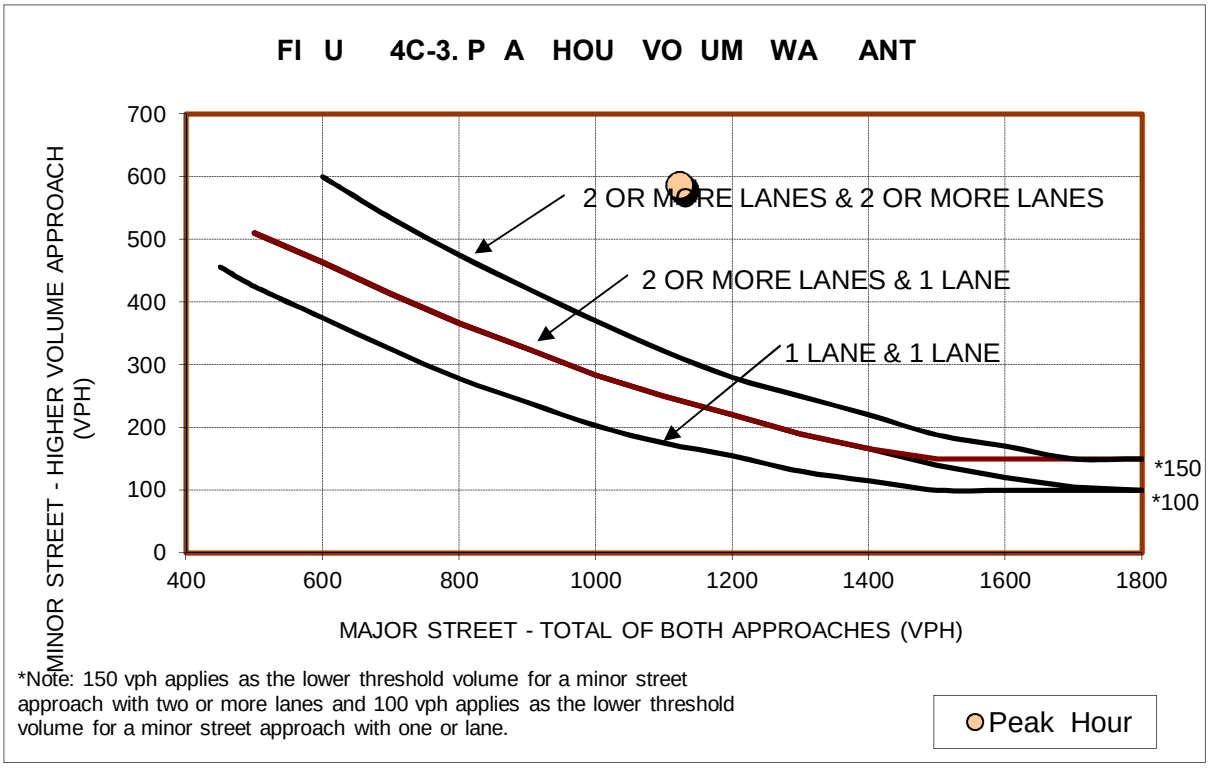
Intersection: California Blvd/US 101 NB Ramps

Scenario: Cumulative W/ Project AM

	No of lanes
Major Street	1
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
7:15 AM	1,123	586



*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one or lane.

Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

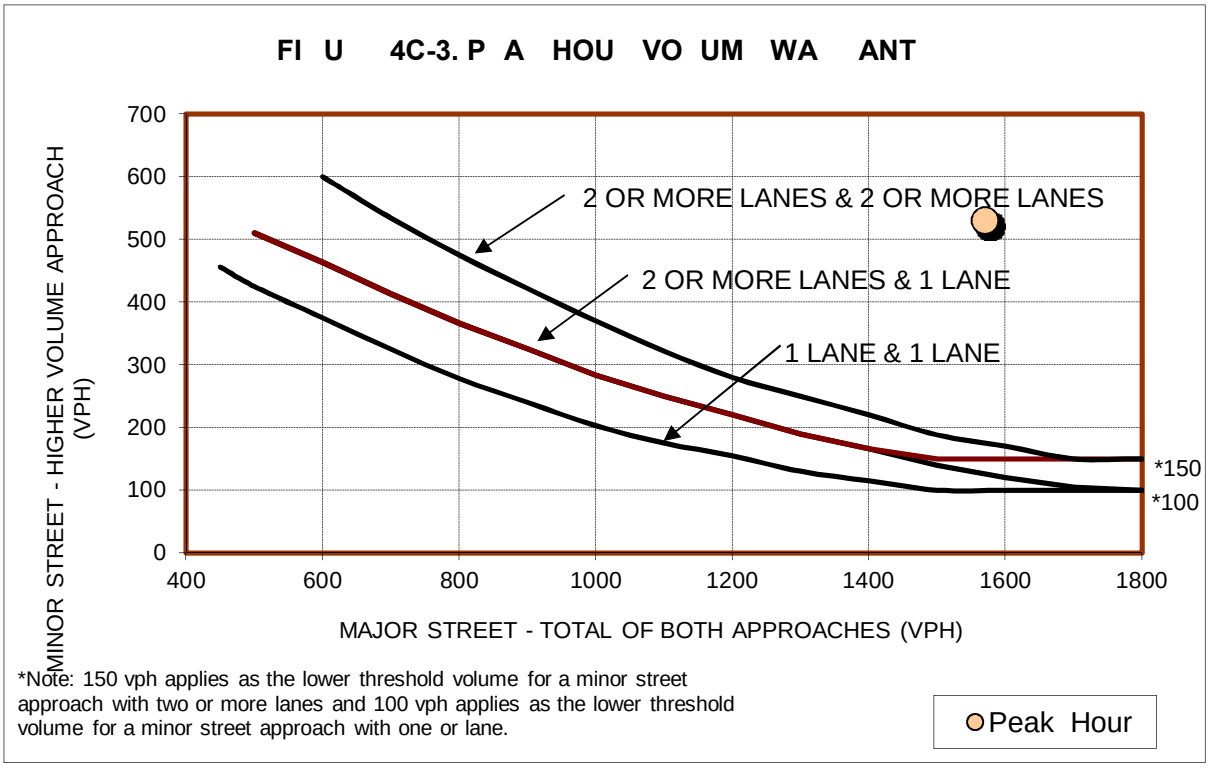
Intersection: California Blvd/US 101 NB Ramps

Scenario: Cumulative W/O Project PM

	No of lanes
Major Street	1
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
4:30 PM	1,570	530



Warrant	MET

Warrant 3: Peak Hour Volume

The peak hour volume warrant is satisfied when the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour of the higher volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the curve in Figure 4-5 for the existing combination of approach lanes.

Analysis

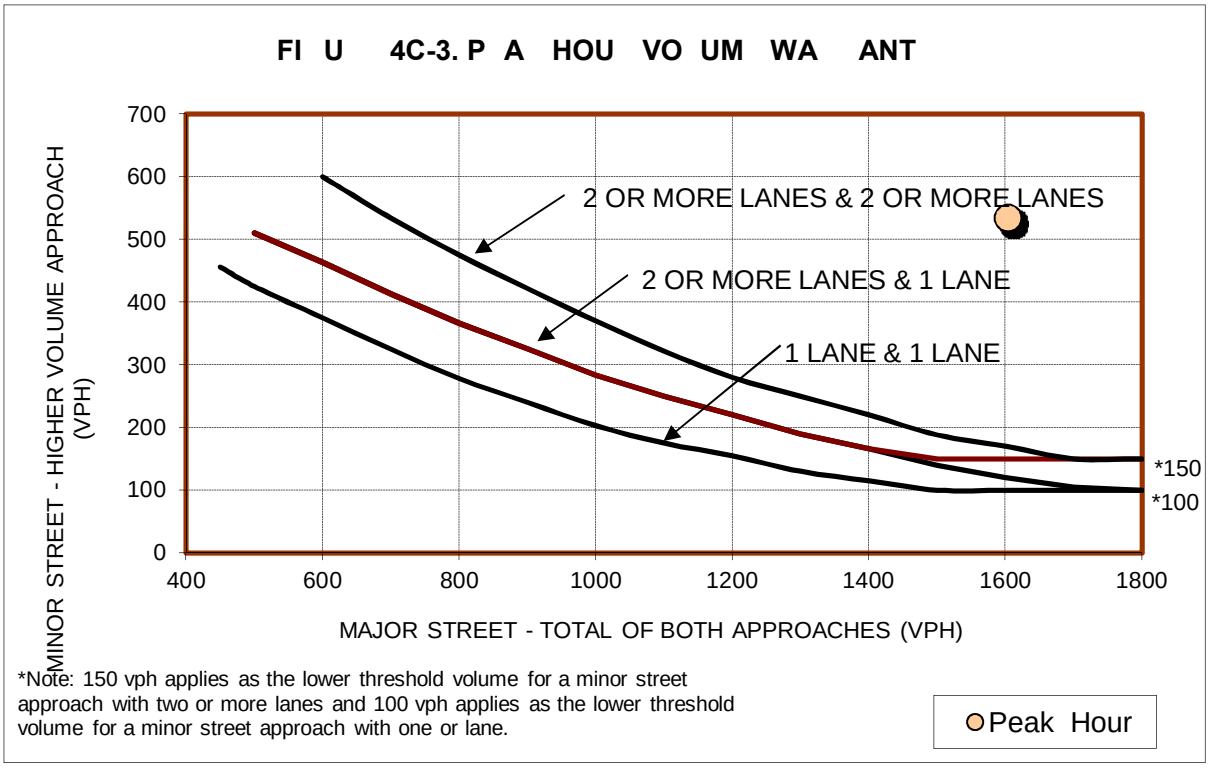
Intersection: California Blvd/US 101 NB Ramps

Scenario: Cumulative W/ Project PM

	No of lanes
Major Street	1
Minor Street	1

Peak Hour

Time	Vehicles Per Hour	
	Major Street (Sum of both approaches)	Minor street (High volume approach)
4:30 PM	1,604	534



*Note: 150 vph applies as the lower threshold volume for a minor street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one or lane.

Warrant	MET

APPENDIX G.
UTILITIES
BACKGROUND INFORMATION

This Water Supply Assessment (WSA) has been prepared pursuant to Section 10910 of the California Water Code to provide a discussion of water supply and the potential demand of the Student Housing South project. The purpose of this study is to determine the adequacy of existing and planned water supplies available to the University, and the University's ability to serve the proposed project.

The California Water Code and the Public Resources Code have been amended to implement Senate Bill (SB) 610, which took effect in January 2001. SB 610 was an effort to integrate land use and water supply planning to ensure adequate consideration of water resources in land use planning. Section 21151.9 of the Public Resources Code (relating to CEQA), Sections 10631 and 10656 of the Water Code (relating to Urban Water Management Plans), and Sections 10910, 10911, 10912 and 10915 of the Water Code (relating to the preparation of Water Supply Assessments) were amended or added to implement the law.

The California State University at San Luis Obispo is the lead agency for the project and the operator of the water system serving the project. It is not clear whether the water serving the project is considered a public water system, or if the provisions of the Water and Public Resources Code which implement SB 610 were intended to apply to campuses in the State University system that maintain their own water supplies and systems of land use control. However, due to the size of the project, an analysis is deemed useful and appropriate. This assessment is therefore provided, and has been prepared pursuant to applicable WSA guidelines.

The assessment provides evidence for decision-makers to answer the following question:

- Will the water supplier's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection meet the projected water demand of the proposed project, in addition to the water supplier's existing and planned future uses, including agricultural and manufacturing uses?

Based on the analysis in this assessment, the University has sufficient supply to serve the project's water demand, in addition to future uses, during normal, single dry and multiple dry water years through 2035. Previous documents, including the Poly Canyon Village EIR (2003) and the Master Plan EIR (2001) identified a modest deficit in water supply by 2015 or at Master Plan buildout. Water demand has, in fact, remained fairly constant even with the addition of substantial numbers of new beds and facility square footage on campus. Water savings and the continuation of a robust surplus have been attributed to campuswide efforts to retrofit fixtures, upgrade mechanical systems, improve agricultural water use efficiency, and otherwise conserve water. Current surplus water supply averages over 300 acre-feet per year (AFY).[1]

[1] An acre foot is equal to 325,851 gallons. An acre foot, or AF, is the primary measure used in this document.

The objective of the WSA is to provide substantial evidence in the record of the sufficiency of water supplies available to serve the project. This assessment has been prepared consistent with steps outlined in the *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001*, by the California Department of Water Resources (October 2003). The *Guidebook* is quoted or paraphrased throughout the document. To achieve the stated objective, the following tasks were completed:

- Obtained all pertinent water rights, entitlements and agreements
- Requested an obtained water use records
- Interviewed Cal Poly staff regarding water rights, water supply, and projected demand
- Reviewed previous assessments prepared for campus projects (Poly Canyon Village 2003)
- Identified reasonable demand factors for water use projections
- Calculated projected demand based on reasonable demand factors and planned projects, enrollment and staffing

Three appendices are included in this report. Appendix A presents all assumptions made in calculations, and Appendix B presents water use records and campus planning documents. Appendix C includes all pertinent water rights documentation. A bibliography and personal communication list is included at the end of this document.

The assessment must "identify and quantify the existing and planned sources of water available to the water supplier in 5-year increments for the 20-year projection. For each identified water supply detail the quantity available and whether it is a

- Water supply entitlement
- Water right
- Water service contract

and whether or not the source has been used in the past."

Table 1. Annual Amount under Each Right, Entitlement, and/or Contract

Source	AFY	Entitlement	Right	Contract	Used?
Whale Rock	1,384	X			Yes
Groundwater	250 (avg)		X		Yes – Ag
Surface Water	Unknown		X		Yes – Ag
Supplemental Storage (Reservoirs)	40	NA	NA	NA	Yes – Ag and Irrigation
Total	**1,631 +**				

Notes: See below for justification of Whale Rock amount; groundwater is from two wells, no specific limits on pumping; Surface water rights are an unknown amount; Supplemental storage based on information provided in the Cal Poly Water Quality Management Plan

Total water currently available for domestic use = 1,384 AFY, however, the entire amount available for domestic use is limited by existing agreements covering treatment infrastructure to 1,000 AFY

The assessment must also: "Summarize the past, current and projected deliveries from each supply source (entitlement, right or contract amounts might overstate or understate the quantity that can actually be delivered during normal years)." A more detailed summary of water deliveries is provided in the following paragraphs.

Whale Rock. The University is a 33% owner in Whale Rock Reservoir, located east of Cayucos in San Luis Obispo County. The University owns 13,707 acre feet (AF) in the reservoir for its discretionary use.[2] A "safe annual yield" for Cal Poly's share of the Reservoir has not been formally established. However, the City of San Luis Obispo has developed a model for water supply planning that charts the historic climate and discharge/recharge patterns of the Reservoir, including multiple-year drought cycles, enabling water users to estimate their annual supply. This model was run for the Master Plan EIR in 2001, and resulted in an annual yield of 1,384 AFY (shown in Table 1). Worst-year demand for the University occurred in 2009, when demand totaled 1,211 AF, divided by use as follows: 51% for agriculture (untreated), 26% for landscaping, and 24% for indoor use. Average total demand for the last three years on record (2009-2011) was approximately 1,071 AF. Average agricultural demand (501 AF) for the same period currently exceeds internal agreements that limit use of Whale Rock water for agricultural purposes to 470 AFY. The agriculture department maintains wells and reservoirs that provide supplemental supply, and is implementing several projects designed to monitor use and improve system efficiency. Increased efficiencies in the use of these supplemental sources may enable Cal Poly to reduce agricultural demand during drought conditions.

Water from Whale Rock Reservoir is treated at the Stenner Canyon water treatment facility owned and operated by the City of San Luis Obispo. Peak treatment capacity is 16 million gallons per day (gpd). Since water is conveyed to the University through the City's treatment plant and distribution system, the actual source of treated water arriving at the campus may be Whale Rock Reservoir, Salinas Reservoir, or Nacimiento Lake. Cal Poly is

[2] Cal Poly Master Plan EIR, 2001

entitled to 1,000 AFY in treatment at the plant. Domestic demand averaged 558 AFY over the last seven years on record or 56% of Cal Poly's capacity.

Groundwater. Information regarding groundwater is provided in the next section of this assessment.

Surface Water Rights. Cal Poly owns surface water rights along Stenner and Brizzolara Creeks. This water is not available for the project since the University lacks sufficient infrastructure for treatment and delivery.

Supplemental Storage. Supplemental storage is provided by the reservoir system on campus. This water is not available for the project since the University lacks sufficient infrastructure for treatment and delivery.

Records are only available for Whale Rock water and groundwater withdrawal from two wells on the main campus; other sources of water are not metered (NM) and therefore past and future deliveries cannot be quantified. Groundwater is used to supplement non-potable agricultural demand.

Table 2. Water Received – Actual

Source	2006	2007	2008	2009	2010	2011
Whale Rock (Treated)	509	552	616	599	551	558
Whale Rock (Untreated)	330	402	424	612	376	517
Groundwater	NM	NM	NM	NM	NM	125
Surface Water Rights (Stenner and Brizzolara Creeks)	NM	NM	NM	NM	NM	NM
Supplemental Storage (Reservoirs)	NM	NM	NM	NM	NM	NM
Total	**839**	**954**	**1,040**	**1,211**	**927**	**1,075**

Source: Cal Poly Utilities (tables attached as Appendix A)

NM = Not Metered

Projections are shown in Table 3. Projected water supplies include increased pumping of groundwater for agricultural use. Projected groundwater pumping is based on system capacity, and historical averages, as outlined in the following section. It is important to note that groundwater is available for agriculture and irrigation only; as the University lack treatment facilities necessary to render it potable.

Table 3 – Actual Water Received and Projected Water Available

Source	2010	2015	2020	2025	2030	2035
Whale Rock (Treated)	551	914	914	914	914	914
Whale Rock (Untreated)	376	470	470	470	470	470
Groundwater (Non-potable)	NM	247	247	247	247	247
Surface Water Rights (Stenner and Brizzolara Creeks)	NM	UK	UK	UK	UK	UK
Supplemental Storage (Reservoirs)	NM	UK	UK	UK	UK	UK
Total	**927**	**1,631**	**1,631**	**1,631**	**1,631**	**1,631**

Source: Actual Water Received for 2010 is based on figures submitted by Cal Poly Utilities. Projected groundwater pumping data is based on figures provided in the Poly Canyon Village EIR (2003). The 2003 EIR utilized records of energy demand from the two groundwater pumps to determine average usage. Usage ranged from 86 AF in 1997-1998 to 590 AF in 2002-2003.

NM = Not Metered
UK = Unknown

Domestic (treated) water supplies are expected to remain static. The University has no plans to develop new potable water supplies or alter existing entitlements. Total water available is expected to remain an average of 1,631 AFY for each of the projected five-year increments through 2035. Total potable water available for domestic use is capped at 1,000 AFY by existing agreements for treatment capacity at the City's Stenner Creek treatment plant.

Groundwater is not expected to serve as a source of water for the project; the University lacks the treatment infrastructure to make groundwater potable. It is, however, an existing component of the supply for irrigation and agriculture and plays an important role in understanding total water availability. The 2003 EIR prepared for the Poly Canyon Village project included a Water Supply Assessment which estimated groundwater use. Based on review of power consumption, the 2003 Water Supply Assessment was able to estimate annual pumping from the two, unmetered groundwater wells. Average withdrawals were estimated at approximately 250 AFY, including a low of 86 AF in 1997-1998 and a high of 590 AF in 2002-2003. Meters have recently been installed on the two wells, and withdrawals have been measured at approximately 125 AF for the last year (2012-2013). Total pumping capacity is currently being assessed.

The San Luis Obispo Valley Groundwater Basin (Stenner Creek Sub-basin) is the source of groundwater currently used on the main campus. Information regarding the groundwater basin serving the campus can be found in Appendix B. The basin is not adjudicated, in overdraft or otherwise under a groundwater management plan. The sustained yield of the basin is 5,900 AFY; current extractions total approximately 5,800 AFY. Groundwater pumping capacity is therefore limited only by existing pumping infrastructure.

The following tables outline existing and projected demand through 2035. Assumptions used in projecting demand are noted in the tables and discussed further in Appendix A. Projects included in the 2015 and 2020 are based on information from Mr. Joel Neel, Director of Facilities Planning and Capital Projects. The 2025 scenario consists of buildout of the current Master Plan. The 2030 and 2035 scenarios are based on additional enrollment and staffing increases at a pace similar to the Master Plan projections. Projections of demand and supply differ from the Master Plan EIR because of the availability of more accurate and detailed demand and performance factors, as well as modifications in the capital projects program.

Enrollment is difficult to predict; factors such as the economic downturn have played an important role in the annual enrollment scenario. The Master Plan projected enrollment at 20,912 by 2020; actual enrollment has varied, with a high of 19,777 in 2007 and a low of 18,262 in 2011. Table 4 outlines the total enrollment for the last seven years on record.

Table 4. Enrollment Patterns, 2005-2011

Year	Total Enrollment, Headcount	Percent Increase (Decrease)
2005-2006	18,475	
2006-2007	18,722	1.3
2007-2008	19,777	5.6
2008-2009	19,471	(1.5)
2009-2010	19,325	(0.7)
2010-2011	18,360	(4.9)
2011-2012	18,262	(0.5)
2012-2013	18,679	2.3
2013-2014	18,975 (est)	1.6
Increase/Decrease over Period	500	2.7

Source: Cal Poly IP&A, Cal Poly Registration Monitor Fall 2011, and Fall 2010 Census Enrollment InfoBrief. Both available online at www.calpoly.edu/ipa

The historic variability in enrollment must be taken into account when projecting water demand on campus. For the purposes of this analysis, enrollment is assumed to grow at a rate of 1.5% consistent with Master Plan projections. Faculty and staff are calculated at 0.07 faculty per enrolled student. Agriculture and irrigation demands are held constant after 2015; Cal Poly will continue to improve landscape and agricultural irrigation efficiency and no new significant areas of landscaping or agricultural water demand have been identified; water supply available from groundwater sources is considered 247 AFY, consistent with historical averages. No information regarding facilities or other capital improvements are available beyond 2020. The University anticipates revision of its Master Plan prior to 2020.

Table 5. Existing Demand (AFY)

Type	2009	2010	2011
Indoor	289	300	277
Irrigation	310	251	281
Agriculture	612	376	517
Total Demand	1,211	927	1,075
Total Supply – Whale Rock	1,384	1,384	1,384
Total Supply – Groundwater and Other Sources	247	247	247
Surplus (Deficit)	**420**	**704**	**556**

Source: Cal Poly Utilities, see Appendix A

Table 5. 2015 Projected Demand (Project Year 1)			
Use	**Number**	**Demand Factor**	**Total Water Usage**
Existing Domestic (Three Year Average)			289
Student Housing South	1,475	0.04 AFY	59
Existing Students Captured	1,475	0.03 AFY	(44.25)
Pipeline Projects	14 staff and faculty	0.03 AFY	0.42
SHS - Staff/Faculty	30	0.03 AFY	0.9
General Staff and Faculty	20	0.03 AFY	0.6
Enrollment	285	0.03 AFY	8.55
Domestic Total			**314**
Existing Agriculture/Irrigation			782
Irrigation – Student Housing South	5.5 acres	1.4 AFY	7.7
Non-potable Total			**790**
Total Demand			1,104
Total Supply			1,384
Groundwater			247
Surplus/Deficit			**527**
Notes (a) Center is consolidation of existing functions, no net water impact (b) Project involved significant upgrades in water conserving methodologies, including pool management (c) Project involved significant upgrades in water conserving methodologies, including laboratory water use efficiency			

Table 6. 2020 Projected Demand			
Use	**Number**	**Demand Factor**	**Total Water Usage**
Total Demand, Table 5			1,104
Academic Center and Library			New water demand from these facilities are accounted for in increased potential for enrollment – facilities do not present significant new water demand based on use
Northeast Polytechnic Ctr			
Music Center			
Graphic Arts			
Science North			
Staff/Faculty	104	0.03 AFY	3.12
Enrollment	1,488	0.03 AFY	44.6
Total Demand			1,151
Total Supply			1,384
Groundwater			247
Surplus/Deficit			**480**

Table 7. 2025 Projected Demand			
Use	**Number**	**Demand Factor**	**Total Water Usage**
Total Demand, Table 6			1,151
Staff/Faculty	112	0.03 AFY	3.36
Enrollment	1,603	0.03 AFY	48.1
Total Demand			1,202
Total Supply			1,384
Groundwater			247
Surplus/Deficit			**429**

Table 8. 2030 Projected Demand			
Use	**Number**	**Demand Factor**	**Total Water Usage**
Total Demand, Table 7			1,202
Staff/Faculty	121	0.03 AFY	3.6
Enrollment	1,727	0.03 AFY	51.8
Total Demand			1,257
Total Supply			1,384
Groundwater			247
Surplus/Deficit			**374**

Table 9. 2035 Projected Demand			
Use	**Number**	**Demand Factor**	**Total Water Usage**
Total Demand, Table 8			1,257
Staff/Faculty	130	0.03 AFY	3.9
Enrollment	1,860	0.03 AFY	55.8
Total Demand			1,316.7
Total Supply			1,384
Groundwater			247
Surplus/Deficit			**314**

The Whale Rock annual yield of 1,384 AFY reflects worst-case weather conditions, including a thirteen-year drought cycle, and therefore is inclusive of single and multiple dry year supplies. The model cannot be altered to account for normal, single dry or multiple dry years.

In general, agricultural operations are expected to require more water in short-term droughts, with less water required during long-term droughts as certain practices or crops are changed to account for weather conditions. Landscaping demands may likewise increase, although the general landscaping trend on campus is towards more drought tolerant landscaping and Cal Poly has been highly successful at curtailing landscape water use when necessary in the past.

The projected water supply is sufficient through 2035.